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MONOGRAPH SERIES

New Approaches to Treatment of Chronic Pain:

A Review of Multidisciplinary Pain Clinics and Pain Centers

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service • Alcohol, Drug Abuse, and Mental Health Administration

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A Review of Multidisciplinary Pain Clinics and Pain Centers

Editor:
Lorenz K.Y. Ng, M.D.
National Institute on Drug Abuse

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Foreword

At one time or another, pain is a matter of intense personal interest and concern to almost every one of us. Acute pain warns of a physical condition needing correction; yet all too often pain becomes chronic, a persistent and seemingly useless burden that inflicts suffering and disability out of all proportion to any discoverable physical pathology. Taken together, the costs of chronic pain to individuals and their families, to employers, insurers, and treatment providers are enormous.

The person who suffers such pain seeks help, often with increasing desperation, through a health care system which is now awakening to the importance of chronic pain as a medical entity that demands a new body of knowledge reflected in professional training and in new approaches to treatment. In traditional treatments, medications, often including narcotic drugs, have played a prominent part. A large proportion of patients become psychologically dependent upon these drugs and some become physically addicted.

Multidisciplinary pain clinics or centers, often university-based, are emerging as institutions in which new understanding of the nature of pain and pain-related behavior is being developed and applied. Neurologists, orthopedic and neurological surgeons, psychiatrists and psychologists, anesthesiologists, social workers, specialized nurses, physical and occupational therapists, vocational counselors, and others, all may be part of the therapeutic team; but the patient's own active role in achieving a level of function as nearly normal as possible is central. As part of this process, elimination of all or most analgesic medication is stressed.

The particular interest of the National Institute on Drug Abuse in the work of the pain centers is based on its mandate to encourage research on narcotic and other drugs, the use or misuse of which may result in drug abuse or dependence, and to publish information about such research and its practical applications.

In this monograph, the pain clinics and centers report on their staffing and organization, the problems for which patients are treated, drugs taken by entering patients, therapeutic approaches used, costs of treatment, and methods for long-term evaluation of treatment effectiveness. Goals for future research and professional and public education are also presented.

Strong beginnings have been made in this field. We hope that this sharing of ideas among active treatment practitioners will lead to further progress in alleviating the suffering caused by that most widely shared of human afflictions: pain.

Marvin Snyder, Ph.D.
Director, Division of Research
National Institute on Drug Abuse

Preface

Despite recent encouraging trends in pain research and therapy, the management of patients with acute and chronic pain remains one of the most pressing issues of the American health care system. This importance stems from the fact that acute and chronic pain that requires therapy by physicians and other health professionals afflicts some 45 percent of Americans annually. In many patients with chronic pain, and in some with acute pain, it is inadequately relieved. Consequently, pain is the most frequent cause of suffering and disability which seriously impairs the quality of life of many Americans.

Accurate statistics from national epidemiologic studies on the prevalence of pain and its impact on the national economy are not available; however, data from numerous local and regional surveys and those published by various Federal and private agencies permit one to extrapolate and compute reasonable cost estimates. These indicate that acute and chronic pain costs the national economy between $85-90 billion annually. The available data suggest that nearly one-third of the American population has persistent or recurrent *chronic* pain. Over 50 million individuals are either partially or totally disabled for periods of days, weeks, or months, and some permanently. In most patients with back disorders, arthritis, headache, cancer, and other chronic painful conditions, it is *not* the underlying pathology but the pain that primarily impairs the patient's carrying out a productive life. On the basis of these data, it is estimated that as a result of chronic pain, well over 700 million work-days are lost which, together with health care costs and payments for compensation, litigation, and quackery, total nearly $60 billion annually.

Even more important is the cost in human suffering. It is a distressing fact that in this age of marvelous scientific and technologic advances, millions of patients suffer persistent pain which produces serious physical, emotional, and affective disorders. Moreover, in addition to the economic impact, pain has serious emotional and sociologic effects on members of the family.

Despite its overwhelming clinical importance, pain research, until recently, was virtually neglected, and the advances in diagnosis and therapy have not been commensurate with most other biomedical scientific achievements.

Many patients with non-malignant chronic pain do not respond to the usual medical therapy and, indeed, an impressive number are exposed to high risks of iatrogenic complications including drug toxicity, drug addiction, and multiple, often useless, and sometimes mutilating operations, A significant number of these patients give up medical care and consult quacks. Some become so discouraged and so desperate as to contemplate, or even commit, suicide.

Patients with cancer pain, which must be considered a form of chronic pain, fare no better. Indeed, there are numerous reports which indicate that many of the 250,000 Americans who have severe pain from advanced cancer live the last part of their lives with pain that is unrelieved.

The reasons for this serious deficiency in our health care system can be grouped into three major categories: (1) voids in our knowledge about pain and its mechanisms; (2) inadequate or improper application of the knowledge and therapies currently available; and (3) problems with communication. Until very recently, pain research was neglected by the biomedical scientific connmmity, the National Institutes of Health (NIH), and other Federal and private research agencies. This fact was acknowledged by the then newly formed Interagency Committee on New Therapies for Pain and Discomfort when it stated that pain research had been exposed to 'benign neglect," which I consider to have been a "malignant neglect." Equally important has been the fact that knowledge currently available has not been properly applied. This is due to a lack of organized teaching of medical students, physicians, and other health professionals in the basic principles of diagnosis and therapy of acute and chronic pain. Inadequate communication among investigators, and between investigators and clinicians, has contributed to the problem. Progressive specialization in the basic and clinical sciences has precluded interaction and cross-fertilization of ideas and dissemination of information among the various basic science groups and clinicians. Other major communication problems have included the lack of an international standard terminology for pain syndromes and the lack of national and international pain data banks or data pools for the storage and retrieval of research and clinically relevant information.

Fortunately, during the past decade or so, there has been a surge of interest among some basic scientists in studying the mechanisms of acute and chronic pain syndromes and in collaborating with clinical investigators and practitioners to begin to solve some of the major problems. As a result, we have acquired more information about pain during this period than in the previous century. Moreover, an impressive number of physicians have manifested interest in acquiring more knowledge about pain and its treatment. We are also gratified by the growth of multidisciplinary and monodisciplinary pain clinics.

I must, however, interject a note of concern that some of these facilities are being run by physicians and other health professionals who have had no training or experience in managing patients with chronic pain. Some well-intentioned but unqualified physicians have been attracted to this field because having a pain clinic or pain center is the "in" thing to do. Among these individuals are highly reputable chairmen of departments of anesthesiology, neurosurgery, or other specialities who wish to broaden the base of their department by having such a facility. Of even greater concern is the fact that some facilities are being run by unscrupulous physicians and non-physicians who are using the current surge of interest in pain merely to make money, as occurred with acupuncture clinics during the height of the public's interest in acupuncture in 1972-75. Such individuals do not hesitate to exploit patients who are always looking for something new to grasp in order to relieve their persistent pain. These facilities will surely be detrimental to the general cause of pain research and therapy, to the current international movement in the field, and, most importantly, to the good of individual patients.

In regard to communication, the Committee on Taxonomy of the International Association for the Study of Pain (IASP) is working vigorously and making good progress under the chairmanship of Professor Harold Merskey. They have developed a list of definitions, published in the journal Pain and, more recently, in the Journal of the American Medical Association. Moreover, as a preliminary step in developing a classification, the committee has developed a scheme for coding pain diagnoses which consists of five axes related to pain: (1) region of the body; (2) system involved; (3) temporal characteristics of pain and patterns of occurrence; (4) patient's statement of intensity and time since onset of pain; and (5) etiology. Recently, the committee has requested a number of international authorities to provide a description of the various pain syndromes. It is hoped that this task will be completed by the time of the Third World Congress of IASP which will be held in Edinburgh in September 1981, so that classification can be officially adopted by IASP and then submitted to the World Health Organization (WHO) for worldwide use.

I am sure you will agree that in the future we must not only sustain but markedly increase the current momentum to expand the gains we have made. We must mount and support a multifaceted program consisting of greatly expanded research and research training programs, activation of highly effective teaching programs for students and practitioners, and improvement of the various systems of communication. Since the number of pain scientists in this country and throughout the world is very small, we must develop pain research training programs. Professional education is the crucial issue because most of the physicians simply do not know the basic principles of managing acute and chronic pain. Teachers in health professional schools apparently believe that the few lectures on neuroanatomy and neurophysiology of pain and clinical pharmacology of narcotic and non-narcotic analgesics given to medical students adequately prepare them for the management of acute and chronic pain in clinical practice. There is, however, overwhelming evidence that this is not the case.

Finally, there is the equally important task of informing the public; members of Congress; people in Federal, State, and municipal governments; insurance carriers; science writers; and many others so they will understand the magnitude of the human and economic impact of pain. The recommendations from this workshop are presented in the appendix to the monograph. These recommendations address the important issues of research, professional education and training, and public education. I believe that the technical workshop and the monograph on multidisciplinary pain centers and clinics can make an important contribution to the efforts to deal with this serious national health problem.

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Appendix--Workshop Recommendations

A Perspective on Chronic Pain: Treatment and Research

Lorenz K.Y. Ng, M.D.

Pain, both acute and chronic, afflicts about one-third of the population of the United States each year. It ranks as perhaps the most frequent cause of suffering and disability, yet it is only now coming to be recognized by the medical community as a disease entity with serious individual and societal impact.

The National Institute on Drug Abuse (NIDA) has had a historical and ongoing interest in pain and its treatment, rooted in its concern with analgesic drugs. Since the phenomena of analgesia appear to be closely linked to processes involved in development of physical and/or psychological dependence, a fundamental understanding of pain and its relief may provide us with better insight into the addictive states and their management. Greater knowledge of chronic pain behavior may well shed light also on other forms of dependence and habitual behaviors and their treatment. These behaviors appear to share certain important commonalities with the addictive states, including their self-destructive features, intractability to treatment, frequency of recurrence, and high incidence of iatrogenesis.

NIDA's early efforts led to the funding of the first controlled study on the use of heroin in terminal cancer patients, a subject which is presently of great interest and controversy in this country. In fact, it was NIDA's initiatives that prompted the White House, through its Domestic Council, to call for formation of a comprehensive interagency task force to review and make recommendations in the area of pain, discomfort, and humanitarian care. Recognizing that the time had come for greater attention to the problem of pain, the White House, late in 1977, asked the National Institutes of Health to convene a Government-wide committee to address this issue.

In January 1978, the Interagency Committee on New Therapies for Pain and Discomfort was appointed and charged with examining the status of research, education, and organization of health care services in the areas of chronic intractable pain and humane care of terminal patients and with developing recommendations in these two areas. Actions by the Interagency Committee included the convening of a National Conference on Pain, Discomfort, and Humanitarian Care in February 1979. The proceedings of this conference have been published (Ng and Bonica 1980). The Committee submitted a report of its findings which was accepted and praised by both the White House and the then Department of Health, Education, and Welfare (DHEW). Subsequently, upon recommendation of the Secretary of DHEW, the Committee was reconstituted in 1980 and charged with developing an implementation plan based on its recommendations.

NIDA, in accordance with the mandate to the Interagency Committee to follow up on the recommendations presented in its report, convened a technical review workshop with a twofold objective: (1) to review the experience of the major multidisciplinary pain clinics/centers in the diagnosis, treatment, management, and rehabilitation of patients with chronic pain, which claims among its victims a significant percentage who are polydrug abusers and who are dependent on narcotic analgesic drugs and various tranquilizers; and (2) to establish guidelines and make recommendations concerning possible Federal initiatives to facilitate collaborative research, education, and the organization of health care services to improve the care and treatment of patients suffering from chronic pain.

This monograph is based upon papers presented at the technical review workshop, which was held on the campus of the National Institutes of Health on June 20-21, 1980. It was sponsored by NIDA in collaboration with the Interagency Committee on New Therapies for Pain and Discomfort. Each workshop participant was invited to describe experiences in his or her own pain clinic/center as they related to a variety of subjects, including but not limited to the following:

> (1) Taxonomy and epidemiology of pain syndromes seen; previous treatments received by patients and results of these; psychological, social, and economic impact of the patients' pain upon self, family, and others; costs of therapy; sources of reimbursement, and their influence on treatment outcome.
>
> (2) Staffing of the pain center/clinic program, and relationship of each staff member to the therapeutic program; treatment modalities used; criteria for evaluating therapeutic outcome at discharge and on followup.
>
> (3) Patterns of drug use and abuse by patients with chronic pain; types and classes of drugs abused in relation to types of pain syndromes; the incidence of dependence; and strategy used in withdrawing drugs.

Because the kinds of information requested about each treatment program were the same, the responses of the authors are variations on a common theme, differing in content and emphasis because of differences among the programs and among the individuals describing them. Collectively, the papers present a picture of the treatment of chronic intractable pain at the major multidisciplinary pain clinics/centers in the United States at the present time.

The principal focus of the monograph is on chronic noncancer pain and experience of the centers in the treatment and management of such pain. Two papers also discuss pain management in patients with cancer. The preface to the volume by John J. Bonica eloquently points out the magnitude of the problems presented by chronic pain, which is estimated to cost the national economy $85-90 billion each year in addition to its more important cost in human suffering and the accompanying disruption of normal living for the individual and family. Dr. Bonica goes on to discuss past and current status and future needs in understanding and treating pain, from the standpoint of both research and therapy.

Robert Addison describes the multidisciplinary program for management of chronic pain at the Center for Pain Studies of the Rehabilitation Institute of Chicago, stating that the “importance of the integrated, multidisciplinary approach cannot be overemphasized.” The ability of patients to cope with their pain is seen to be closely related to their ways of coping with other forms of stress.

The Center’s treatment process is presented in some detail? from the 2-day outpatient assessment for suitability for admission to follow-up after discharge and to assessments of program efficacy, based on computerized analysis of self-assessment questionnaires, administered at several stages before, during, and after treatment. Most entering patients are unable to work or carry on pre-injury activities. The intensive 4-week inpatient education and treatment experience utilizes injection techniques, physical therapy, relaxation techniques, family intervention, psychological services, vocational counseling and placement, and other approaches. The inpatient environment is structured so that each patient carries maximum responsibility for his own care, self-sufficiency rather than pain behavior is encouraged, and the patient’s family is regularly involved. Most patients have previously been treated for isolated physical symptoms in treatment based on the “disease model.” Since psychogenic factors and the problem of functional overlay influence experience of pain as much or more than organic abnormalities in patients whose pain has persisted over an extended period of time, it is considered essential that each factor in the total problem be treated in conjunction with all others. Frequent staff conferences facilitate this approach.

In his recommendations, Dr. Addison points to the need for cooperative, nonadversary relations among interested groups involved in patient care and the need for expanded professional education and research directed toward development and use of predictor scales identifying those persons likely to become chronic pain patients.

The chapter by Gerald Aronoff emphasizes the Boston Pain Unit's holistic approach to pain rehabilitation and the need for patients to take an active role in their health care. It is pointed out that chronic pain patients frequently represent the treatment failures of the medical system, whose lives have become significantly disrupted by the time of admission to a pain unit. The relationship between chronic pain and mood disturbances is stressed, in particular the pain-depression-insomnia cycle. Regardless of which problem is primary, treatment for this cycle, says Dr. Aronoff, should be considered a specific therapeutic intervention for chronic pain. Focus is also placed on a system for medication deceleration, used successfully in a patient population which reveals at admission a greater than 50 percent dependence on narcotic analgesics. Observations derived from the program indicate that success does not appear to be related to the extent of organic pathology, although there is some correlation with the duration of illness. The variables believed to be most essential to successful outcome include motivation, a desire to return to a more functional, productive lifestyle; relative absence of secondary gain, especially financial; the absence of active litigation; and adequate support systems.

In the description of the multidisciplinary pain program of the Northwest Pain Center, Joel Seres and colleagues point to the high cost of the inpatient program (averaging over $7,500 for 3 weeks in 1980) and the advantages of a full daycare model which they are now adopting (the present cost of which is $3,250 for all services other than the cost of the motel). Again it is pointed out that chronic pain is attended by a high consumption of medical resources and a high rate of iatrogenesis, such as inappropriate drug use and possibly unnecessary surgeries. The point is made that psychological, social, and environmental factors appear to be more closely related to pain and to pain relief than are such factors as severity of injury, number of surgeries, or radiographic findings. Furthermore, our compensation and disability systems are believed to be powerful incentives that maintain pain-oriented behaviors. Particular emphasis is given to the need for professional and public educational efforts in this area, emphasizing that what may work in acute care medicine may not be appropriate for conditions such as chronic pain. More basic and clinical research are needed to help to define the syndrome of chronic pain and the multiple factors which affect it and its treatment.

Donlin Long describes the Johns Hopkins Pain Research and Treatment Program. This university-based treatment program has two primary functions: to provide evaluation and therapy for the individual patient and to conduct research within the program without interfering with the care of the patient. The secondary function of the program is to educate medical students in management of both acute and chronic pain.

The Center is organized to provide both inpatient and outpatient care, based on individual diagnosis, psychiatric evaluation, and personalized therapy. The heart of the comprehensive pain management is the 2- to 3-week inpatient program, administered through the Department of Neurosurgery, involving consulting physicians, psychiatrists, clinical psychologists, social workers, and specialized nurses. As in other programs, the basic theme is self-help and self-responsibility. Since most patients admitted to the program are addicted to drugs, particularly the narcotics and benzodiazepines (usually Valium), drug withdrawal is mandatory. Pain-relieving procedures are utilized only in a small number of patients after careful selection. It is emphasized that a number of questions need to be answered before any major improvements in pain therapy are likely to be forthcoming. Goals for future research are to identify epidemiological, psychological, social, and medical factors which are operating in the current epidemic of chronic pain and to develop models for evaluation of the effectiveness of pain therapy.

Steven Brena and his colleagues at the Emory University Pain Control Center make the point that chronic pain is often a conditioned socioeconomic disease, with a majority of chronic pain patients showing pain behavior in excess of biomedical findings and disability ratings out of proportion to actual physical impairment. These observations are interpretable within the framework of our understanding that biomedical data and pain-illness behaviors are independent variables and that chronic pain patients require evaluation and management of both variables. One method proposed is the use of the Emory Pain Estimate Model which provides an operational definition of chronic pain states involving separate ratings of tissue pathology and pain behavior based on objective data. The Emory Pain Control Center, in operation since 1972, became a division of the Emory Department of Rehabilitation Medicine, with inpatient and outpatient programs, in 1976. The program is based on principles of contingency management, employing techniques of “cognitive behavioral modification for competent coping in maladaptive situations of existential suffering.” The entire contingency management program takes 18 hours of actual treatment: 3 hours a week for 6 weeks as an outpatient or 9 hours per week for 2 weeks as an inpatient. Total cost of the outpatient program is around $1,500 in professional fees. The patients are educated in a variety of ways to desensitize them to particular sensory inputs, to increase their activity, and to accept the basic idea that chronic pain and impairment of some bodily functions are not necessarily deterrents to meaningful and gratifying lives.

Harold Carron and John Rowlingson discuss the University of Virginia Medical Center’s program, which is primarily an outpatient facility serving a predominantly rural population. Its philosophy is to encourage the patient to assume responsibility for all aspects of the treatment program including drug detoxification, activity and exercise programs, and functional performance. Their outpatient model permits initial evaluation and institution of treatment at a much reduced patient cost. Among the therapeutic modalities available at the clinic are nerve blocks, pharmacological management including drug detoxification, physical therapy, neurostimulation, activity/social programs, and psychotherapy. The degree of drug use and abuse seen in the clinic population is underscored. The authors reveal that approximately 98 percent of all patients prior to the clinic visit have been placed on nonnarcotic analgesics and 85 percent of these have also taken prescribed narcotic analgesics. The use of benzodiazepines by 85 percent of patients prior to the clinic visit resulted in a 60 percent drug dependence for these compounds and made it necessary, as the initial step in therapy, to provide for detoxification following the first visit. Drug withdrawal is accomplished on an outpatient basis with almost total acceptance by the patients, and followup studies indicate that few patients return to drug abuse.

The chapter by Hubert Rosomoff and colleagues of the University of Miami School of Medicine addresses a number of issues bearing on outcome results. Data are drawn from a group of 125 patients with low back pain who have gone through the program since August 1977. Some interesting results from the study emerge. It has been thought that compensation patients are less likely to improve than the general population. With regard to function, data from this study do not support this concept. Following discharge, 88 percent of compensation cases and 84 percent of noncompensation cases are found to be fully occupied. It is concluded that compensation status does not bear upon final outcome of function. The data also show that while 64 percent of compensation patients prove to be “problem cases,” this percentage is not significantly different from that in noncompensation cases. The authors further note that successful adaptation appears to be as strongly related to the patients’ belief that they can manage their problems as to improved physical strength and mobility. The issue of the patient and optimal treatment is a complicated one, affected by both the nature of the problem and a myriad of concurrent psychosocial issues.

The authors note that rehabilitation of patients with back pain is costly and available only to a privileged few relative to the numbers of patients that require this form of treatment. Their study stresses the need to develop a systematic, multicenter study of patient populations, diagnoses, the specifics of treatment within the various settings, and outcome over time, utilizing agreed-upon diagnostic criteria, instruments, and evaluation techniques.

John Gregg and Jawahar Ghia summarize the experiences of the University of North Carolina Pain Clinic, which serves as a tertiary care center for outpatients as a component of the North Carolina Memorial Hospital and also provides a coordination function for research, pre- and post-doctoral and resident training, and clinical services. A wide array of multidisciplinary evaluative and therapeutic services is provided. Of interest are the data that the clinic has compiled showing the most frequent diagnostic entities in cases of chronic pain in the head and neck versus the trunk and appendages. For the head and neck, the most frequently encountered admitting diagnoses are temporomandibular joint arthritis, myofascial pain, and migraine; for pain of the low back and extremities, degenerative disease, post-traumatic, and post-laminectomy; for upper extremity pain, reflex sympathetic dystrophy, rheumatoid arthritis and osteoarthritis, and post-mastectomy syndrome; for chest pain. intercostal neuralgia. cancer, and costochrondritis-myofascial pain. Of the patients sampled, 87 percent reported that they felt they had used “too much” of some drug. The most commonly abused drugs, in the opinion of the patients, were narcotics, propoxyphene, alcohol, diazepam, and tobacco.

The primary pain complaints, by body regions, encountered in the clinic are: head, face, and neck, 53 percent; back and lower extremities, 23 percent. Chest, abdomen, upper extremities, inguinal, flank, and pelvic pain account for smaller numbers of cases. The predominance of the head, face, and neck complaints seen by the clinic probably reflects the particular specialty interests of the clinic, which is administered by co-directors from the Departments of Oral and Maxillofacial Surgery and Anesthesiology.

Frank Moya of the Mount Sinai Medical Center, Miami Beach, Florida, discusses primarily the two chronic pain problems most commonly seen in the geriatric population of Miami Beach: osteoarthritis of the spine and herpetic neuralgia. Thirty-two percent of the clinic population have a diagnosis of osteoarthritis of the spine as the basis of their chronic pain. A typical patient is 72 years old and has a past pain history which includes several years of back pain treated by various physicians with anti-inflammatory agents and analgesics, to no avail. While past history of surgery and drug abuse is reported to be rare, depression is common. Therapy at the Pain Center employs primarily an exercise program and the use of epidural and/or subarachnoid steroids. Approximately 70 percent of the patients are said to show improvement in this program.

The next most common diagnostic category is herpetic neuralgia, which is found in 13 percent of all patients. A typical patient is 73 years old and has had herpetic neuralgia for 10 months, unrelieved by various topical and oral medications. As with osteoarthritis of the spine, there is rarely a history of drug abuse or surgery, but extreme depression is common. The experience of the clinic indicates that if duration of the neuralgia is less than 1 year, 85 percent of patients obtain significant or complete relief through the use of sympathetic nerve blocks and/or the subcutaneous infiltration of steroids and local anesthetic. However, once the herpetic neuralgia has been present for more than 1 year, only 55 percent of patients are improved.

The University of Washington Pain Clinic program is described in the chapter by Terence Murphy. Initially established by John Bonica and Lowell White about two decades ago, this program has over the years developed into a full-time pain clinic including daily evaluation of newly referred patients (500 a year) plus ongoing maintenance therapy in established patients (about 2,000 patient visits per year). There is also a six-bed inpatient facility where patients with the most complex problems are admitted for diagnostic evaluation. A proportion of these are maintained as in-patients for the formal behavioral modification program established by Wilbert Fordyce. The typical chronic pain patient seen at the clinic is described as likely to be female, about 40 to 50 years of age, with a full-year history of back pain or headache, in whom intensive investigations have failed to disclose a specific pathological diagnosis and this symptom has proven resistant to conventional therapies. About 30 percent of the patients are found to take dependency-producing medications in significant amounts. Patients usually have undergone more than one pain-related surgery. In addition, many manifest considerable psychopathology, classified as mild to moderate depression, somatic preoccupation, illness conviction, and denial.

Included in this report is a description of the Clinic's experience with debilitating chronic pelvic pain. None of these patients was deemed to have any correctable pelvic pathology, yet 95 percent demonstrated significant pathology on psychological evaluation. Significant among these patients is the history of sexual abuse: about 65 percent give a history of incest, rape, or sexual molestation. Forty percent had been subjected to an incestuous relationship, usually with stepfathers or brothers. Treatment of this group includes the use of antidepressants for depressed patients, biofeedback with levator muscle retraining mainly in the hysterical group, and ongoing supportive care for the borderline and character disorders. Conventional gynecological treatment such as hormone replacement, antipruritics, etc., is used in conjunction with the above therapy.

Jose Medina and Seymour Diamond discuss the extensive experience of the Diamond Headache Clinic at the Chicago Medical School Department of Neurology which has about 2,000 initial patient visits and 14,000 followup visits per year. These authors point out the immense social burden of headache: of 200 consecutive new patients studied between June and September 1980, the authors found that 3 percent did not work during the entire year because of disabling headaches; 63 percent missed from 1 to 150 working days (average 18.1 days) during the past year; 27 percent had been hospitalized; 1 percent had lost jobs due to the headaches;

and about 21 percent felt they might be risking their jobs because of absenteeism due to headaches. Furthermore, the chronic headache sufferer is also a potential drug abuser. Of the slightly over 2,000 patients studied between March 1, 1975, and January 31, 1976, approximately 3 percent were significant users of narcotics or a combination of analgesics and barbiturates. The paper succinctly describes the evaluation procedures and treatment of headaches, which can be simply classified as migraine, muscle contraction headaches, and traction headaches. The most common type seen by a headache specialist is a combination of migraine and muscle contraction headache. The paper discusses the use of pharmacotherapy; the relative significance of precipitating factors; the role of diet; and the value of and indications for biofeedback training.

The chapter by Benjamin Crue and Jack Pinsky addresses four specific aspects of the treatment of patients with chronic pain syndrome. They point to the problems stemming from our still rudimentary understanding of the underlying mechanisms of chronic pain, leading to two often diametrically opposed positions: the peripheralist, which regards chronic pain as resulting from continued nociceptive input from the periphery into the central nervous system; and the centralist, which regards the chronic pain syndrome as resulting from central nervous system phenomena without ongoing peripheral nociceptive input. The taxonomy problem is also underscored by these authors, as well as by other participants at the workshop. Workers in the field of algology face complex problems in comparing the diagnostic, prognostic, and treatment outcome results of patients who suffer from chronic pain syndromes. Much of this situation results from a lack of agreed-upon definitions and classifications of pain syndromes encountered clinically. References are given for more complete discussion of these two important issues.

The principal focus of the chapter is the long-term evaluation of a pain treatment program that had its origin at the City of Hope National Medical Center in 1960 and continues at New Hope Pain Center and Pain Research Foundation, based in Alhambra, California. Data were gathered from questionnaires mailed to followup patients and analyzed at various time stages after discharge. Changes were recorded in such phenomena as: (1) drug use, (2) continuing medical-surgical treatment, (3) subjective pain reports, and (4) general life outlook and attitude. Their data indicate that long-term, positive therapeutic changes in each of the above-mentioned areas have occurred for a large segment of their patients. The authors emphasize that differences in patient populations, treatment settings, and other intervening variables make it difficult to compare outcome data from one pain treatment setting with another unless many factors are appropriately weighted.

The concluding section of the chapter provides an interesting operational description of a multidisciplinary team approach to the management of pain in patients with cancer, either terminal or preterminal. Pain relief therapy presupposes, of course, that the attending physician and the pain team members agree that all possible efforts have first been made to ameliorate the suffering by treatment of the primary neoplastic condition (or, at times, other pain-potentiating medical conditions). The authors stress the need for further studies, such as those being proposed by the National Cancer Institute, to evaluate the team effort in pain management in cancer patients.

The chapter by Kathleen Foley highlights several important issues related to the management of pain patients with terminal cancer. In a survey of over 36,000 admissions to the Memorial-Sloan Kettering Cancer Center (MSKCC) between January 1974 and January 1978, 9 percent of patients reported pain severe enough to require a specific consultation from the pain service; in another survey, also done at the MSKCC, approximately 29 percent had pain requiring the use of analgesic drugs. This range in prevalence rate points to the need to define more precisely the nature of pain in cancer patients. MSKCC breaks down the pain into three categories: (1) pain associated with direct tumor involvement; (2) pain associated with surgery, chemotherapy, or radiation therapy; and (3) pain unrelated to the cancer or cancer therapy.

Evaluation and treatment of patients with cancer pain requires a specific expertise which should include a clear understanding of the nature of the pain and the various approaches to pain management. Narcotic analgesic drugs are the mainstay of pain therapy for patients with cancer. Most physicians, however, lack sufficient knowledge of narcotic pharmacology to use these drugs appropriately. A number of controversies have arisen, pertaining in particular to the question of the best analgesic regimen to use in patients with terminal cancer pain and the question of whether physical dependence and tolerance develop. Comparative studies of heroin and morphine in cancer patients with pain at MSKCC demonstrate that, using equianalgesic doses, heroin and morphine have comparable analgesic and mood effects. While heroin did offer a more rapid onset and shorter duration of action than morphine, it did not appear to offer any special advantages in the management of cancer pain patients. The role of long-acting analgesics such as methadone also remains unclarified. With respect to the development of tolerance, the experience at MSKCC suggests that, in contrast to Robert Twycross' experience, tolerance does occur in patients with pain and progression of disease, representing a significant practical management problem. However, drug abuse and addiction did not occur in the cancer patients with pain studied at MSKCC. There is a tremendous need, it is pointed out, to develop guidelines based on careful clinical studies, not limited experience and anecdotal data. Escalation of drug dosage, switch to alternate drugs, and use of combination drug therapy represent empirical approaches to providing adequate pain relief.

The above summaries provide an overview of the experiences of the clinics/centers in the treatment and management of chronic pain. Obviously, these may differ by virtue of differences in interest, particular expertise, geographic location, and resources available to each center. Collectively, the data presented by the various participants provide us with a map of the current state of knowledge and help us to identify areas where knowledge is deficient.

The second day of the workshop was devoted to reviewing the data presented and to developing recommendations on areas where further action is needed. In preparing the recommendations, the participants worked in three study subgroups: <u>Research,</u> <u>Public Education,</u> and <u>Professional Education and Training.</u> There was a consensus on the need to recognize chronic pain as an important medical problem and as a disease entity with its own characteristics to be further defined and understood. General and specific recommendations for short- and long-term goals were presented by the three study subgroups. Funding of a center or office with a mandate to implement the study of pain in all its aspects was also recomnended. The workshop recommendations were submitted in their entirety to the Interagency Committee on New Therapies for Pain and Discomfort for its deliberation and use in preparation of its report to the White House. The reports of these subgroups are presented in the appendix.

Treatment of Chronic Pain: The Center for Pain Studies, Rehabilitation Institute of Chicago

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ABSTRACT

The Center for pain Studies of the Rehabilitation Institute of Chicago(fomerly known as the Low Back and Pain Clinic)has developed a multidisciplinary program for the management of chronic pain. Typically patients present a variety of chronic pain syndromes, most frequently low back pain, which have not responded to previous treatment including surgery, physical therapy, medication, vogue therapies, and other pain management programs. Patient capability to engage in normal daily activities such as standing, walking, sitting, lifting, etc. is often limited; most are unable to work or carry on pre-injury activities. Psychological ramifications of chronic pain appear frequently as a retreat from responsibility by the patient for his own welfare, manifested by distinct behaviour patterns (measurable on the MMPI); however, the ability of the patient to cope with chronic pain is largely a function of his ability to cope with other stresses prior to onset of pain. The patient's physical and psychological status alters his relationships with spouse and children, straining family well-being. Economic factors often occasion additional alteration in personal and family relations. Frequently a spouse not employed outside the home goes to work. Compensation programs and aid from public agencies may provide insufficient support or, conversely, compensation practices may establish perverse incentives toward recovery by providing the patient with net income equal to or greater than normally received.

Admission to the Pain Clinic is determined by a two-day outpatient evaluation, assessing patient suitability for the multidisciplinary inpatient program by physical and psychological examinations, physical therapy and vocational therapy evaluations, interviews, and appropriate tests deemed necessary. The inpatient program consists of a four-week intensive education and treatment experience, utilizing injection techniques, physical therapy, relaxation techniques, family intervention, psychological services, vocational counseling and placement, and other approaches within the scope of the clinical facilities. Program efficacy is calculated by means of computerized analysis of the pain patient self-assessmemt questionnaire, which measures chronic pain in terms of severity and duration, and of performance of daily activities (standing, lifting, walking, sitting, etc.) with the RIC Rehabilitation Information System (REHABIS). Patient pain perception and tolerance

in activities performance have shown significant change from pre-treatment status, an improvement which appears to be maintained post-discharge. Program cost effectiveness is enhanced by the outpatient evaluation which maximizes inpatient treatment effectiveness, and by the high percentage of vocational placements.

Patients typically enter the program on multiple medications including some form of narcotic, most frequently lesser narcotics in conjunction with analgesics. While the incidence of physiological dependence is minimal (less than five per cent), psychological dependence is common. Detoxification is accomplished by education, rapid decrease of drug potency during first week, followed by decreased frequency of administration with maintenance on mild analgesic if needed. No medications are given pro re nata; all are administered according to behavioural modification techniques.

TAXONOMY: PAIN SYNDROMES TREATED AT THE REHABILITATION INSTITUTE OF CHICAGO

At the present time there is no universally accepted taxonomy of chronic pain syndromes. Several medical specialty societies have instigated efforts to develop a standard taxonomy. Two of them are the International Association for the Study of Pain, which seeks to classify chronic pain syndranes generally, and the American Academy of Orthopaedic Surgeons which has focused on classification of spinal diseases.

In the absence of a standard taxonomy, the Center for Pain Studies (CPS) and other treatment facilities utilize classification systems based on working definitions of pain syndromes presented. The Rehabilitation Institute of Chicago (hereafter RIC) concentrates upon treatment of six categories of chronic pain based on anatomical sites: 1) low back, 2) cervical, 3) headache, 4) cancer, 5) facial, and 6) spinal cord injury pain. A majority of patients admitted to CPS exhibit low back pain; cervical, headache, and spinal cord injury pain are seen as well. Cancer pain is treated by an affiliated research entity, the Pain Management Team of the Cancer Research Group.

The Pain Management Team of the Cancer Research Group treats pain attendant upon 1) bone destruction by metastatic tumor, 2) distention of a hollow organ produced by obstruction due to tumor growth, 3) infiltration and canpression of a peripheral nerve, and 4) enlargement of a solid organ. This selection is limited to pain associated with solid tumor growth, excluding leukemia and diffuse lymphoma. The Pain Management Team is affiliated with RIC, the Northwestern University McGaw Medical Center, and six similarly based research groups in the U.S.

EPIDEMIOLDGY AND ETIOLOGY: PAIN SYNDROMES TREATED AT THE CENTER FOR PAIN STUDIES

Approximately one half of CPS patients present chronic pain arising from work-related injuries: falling, prolonged or repeated lifting, twisting, pushing or pulling, and motor vehicle accidents. Pain syndromes of the remaining fifty per cent typically arise from motor vehicle accidents, recreational accidents, lifting, post-surgery or post-pregnancy pain, or entail an insidious onset unrelated to any single injury.

ORGANIC FINDINGS

Since patients come to CPS on referral from other physicians specifically for management of chronic pain after acute care treatment modalities have been exhausted, rarely does the examination at CPS reveal organic abnormalities requiring further treatment by conventional means. Generally, patients present minimal clinical problems relative to pain behaviour displayed. While CPS provides ongoing care for acute conditions other than those associated with chronic pain in persons who are accepted for inpatient treatment, patients whose organically based symptoms might be relieved by surgery or other invasive procedures are returned to their referring physicians with appropriate recommendations. When CPS examinations suggest the presence of organic abnormalities, for example a cardiac condition, which would not ordinarily be diagnosed in the course of orthopaedic and neurological examinations, the patient is referred to a CPS physician consultant within the McGaw Medical Center for evaluation.

Organic findings in chronic pain patients constitute a broad and variegated spectrum. The results of a sampling of 61 persons with chronic low back pain evaluated as outpatients in 1977 are instructive in this regard. EMG studies revealed abnormalities in six patients, four of which were attributable to an old radiculopathy, one to a mild neuropathy of the suprascapular nerve, and one clear cut abnormality not attributable to a particular nerve. Eight yielded positive results unilaterally or bilaterally to Fabere testing. Six instances of mild to severe paraspinal muscle spasm were found. Impairment of ankle reflexes unilaterally was found in three cases, bilaterally in four. Two reported impairment of knee reflexes bilaterally, one unilaterally. Three were unable to walk on heels or on toes. Five showed marked weakness of the extensor hallicus longus and accompanying deficiencies. While many exhibited a slightly limited range of motion in the upper and/or lower extremities, six had moderate to severe limitations. Equilibrium in three was moderately to severely impaired generally or on one side.

NONORGANIC FINDINGS

Of the 61 patients evaluated, the problems of 48 were considered to be mostly functional. One person was found having mostly organic problems, and five had abnormalities of both an organic and functional nature. Three had distinctively heavy functional overlay; in two others, functional overlay was minimal.

Common indications of nonorganic phenomena centered on reports of decrease or absence of sensation. Testing revealed fifteen persons who showed a decrease or absence of sensation on one side or one extremity with no dermatone pattern. One person reported decreased sensation in both lower extremities with no dermatone pattern. Decreased sensation corresponded with a dermatone pattern in two persons. In addition, one person reported numbness in all ten fingertips, with no other decrease in sensation.

PSYCHOLOGICAL FINDINGS

The taxonomy of patients seeninour program, fran apsychological Point of view, has three broad classifications. First, as described in detail below, is the group of patients whose pain has set in motion a series of stresses which results in Psychological dysfunction. Second is the group of patients where pain, though unpleasant in itself, directly or indirectly solves a range of problems in their lives, such that over time pain becomes a component of their psychosocial stability and the potential of being pain-free carries with it the attendant risk of psychological destabilization. Third is the group where both the above factors operate together. In this last group, the initial psychological dysfunction (reactive to the stresses associated with pain) is accommodated by the development of a modified psychosocial structure, and this modified structure gives heavy emphasis to the potential secondary gains of the pain complaint. Within all three groups, the types of pre trauma personality patterns described below relate to the severity and resistance to change in the psychological disturbance. Moreover, the longer the duration of the pain complaint, the greater the likelihood of a Patient falling into the third category discussed above.

PATIENT TREATMENT HISTORY

patients are usually referred to CPS when chronic pain proves intractable to conventional treatment modalities administered on a disease model, addressing only the organic sources of pain. Standard diagnostic techniques including physical examination by an industrial physician, family physician, orthopaedic surgeon or neurosurgeon, a myelogram, electranyography, X-ray studies, and laboratory studies have generally been employed prior to the patient's appearance at CPS.

Our patients have undergone an average of no more than one surgical procedure for the Pain-related injury prior to appearance at CPS, although a few report as many as seven surgeries. Often surgery has been done as a "last resort" or as an exploratory measure where pain continues after completion of initial treatment. A previous laminectomy, spinal fusion, open or closed rhizotomy, or dorsal column stimulation is commonly reported.

In general the rate of surgical intervention for back pain in the U.S. far exceeds that of other nations. A recent study by William J. Kane, M.D., of Chicago comparing discharge statistics in the U.S. and Sweden discovered that in 1978 the rate for lumbar laminectomies for herniated intervertebral discs in the U.S. was 75 per 100,000 population nationwide. Sweden's statistics yielded an estimated average of 11 per 100,000; Great Britain (in 1970) reported 10 per 100,000.

In addition to surgical procedures, most patients at CPS have undergone some combination of physical therapies, especially ultrasound, diathermy, whirlpool, heat and/or cold packs, massage, transcutaneous nerve stimulation (TNS), or traction.

Medications for pain used prior to admission to CPS can be categorized generally as analgesics, including narcotic and non-narcotic drugs, sedatives, including muscle relaxants and tranquilizers, and anti-inflammatory drugs. In addition a limited number of injection procedures have been employed, usually steroids or anaesthetic agents. A moderate number have had chemonucleolysis.

Occasionally patient histories report treatment by such unconventional therapies as acupuncture, radiofrequency, rhizotomy, biofeedback, hypnotherapy, electrical stimulation, and other unorthodox individual applications. A few histories note previous treatment at other pain facilities utilizing various injection techniques and/or psychological services.

Prior treatment proved wholly or partially unsuccessful in patients referred to CPS for a variety of reasons. Generally, however, failure to involve the patient in responsibility for the management of his own pain, and a tendency to treat specific physical symptoms isolated from consideration of patient attitudes, relationships, etc., are typical. Partial successes prior to treatment at CPS take the forms of partial cessation, change of pain site, change from constant to episodic pain, change in kind or severity of pain, or return of pain after cessation for a period of months or years, especially when surgery corrected the initial pain syndrome but is not indicated for the subsequent occurrence.

from a psychological standpoint, the usual course of patient treatment prior to arrival at CPS exacerbates the psychological conditions described above. Particularly in those patients where pain is a solution to some pressing problem(s) in living, as well as being the presenting problem, purely medical interventions do not address the core of the problem, and often serve further to obscure the core problem from both the patient and the medical staff. The general course of events inourpatients is that all reasonable (and some unreasonable) medical interventions are exhausted before potential problems in the patient's psychosocial life are examined. Iatrogenesis in such cases occurs as a result of the following factors: 1) the delayed identification and treatment of psychosocial issues allows them to become more entrenched and resistant to correction; 2) the patient's failure to obtain satisfactory relief despite multiple medical contacts creates various forms of counterproductive interactions between patients and physicians (adversary roles, rescue roles, excessive dependency, etc.); and 3) the counterproductive interactions in some instances set the stage for inappropriate or unnecessary medical procedures and treatments.

IMPACT OF PAIN

Physical Impact

The physical impact of chronic pain insofar as it can be separated from other aspects is characterized by development of pain behaviours over time, a limited capability to carry on normal daily activities (usually including work), intake of medication often resulting inpsychologicaldependency, a decreased range of notion, decreased endurance, and often a change in physical appearance including weight gain or loss, development of protective gestures and modes of motion, as well as any disfigurement immediately caused by the original accident or injury.

Psychological and Psychosocial Impact

Despite the numerous and varied etiologies of pain syndromes in patients evaluated for admission to CPS, the psychological and social impact of life with chronic benign pain does not appear to differ clearly on the basis of diagnosis alone. Temporal factors are most salient, with patients suffering psychological sequelae to a heightened degree as pain continues over the course of several years. The length of time the individual has been removed from the work force, the number of surgical interventions and hospitalizations, etc., do most certainly yield a patient who evidences greater adjustment difficulties than the individual for whom injury has been a more recent occurrence. However, in our patient population, the psychosocial impact of life with chronic pain appears most directly related to how such losses in functioning and alterations in lifestyle are perceived by the individual. In essence, the ability of the patient to cope with his physical circumstances is in large part a function of his prior level of adaptation and his wherewithal in handling the stresses of life before onset of pain.

There are a number of characteristics which predominate in our patients as they present themselves for evaluation. The perception of one's life being out of one's own control, or a lack of contingencies based on individual behaviors, a sense of helplessness in intervening on one's own behalf is most often the general overlay to all other psychological and emotional changes. The ability to plan long- and short-range activity is relinquished and viewed as an impossible and fruitless endeavour.

The disruption of family relationships and functioning appears universally. Role reversal necessitated by loss of general function and employment has its greatest effects in families where patients' self-esteem is in large part derived from the gratifications received via employment, at home or in the outside work force. This appears to be the case regardless of sex or type of employment; the greater the investment in and reliance on external sources of esteem, the greater the likelihood that the psychological impact of this loss will be a major problem. Additionally, the greater the role rigidity within the family (and the patient's need for a clear cut, highly circumscribed role definition), the less likely the family unit is successfully to absorb and accomodate changes precipitated by injury and pain. Thus, while the psychosocial impact of chronic pain is always observable in some fashion, it is likely to be most devastating in circumstances where individuals have few or ineffective internal and interpersonal resources with which to cope with change. Our current system of benefits and remuneration becomes, for many, a source for projection of their pain and despair; the tendency to over-prescribe analgesics becomes a source of heightened sense of helplessness and inability to control one's life. In sum, however, what the individual brings to this situation, in terms of his personal organization and psychological wherewithal, is merely heightened and challenged by his new circumstances. Chronic pain does not produce a new person — rather it maximally stresses the resources, abilities, and coping effectiveness of the individual and family who were once pain-free.

The presence of chronic pain particularly taxes family relationships. Depending upon the antecedent circumstances of family and/or work relationships, chronic pain may serve to transpose what would otherwise be unacceptable disability into an acceptable one, one which in some measure alleviates previous problems inherent in the relationship. Frequent hospitalization disrupts family life and often family finances, tending to heighten the patient's sense of isolation. Spouses encounter depression, anxiety, loss of self-esteem, increased dependency and decreased sexual function intruding on marital relations; role reversal vis-a-vis employment often aggravates an already drastic emotional alteration. Children may face emotional distancing by the chronic pain patient as he becomes increasingly introverted and preoccupied with his pain. Children often associate parental illness with impending death, further upsetting the child's emotional equilibrium. The child loses an important role model and an accustomed partner in recreational and social activities. Family emotional stability on the whole may fluctuate from day to day, depending upon the patient's level of pain.

It is rare for our staff to see patients who have previously been consumers of psychotherapeutic services. For some, this reflects a sense of hopelessness or passivity in response to trauma. For many, the recommendation to the patient to pursue these services has often been made by a physician in the context of the patient's failure to improve, where the suggestion becomes inextricably tied to the question of etiology and, hence, is avoided or refused by the patient for fear that it will be viewed as acknowledgement of such an interpretation. When psychotherapy has occurred prior to our evaluation of the patient, it has most often been in conjunction with marital or family difficulties. One might hypothesize that, for the patient, this is a legitimate entree into a system not acceptable as related to himself as an individual. "The problem of early psychological intervention is compounded by the fact that few professionals appear to have the skills and understanding of pain to appropriately recommend management approaches in addition to traditional psychotherapy. Nonetheless, the result for most patients is that the psychological impact of chronic disability is experienced daily but never addressed directly prior to involvement in intensive rehabilitation programming, often several years later.

In most cases, some aspect of the patient's dilemma, however minor, appears directly precipitated by our system of health care delivery for the chronic pain patient. The fashion in which the patient's complaints and frustrations have been handled from entry into the system does in fact set the course for the individual's acceptance of emotional and psychological issues as relevant to the quality of his life, the exacerbation of his pain, and his ability to function despite losses of major proportion. Perhaps the most critical issue is the likelihood for the patient that at some point the suggestion will be made, covertly or directly, that his pain is imaginary, not understandable from an orthopedic or neurological perspective, not in line with medical data at hand -- not legitimate. For most, this occurrence leads to heightened resistance to acknowledgement of emotional overlay for fear of closing medical options, despite the patient's very real experience of psychological difficulty. The search for "the answer" becomes paramount, and intervention from a psychological framework becomes more difficult as the situation is viewed as "either/or" by the patient. Many patients are for the first time in their lives faced with the awareness that our current medical knowledge is limited, which shakes beliefs and trust which have their roots in early childhood. Hence, the patient's confrontation of these issues often leads to anger, hostility and projection directed onto those on whom he is most dependent for relief and guidance.

Secondly, the prescription of analgesics for chronic pain patients, while done most often in good faith, remains the most expedient treatment of choice by many for short term relief. The patient, however, is usually faced with side effects, especially depression and impaired cognitive fuuctioning,which further feeds his sense of inability to function, dependence on physicians, and need for greater relief through increased dosage or a shift to more potent medication. Additionally, the prescription of bed rest and other passive modes of treatment in chronic vs. acute syndromes encourages the patient's perception of himself as helpless, useless, and unproductive.

It is often the physician last seen for consultation who is most honest and open with the patient (i.e., There is nothing more I can do for you"), leading to the ultimate sense of betrayal we see upon evaluation of our patients. The long-term process, then, is often counterproductive and oppositional to the pain management techniques we encourage patients to invest in upon their acceptance to programs emphasizing increased physical function, independence, and self responsibility for pain control. As this process is most frequently a lengthy one spanning several years, it behooves us to look toward early intervention and the appropriate presentation to patients of the psychological components of physical disability as integral versus causative aspects of illness and health related change.

Economic Impact

Financial problem due to decrease in income may be a major source of stress for the chronic pain patient and his family. Where insufficient funds may not be pressing, inconsistency in the amount and/ or frequency of payments may nevertheless prove troublesome. Patients who have been the primary source of income for the family may arrange in some cases to continue working with modifications in the kind or scheduling of work performed, in order to provide for basic economic needs. however, those patients who have been off the job for six months or more tend to undergo a reorientation toward the work ethic and an adjustment in self-image which radically diminish the likelihood of their reentry into the work force unassisted. As noted above, spouses previously not employed outside the home frequently enter the work force; however, the level of income generated by a spouse working for the first time seldom equals that attained by the injured spouse if he or she has been employed for some years.

In some cases the level of compensation provided an injured person actually surpasses the level of "take-home" pay attained while employed, creating a serious disincentive to work or to seek successful rehabilitation. Pending personal injury litigation poses another substantial countermotivation to resumption of normal daily activities, although only a small percentage of patients are still involved in litigation by the time they reach CPS.

Various levels of income maintenance are provided for the chronic pain patient by such organizations and agencies as Workman's Compensation, the Illinois Department of Vocational Rehabilitation, Illinois Public Aid, federal Social Security Disability Insurance, and an assortment of public and private disability insurance sources. Medicare, Medicaid, and various private and/or work-related health insurance plans offset a substantial portion of acute care costs, but provisions for rehabilitation care are often limited.

Approximately fifty per cent of CPS patients are referred by Workman's Compensation, which provides reimbursement for one hundred per cent of patient costs for rehabilitation. Agencies such as the Division of Vocational Services and Illinois Public Aid reimburse all patient costs as well. Medicare provides eighty per cent of inpatient costs, and does not cover certain specific kinds of services such as biofeedback. Private insurers cover varying percentages of inpatient costs, usually eighty per cent. Coverage of psychological and rehabilitative services is uneven; reimbursement for vocational rehabilitation generally is not provided.

While economic factors potentially weigh heavily on the patient's outlook on life and motivation to return to a normal level of activity, experience at CPS indicates that present financial circumstances and sources of reimbursement are less influential factors in the program's success than is patient motivation.

Economic Impact on Society

It is estimated that six and one half million men and women are under treatment every day for low back problems alone. Roughly 600,000-700,000 persons miss work each year due to back injuries, costing employers approximately one billion dollars annually in sick pay and wages for replacement personnel. The cost to society, calculated in terms of annual disability payments expended plus loss of taxes formerly contributed by these workers, is as high in individual cases as it appears to be in aggregate figures. The RIC Vocational Rehabilitation Department has recorded examples from among CPS patients who returned to work upon completion of the program (see Table 1).

TREATMENT IN THE CENTER FOR PAIN STUDIES

Prescreening

Since patients are referred to CPS by private physicians or third party referrers, every effort is made to obtain and review patient records prior to admission to the outpatient evaluation. This prescreening and a two-day outpatient evaluation across all disciplines are designed to determine the appropriateness of a four-week inpatient program for each individual, and to formulate prior to admission a program suited to his or her needs.

Outpatient evaluation

The outpatient evaluation begins with complete physical examinations by the staff orthopaedic surgeon, neurosurgeon and anaesthesiologist in order to obtain a fresh, up-to-date assessment of the patient's physical condition independent of personal reaction to possible functional overlay. An EMG, routine laboratory work, and X-ray studies are performed, as well as any special tests or evaluations deemed necessary to gain a complete picture of the patient's physical status (CT scans of lumbar area, cardiac evaluation, etc.). Early in the Center's history, a gynecological examination for all females was included in the evaluation. This component was discontinued after the first year because of the extremely limited correlation between gynecological findings and chronic low back pain. Cut of some sixty patients, one positive finding was made — endometriosis,which in all probability was unrelated to the pain complaint.

Patients are seen for an extensive psychological interview which focuses on both pain-related issues (i.e., secondary gain, response to disability, etc.) as well as premorbid factors (adjustment, passive/active coping in past crises, etc.). Although no specific criteria are utilized rigidly over time, several are considered as basic to the decision to accept or reject patients at this point. Patients deemed to be psychotic or to have insufficient intellectual ability so as to be able to incorporate or integrate program material are excluded. The patient's inability to invest himself psychologically in terms of taking responsibility for improvement (i.e., active participation in his own behalf, willingness to withdraw from medication or use of other external supports) is seen as a major indicator for nonacceptance, often regardless of level of incapacity or physical limitations. On occasion, where it is felt that a very mixed picture is present, a recommendation is made for a two-week trial of extended evaluation and therapy during which time a more complete assesment can be made regarding patient motivation and likelihood to make significant improvement.

Psychological testing is completed at the time of outpatient evaluation but is used as an adjunct to treatment planning rather than as a tool in assessing the patient's appropriateness for inpatient treatment. As it is a rare case in which psychodiagnostic evaluation yields a significantly different patient profile than is obtained in interview, such testing has been found most useful in the clinical and research areas.

The evaluation also includes a physical therapy evaluation, an occupational therapy evaluation, and if appropriate a vocational rehabilitation interview and evaluation. The physical therapist assesses physical limitations that are secondary to pain such as gait deviations, decreased endurance and spontaneity, and poor balance reactions. The occupational therapist assesses functional disabilities that are secondary to pain such as dressing problems, decreased homemaking and leisure activities and upper extremity physical limitations. The vocational counselor evaluates the physical requirements of the patient's former job, patient capabilities, and attitudes toward work. He tries to determine whether there is a job available for the patient with his employer.

Upon completion of the outpatient evaluation and diagnostic procedures, a team conference determines whether the patient is acceptable for further care at the Center for Pain Studies. The patient is not acceptable if a surgical procedure is indicated or some other acute medical treatment is needed, the patient has severe emotional problems, the patient functions below normal intelligence, or at the time of evaluation the patient did not have the capacity to change "pain behaviour" patterns. While prospective inpatients must be sufficiently fluent in spoken English to participate in therapy, all written materials have been translated and are available in Spanish as well as in English.

The criteria for rejecting a patient are based on our treatment results. Patients who meet any of the above criteria do not have successful treatment outcomes. For example, patients who have difficulty with abstract thinking find it difficult to take a concept and apply it away from the setting where they were initially introduced to it. This patient can apply good body mechanics in

Table 1

Estimated Economic Gain to Society From Return to Work of Four CPS Patients

Job Title	Prior Annual Benefits	Annual Salary	Estimated Annual Taxes	Annual Gain to Society*	Projected Gain to Society by Age 65+
Project Engineer	$8,400	$18,000	$4,320	$12,720	$216,240
Painter	$7,124	$11,856	$2,845	$9,969	$378,838
Mechanical Electrician	$13,200	$16,800	$4,032	$17,232	$241,248
Truck Driver	$9,984	$15,600	$3,744	$13,728	$178,464

*Taxes plus prior benefits.

+Based on working years remaining to age 65, assuming a constant income.

physical therapy, but does not carry the concept into work evaluation or activities of daily living such as making a bed. Within the program the patient has to be cued constantly to apply good mechanics; upon completion he is unlikely to incorporate them into his lifestyle at all.

Another criterion for rejection based on active treatment of numerous patients was the pain team consensus that the patient was not motivated toward pain managanent. A patient who refuses even to attempt several evaluation tasks such as bending or lifting, a patient who recognizes no relation between pain and attitude, who seeks a solely "medical cure" of pain, who evinces unwillingness to accept responsibility for his own treatment in other ways is not likely to succeed in the CPS program.

Patients with emotional problems find it difficult to focus on program concepts. They are so involved with their emotional dilemmas that outside stimuli are not incorporated into their lifestyles. These patients have been found to disrupt with their own agenda of problems group sessions crucial to program success for all inpatients.

Inpatient Treatment

The inpatient treatment program, a conservative interdisciplinary management program for the treatment of chronic benign pain, usually requires four weeks for completion. The importance of the integrated multidisciplinary approach cannot be overemphasized. As stated above, most patients entering the CPS program have previously received some of the individual therapies in the course of treatment based on the "disease model," essentially the treatment of isolated physical symptoms. Since psychogenic factors and the problem of functional overlay influence experience of pain as much or more than do organic abnormalities in patients whose pain has persisted over an extended period of time, it is essential that treatment of any one factor be conducted in conjunction with treatment of the others. At CPS, this approach is facilitated by regular conferences among all staff, by structuring the inpatient environment such that maximum responsibility is conferred upon each patient for his own care, by use of behaviour modification techniques to encourage self-sufficiency rather than pain behaviour, and by involvement of the patient's family through regular family conferences.

A typical schedule for the four-week intensive program runs from 7 a.m. to 5:30 p.m. Monday through Friday. The emphasis of the first two weeks falls on education and physical upgrading; the third and fourth weeks emphasize application of newly acquired techniques to work and home environments, complemented by augmentation of endurance and tolerance. In addition to attending scheduled appointments and activities, patients are responsible for such routine details of self-care as dressing and grooming themselves (street clothes are worn except during injections), laundering their own clothes at facilities on the nursing floor, obtaining linens provided by the Institute, arriving at all therapies on time, cancelling in advance any appointments which might be missed, taking all meals in the RIC cafeteria, administering medications (techniques discussed more fully in section on Medications, below), keeping own rooms and communal lounges clean, measuring and recording daily waist measurment, temperature, and pulse. Telephones are located only on halls, and televisions only in communal lounges, not in patient rooms, to encourage socialization among patients. Uninhibited direct communication between patients and staff is highly encouraged.

Inpatient treatment begins with orientation, part of the ongoing process of education of the patient to his problem and to his alternatives among a range of possible solutions. The educational process permeates all other facets of the program, e.g., physical therapy, psychology, structure of life on the floor, in addition to certain specifically educational components. A lecture/discussion series covers such topics as muscle function, pelvic tilt, anatomy, sexual function, and body mechanics.

As a single diagnostic/therapeutic modality, videotaping patient performance on an "obstacle course" has proven to be one of the approaches, most beneficial to the patient. A videotape of his performance on the obstacle course, which consists of ten activities such as walking, lifting, balance activities, reaching and bending moves, etc., gives the patient a visual experience which is then used through the first three weeks to point out his responses to various daily activities: how he approaches tasks, how he moves (guarding, rigidity), what his body language communicates to others, and how he uses body mechanics. The patient is filmed once during the first week of the inpatient program and again prior to discharge, so that improvement or lack of it in each ration is apparent to him.

According to findings and recommendations formulated in the outpatient evaluation, many patients receive a series of epidural and/or intrathecal steroid injections. These injections are administered by the staff anesthesiologist, who carefully explains their purpose to the patient. Trigger point and facet injections may also be given if appropriate.

Psychology staff utilize a variety of modalities in conjunction with patient treatment in CPS as it is currently devised. Essentially, the basic framework employed is a cognitive and behavioural approach to pain management, with individual and group sessions geared toward facilitating health-related behaviour and the alteration of reinforcement contingencies around the issue of pain. Patients are seen twice weekly in groups which combine didactic and behaviour change approaches. Biofeedback and progressive relaxation training occur three to four times per week on the average. Hypnosis for pain control is utilized with patients for whom it is felt it would be profitable. Individual psychotherapy is geared toward increasing insight into pain-related changes as well as in exploration of alternative modes of response that are more appropriate and functional. A family group meets weekly both to educate those involved closely with the patient and to attempt restructuring of family life away from pain-focused activity and responsiveness. As the role and value of each particular modality for patients often differ, attempts are made in the program to individualize treatment as a function of patient need and orientation, with changes in treatment plan following continuous reassessment of progress or lack thereof. In general, however, above and beyond the utilization of particular treatment modalities, psychologists are responsible forensuringthat sound psychological principles of learning and behaviour change are applied consistently and integrated into all aspects of the program across all disciplines. Likewise, the psychologist functions as team consultant with regard to behavioural management of patients and assessing patient-staff issues which have the potential for interfering with maximal productivity in patient and staff alike.

The program currently is staffed by one and one half full time psychologists with several years of experience in the area of chronic pain. Additionally the program employs a full time bachelor level biofeedback technician supervised by Ph.D. level personnel in provision of training to individual patients. While in the past it was often difficult to select psychologists with pain management experience, the growth of this area of treatment into a full-fledged subspecialty has made the task of hiring professionals armed with the necessary skills a much easier one. Likewise, with the growth of our particular program, we are now in a position to provide supervised training experience to graduate students in clinical psychology via rotations through the clinic.

Following completion of the four-week inpatient program, patients are given outpatient appointments ("recheck") at intervals of six weeks, three months, six months, and one year. Due to the fact that the RIC program draws from a patient population which is geographically very large, successful and consistent followup is often a difficult endeavor from a psychological standpoint. Plans are currently underway to begin long term followup by telephone interview, patient completed questionnaires, and re-administration of psychodiagnostic tests at six month, one-year, and two-year intervals. To date, there has been little formalized patient based psychological data regarding long term effectiveness of the training provided during inpatient stay, although thorough charts are available from all disciplines regarding level of improvement in functional gains, etc., evaluated at recheck appointments.

Training in relaxation techniques, including lectures and participation in breathing and progressive relaxation, biofeedback, autogenic techniques for achievement of deep relaxation and hypnotherapy, equip patients with methods of controlling or altering incidence and experience of pain. Approximately nine to ten hours of biofeedback training concentrates on control of certain physiological states, such as muscle tension, regulation of which is frequently accompanied by a reduction of pain or a favorably changed pain experience. Sessions with a biofeedback machine are conducted in a quiet room during the first weeks; third week sessions take place in a "practical situation" setting such as at a desk, in a kitchen, on a loading dock, etc. Relaxation techniques are used to self-control reactions to stress, including pain, thereby reducing muscle tension and further decreasing the duration and intensity of pain, reversing the escalating cycle of pain-stress-tension-increased pain. Biofeedback training is performed in conjunction with autogenic training. Several meetings with a psychologist allow for evaluation of the patient's need for relaxation techniques, teaching autogenic techniques, assessing deep relaxation in ameliorating individual experience of pain, instruction in self-hypnosis if indicated, and discussion of emotions which may surface in a relaxed state. Provision for continuation of therapy or followup can be accomplished on an outpatient basis if necessary.

Physical therapy in the CPS program, led by one and one half physical therapists, consists of conventional modalities (excluding whirlpool, hot packs, and traction) plus a program of exercise consuming some three hours per day. The purposes of the exercises are to increase mobility, range of motion, stamina, muscle tone, and balance, to decrease the fear of movement and to correct physical limitations such as gait abnormalities. Although most exercising is done in groups on mats and in the RIC pool, individual sessions are scheduled when necessary. Each patient is given a home program of exercises at discharge and strongly encouraged to make exercise a part of daily life. Physical therapy in part and the schedule of treatment as a whole are designed to build endurance and re-acclimate the patient to participation in a full day with many consecutive hours of activity.

Occupational therapy provides education in and supervised application of principles taught in the program, especially proper body mechanics, breathing, and relaxation techniques. patients are taught exercises designed to strengthen certain muscles in order to increase range of motion in the upper and lower extremities, to develop trunk flexibility, and to build endurance and tolerance for daily living skills, vocational tasks, and recreational activities.

The overall objects of the occupational therapy program are to increase proper body mechanics, flexibility, balance, gross coordination, and spontaneous movement. This is accomplished by means of 1) lectures, slides, videotape and practical demonstration, 2) group exercises with apparatus, 3) individual muscle re-education/relaxation sessions, 4) functional mobility course participation and review, 5) community reintegration field trips, 6) daily living skills practice in groups and individually, 7) monitored practice of learned skills, and 8) home exercise and activity programs. Each patient is provided with a home program before discharge and rechecked after six weeks for physical and functional status.

Transcutaneous nerve stimulation therapy is given a trial if it is deemed potentially useful in a particular individual.

All patients contemplating a return to work or change in vocational status are aided by the Vocational Rehabilitation department. Constant reinforcement of learned pain managenent techniques is stressed in counseling and work evaluation sessions. The vocational counselor, coordinator of a team consisting of a work evaluator and a job placement specialist, works closely with patients to determine their feelings regarding return to work issues. Components of the vocational rehabilitation service include counseling and development of job interest, aptitude and achievement profiles, development of positive work attitudes through group process, assessment and redevelopment of pre-injury work skills, assessment and upgrading of physical tolerance and endurance for work, development of pain saving and energy saving techniques suited to patients in particular kinds of work, assessment and training of proper body mechanics for work, identification of appropriate job or training options, work conditioning through simulated job activities, job seeking and job survival training, job placement and followup, and education through lecture/discussions on safety, employer attitudes toward chronic pain, and other relevant topics.

Traditionally the "all or none rule" and a lack of light duty jobs have barred many injured employees' return to work. Persons were not deemed capable of working at all unless they could return all at once to full time, full capacity employment. While the rule is still quite prevalent among all kinds of employers, some flexibility can be introduced. The CPS Vocational Job Site Visit Team may aid both employee and employer by job site analysis, job modification recommendations, setting of physical tolerances, establishing gradual job reentry schedules, and identifying new job options with the same employer. CPS patients working through the vocational rehabilitation program have been extraordinarily successful.

In addition to the staff listed above, CPS also employs two residents, one full time secretary, one full time administrative assistant, one half time research assistant, and twenty-four-hour nursing staff. Research personnel from the Pain Control in Cancer project work closely with CPS as well.

Efficacy and Evaluation of Program Results

RIC has established REHABIS, the Rehabilitation Information System. REHABIS data were combined with information from the CPS data collection instrument, LOBASCA, for a study of program efficacy begun in early 1980 (formal publication of results forthcoming-, as submitted by Robert G. Addison, M.D.). REHABIS contains demographic, economic, medical and psychosocial information on all first admission inpatients at RIC. LOBASCA, by contrast, is a self-assessment questionnaire administered to the patient at four or five different stages in his relationship with CPS from preadmission to four months post discharge.

For the study, three LOBASCA questionnaires from each of 140 CPS inpatients were analyzed to ascertain whether patient perception of pain location, intensity, duration, etc., and patient assessment of functional abilities (sitting, walking, lifting tolerances, etc.) underwent any change in the course of treatment at CPS. LOBASCA results show significant improvement according to all test criteria. All admission to discharge comparisons showed marked improvement. Some test parameters showed further improvement discharge to followup. No decreases were observed in functional ability admission to discharge or admission to followup.

Program efficacy for those participating in vocational rehabilitation is also measured in terms of placement statistics. Over the last four years, the vocational rehabilitation program has steadily increased the number of successful job or training placements. Until 1977, placement records on CPS patients were not maintained separately from those on other RIC patients engaged in vocational rehabilitation. In 1977, 40.5% of CPS patients participating in vocational rehabilitation were successfully placed; in 1978 the percentage rose to 51%. In 1979, 70.8% were placed and in the first six months of 1980 the percentage ran near 81.6%. 72% of the job placements were returned to the old employer either in the same job or a newly modified one. 28% were placed in totally new jobs with new employers. An informal three-year followup indicates that a substantial majority of patients have been promoted or have transferred to better employment within three years following program completion.

MEDICATION

A pattern of multiple medication intake including some form of narcotic characterizes drug use by the chronic pain patient. Analgesics, sedatives (including tranquilizers and muscle relaxants) narcotics, and psychotropic drugs account for the greater part of intake. The vast majority of persons referred to CPS take some form of lesser narcotic in conjunction with an analgesic, e.g., acetaminophen with codeine phosphate (300 kg/ 30 mg respectively), or acetylsalicylic acid with codeine phosphate (325 mg/ 30 mg respectively). Stronger narcotics such as meperidine hydrochloride, morphine, or dilaudid are used with less frequency. On occasion, use of injectable narcotics is reported.

Patients referred to CPS generally consume medications prescribed by a single physician, usually their family physician, or an industrial physician, orthopaedic surgeon or neurosurgeon. Only rarely is a patient found using medications prescribed by two or more physicians. There appears to be no correlation between physician specialty and type of substances prescribed.

Side effects of drug intake, as discussed above, can pose serious obstacles to patients attempting to cope successfully with chronic pain. Most commonly observed side effects include depression, drowsiness, loss of contact with reality, headache, and decreased alertness.

While fewer than five percent of all patients evaluated at CPS are physiologically dependent upon their medications, an extremely high percentage evince psychological dependency. Well over 75 per cent have more than incidental drug intake.

The CPS inpatient program requires detoxification as part of the standard course of treatment. As in other aspects of the program, education is a primary component; at the outset the patient receives a full explanation of detoxification procedures and medical reasons for their importance. The actual strategy involves a rapid decrease in drug potency, usually over a period of one week, with maintenance of ingestion frequency until potency falls. After the initial step, frequency of administration is decreased. The patient may be maintained on a mild analgesic if needed, but all medications are administered according to behavior modification techniques, and none are given pro re nata.

Practices tantamount to iatrogenesis appear to arise from a basic failure on the part of most physicians to recognize the distinction between acute and chronic pain, and the resultant necessary difference in treatment strategies. The differences are particularly crucial in regard to patient attitudes engendered by medication. For example, p.r.n. orders including a refill order tend to focus the patient's attention on his pain, often reinforcing his sense of helplessness to change it and diverting his attention away firm personal physical and psychological resources which might otherwise be brought to bear upon the problem. The patient frequently develops fear and apprehension of being without medication. Finally, the attending physician may fail to prescribe the classification of medication most appropriate to the particular task required; that is, patients may have highly specific needs for sleep, sedation, tranquilizer, or psychotropic effects which remain largely undifferentiated by the prescribing physician in his choice of medication.

RECOMMENDATIONS

1. Facilitate cooperative, non-adversary relations among interested parties.

The chronic pain patient may be best served by recognition of his particular needs at the earliest possible time. Interested groups such as employers, employees, insurers, public agency officials, etc., should collaborate on the establisbment of workable early intervention programs for treatment of chronic pain. The targeted patient population might be those who show no change or worsened condition six months after acute care ends. Ongoing programs might be redirected to include new patient populations; for example, patients deemed to be poor surgical risks might be immediately introduced into programs which would prevent the development or further entrenchment of pain-related functional overlay, and which would recondition that patient to cope with the sudden circumstances of life with chronic pain. Alternatively, patients who are acceptable candidates for surgery but predicted to be long term recuperators might be admitted to a chronic pain treatment program as soon as feasible after surgery, to counteract the establishment of a pain-centered lifestyle.

2. Eliminate a percentage of disability through educational and ergonomic adjustment.

It has been shown that persons employed at tasks tailored to the capabilities of the individual worker, as opposed to persons deemed particularly suited to a task, are significantly less likely to suffer serious injury on the job. Workers involved in heavy physical labor should be educated in the principles of correct body mechanics. Guidelines estimating how much weight a specific person can and should lift occasionally and repetitively should be established. Devices for lifting, stacking and moving materials difficult for workers to move because of weight or bulk should be designed and installed in the workplace.

3. Direct research toward development and use of predictor scales.

Predictor scales identifying those persons likely to become chronic pain patients should be established by collection of sufficient psychological, physical, socioeconomic, and ergonomic data. The means should be found to administer a brief test at the onset of the problem or when the symptoms have lasted longer than are accounted for by physiological findings. With heavy input from vocational, psychological, and physiological treatment resources, programs should be instituted which could abort the development of a chronic pain situation.

4. Expand professional education on management of chronic pain.

The longer a patient is disabled the less likely he is ever to return to a normal level of activity. Failure by both primary care physicians and specialists to recognize the distinction between acute and chronic pain leads in most cases to extended repetition of acute care treatment modalities, allowing for a modified psychological orientation and for patterns of pain behaviour to become firmly engrained in the patient over time. Education of physicians in the differences between acute and chronic pain and the need to incorporate certain differences in treatment should be provided.

5. Organize multidisciplinary pain control program guidelines for practical use by medical facilities (large and small).

6. Develop reference/resource communication with the medical and allied health fields for pain research, education and clinical approaches.

7. Improve data collection to evaluate program results.

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REFERENCE

Kane, W.G. Incidence of lumbar laminectomy in the U.S.A. From a speech at the International Society for Study of the Lumbar Spine, New Orleans, May 1980.

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A Holistic Approach to Pain Rehabilitation: The Boston Pain Unit

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ABSTRACT

The traditional management of chronic pain has generally encompassed such options as bed rest, physical therapy, potent medication, surgery and nerve blocks. Experience has demonstrated the importance of the multi-disciplinary team in the approach to chronic pain, particularly when the pain problem has eluded diagnosis and/or adequate treatment via conventional techniques. In an attempt to widen the patient's choice of treatment modalities, the pain unit has emerged as a concept effective for the management of chronic pain. Frequently, chronic pain patients represent the treatment failures of the medical system. By the time of admission to a pain unit, their lives have become significantly disrupted and their pain problem complicated by depression, disability, financial stress, vocational difficulties, strains in interpersonal relationships, and a great loss of productivity.

For many chronic pain sufferers there is a tendency toward passive-dependent behavior (pill-taking, blocks, surgery, bed rest, unemployment, disability, etc.), and it is not uncommon for them to feel abused by the health care system which they once entered in a desperate attempt to find relief from their suffering. It is essential that these unfortunate individuals with chronic pain learn to take an active role in their health care, have an understanding of the various components involved in their pain problem, understand their options and, wherever possible, they must be helped to escape from the health care system.

For the purpose of this brief presentation I will focus on several of the more important issues dealt with in our pain treatment program.

1. Pain-depression-insomnia cycle
2. Medication deceleration (especially narcotics and sedative-hypnotics)
3. Support systems
4. The distinction between a handicap and a disability
5. Ice massage

The above concepts are especially important, not only for their immediate value to the patient while hospitalized, but also in the belief that unless these issues are addressed, one can anticipate a high recidivism, continued use of narcotic medications despite their limited effectiveness, continued life disruption by pain and depression, limited self-reliance, and gross abuse of the disability system.

Chronic pain remains an enigma that can mystify even the most experienced clinician. The traditional management of chronic pain has generally encompassed such options as bed rest, physical therapy, potent medications, nerve blocks, surgery, and at times, in the more intractable cases, operative lesions to the central nervous system. Although these techniques may have much to offer in ameliorating acute pain, in treating uncomplicated chronic pain (as opposed to chronic pain syndrome), and in relieving terminal cancer pain, their effectiveness is marginal in dealing with the chronic pain syndrome most often encountered in pain units.

Experience has demonstrated the importance of the multi-disciplinary team approach to chronic pain, particularly when the pain problem has eluded diagnosis and/or adequate treatment via conventional methods. In an attempt to widen the patient's choice of treatment modalities, the pain unit has emerged as a concept effective for the management of chronic pain.

Within the context of the "therapeutic community" oriented pain unit, we attack this major health problem in a manner different from conventional methods. Following review of medical data, a complete physical examination, and an assessment for various physical treatments (including biofeedback, transcutaneous electrical nerve stimulation, physical therapy, whirlpool, massage, ice, and heat) our approach is basically psychotherapeutic. The use of non-narcotic analgesics, mood-altering medications, forms of individual, group, and family psychotherapy, and peer pressure is believed to be highly effective. These methods have been discussed in detail elsewhere. (1,2,3,4)

Anxiety and depression are widespread phenomena in the United States and they often concurrently amplify the experience of medical illness. Yet, frequently, the powerful tools of psychological medicine are ignored. We are now aware that pain is multidimensional in that there may be numerous precipitating factors and various concomitants. Some are clearly organic and have physiologic manifestations; however, there is a growing body of knowledge that psychologic, neurologic, physiologic, psychosocial, ethnocultural, motivational, cognitive, and affective (conditioned) factors all contribute to that sensory experience that we interpret as pain. Because of the complex nature of the chronic pain experience, it is our contention that any treatment program designed for pain patients must be holistic in its orientation if it is to be effective.

Of the many aspects involved in the treatment of the chronic pain syndrome patient, I will limit my discussion to the following: the pain-depressed-insomnia cycle; medication deceleration: ice massage, support systems, and the distinction between handicaps and disabilities.

There has been considerable discussion of the relationship between chronic pain and affective disorders, particularly depression. Often the depression is felt to be of a situational type related to inactivity, reactive life changes, vocational disruption, family strain, and other adjustments secondary to the pain process. Frequently,however, we evaluate individuals who have a history of depression preceding the onset of their pain, or whose depression and pain symptoms have a complex inter-relationship. Apart from genetic studies implicating a positive family history of depression and other studies indicating that some individuals become depressed because of certain life deprivations, it has recently been suggested that depressed individuals have relative deficiencies in central catecholamines, specifically norepinephrine, dopamine, and serotonin. Although their role in the limbic system is unlikely to be the sole cause of depression, they may well have a major function in emotional expression. The limbic system has also been implicated in endorphin production and action, suggesting a role of this brain area in the mediation of the pain experience. Stimulation of endorphin production in the peri-aqueductal or periventricular gray matter is believed to involve fibers that enter through limbic sites. It is likely that depressive illness may lower the pain threshold, i.e., increase the perception of pain. Halpern suggests that one probable reason involves decreases in neurotransmitters; i.e., endorphin production and/or action may be partially related to catechol and indolamine production (5), and that through this mechanism, depression may limit endorphin production.

Patients in pain usually suffer from insomnia, with difficulty falling asleep, frequent awakenings, and/or early morning awakenings. These symptions are also extremely common as vegetative signs of depression. However, pain patients will inevitably attribute their insomnia to pain rather than to depression, possibly because this is a more socially acceptable cause. It is difficult to dissect the pain-depression-insomnia cycle as to which problem is primary and which is reactive. However, regardless of the origin, once this cycle is established, it becomes self-perpetuating and requires active intervention. There is growing evidence that the use of tricyclic anti-depressants may be useful in this process. Again, the catechol-indolamine system is implicated in the mechanism of action of these compounds. The use of sedating anti-depressants in a once daily dosage at bedtime (doxepin, amitriptyline) most generally help the insomnia prior to any anti-depressant effect, which may take 7-21 days. What is most striking is the observation that as the insomnia improves and patients awaken in the morning more rested, their subjective complaints of pain appear to be minimized, and clinically these patients appear less depressed. Therefore, treatment for this pain-depression-insomnia cycle should be considered a specific therapeutic intervention for chronic pain. It is also our impression that barbiturates or potent sedative hypnotics are counter-therapeutic and should not be used for this purpose, as they can worsen the depression. Similarly, while diazepam and related compounds may be efficacious in acute pain accompanied by anxiety, these drugs are often less helpful or even harmful in chronic pain patients, as their effects may exacerbate already existing depressive symptoms.

We have been extremely successful in developing a system for <u>medication deceleration</u> in our pain unit. More than 50 percent of the patients admitted to the unit are using narcotic analgesics at the time of admission. Some use narcotics at a daily dose commensurate with some physical dependence. Many also have a history of extensive use of non-narcotic analgesics, such as diazepam and/or other sedative-hypnotics. The use of narcotics is rarely indicated in the daily management of chronic pain syndromes. Upon detailed questioning, most patients state that the medications they take for pain relief are only partially effective, if at all. Many report experiencing unpleasant side effects. Although much has been written about the euphoric effects of narcotics, we have found that many patients openly discuss the dysphoric effects of narcotics and sedative-hypnotics; they frequently describe their experience as being "out of control." Many see the use of medication as a crutch and find that prolonged usage affects their self-image and self-esteem. Many become concerned about the possibility of psychological and physiological dependence. Most important is the realization by the patients that these medications are, in the long run, not the answer for their pain.

Our approach to a more rational use of pain medication is, in part, modified from that described by Fordyce. (6) As quickly as possible following admission, all parenteral medication is replaced by oral medication, even if this necessitates increasing the dosage to fairly large amounts. We are not concerned with the absolute number of pills ingested daily by patients at the time of their admission. We try to minimize confrontations on these issues because patients tend to distort the importance of medication, often elevating analgesics to a major position in their lives. We discourage this perspective, and, in fact, encourage patients to de-emphasize their need for pills by discussing medications in a very straightforward manner. We use no PRN pain medication, since this tends to operantly reinforce both pain and pill-taking behavior. Patients are placed on a schedule for taking medication at specific time intervals during the 24-hour period. They are responsible for fetching their own medication at the nursing station at the appropriate times. No medications are given in the patients' rooms, nor are patients reminded of medication times by staff members. Should a patient miss a scheduled medication, he/she must then wait until the next scheduled medication time, assuming that the medication is not medically essential (digoxin, thyroid replacement, etc.). Initially, some patients test this system and become angry when they do not receive missed medications. However, they rapidly adjust to this regimen, and after the first several days of the program, rarely find it a problem. Occasionally some patients continue to test this system until they become convinced that it is a losing proposition for them.

Deceleration begins after the patients have been in the program long enough to have begun to develop alternative methods of coping with pain. This is usually after about two weeks.

Deceleration from medication would not be possible without the tremendous assistance given by our pharmacists. All medications which are to be tapered are combined into one large capsule. Patients then receive decelerating doses of the active ingredients at the normally scheduled times. This appears to be an innocuous way of gradually decreasing the medication dosage. Patients see the same number of pills daily, until the active ingredients are totally withdrawn and the medication is discontinued. Rather than being deceived, patients are completely informed about the deceleration process. They are informed when deceleration will start and they are told the exact number of days through which deceleration will extend. Generally, the deceleration process averages from 9-18 days, depending upon the extent of dependence and the absolute amount of medication taken at the time of admission. It is of note that we have seen only one case of withdrawal using this approach, and this reaction was not severe. It should also be mentioned that frequently while deceleration is in progress, patients receive doxepin at bedtime and hydroxyzine, either on schedule throughout the day and/or at bedtime.

Our success rate in decelerating chronic pain patients from medication is quite impressive. Of all patients admitted to the pain unit taking narcotics and/or sedative-hypnotics, 95 percent or more are free from these medications at the time of discharge. At least two-thirds of those patients who leave the pain unit off narcotic medication remain off narcotic medication at the time of their one-year follow-up visit. We are in the process of conducting a study to determine if these individuals will continue their drug-free status over longer times. Our initial results appear encouraging.

It is crucial to mention that weaning patients from their medication is simultaneously accompanied by intensive training in alternative techniques of pain control. These involve physical therapy exercises, whirlpool, massage, biofeedback, relaxation and meditation exercises, transcutaneous nerve stimulaton, and ice massage.

The use of <u>ice massage</u> for pain control is, for many patients, an extremely efficient, safe, and inexpensive method to achieve partial or complete pain relief for variable periods of time. The purpose of ice massage is to decrease pain and promote relaxation by numbing a local area superficially. Nearly all patients receive trials of ice massage. After a minimum of three treatments, we assess the efficacy of this particular mode of pain control for the individual patient. The only absolute contraindication for ice massage which we have thus far encountered is previous frostbite in the area to be treated, or hypersensitivity to cold. It should be noted that ice massage is a safe treatment for patients with hyperesthesia; however, caution is advised. (7,8,9,10) Most of our experience consists of giving ice massage to patients with chronic low back pain, ranging from uncomplicated back strain to the most complex post-surgical back syndromes accompanied with sciatica and/or arachnoiditis. These individuals generally do well, with initial pain relief extending from 15-30 minutes to as long as three hours. The duration of pain relief usually increases after multiple applications of the ice massage technique.

In assessing results from the pain unit, we have made attempts to better understand and therefore predict the likelihood of success for the individual patient in the program. Those patients who clearly are unlikely to benefit from the pain program should be identified and discharged as quickly as possible both for their own good and that of the therapeutic community. Generally, our observations indicate that success does not appear to be related to the extent of organic pathology, although there is some correlation with the duration of illness. That is to say, individuals with life-long pain histories and/or medical disability are less likely to break the cycle than those for whom the pain problem is more recent. Patients with severe primary depressive illness, severe character disorders, or thought disorders also generally do less well than those whose emotional disorders are reactive and developed subsequent to the pain process. We have not found a correlation between the number of surgeries and the likelihood to improve in the pain program. Those variables believed to be most essential include the following: motivation; a desire to return to a more functional, productive lifestyle; relative absence of secondary gain, especially financial; the absence of active litigation; and adequate support systems.

By support systems we refer to those areas of an individual's life which appear to be nurturant - primarily vocation, family, friends, hobbies, church, and school. We believe that loneliness often becomes a way of life for those individuals with few "significant others" and tenuous external supports. The chronic pain of these patients often remains refractory to treatment because they utilize the health care system as their major emotional supportive network. Because relationships may reinforce mal-adaptive, self-defeating behavior, as well as adaptive behavior, families can either become supportive to the goals of the pain unit or sabotage those goals. Therefore, a full assessment of composite support systems for an individual patient is an integral component in determining whether that patient is more motivated to remain ill or to begin the healing process. Also, the family unit becomes a treatment entity as handled by the social worker in our unit.

Many individuals admitted to the pain program have previously been identified as being "totally and permanently disabled." It is essential that the patient learns to distinguish between a handicap and a disability. A handicap is a disadvantage that makes achievement of certain goals unusually difficult; it may be either physical or psychologic. The vast majority of the patients encountered in our pain program might be considered to have a handicap in the sense that their "weak system" prevents them from using the specified or affected body part as effectively as they had in the past. A disability, on the other hand, implies that for one of a variety of reasons, physical or psychological, an individual is deemed incapable of functioning or being productive in some area. The "in some area" is emphasized because, of the approximately 1,000 patients seen on the Boston Pain Unit, we have yet to encounter an individual who is "totally and permanently disabled" from everything. An individual with severe discogenic disease who has had one or more surgical procedures may be disabled from heavy lifting, prolonged or repetitive bending, or tasks which involve significant overhead reaching. That same individual, however, may be capable of a myriad of other types of work, as yet unexplored. We have seen paraplegic patients learn to cope with pain, resolve depression, return to school, and become self-employed. We have seen a young athletic woman involved in a motorcycle accident with subsequent hip disarticulation, cope with pain, resolve depression and through perseverance, become a champion skier. These are but two examples of individuals whose personal convictions about their self-worth prevented them from falling into the welfare system and prevented them from being labeled as "totally and permanently disabled." Many individuals with handicaps are not disabled, nor do they wish to be considered as such. Furthermore, those patients who seek total and permanent disability statements from physicians perhaps have a problem of motivation, and therefore a psychologic disturbance rather than an absolute physical problem must be considered. If we, as health care providers, continue to write letters freely for patients attesting to total and permanent disability, then we will often be doing the patient more of a disservice than a service - we will rob him/her of a chance to be productive and regain his/her self-respect and the respect of others.

Patients come (are referred) to the pain unit often as the treatment of last resort in the health care system. They are depressed, lonely, angry, and suffering. Many leave much improved - coping better with their pain, which is frequently diminished, less reliant on medication (and in general on the health care system), more active, more comfortable, less depressed and more in control of their lives. They live in the present looking forward to the future compared to the prior pattern of remembering the past and dulling the painful present with medication. These are the changes which make team work on the pain unit so gratifying.

REFERENCES

1. Aronoff, G.M., Wilson, R.R. "How to Teach Your Patients to Control Chronic Pain", Behavioral Medicine, pp 29-35, July, 1978.

2. Wilson, R.R., Aronoff, G.M. "The Therapeutic Community in the Treatment of Chronic Pain", pp 477-481, Vol. 32, No. 7, 1979.

3. Aronoff, G.M., Wilson, R.R., Sample, S.S. "Treating Chronic Pain: The Team Approach", Nursing Care, pp 12,13,27, April,1978

4. Aronoff, G.M., Kamen, R. "Biofeedback - A Major Adjunct in a Comprehensive Pain Rehabilitation Program", Unpublished Manuscript.

5. Halpern, L. "Neurophysiological Theories of Pain in the Management of Pain in Surgical Practice", Postoperative Pain, pp 16-18, Chirurgecom, 1979.

6. Fordyce, W.E. Behavioral Methods for Chronic Pain and Illness, pp 157-168, C. U. Mosby, 1976.

7. Waylonis, G.W. "The Physiologic Effects of Ice Massage", Arch, Phys. Med. Rehabil. 48.1, pp 37-42, January 1967.

8. Grant, A.E. "Massage With Ice (Cryokinetics) in the Treatment of Painful Conditions of the Muscoskelatal System", Arch. Phys. Rehabil., pp 233-238, May 1964.

9. Aronoff, G.M., Walls, C.M.; Wheaton, C., Carlile, J. "Clinical Report on Ice Massage for Pain Control", Mediguide to Pain, DellaCorte Publications, accepted for publication.

10. Olson, J. E., Stravino, V. D. "A Review of Crytotherapy", Journal APTA, 52:840-853, August, 1972.

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Multidisciplinary Treatment of Chronic Pain at the Northwest Pain Center

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ABSTRACT

The Northwest Pain Center is a three-week multidisciplinary day care pain management program which has been operating since 1972. Experience shows that pain problem result in excessive use of medical resources, inappropriate medication use, and possibly unnecessary surgeries. Significant depression and family disruption are common. In spite of powerful incentives that maintain pain behavior, most important being the compensation and disability systems, more than 70 percent of patients maintain objective physicial gains resulting from pain center treatment. Studies attempting to differentiate long-term successes from long-term failures provide implications for treatment and evaluation strategies. Areas of need are identified in public and professional education, and necessary future research.

THE NORTHWEST PAIN CENTER PROGRAM

The Northwest Pain Center program has treated chronic pain patients since 1972. At the present time, forty percent of patients referred are excluded from treatment after evaluation because they do not appear to be candidates for a self-help approach, or because they are not interested in admission. Reasons for exclusion are rooted in results of follow-up studies (Seres et al. 1977, Painter et al. 1980). An initial screening evaluation brings much of this to light.

Effectiveness of the pain center is in part a function of the milieu which is established through careful planning, revision of strategies, and staffing approaches (Newman et al. 1978). The Northwest Pain Center is staffed by two full-time physicians, three full-time clinical psychologists, two physical therapists, an occupational therapist, a vocational counselor, four nurses, two biofeedback therapists, and a secretarial staff consisting of six full-time persons. Appropriate physician specialists are used as consultants for specific medical problem. The average cost of referral had increased from $3400 in 1976 to over $7500 for the three-week program in 1980. As a result of these increases, the program has recently (June, 1980) changed to a full day-care setting with housing being provided for out-of-town patients at a nearby motel. patients specifically requiring hospitalization for drug withdrawal or significant medical problems are hospitalized only as long as needed to resolve these issues. Transportation to the day-care program is provided. A staff member maintains liaison at the motel and runs an evening program. The present cost of the day care program is $3250 for all services provided other than the cost for the motel.

The program is three weeks in duration, and each week is organized around a general theme. Admission occurs on Monday and Tuesday of each week. Each new patient is assigned a more senior "buddy" to enhance the effectiveness of the milieu.

The philosophical bases for therapies used are education and "self-help." No form of active intervention is ever used: on the rare occasions that surgery or other interventionary procedures seem to be indicated, patients are referred to their own physicians. No passive modalities such as manipulation, heat, massage, or traction are used. Patients are involved in an <u>active</u> program stressing exercise and application of proper exercise principles to posture mechanics and to daily activities. Psychotherapy in groups, individually, and with the spouse is an important part of the program. Daily lectures and discussion groups provide patients with information regarding the source of the pain and the reasonable therapies available. Vocational readiness and planning are stressed during the last two weeks by the occupational therapist and vocational liaison person. Nurses assist patients in drug withdrawal and daily monitoring of medical problems, with the physicians. Biofeedback and relaxation training are used as appropriate to the patient's needs. Spouse involvement at the initial evaluation and during the last two days of therapy is urged. The role of the Pain Center as a turning point in the patient's life is stressed.

THE VICTIMS OF CHRONIC PAIN

Sixty-four percent of patients present with low back pain as the major source of distress. Twenty-three percent have neck pain or headache or both. Duration of disability has decreased from an average of 4.5 years prior to 1976, to 4.0 years in our most recent survey. Most patients are blue collar workers, with sawmill workers, construction workers, loggers, truckers, and other laborers representing 40 Percent of patients seen. Other occupations represented range from college professor and management to grocery checker. Twenty-one percent of the population have had white collar jobs.

Seventy-six percent of our patients are covered by workers compensation. Eight Percent are covered by Federal Workers Compensation.

Typical patients have had extensive involvement with the medical system prior to treatment: they have spent an average of eight days in the hospital in the year prior to admission. Low back patients have had an average of 1.1 surgeries in one group studied (the first 100 patients of 1980), and 2.0 in another (Seres et al. 1978). An average of 0.72 surgeries had been performed on the group with neck pain. Surgeries obviously had not solved the problems; in fact, patients often report that surgery has either been of no benefit, or has worsened their condition.

A frequent pattern in the treatment of chronic pain is the repetition of diagnostic tests; in our experience, about half of the patients have gone through recent, unnecessary diagnostic procedures, by far the most common of which is the myelogram. Long-term followup results (Newman et al. 1978) present pranising data to suggest that pain center treatment reduces this tendency, with only 16.7 percent of patients seeking further care at the fourteen week followup, a figure which is reduced to 8.3 percent eighteen months after discharge.

Although data are hard to obtain, it seems that approximately 3 percent of patients have surgery performed after discharge even though such surgery has been explicitly discouraged; results have been uniformly poor. Requests for readmission have occurred after as many as three surgeries that had been advised against. Individual review of these cases supports the belief that the indications for repeated surgeries are largely uncorrelated with clinical improvement in spinal pain. If confirmed, such an observation could have profound impact on the traditional course of pain treatment, and perhaps more importantly, upon the course of the injured worker with pain. Much literature which supports use of surgery for spinal pain is anecdoctal and rests upon possibly spurious observations. The following example (Keim 1978) suggests the sort of data-collection error faced by the individual practitioner: "In a very large series of personally operated patients the author can recall only one or two instances where a spine fusion was performed and the patient was unhappy with final results."

In fact, not only does prior treatment seem to have little positive effect upon patients, but in our experience, it often appears to consolidate a pattern of disability which might have resolved. In many cases, medical treatment offered by well-intentioned practitioners has increased subjective discomfort and prolonged a state of dependency. The following cases are offered as examples:

> BJC. A 42-year-old women was contemplating a trip to Europe when she hurt her back at home. She saw her family physician who suggested that prior to her trip she should at least see an orthopedic surgeon to be sure a ruptured disc was not present. Although no neurological signs were evident, the orthopedist suggested a myelogram to be sure that something wasn't missed so that the patient would not have difficulty during her trip. Due to a mixed injection, the patient developed a severe neuritic reaction requiring complete bedrest in a hospital for three weeks following the myelogram. Despite the mixed injection and no evidence of neurological dysfunction or positive findings on the myelogram an explor-

atory laminectomy was performed in August 1976, four months later. With significant increase in leg symptoms postoperatively, a repeat laminectomy was performed in May 1977 and a L4-5 fusion in September of 1977. Because of the type of persisting pain it was felt that central pain was the source of the patient's distress. In November 1977 a dorsal column stimulator was implanted. This resulted in the usual paresthetic sensations. However, the patient now noted only improvement in some of the foot pain, but no improvement in the back or leg pain problems. A revision of the dorsal column stimulator was performed a month later. Because of persisting difficulty, in March 1979 a revision of the lumbar fusion was performed. The dura was explored and arachnoiditis was found. In June 1979, the fusion was taken down and a decompressive laminectomy removing the spinous processes was performed. Because of persisting pain, the patient had been considered for a brain implantation procedure. She attended the Pain program three weeks in the latter part of 1979. The following is a letter received recently from her physician at the University of California.

> Dear Dr. Seres:
>
> Just a note to let you know how much I appreciate your treating BJC. She has had an excellent result through your approach to a difficult pain problem. She is much more active now and has considerably less pain. She is not on narcotics. I saw her in follow-up on May 16, and she is truly a changed person. . . .

The following case demonstrates an acceleration of well-intentioned procedures for pain relief extending far beyond the needs of the patient.

> The patient is a 34-year-old man with persisting posterior cervical pain who was seen in the program in January 1980. The surgical procedure which had been performed was a complete removal of all the spinous processes and laminae of his cervical spine because of chronic cervical pain. Nowhere in his record is there any evidence of spinal cord compression, neurological dysfunction, sensory loss, or motor weakness.

The surgical philosophy, "If it hurts, cut it out," persists, Clearly this patient's pain was not relieved, but rather exacerbated by the surgical procedure performed. Yet in speaking to the surgeons involved, it became clear that their feeling was that there was nothing to lose, and after all, the indications were there.

Positive findings on myelography and other diagnostic tests may have no bearing on the source of the pain. Thus treatments designed to eradicate the radiographic findings (manipulation, surgery, and so forth) may not succeed. Also, in the spine, most surgical procedures require essentially a dismantling of the anatomy which cannot be restored.

Too often, new indications are developed and put into general use before correlation with outcome is demonstrated. While some indicators do seem to predict successful results, others do not. Also, short term benefit after surgical procedures seems not to last in a significant number of patients who complain of even more severe distress on assessment in the pain clinic setting.

DRUG USE IN CHRONIC PAIN

Inappropriate or questionable drug use is common. While it has been widely suggested that narcotics and muscle relaxer-sedative drugs are not likely to be of benefit in the chronic pain patient, fully 63 percent of patients were taking one or more of these medications. The typical patient has been using a narcotic and a muscle relaxer for more than a year. Codeine is the most prevalent drug, usually taken in doses of from four to eight tablets daily. Schedule II drugs are being used by nine percent of patients. Prescription anti-inflammatory drugs are widely used in chronic pain. Eighty percent of patients seen in 1979 had used one of those. In fact, 16 percent were still taking them when seen for their initial evaluation. Use of such medications in non-inflammatory pain must be questioned. Only 36 percent of patients are not using prescription medications when they are seen. This is a rather discouraging statistic when one considers effects which range from no benefit to exacerbation of the problem with mental depression, reduced cognitive efficiency, personality deterioration, and compromised doctor-patient relationships based upon dependency and need for prescriptions.

No clear patterns have emerged in informal observation of the source of drug overutilization by medical specialties. In our experience, there are a handful of individual practitioners in each of the specialties associated with treating pain who tend to overprescribe medications. Curiously, we have found psychiatrists using analgesics fairly extensively, Recently, one such individual who was prescribing 20 milligrams per day of hydromorphone for pain relief explained that, "To deal with the psychiatric problems, we must first resolve the pain problem." The psychiatrist actually believed that habituating the patient accomplished this. In our experience, this is not a productive solution.

Significant withdrawal problems have not been frequent and are usually managed successfully by increasing the dose of the medication or by slowing the rate of reduction. When drug use is excessive, individuals are detoxified prior to admission in a local, private substance abuse program. This degree of dependency is rare. Because of the fairly gradual reduction regimen, it is difficult to determine the extent of physiological dependency in our population. Psychological dependency upon pain medications at the time of admission is estimated at about three-fourths of those who use prescription medications. Therefore, major emphasis in the program is placed upon education about chronic use of pain medications. This effort is apparently rewarded with fairly good maintenance, especially with more powerful drugs (figure 1)*.

Drug withdrawal has been accomplishedthroughthe use of masked capsules given on schedule, or through individual contract with the patient, who monitors his or her own withdrawal regimen. The latter procedure seems to work well, and is more in keeping with the philosophy of self-help and self-control. It also serves as another index of interest on the part of the patient in meaningful change. The use of peer pressure and operant reinforcement are critical components in this approach, requiring an established therapeutic milieu.

EFFECTS OF CHRONIC PAIN

Psychological and Family Impact

Psychological effects of chronic pain are difficult to assess by the time of Pain Center referral, since some psychological factors my be assuned to preexist a chronic pain problem. Other factors my he a result of loss of wages, loss of family role position, and the corrosive effect of pain itself. Significant depression is noted in 56 percent of patients at admission, and a pattern of hysterical conversion reaction in 70 percent (table 1). Depression is probably a result of chronic pain in at least half of those with the problem, and may have preceded the injury in the others. The tendency toward conversion reaction is presumably a fixed pattern of personality, but some evidence suggests that elevations in psychological tests such as the MMPI increase during chronic illness states. We have found that elevations in scales Hs (Hypochondriasis) and Hy (Hysteria) are reduced following Pain Center treatment (Seres and Newman 1976). Since these psychological factors are presumably changeable based upon the involvement of the patient, it is difficult to see how they can be used, as they seem to be, as criteria for amounts of compensation from Social Security and other disability determination systems.

By subjective report, pain patients retrospectively rate themselves as having been very depressed prior to treatment, with an average depression rating of 93 on a scale of 0 to 100 (with 100 representing the most severe depression). At the time of discharge they estimate average depression on the same scale at 39, and again at 39 on followup an average of 18 months later (Painter et al. 1980). Interestingly, few patients initially admit to depression.

Chronic pain has a profound impact on the family as well; even so, one again notes the tendency of patients to deny family problems when they are initially evaluated. Roles are usually changed dramatically, and in many families there is an increasing resentment which is carefully controlled, producing gradually deteriorating patterns of communication. Separately conducted interviews with

*Tables and figures begin on page 55.

spouses at the time of admission reveal perceptions of family dynamics that are quite different, a pattern which my have preceded the onset of pain. In spite of the manifest difficulties related to chronic pain problem, divorce does not characterize the group: eighty percent of the patients are married, a proportion which does not seem to change at followup.

COMPENSATION AS INCENTIVE FOR PAIN BEHAVIOR

A crucial factor in assessing costs of chronic pain, as well as in fashioning treatment strategies, has to do with the canpensation associated with maintained pain behaviors. Oregon has been the most costly state of the 36 states whose insurance rates are set by the National Council on Compensation Insurance (NCCI). This rather progressive State has shown a 390 percent increase in the number of hearings requests filed in the decade 1968 to 1978. Ninety percent of these hearings result in an increased award (Redburn 1980). Thus, Northwest Pain Center may be particularly well qualified among pain centers to comment on compensation as a secondary gain factor related to chronic pain.

Frequently, patients state that at their age of 35 to 40, no one will hire them at a wage comparable to the income they received prior to a relatively minor injury. While there is merit to this observation, it is not rare to have a patient honestly admit that he is "going for retirement" because his lawyer says he can get it, even though he freely admits that he is not totally disabled. Thus, a system is apparently evolving in which some people are working diligently toward retirement, much as others work toward college degrees. For this reason, many patients literally <u>defy</u> the treatment team to make them better. A recent patient gave up a back brace, crutch, and leg brace which she had used for a year on her first day in the program when she learned from other patients that she did not have to look quite that bad in order to gain total disability.

While percentages or degrees of disability are used by most State Workers Compensation carriers to calculate the financial rewards for partial disability, these do not correlate in linear fashion with the settlement for total disability. For example, in Oregon, a permanent and total disability may merit up to $10,060 per year tax free for life, while a 50 percent disability represents a one-time settlement of about $18,000. Thus, incentive to achieve total disability is quite powerful. Once this is awarded, a physician must certify annually only that no change has taken place, not that an individual could work. Thus, it is almost impossible for a totally disabled individual to undergo a change in status, and he has effected a kind of lifetime financial security virtually unavailable to working individuals.

The concept of the "odd lot" allows the compensation board to include such factors as age, job availability in the individual's locale, job experience, and education, to add to the level of medical impairment in determining disability levels. Thus, determination of disability is taken out of the hands of medical experts, and responsibility is diffused among different disciplines. The decision becomes a part of the adversary system, further polarizing the patient away from recovery. It should be noted as well that this concept encourages the injured worker to remain in or move to a community that offers nothing but heavy labor; further, any effort to improve employability through education becomes a financial risk for the worker.

Thus, the system seems to provide a solution to a worker's employment problems through disability. The predicted high incidence of work-associated injuries reported prior to recent lumber mill closures in Oregon is but one example of this factor.

The Federal Workers Compensation system provides yet other problems. Patients on medical disability may receive up to three times more in canpensation than if they opt for medical retirement. Responding to a need to return workers to the job, the Postal System has recently begun creating job settings such that anyone, virtually irrespective of the degree of impairment, could perform in them. Recently, we have been told by postal employees that they cannot go to such settings because now the stress is too great.

A recent case illustrates the abuse of the Social Security System, and the almost tautological approach to disability that may render minor injuries irreversible.

> A 55 year-old womam developed neck pain in 1977, while employed helping her husband with an insurance business. In early 1978, she had a cervical laminectomy performed. Her husband subsequently retired. Although she was fully active, demonstrated no significant physical distress, was taking no prescription analgesics after her stay in the pain program, and maintained these gains for two years following discharge, she requested a hearing after her claim for Social Security had been denied. Physicians called to testify were asked if the patient desired retirement at this time. Of course the answer was affirmative. They were then asked if the patient's best interest would be served by giving her Social Security disability; the answer was, "Since the patient wants Social Security Disability, of course it would be in her best interest to obtain it." On no other grounds was it felt to be justified. On this basis, Social Security disability was awarded. In later discussions with the patient's attorney, the following philosophy emerged: "If I believe in my heart that I deserve it, then I should get it." This patient, on the basis of her success with Social Security, is presently claiming total disability with the State Workers Compensation system.

It seems clear that incentive factors as they relate to improved physical measures, maintenance of improvement, and return to work, are often not in a positive direction. It would appear that an individual who has done reasonably heavy physical work cannot continue to do this after an injury stops such activity; re-entry at a lower level or availability of jobs which are not particularly appealing for the individual seems to provide reasons for not actively pursuing rehabilitation. Without being a "malingerer," such an individual can maintain financial security by literally choosing not to return to work.

Because of the variability in claims settlements by Federal or State system, different degrees of liberalness associated with Social Security determinations in various States, a progressively larger system of advocate physicians and attorneys develops. The patients' best interests are served by actively exploring all possibilities within the system and delaying substantial attempts at rehabilitation. As laws become more liberal, insurance carriers merely petition for higher premiums. Increased costs are passed on to the consumer; thus, there is no limiting influence regarding the sums spent. In surveying the treatment of chronic benign pain, one must ask, "Isn't anyone watching the store?"

EVALUATION OF THERAPEUTIC RESULTS

The Northwest Pain Center has been outcome-oriented since the outset. Followup studies in a group of 100 consecutively-admitted low back pain patients have been published (Seres and Newman 1976, Newman et al. 1978). These studies demonstrated maintenance of overall effectiveness in objective physical measures, decrease in use of drugs, and reduced medical contacts. In an eighteen-month followup, objective measures suggest meaningful gains in approximately 75 percent of patients, although some tendency toward deterioration is noted. When patients are compared by employment status, it becomes obvious that full-time employment is associated with maintenance of improved function, or with further gains (figures 2 and 3). Part-time employment and student status are associated with similar although less striking results; doing nothing appears to result in significant regression of gains made.

Followup data for patients seen throughout the year 1976 were requested of the State Accident Insurance Fund (SAIF), the largest of the State's Workers Compensation carriers. Table 2 shows these values for 1977, 1978, and 1979. At the time they were initially,. seen, all patients who were referred were admitted except those who refused. Of the 75 seen in 1976, 71 were admitted. Average cost of referral at that time was $3,413.15. By 1979, claim that had been opened an average of 4.5 years were closed in 58 cases (82 percent). Despite the long term of disability, 18 (25 percent) had returned to work. Such data are difficult to obtain, and we have not been able to obtain similar data following our institution of a more selective admission procedure; presumably results would be improved.

It appeared that overall treatment effectiveness would be reflected in an increased number of patients who continue to do well or even improve. In a study of 145 patients who responded to retrospective questionnaires in 1978 (Painter et al. 1980), reasons for recidivism were investigated. Criteria for success in this study were subjective ratings, including subjective pain relief, amount of impairment based on pain, and mood state. As shown in table 3, the pain center experience was felt to be helpful by 77 percent of the patients, with an average pain reduction of 33 percent. Over the next eighteen months, further improvement was noted by 27 percent of the sample. On the other hand, deterioration was reported by 27 percent over the same period. A total of 73 percent are therefore as improved as they were at discharge or even better.

Pain severity at admission and degree of pain relief as a result of the pain center experience were not distinguishing factors between those who continued to improve after discharge and those whose gains dissipated (table 4). Demographic variables (table 5) show some relationship to success, in that females seem to do somewhat better. Contrary to usual beliefs, many younger patients with short-term disabilities do not appear to do particularly well; this my reflect little need on their parts to interest themselves in rehabilitation when compensation factors make the present situation tolerable. Marital status is likewise related to success or regression. Duration of disability and age, however, are not predictive. Operant and attitude factors, as measured by outside activities, amount of help at home (table 6), continued cure-seeking, involvement in job placement activities, and maintenance of dependency on compensation providers (table 7) seem to be related to the distinction between the success and failure patients. The only psychological factor which is related would appear to be depression/insomnia (table 8).

Incentive factors, as reflected in compensation, jobs, and by inference, job flexibility, are most powerfully related again to the degree of success individuals enjoy in the pain center experience (tables 9 and 10).

CONCLUSIONS

Although much has been learned about pain and its treatment, a good deal more needs to be done in the areas of professional education, improved public knowledge about pain and its treatment, and more powerful andprecisebasic research.

Professional Education: Appropriate Treatment of Chronic Conditions

Acute care medicine does not work for chronic conditions. Although this observation is not widely made among physicians treating pain, it is seen, for example, in the develoment of hospices for cancer patients. The acute-care model holds that symptoms and signs are reflections of an underlying pathological condition. This belief produces a predictable sequence of investigative procedures aimed at finding the "cause" of the condition, removal of which will presumably cure the symptoms. Analgesics, sedative-relaxers, and hypnotics aggravate both physical and psychological difficulties in chronic pain.

Unfortunately for the patient suffering chronic pain, physicians are accustomed to intervening in active if not heroic ways to alleviate suffering. Positive tests do not necessarily lead to positive surgical results; in many cases, there is no relationship whatever between test results and relief of pain. In general, surgery may not be a viable option when performed for the relief of pain. Changing the heroic mentality in concerned physicians will require considerable training beginning as early as medical school.

Alternative Approaches in Management

Orthopedists, neurologists, and neurosurgeons are frequently not well versed in the use of proper body mechanics, active exercise, and other self-help approaches in the management of chronic pain conditions. Highly trained physical therapists should be used as a potent educational resource for the patient rather than as a source of palliative, passive symptom reduction.

Expanded Evaluation and Education Procedures

Directions for therapy may be augmented with the use of psychological and social evaluations. These should be performed early in the course of treatment, rather than after invasive diagnostic techniques and even surgeries have failed. Too frequently, physicians see psychological evaluation as useful only in determining whether the suffering individual is 'mentally ill," malingering, or in some way "imagining" discomfort. Indeed, psychological, social, and environmental factors appear to be more closely related to pain and to pain relief than are such factors as severity of injury, number of surgeries, or radiographic findings.

The physician should be trained to be alert to a variety of incentive factors that may encourage increased pain behavior, such as financial reward, family sympathy, or escape from boring or dangerous work. The physician may also provide early education to his patient that would discourage attempts at retirement on the basis of a minor injury. This requires training in relevant legal matters.

Pharmacology and Pain

Unfortunately, much of the day-to-day education received by the practicing physician regarding medications comes from the drug companies themselves. For example, the market has recently seen the advent of combined narcotic agonist and antagonist compounds, with the indication that these are "safe for prolonged pain relief." The latter assertion is simply not true. Unfortunately opposing points of view are not nearly so persuasively presented.

PUBLIC EDUCATION

The problem of pain could be reduced significantly with public education about such points as the limits of the medical profession in alleviating discomfort, the use and abuse of medications, the structures involved in pain, and the nature of the compensation system and disability.

Medications

Broadcast media provide a repetitive "education" about drugs, the effect of which is profound although virtually subliminal. Drugs are portrayed as panaceas for pain, tension, symptoms of allergies and colds, and so forth. Indeed, one would believe that most medications cure the disease rather than merely alleviating the symptoms. Side effects of medications are not really addressed, and the general public certainly is not likely to appreciate the fact that use of any drug involves a tradeoff. Current packaging and advertising techniques leave the public with a picture of a much broader array of medications than is actually available. The concept of "extra strength" seem to imply more power, rather than increased dosage. Such terms as "aspirin free" when applied to acetominophin products seem to insure against the adverse effects of salicylates (which the opposing side, incidentally, dismisses as "upset stomach"). The public indeed comes to expect a "pain killer" with the implication of eradication of the cause of the pain. Unfortunately, prescription medications are perceived merely as more powerful extensions of the highly advertised nonprescription drugs.

This mentality would appear to coincide with a broader belief that we have a right to "feel good now." This is commingled, particularly among the younger patients, with weakening of societal taboos against drugs. Certainly the presumed value of suffering, or at least the expectation that some suffering is a normal part of the human experience, has faded in recent years.

public education designed to counter this set of beliefs would havetobe extensive and variegated. Some lessons may be learned from people who currently avoid narcotics. In our experience many people avoid them for reasons that are almost moralistic, citing a long-term distrust of drugs of any kind or a general notion of pills as being evil. This pattern tends to be associated with conservatism and perhaps with age. Thus one suspects that the utility of a morally based educational program would diminish with time in this population. Another segment of drug-avoiders is more pragmatic, objecting to personality changes and alterations in mentation as reasons for avoiding use of narcotics and minor tranquilizers. Curiously, lack of efficacy may not be particularly salient; many individuals taking moderate to heavy doses of narcotics readily report that their medications "do no good," or that the pain level remains unchanged when drugs are stopped. Yet, these are the same patients who report they only take their medications when they "have to."

Our experience at Northwest Pain Center demonstrates that education can be useful on a large-scale basis, at least with an interested population. Patients have readily come to understand such concepts as appropriateness, side effects, tolerance and habituation, mechanisms of action, and other technical aspects on the basis of two or three hours of direct lecture with additional informal discussion. They have eagerly learned the use of reference materials regarding drugs. The current public availability of publications formerly available only to the physician may herald an era of greater public awareness about drugs. Further, the trend toward consumerism seems to encourage this kind of skepticism, and may prove an ally in the struggle against misuse of prescription as well as nonprescription drugs.

Limits of the Medical System

Striking advances in medical care in recent years have received wide publicity. Given success in heart surgery, including replacement valves and pacemakers, and the more publicized organ transplants, it is difficult for the lay public to accept failure of the medical system to provide a total cure for suffering. This faith leads to insistence on relief, which may contribute directly to prescription-writing by the physician, and to possibly unnecessary surgery. Although there is clear need for education in this area, the medical profession itself is not likely to provide it.

General Medical Education

By conservative estimate, seventy-five percent of operated patients do not understand what has been done to them, and are surprised to find out. They do not recall having been shown a model of the affected system, nor do many recall even the most rudimentary education regarding their own situations or the alternatives they faced. Certainly some of this ignorance may be the result of faulty memory or attention; nonetheless, more general and easily available instructional material about pain-producing structures might deter many from a career in chronic pain. Encouraging the use of second medical opinions and education about the meaning of disagreement among doctors might also help reduce unnecessary surgery (Gertman et al. 1980).

Compensation Factors

The public in question does not distinguish between the concepts disability, handicap, and symptomatology. A handicap may persist even though symptoms such as pain have abated. handicaps are not equivalent to disability, the former being functional and the latter legalistic in character. Again our experience is that individuals are interested in such distinctions and show considerable interest in laws that relate to them. An unrealistic view of the possibility of retirement based upon minor injury may perpetuate a period of disability. Better understanding at the outset might reduce temptation to pursue the course of disability, whether consciously or unconsciously.

RECOMMENDATIONS FOR RESEARCH

The rapidly expanding body of knowledge about pain in recent years has only served to highlight our ignorance in the area. We have progressed from a rather mechanistic view of pain to the realization that it must be treated as a complex, shifting phenomenon with biological, psychological, and social features. Basic research is needed to help define the problem and meet its challenges.

Basic data are still needed regarding such factors as prevalence of drug use and variability of use among different individuals, and prescription patterns by different medical specialty. Knowledge about physiological addition is not normally available to the practitioner and must be studied in organized research. Direct evaluation of the efficacy of drugs in chronic care is an area that still needs further research; for example, if physicians and patients knew that pain medications lost substantial efficacy over a few weeks, this could substantially reduce incentive in both areas for prescriptions.

Outcome research is essential for all forms of therapy currently available. It may be seen as paradoxical that the "soft" practitioners (e.g., the pain centers) appear to be the only ones doing hard research. long-term outcome studies of many pain-relieving surgeries are difficult to find and frequently suffer serious methodological short comings. The frequently observed pattern of initial surgical success followed by deterioration mirrors the placebo effect, and may be the only value to surgery for a defined body of patients who will later become "chronic." Major research projects will be needed to evaluate this possibility, including double-blind studies using sham surgery. Outcome of drug therapies should be studied in controlled investigations, including use of antidepressant medications as well as analgesics. Pain centers should likewise continue to evaluate themselves, striving for more appropriate controlled studies.

Research is also needed in the area of outcome as it is related to new diagnostic techniques. It would not appear that introduction of newer tests such as the discogram and computerized tomogram has led to a higher proportion of successful surgeries, although it may lead to a greater number of justifications for surgery.

The most basic form of research has to do with the appropriate match between therapy and patient. Too little is known about the qualities of the patient who will benefit from each treatment strategy, whether we are discussing the pain center, drug therapy, surgery, benign neglect, or psychotherapy. So long as people are viewed as essentially indistinguishable, little meaningful knowledge can be gained about either the problem or the efficacy of the various approaches. We must look more to a careful definition and understanding of the syndrome we are treating, and the multiple external factors which may affect it, and less toward searching for indications for procedural interventions.

Table 1

Hysterical features	70%
Depression	56%
Character disorder	8%
Passive-aggressive features	6%
Normal	5%

Percent of patients demonstrating psychological disturbances at admission. Values sum to more than 100 since patients may display more than one.

Table 2

	1977	1978	1979
Returned to work	5	15	18 (25%)
Involved in vocational rehabilitation	14	11	4
Continued regular medical care	43	20	15
Closed claims	27	56	58 (82%)
Open claims	34	13	12

Average cost of admission	$3413.15
Total claims reviewed	75 (all SAIF patients seen)
Total enrolled in program	71

Cost benefit analysis for SAIF patients admitted to Northwest Pain Center in 1976

Table 3

	Pain increased	No overall change	Pain reduced
Overall effect Admission to followup	5%	18%	77%
(Average pain change)	(+21%)	(0)	(-33%)
Post-discharge changes Regression, added benefit	26	47	27
(Average pain change)	(+23%)	(0)	(-21%)

Overall treatment effect of pain center

Tabled values are percent of patients reporting pain increase, no change, or pain reduction. Values in parentheses are average change in pain intensity for those reporting a change.

Table 4. CRITERION VARIABLES

	Total group		Failure		Success	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Pain severity						
Admission	7.96	1.97	7.90	1.96	8.80	1.28
Discharge	4.91	2.76	4.45	2.11	5.75	2.47
Follow-up	4.93	3.01	7.60	1.61	2.60	1.97
Limitations caused by pain						
Admission	6.63	2.31	6.40	2.29	7.60	2.10
Discharge	3.83	1.96	3.30	1.87	4.60	1.72
Follow-up	3.71	2.23	5.50	2.17	2.30	1.60
Depression						
Admission	7.93	2.03	7.60	2.15	9.07	1.19
Discharge	3.88	2.35	3.73	2.32	4.13	2.15
Follow-up	3.88	2.47	6.07	2.40	2.07	1.88

Tabled values represent scales ranging from 1 to 10, with 10 representing the highest degreee of pain or disability respectively.

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-press.

Table 5. DEMOGRAPHIC VARIABLES

	Total	Fail.	Succ.	Fail/succ.		Fail./total		Succ./total	
				x^2	P	x^2	P	x^2	P
Sex									
Male	52.8	80.0	44.0	6.88	<0.05	9.00	<0.05	0.94	
Female	47.2	20.0	56.0						
Marital status									
Married	77.0	87.5	48.0						
Single	1.5	0	0						
Separated	4.5	4.2	12.0	11.80	<0.05	3.40		22.68	<0.01
Divorced	14.3	4.2	40.0						
Widowed	2.4	4.2	0.0						
Age category									
20–30	10.3	20.0	8.0						
30–40	29.0	20.0	28.0						
41–50	31.7	16.0	44.0	8.03	<0.10	8.52	<0.10	3.14	
51–60	24.8	36.0	20.0						
61+	4.1	8.0	0						

	Total group		Failure		Success		Fail./succ.		Fail./total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	P	t	P
Age	43.5	10.2	43.8	12.9	42.6	9.0	0.4		0.1	
Duration of disability	3.91	2.84	3.08	2.50	5.24	3.14	2.7	<0.05	1.6	

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-press.

Table 6. OPERANT VARIABLES

	Total group		Failure		Success		Fail/succ.		Fail./total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	P	t	P
Activities	1.6	2.9	–0.8	2.6	3.2	2.3	5.8	<0.01	3.8	<0.01
Pain talk	2.3	2.5	1.4	2.8	3.1	2.1	2.2	<0.05	2.1	<0.05
Understanding	2.1	2.3	1.1	2.4	2.2	2.1	1.7		2.4	<0.05
Help	1.2	2.8	1.4	2.3	2.0	3.8	0.8		0.5	
Marr. qual.	2.3	3.1	0.8	2.9	3.8	3.8	3.1	<0.01	3.8	<0.01

Tabled values represent linear transformation of rating scales such that --5 represents the greatest possible regression (e.g., increased pain talk, decreased outside activities, increased help from others).

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Table 7. ATTITUDE VARIABLES

	Total	Fail.	Succ.	Fail./succ.		Fail./total		Succ./total	
				x^2	P	x^2	P	x^2	P
Further medical care									
None	61.4	48.0	76.0						
Regular visits	21.4	16.0	24.0						
Further diagnosis	5.5	8.0	0						
Seek new opinion	6.2	12.0	0	11.0	<0.10	17.7	<0.01	6.4	
Desire surgery	3.4	4.0	0						
Had surgery	2.1	12.0	0						
Summary									
No care	61.4	48.0	76.0						
Reg. care	21.4	16.0	24.0	11.0	<0.01	7.5	<0.05	6.4	<0.05
Seeking medical solution	17.2	36.0	0						
Positive aspects									
Active	83.7	80.5	86.3						
Passive	16.3	19.5	13.7	0.6		1.0		0.1	
Negative aspects									
Active	47.5	61.1	28.6						
Passive	52.5	38.9	71.4	3.4	<0.10	1.0		3.3	<0.10
Reasons for reduced exercises									
Somatic	44.6	42.9	27.8						
Other	55.4	57.1	72.2	1.0		0.1		2.3	
Medication use									
Narc.	19.2	20.6	10.7						
Tranquilizers									
Minor	4.0	2.9	10.7						
Major	5.6	8.8	0.0						
Aspirin	53.0	47.1	53.6	5.1		1.4		7.5	
Antidepressant	18.2	20.6	25.0						

	Total group		Failure		Success		Fail./succ.		Fail./total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	P	t	P
Exer. freq.	11.4	9.5	9.6	9.4	15.2	10.2	2.0	<0.05	1.0	
Relax freq.	7.3	5.7	5.7	6.1	7.7	5.5	1.3		1.5	
Stim. use	8.8	10.2	10.6	10.0	7.3	10.0	1.2		1.0	
P.C. rating (±3 scale)	2.0	1.1	1.3	1.3	2.5	0.8	4.0	<0.01	3.5	<0.01

Tabled values for non-parametric factors are expressed as percent.

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-press.

Table 8. PSYCHOLOGICAL VARIABLES

Sleep quality	Total	Fail.	Succ.	Fail./succ.		Fail./total		Succ./total	
				x^2	P	x^2	P	x^2	P
Admission									
R-N	85.5	84.2	88.2						
R-E	5.1	5.3	5.9						
S-N	1.7	5.3	0.0	0.9		1.9		0.5	
S-E	7.7	5.3	5.9						
Discharge									
R-N	29.6	42.1	21.4						
R-E	21.3	21.1	7.1						
S-N	4.6	0.0	7.1	4.7		2.6		3.5	
S-E	44.4	36.8	64.3						
Followup									
R-N	31.0	45.0	13.3						
R-E	17.7	25.0	6.7						
S-N	9.7	5.0	9.7	8.8	<0.05	4.4		7.3	<0.10
S-E	41.6	25.0	73.3						

	Total group		Failure		Success		Fail./succ.		Fail./total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	P	t	P
Sleep adm.	4.6	2.3	4.3	1.7	5.2	2.5	1.4		0.9	
Discharge	5.8	1.5	5.7	1.6	6.0	1.5	0.9		0.9	
Follow-up	6.0	1.4	5.4	1.6	6.8	1.3	3.1	<0.01	2.2	<0.05

Tabled values for non-parametric factors for expressed in percent. R = restless; S = sound; E = enough; N = not enough

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-Press.

Table 9. INCENTIVE VARIABLES

	Total	Fail.	Succ.	Fail./succ.		Fail./total		Succ./total	
				x^2	P	x^2	P	x^2	P
Admission									
Comp.	71.7	72.0	72.0						
No comp.	28.3	28.0	28.0	0.0		0.0		0.0	
Follow-up									
Comp.	53.0	68.0	40.0						
No comp.	47.0	32.0	60.0	4.0	<0.05	2.7	<0.10	2.1	
Employment status									
Disabled by pain	40.5	56.0	25.0						
Not working									
Other	19.0	20.0	12.5						
Empl. part-time	8.4	12.0	12.5	9.7	<0.05	8.2	<0.10	6.4	
Empl. full-time	23.7	12.0	37.5						
Student	8.4	0.0	12.5						
Degrees									
GED	19.3	20.0	24.0						
Assoc.	4.8	4.0	12.0						
Bachelors	6.2	4.0	4.0	2.6		1.2		5.3	
Advanced	3.4	0.0	12.0						

	Total group		Failure		Success		Fail./succ.		Fail./total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	P	t	P
Highest grade	11.3	2.4	10.2	2.4	12.1	2.5	2.6	<0.05	2.5	<0.05
Work history										
Unskilled	5.8	9.9	3.8	6.1	11.0	14.4	2.3	<0.05	1.1	
Skilled	7.1	10.3	11.8	13.8	4.5	8.4	2.3	<0.05	2.5	<0.05
White collar	2.4	5.8	2.1	6.4	0.9	2.5	0.9		0.3	
Professional	1.9	5.9	0.2	1.0	1.7	5.1	1.5		1.7	
Total work	17.3	10.7	17.8	12.6	18.1	12.0	0.9		0.9	

Tabled values for non-parametric factors are expressed in percent.

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-press.

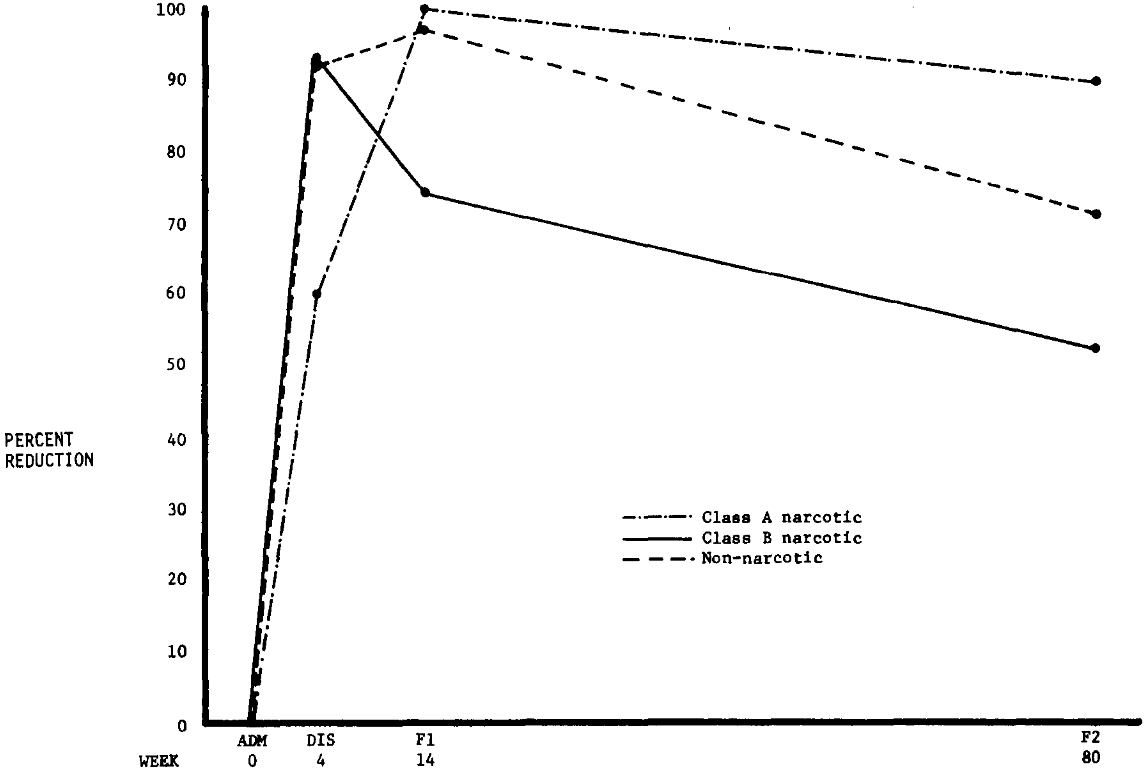
Table 10. CORRELATIONS AMONG NUMERICAL VARIABLES AND CRITERION VARIABLES

Variable	Regression			Overall change		
	r	*z*	*P*	*r*	*z*	*P*
Age	0.003	0.05		0.014	0.17	
Duration of disability	–0.199	2.37	<0.05	0.264	3.16	<0.01
Highest grade	–0.214	2.44	<0.05	0.154	1.75	
Total work (years)	–0.022	0.27		0.021	0.25	
Unskilled work	–0.100	1.19		0.141	1.70	<0.10
Skilled work	0.117	1.41		–0.165	1.98	<0.05
White collar, clerical	0.017	0.21		–0.015	0.18	
Professional	–0.096	1.15		0.103	1.23	
Exercise frequency	–0.146	1.75	<0.10	0.282	3.38	<0.01
Relaxation frequency	–0.072	0.86		0.067	0.80	
Stimulator use	0.134	1.60		–0.030	0.35	
Overall rating	–0.286	3.41	<0.01	0.592	7.05	<0.01
Mood: Admission	0.170	2.04	<0.05	–0.436	5.21	<0.01
Discharge	0.209	2.48	<0.05	0.331	3.93	<0.01
Followup	–0.463	5.52	<0.01	0.608	7.25	<0.01
Sleep: Admission	–0.136	1.62		0.027	0.32	
Discharge	–0.026	0.31		0.091	1.08	
Follow-up	–0.300	3.55	<0.01	0.247	2.93	<0.01
Enjoyable activities	–0.380	4.55	<0.01	0.610	7.29	<0.01
Pain talk	–0.219	2.63	<0.01	0.425	5.10	<0.01
Understanding	–0.114	1.34		0.288	3.41	<0.01
Help at home	–0.020	0.24		0.174	2.05	<0.05
Marriage quality	–0.323	3.76	<0.01	0.365	4.24	<0.05

Regression value represents arithmetic sum of change in pain severity and limitations due to pain following discharge; overall change represents amount of change in pain severity and limitations between admission and follow-up.

From Painter et al. Assessing benefits of the pain center: Why some patients regress. Pain, 8:101-113, 1980, © 1980, Elsevier/North-Holland Biomedical-Press.

Figure 1. Percent reduction in daily use of analgesic medication, by drug type



From Fletcher, L.J., ed., Pain Management: Symposium on the Neurosurgical Treatment of Pain, © 1977, The William & Wilkins Co.

Figure 2. STRAIGHT LEG RAISE exercise expressed in degrees, by employment categories

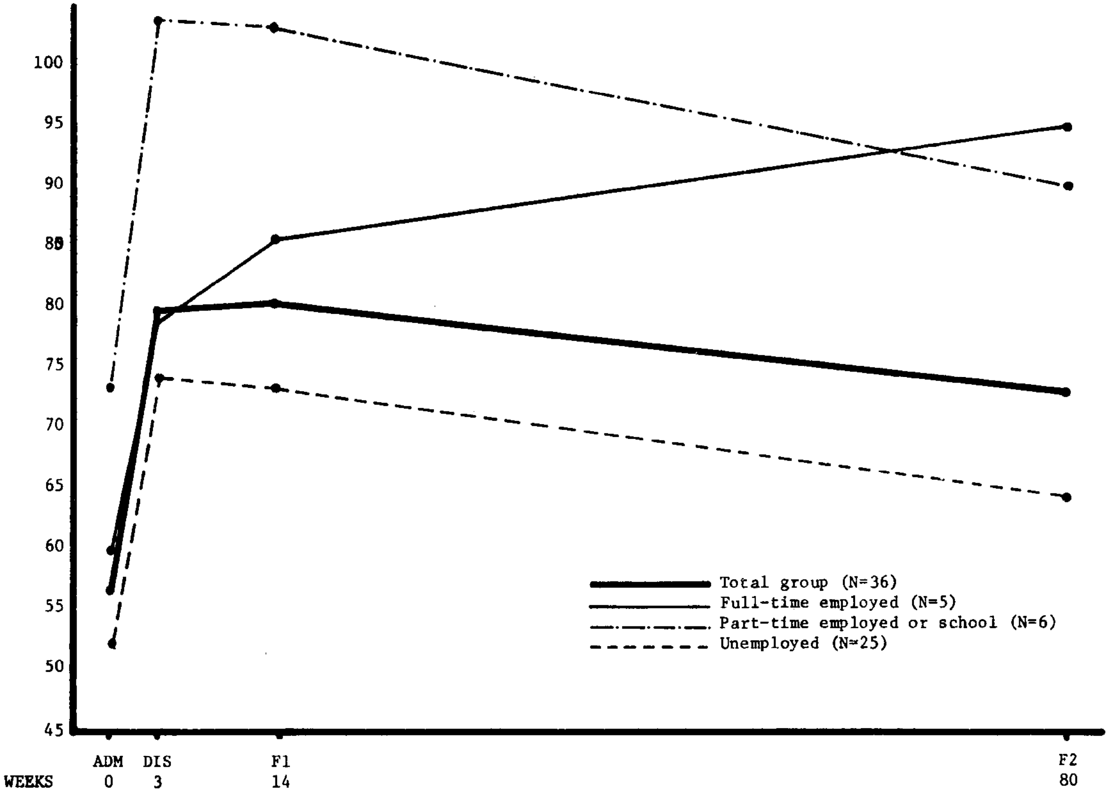


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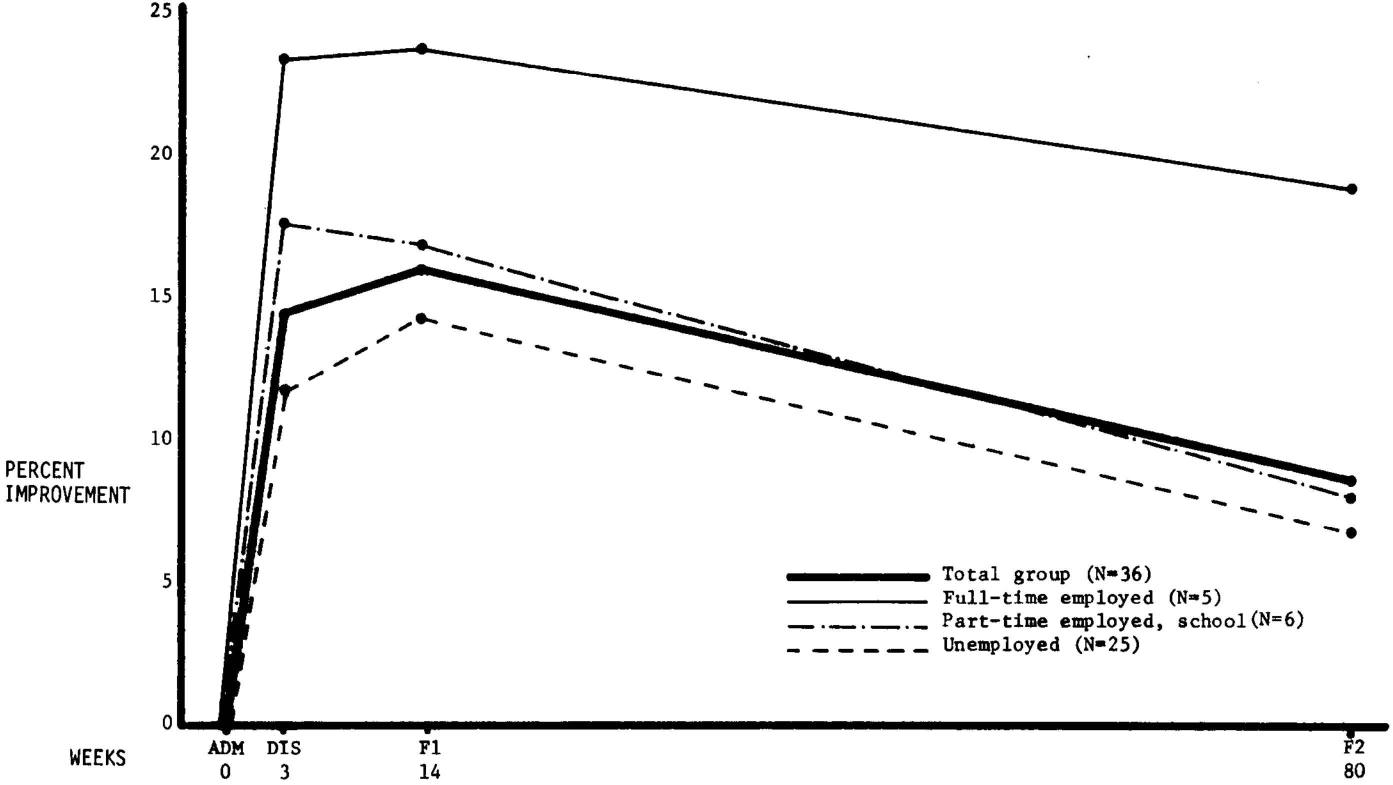
Figure 3. KNEE-TO-CHEST exercise expressed in percent improvement, by employment category



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REFERENCES

Gertman, P.M., Stackpole, D.A., Levenson, D.K., Manuel, B.M., Brennan, R. J. and Janko, G.M. Second opinions for elective surgery: The mandatory Medicaid program in Massachusetts. The N E J of Med, 302: 1169-1174, 1980.

Keim, H.A. Indicators for spine fusions and techniques. Clin Neurosurg, 25: 266-275, 1978.

Newman, R.I., Painter, J.R., and Seres, J.L. A therapeutic milieu for chronic pain patients. J Hum Stress, 4 (2): 8-12, 1978.

Newman, R.I., Seres, J.L., Yospe, L.P., and Garlington, B.E. Multidisciplinary treatment of chronic pain: Long-term followup of low-back pain patients. Pain, 4: 283-292, 1978.

Painter, J.R., Seres, J.L., and Newman, R.I. Assessing benefits of the pain center: Why some patients regress. Pain, 8: 101-113, 1980.

Redburn, R. Factbook for Oregon's Workers Compensation System. Salem, Oregon: Oregon Executive Department Publication, 1980.

Seres, J.L., and Newman, R.I. Results of treatment of chronic low back pain at the Portland Pain Center. J Neurosurg, 45: 32-36 1976.

Seres, J.L., Newman, R.I., Yospe, L.P., and Garlington, B.E. Evaluation and management of chronic pain by nonsurgical means. In Fletcher, L. J., ed. Pain Management: Symposium on the Neurosurgical Treatment of Pain, Ch. 4. Baltimore: The Williams and Wilkins Co., 1977.

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A Comprehensive Model for the Study and Therapy of Pain: Johns Hopkins Pain Research and Treatment Program

Donlin M. Long, M.D.

Abstract:

The Johns Hopkins Pain Research and Treatment Program is based upon individual diagnosis, psychiatric evaluation, and individualized therapy. This is done within the framework of a concurrent program involving neurosurgeons, consulting physicians, psychiatrists, clinical psychologists, social workers and specialized nurses. The basic theme is self-help and self-responsibility. Drug withdrawal is mandatory, and an emphasis is placed upon psychotherapeutic techniques. Pain relieving procedures are available and utilized in a small number of patients.

INTRODUCTION

The university-based pain treatment program should serve two primary functions. Any comprehensive pain treatment program must provide evaluation and therapy for the individual patients seen. However, a university program must also have specific study goals, and these research aims must be incorporated into the framework of the programs so that they do not interfere with patient evaluation or care. Secondary functions of the pain treatment program are largely educational. Most authorities now agree that neither acute nor chronic pain is managed well by the majority of physicians. It is important that the pain treatment center provide a focus for expanding under-graduate and post-graduate education in pain management. In addition, the most comprehensive and multidisciplinary of such programs should develop guidelines for the training of a limited number of individuals with a primary interest in the study and therapy of pain. The Johns Hopkins Comprehensive Pain Research and Treatment Center has been organized to try to meet all of these goals.

THE PATIENT CARE PROGRAM

Philosophy Of The Program: The center is organized in both the in-patient and out-patient mode. The basic theme is self help and the program is entirely voluntary. Patients sign a contract concerning their behavior and obligations during hospitalization. Patients may elect to leave at any time without onus and may be discharged if they fail to comply with the written contract. Family participationis required on a limited basis.

Selection Of Patients: Patients are accepted by physician referral only. Patient inquiries which oriqinate with patients are actually-seen only after a physician contact is made and complete records are available. before appointments are made for any patient, pertinent records and X-rays are obtained from the referring physician and reviewed by an individual member of the Pain Treatment Center physician's staff. There are no specific categories of patients that our protocol rejects, but we have facilities for managing several kinds of important pain problems in other environments. The Johns Hopkins Rheumatology Clinic has an international reputation, and inquiries from arthritis sufferers are directed there. An occasional arthritic patient is accepted upon referral from a rheumatologist for a specific purpose. We are fortunate in having a physician team specializing in the therapy of headaches so headache patients are treated in the Pain Treatment Center environment only upon referral from specialists in headache for the correction of specific problems, usually drug dependency. Cancer pain is managed in a separate clinic located within the regional Cancer Center which is also staffed in a multidisciplinary mode and utilizes the resources of the Chronic Pain Treatment Center. Patients with abdominal and thoracic pain are generally referred to appropriate speciality clinics at Johns Hopkins for evaluation prior to admission to the Pain Treatment Center.

At the time of initial record review, several courses are open. The first is direct referral to another specialist. The patient may be referred directly to psychiatry, if psychiatric therapy appears to be the most important need. The patient may be referred to another Pain Treatment Program. The patient may be admitted directly to the neurosurgery ward for evaluation. An occasional patient is rejected completely. Usually, these patients are individuals with clear-cut serious psychiatric disturbance whose primary need is for psychotherapy.

After the patient is accepted to the Pain Treatment Program, one of two routes is followed. The patient may simply be placed on the waiting list and nothing further done until the time of admission. Or the patient may begin an out-patient program. This usually will include appropriate medical diagnostic measures, group psychotherapy, and drug management. Out-patient physical therapy is also a possibility.

The patient first is seen in the Out-Patient Clinic for an examination that takes approximately one day. If the appropriate disposition could not be made from the record (which is the usual case) the decision for further evaluation and therapy is made at the time of the first visit. The out-patient evaluation consists of an examination by one of the neurosurgical members of the team and a psychiatric interview with a clinical psychologist or a psychiatrist. The SCL-90 is obtained for a quick look at anxiety and depression. The patient also maybe seen by the resident in training or by a nurse practitioner as the initial step and reviewed by of the neurosurgery staff. Appropriate diagnostic studies are often carried Out in the Clinic before a disposition is made.

<u>In-Patient Program</u> The heart of comprehensive pain management is the in-patient program. The Johns Hopkins Pain Treatment Center is a self-contained 14-bed unit administered through the Department of Neurosurgery. Patients are admitted for between two and three weeks for an intensive program which is looked upon as the beginning of therapy.

The staff consists of three neurosurgeons, one psychiatrist, one clinical psychologist, one experimental psychologist, a psychometrist for psychological testing, a nurse practitioner, one neurosurgery resident, a social worker, a physical therapist and a specialized nursing staff. The nursing staff takes great responsibility for the ward management of the patients. Even though the program is located within the Department of Neurosurgery, its governance is multidisciplinary. There is an Executive Committee which reports to the Chairman of the Department of Neurosurgery. The Executive Committee consists of two neurosurgeons who serve as co-directors of medical services. There is an anesthesiologist who is Director of Block Services and a psychiatrist who is Director of Psychiatric Services. In addition to these full-time staff members, the Psychiatry-Liaison Service consults regularly on all patients where consultationis required and the general staff of the Johns Hopkins Hospital is used liberally for consultation.

The three principles of The Johns Hopkins Program are (1) accurate physical diagnosis, (2) accurate and comprehensive psychiatric and psychosocial evaluation, and (3) individualization of therapy in an eclectic mode. The evaluations are integrated into a standard program that begins immediately upon admission. After admission, the patients are presented with the Pain Treatment Center Contract which outlines our expectations and the patients' obligations. They have 24 hours to accept or reject the principles of the Pain Treatment Center and no change in their status is undertaken until they have signed a contract unless some drug behavior offers a serious danger. If they fail to sign the contract, they are asked to leave after 24 hours. Once the contract is signed, the first step is to correct what is usually an unacceptable drug situation. The characteristics of the average patient reviewed in our program are found in Table I. Most patients seen in our program are addicted to drugs in every sense of the word. They exhibit marked drug seeking behavior and serious physical withdrawal signs if the drugs are discontinued. Withdrawal from medications constitutes the most common reason for admission. Over one-fourth of our patients are so intoxicated from their drug ingestion that they show marked deficiencies of cognitive thinking on standard testing. 56% show significant electroencephalographic abnormalities. It would be difficult to over estimate the importance of inappropriate drug use in these patients and it is mandatory that this drugusebe regulatedbefore thepatients can begin even to understand the program presented to them. Most are seriously intoxicated, and no therapy will be effective until their medications are controlled.

TABLE ONE

DRUG STATUS OF 100 CONSECUTIVE PATIENTS ADMITTED TO THE JOHNS HOPKINS PROGRAM

Regular use of narcotics -	95%
Regular use of psychotropics -	90%
Misusing drugs -	90%
Using drugs from multiple physicians -	50%
Withdrawal symptoms from something -	80%

All narcotics are withdrawn. There is virtually no indication for the continued use of narcotics in chronic pain of benign origin, except excellent pain control. Since none of our patients enjoy pain control, the narcotics are discontinued in all. Even more importantly, it is necessary to remove diazepam (Valium). We have more difficulty in withdrawing patients from this drug, see more significant withdrawal side effects, and see more effect upon brain function than with narcotics. Barbiturates and amphetamines are also contraindicated in chronic pain, and these are eliminated as well. Drug withdrawal schedules depend entirely upon the severity of intoxication and the quantities of drugs ingested. In general, we will discontinue narcotics over a one-week period and diazepam within five to seven days, but, of course, large doses of drug require longer periods of time for withdrawal.

During the time that drug withdrawal proceeds, a comprehensive physical examination is completed and the psychiatric and psychosocial evaluation begun. An assessment of the patient's physical capabilities and deficiencies is made and an appropriate physical exercise and activity program started. This will first be in the group mode and then an individual exercise program designed. Patients are required to care for themselves during hospitalization and dress in street clothes. Patients who have less physical impairnent assist those with more. Compliance is designed to be primarily through peer pressure rather than confrontation between nurse or physician and patient. Regular group therapy programs are held. Patient community meetings are employed to explore problems. Regular family programs are made available. A social worker is employed to assist with social problem and also provides couple's therapy and sex counseling. Serious sexual psychopathology is treated in a specialized clinic available for that purpose and referrals are made if a problem of a serious nature is found to exist.

The patient's stay is individualized according to the patient's needs and progress. The average hospitalization is 17 days.

<u>Pain Therapy:</u> The standard program is required of all patients. Even the standard program is individualized. in that not all patients meet all aspects of it to the same degree, but the basic principles are employed for all patients. However, therapy of pain is completely individualized.

The major focus of the pain-relieving techniques is patient selection and individualization. During the psychiatric evaluation, patients are categorized into one of four areas. These groups are meant to guide therapy that we currently have available. They appear to be very useful from a practical standpoint, but require significantly more study for validation. The first of these groups is termed <u>objective.</u> Such patients have a definable cause of pain, their behavior is commensurate with the cause and their premorbid adjustment was normal. They may be depressed and anxious as a result of their chronic pain state, but their basic psychological makeup is normal. These are the patients that are considered candidates for interventional procedures and no patients in other categories are offered interventional therapies. The second major category we term the <u>amplified</u> pain syndrome. These patients usually have an insignificant physical problem and are disabled out of proportion to their physical disability. Important factors appear to be an underlying personality disorder or situational stress. Frequently, these patients present with combinations of these two major factors. It is extremely important to recognize this group of people. In our experience a large number of industrial injury victims fall in this category and exhibit significant personality disorders. Interventional procedures are never indicated for a complaint of pain without a clear-cut organic basis and certainly should be avoided in this group of individuals. The third group are those with clear-cut <u>affective</u> disease. Their need is for psychotherapy just as the need for the amplified group is for behavioral therapy. We have a fourth <u>unexplained</u> category for those patients where no cause of pain can be found and no psychiatric factors are present either. It is extremely important to make certain that psychiatric diagnoses are made on the basis of positive findings. The absence of a physical cause of pain is not a reason for a psychiatric diagnosis. The developmental stage in which the patient is currently located is also determined and is very important in determining interventional therapy.

We believe that patients with chronic pain go through the staging described for death and dying. In the early phase of the disease, the patients are unaccepting of their disability and rational treatment plans. They often go from physician to physician looking for an easy answer and are particularly prone to accept surgical intervention. In a second phase, after multiple failures of therapy, the patients become hostile and angry and are particularly prone to sue. The third phase is where most patients in chronic pain present to the Pain Treatment Center. This is characterized by depression and drug dependency. The fourth phase is one of rational understanding and acceptance of disease and its treament. The object of the program is to bring all patients into the fourth phase and to direct them into appropriate therapy. Interventional procedures should not be used, except for objective pain states when the patients are in the phase of rational understanding. The use of surgery for the complaint of pain in patients with amplified and affective pain states is probably the most serious error currently made in pain management.

Our interventional pain therapy begins with transcutaneous electrical stimulation. A significant number of patients will respond to this modality. However, because of the highly specialized nature of our clinic and the fact that the technique is gaining wider acceptance with the medical profession, we now rarely see a patient who has not used it,and the number that we can benefit with transcutaneous stimulation is dropping.

Diagnostic and a few therapeutic nerve blocks are used regularly. Diagnostic blocks include individual nerve blocks, sympathetic blocks, and lumbar facet blocks. Repetitive sympathetic blocks are sometimes therapeutic in the reflex sympathetic dystrophy syndromes. Coeliac axis blocks are sometimes employed in chronic abdaninal pain and may occasionally be therapeutic. We do not use neurolytic blocks.

Radiofrequency neurolysis is employed. The innervation of the lumbar facets may be destroyed by radiofrequency current, the so-called facet denervation. Individual roots are amenable to differential destruction with radiofrequency current as in intercostal nerves and the greater occipital nerves. Radiofrequency trigeminal lesions are routinely employed.

Implantable neural stimulators are also employed. Peripheral nerve stimulators are used specifically for pain of peripheral nerve injury origin. Spinal cord stimulators are employed almost exclusively for the pain of arachnoiditis complicating multiple operations upon the low back, and deep brain stimulators are employed for patients with pain of central nervous system injury origin. However, the number of patients chosen for these procedures is small, averaging less than 5% of the total number of patients evaluated each year.

Destructive procedures for pain relief are rarely employed except in cancer pain. An occasional patient undergoes a destructive peripheral nerve operation, but virtually no other destructive procedures are utilized.

The most likely operation is reoperation upon the back or neck to correct some major abnormality which occurs as a complication of the previous operative procedures. Reoperation in the patient who has undergone multiple lumbar or cervical operations is a major decision and must be made carefully only after conservative measures have failed. Primary indications are significant instability, acquired spinal stenosis, continued root compression, and arachnoiditis with intractable pain or progressive neurological deficit.

Out-Patient Follow-Up: Following a hospitalization which averages 17 days, patients are allowed to continue a program in the Out-Patient Department. Follow-up of six months to one year is routine for most patients. Some patients may be referred to other facilities, usually for psychiatric care or for the therapy of some previously undiscovered madical problem. Some patients are returned to the care of their personal physicians with the summary of in-patient activities and recommendations for therapy. Most patients will be followed by members of the pain treatment program team. The majority of patients are returned for follow-up in group or individual psychotherapy, by physical therapy, by the specialized nursing service, and for therapy with the psychiatric social worker. Only those that have undergone interventional procedures are followed by the physicians of the team. Patients maybe sent back to the physicians by other team members at any time it seems to be important.

The Philosphy Of The Pain Treatment Center: The primary original aim of the program is an accurate diagnosis which includes both physical and psychosocial factors. The second aim is individualization of therapy. Within this over-all framework we have a number of goals. our patient care goals are relief of pain, elimination of drug dependency, treatment of anxiety, depression, and related psychological epiphenomena. In addition, we would like to improve or restore social and personal competence, reduce the dependence of the patients upon physicians and the medical system, reduce medical costs and restore or improve vocational function. We do not undertake job rehabilitation primarily, but involve ourselves at this level by diagnosis and the appropriate direction of therapy. An important goal which is not entirely related to patient care is the acquisition of data which would allow us to make intelligent choices in the modification of social programs that impinge upon the entire problem of chronic pain.

These goals are approached through a standardized program and then a specific program. All patients undergo drug withdrawal and modification of drug therapy. All patients have appropriate psychotrophic drug therapy for insomnia and depression. All patients undergo the beginnings of a physical conditioning program and begin the rudiments of self help. Transcutaneous electrical stimulation is used ubiquitously through the program. It is unusual when a patient reaches us now without having first tried this modality and those patients who are relieved by such a simple technique have been selected out of our series. Diagnostic nerve blocks are employed routinely, but therapeutic nerve blocks are used infrequently. Specific surgical procedures are used rarely. Approximately 10% of patients are considered candidates for interventional procedures. Reoperation upon the low back or surgery on an injured peripheral nerve are the most common procedures employed. Implantable electrical stimulators are used, but currently are considered appropriate for between 1% and 2% of all of the patients seen. Destructive surgical procedures virtually are not employed in this group of patients. The so-called lumbar facet denervationis rarely used, and radiofrequency neurotany may also be occasionally employed.

The major aim in our pain therapy is to direct the patient into the therapeutic modality best suited to the underlying diagnosis. Patients with clear-cut organic pain generators, who have a normal premorbid adjustment, are the only patients considered candidates for interventional procedures. Interventional procedures are carried out only after the comprehensive pain program has reached its limits. Patients in the amplified category are generally candidates for behavioral therapy, and interventional procedures are rarely used in this group. Patients with clear-cut psychiatric disease are directed into the appropriate psychotherapeutic programs.

The major behavioral therapies used are by suggestion rather than through any strict behavior modification mode. Patients are involved in a self-care self-help program, and an attempt is made to modify their dependence upon individual physicians, drugs, and therapy. Group psychotherapy, assistance with family and personal matters, and occasionally individual psychotherapy are the techniques most employed. The basic therapeutic form is the group therapy program.

Patients with psychiatric disease are not managed in the chronic pain program. As soon as they are identified, they are sent to the appropriate psychiatric facility.

The basic principle behind this kind of patient selection for therapy is to treat what is wrong with the patient rather than to employ a doctrinaire program which is generally applied to all patients.

<u>Research In ThePain Treatment Program:</u> It is important that any university-based program have a significant research component. Research projects may be wide ranging according to the expertise of specific programs.

Our primary patient-related interests relate to a series of epidemiological questions. The first of these is, "Are there patient factors in chronic pain which have diagnostic, therapeutic, or prognostic significance?" The second question we are attempting to answer is, "Are there practice patterns or physician characteristics that influence the complaint of chronic pain?" We approach these questions with a multifactorial analysis of chronic pain. In this analysis we are studying epidemiology of chronic pain, psychiatric and psychological characteristics of the patients, and patterns of therapy prior to the patient's arrival at the Pain Treatment Center.

The program also has a basic research arm. The primary project concerns the psychophysics of pain sensation in normal subjects and in patients with chronic pain. The pathophysiology of peripheral nerve injury is also under study. Studies on the cerebrospinal fluid and blood levels of beta endorphin in normal subjects and in patients with chronic pain are carried out in collaboration with laboratories of the National Institutes of Health. There is also a research project which studies the effects of narcotic antagonists upon stimulation induced analgesia. Through these studies, we are attempting to define the psychophysical characteristics of pain and determine if the opioid system is important in some types of pain and pain therapy.

The program also has a major component of biomedical engineering research. In collaboration with the Applied Physics Laboratory of The Johns Hopkins University, we have developed a completely implantable electronic human tissue stimulator which can be utilized with every kind of implantable stimulator for pain relief. We are currently engaged in developing an implantable drug infusion pump which will deliver measured amounts of drugs intravenously into the cerebrospinal fluid or into body cavities.

<u>Future Goals:</u> Our experience to date indicates that there are a number of questions to be answered before any major improvements in pain therapy are likely to be forthcoming. Our goals are to identify epidemiologic, psychological, social and medical factors which are important in the current epidemic of chronic pain. The entire problem needs to be characterized both medically and from a social standpoint. The complaint of pain has become a major social issue because of the great cost of disability based upon pain. Changes in disability rating system, industrial injury disabilities, and social security disabilities will be possible only when we have the data that characterize these groups of patients so that improvements based upon fact are possible.

An important long-term goal is to develop models for the evaluation of pain therapy. At the present time, there is little data which allows the results of pain therapy to be analyzed effectively. We wish to develop standard systems for determining levels of pain disability and recording changes in these levels with therapy.

Everyone agrees that an appropriate taxonomy of pain must be developed. The epidemiologic and patient studies will be important in allowing appropriate taxonomy to be developed. Standard methods of characterizing patients and the results of therapy will be possible only after a satisfactory taxonomy is available.

Conclusions: Chronic pain is currently an epidemic in the United. States and a major public health issue. This is so because of the great cost of disabilities based loosely upon complaint of pain and the cost of current medical therapy directed at pain as a symptom. Pain is a complaint which may or my not be related to a nociceptive event. It may express distress related to internal or external events. The goals of the comprehensive Pain Treatment Program are accurate diagnosis, psychiatric and psychologic characterization of the patient and evaluation of the psychosocial factors which may be important in the complaint of pain. Therapy techniques are many, but their success is limited. Only through continued study of this problem are we likely to improve treatment of these patients and so solve the social issues which have been raised.

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Chronic Pain as a Learned Experience: Emory University Pain Control Center

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ABSTRACT

Chronic pain is often a conditioned socioeconomic disease. A majority of chronic pain patients show pain behavior in excess of biomedical findings and disability ratings out of proportion to their actual physical impairment. Biomedical data and pain behavior are independent variables, as the latter is heavily controlled by socioeconomic factors. The diagnosis of chronic pain patients requires evaluation and matching of both variables. When disability claims are present, a comprehensive vocational evaluation should be performed and matched with biomedical and behavioral findings. The Emory Pain Estimate Model for diagnosis of chronic pain states is discussed briefly and techniques of vocational evaluation are presented also. The structure of the Emory Pain Control Program and data from treatment outcome are presented and discussed.

Figures from Bonica (1979) have indicated that the total cost of chronic pain is in excess of fifty billion dollars.

A study of eighty patients from the Emory University Pain Control Center has revealed that chronic pain may have a hidden, but greater, impact on the vocational and social lives of individuals and on the community. The study is composed of a sample of fifty-five men and twenty-five women (mean age 39.9 years). The data are summarized in Tables I and II.

A further analysis of the eighty selected subjects found that sixty-nine percent would be able to return to gainful employment compatible with their age, education, previous work history and transferable work skills, if properly managed medically and vocationally.

TABLE I

UNIT OF ECONOMIC LOSS FOR PAIN-DISABLED SUBJECTS

Average Income Loss		Average Tax Loss	
Per week:	$207.00	Per week:	$ 41.00
Per year:	$9,936.00	Per year:	$1,969.00

TABLE II

UNIT OF COSTS FOR DISABILITY INCOME AND MEDICAL

EXPENSES FOR PAIN-DISABLED SUBJECTS

Income Support Benefits	Yearly
Georgia Workmen's Compensation	$5,720.00
S.S.D.I. Benefits - Family of Four	$14,100.00

Medical Costs (Average)	Yearly
Hospital per diem	$1,918.00
Surgical Expenses:	
Laminectomy (Range $5,000 - $10,000)	$7,500.00

TOTAL COST OF PAIN TO TAXPAYER PER INDIVIDUAL/YEAR (WITHOUT MEDICAL EXPENSES)

ESTIMATED AVERAGE $21,814.00

The Emory data show an average annual cost of chronic pain to society per individual of $21,814.00. Information is not available on the total number of chronic pain patients in the United States. If a conservative estimate of 2 percent of the population is made, the resultant pain-disabled population would be 4.6 million, with a cost to our society in excess of 100 billion dollars per year. A 2 percent estimate is probably low, considering that the Social Security Administration alone has estimated the total number of disability beneficiaries in 1980 to be 5 million, up from 2 million in 1970, with a rate of growth ten times faster than the growth of the general population (Grossman 1980).

The roots of this gigantic problem are multiple and complex; many of them probably reflect changes in values and work ethics in contemporary society, where pain behaviors have been socially accepted as legitimate ways to gain early retirement, escape from responsibilities, or obtain drugs, etc. Unknowingly the medical profession reinforces these social attitudes by its continuing and uncritical acceptance of the biomedical model which considers pain only as a symptom and not as a set of behaviors. Present legislation also reflects a medical position, by granting open-ended disability benefits to individuals who chronically engage in pain behavior on the assumption that these individuals must have some biological derangement "to cause their pain." The adversary legal system is ideal to keep an injured worker with a mild back sprain on disability benefits for years, while manipulating physicians in endless medical investigations, to find "the cause of the pain." Fifty-one percent of all patients with chronic pain at the Emory Pain Control Center have disability benefits or pending litigation associated with their pain problems; many others report unsatisfactory family and social situations preexisting the onset of pain.

A sample of 101 consecutive patients at Emory has shown the following data-- mean age: 40 years; mean education level: 10 years; manual labor: 64 patients; clerical work: 20 patients; technical and managerial positions: 17. Eighty-seven reported the back as the primary pain location (23 cervical back).

The conditioning process significantly affects responses to treatment. Out of a matched sample population of 61 patients with chronic pain and similar degrees of tissue pathology, 35 were receiving compensation for work-related accidents and 23 were receiving no compensation for their illness behavior. Of the noncompensation group, 69 percent of the patients successfully completed the Pain Rehabilitation program by increasing significantly their activities of daily living (ADL). In the compensation group, a higher number of patients dropped out of the rehabilitation program, and only 43 percent demonstrated similar ADL increase (Hammonds et al. 1978). Out of a matched sample population of 144 subjects, with comparable biomedical findings, 70 subjects had no pending litigation and no disability benefits; 74 subjects were receiving monetary compensation for an accident suffered at work. All subjects received a series of six sympathetic nerve blocks performed with a local analgesic agent (bupivacaine 0.25%) and with a saline solution. Only 17.6 percent of the Workers' Compensation patients displayed a placebo effect following saline injections, against 35.7 percent in the no-disability group. Among the patients with no paid disability, sixty-seven percent reported decreased subjective pain intensity from both analgesic and saline injections; 50 percent of the Workers Compensation group reported similar results (Brena et al. 1980).

The work of Fordyce (1976), Sternbach (1974), and others has clearly demonstrated that pathological changes and pain-illness behaviors are independent variables. Diagnosis of chronic pain patients, therefore, requires evaluation and matching of both variables. One such method is the Emory Pain Estimate Model (Brena and Koch 1975). The model is an operational definition of chronic pain states and involves separate ratings of tissue pathology and pain behavior from objective data. The amount of tissue pathology is rated on a 0 - 10 severity scale, using traditional biomedical diagnostic procedures. The amount of pain behavior is rated on a 0 - 10 severity scale using the following measures: McGill Pain Questionnaire; ADL check list; drug use rating scale; MMPI. The matching of both sets of data yields four different classes of chronic pain states: Class 1 patients are pain disabled with high behavior (> 5) and low pathology scores (< 5). Class 2 patients score low on both variables (< 5) while class 3 patients score high on both (> 5). Class 4 patients score < 5 on the behavior scale and> 5 on the pathology scale. Independent assignment to pain class of fifteen case histories by five physicians yielded a Pearson product-moment correlation of 0.85, indicating high inter-rater reliability of the model (Brena et al. 1976).

Table III shows the distribution of patients to classes of chronic Pain states (Brena and Chapman 1980).

TABLE III

DISTRIBUTION OF PATIENTS TO CLASSES OF CHRONIC PAIN STATES ACCORDING TO DISABILITY STATES (*N*=144)

Workers' Compensation *N*-74		No Pending Disability *N*=70	
Class 1	72%	Class 1	40%
Class 2	0%	Class 2	35%
Class 3	28%	Class 3	21%
Class 4	0%	Class 4	3%

The high percent of chronic pain patients in classes 1 and 2 (72 percent in the Workers' Compensation group and 76 percent in the group of patients with no pending disability) clearly points out that chronic pain can persist even with relatively few biomedical findings.

The process of pain quantification and classification should be supplemented by measurable data from vocational assessment in Workers' Compensation cases or whenever requested in cases of pending disability litigation. There are several systems of vocational evaluation; among them the Hester and the Valpar systems have emerged as leaders in the field. The Hester system consists of a battery of twenty-two factor pure vocational tests which measure twenty-six basic worker traits covering motor, perceptual, and intellectual skills. The Valpar system consists of a series of work samples that measure universal traits which are related to a person's success in many occupations with a large variety of job characteristics. By matching vocational evaluation with traditional biomedical investigation, psychosocial, and functional evaluation, a comprehensive diagnostic judgment of a pain-disabled patient can be obtained. This diagnostic judgment will eventually help the individual to return to a state of health[1] in many cases through reversing illness behavior, preventing repetition of needless medical interventions, and insuring prompt settlement of the disability case.

Brena et. al. (1979) have studied the relationship of chronic pain states to impairment and disability. Consistent with prediction, they found higher impairment and disability ratings in class 3 than in class 1 patients and the lowest ratings in class 2 patients. Fifty-nine percent of the patients in the study showed higher disability than impairment ratings, clearly indicating the possibility of gainful reemployment through behavior modification and vocational counseling.

The Emory Pain Control Center has been in operation since 1973. It first functioned as an outpatient clinic within the Department of Anesthesiology. In 1976, it became a comprehensive Pain Control Center, a division of the Emory Department of Rehabilitation Medicine, with inpatient and outpatient programs, education and resource facilities, and one satellite pain clinic at the Grady Memorial (County) Hospital in Atlanta. Various treatment programs have been developed: a headache control program, a cancer rehabilitation program, and a pain control program for class 1 and class 3 pain-disabled patients based on contingency management (CM). The thrust of the CM program is cognitive behavior modification for competent coping in maladaptive situations of existential suffering. The patients are educated to accept the basic idea that chronic pain and impairment of some bodily functions are not necessarily deterrents from meaningful and self-gratifying lives; through individual and group counseling, they are educated in how to change ways of thinking and acting in order to deal more efficiently with their physical and emotional impairments. Six target areas are identified: (1) to teach patients to give up their dependence on drugs and to detoxify them if they have developed a physical dependence; (2) to desensitize them to particular sensory inputs which they have learned to perceive as unpleasant. Phasic stimulation of the anatomic region where the painful perception is located is achieved through transcutaneous nerve stimulation (TNS) and nerve blocks. This treatment may also interfere with central pain modulation by effecting changes along sensory and nociceptive peripheral pathways; (3) to train patients to increase ADL, to perform specific exercises, and to coach them away from obsessive attention to bodily cues; (4) to teach patients new skills to cope with stress situations; (5) to educate relatives in how to effectively interact with the chronic sufferer by avoiding actions leading to reinforcement of illness behavior and by strengthening those actions conducive toward states of health; (6) to assist patients to resume gainful employment, via vocational evaluation and counseling. The informed consent of the patient before treatment is obtained through a one-hour informative videotaped lecture which is held every week at the Center. The entire CM program takes 18 hours of actual treatment: three hours per week for six weeks as an outpatient or nine hours per week for two weeks as an inpatient. Criteria for hospital admission are: the patient has severe physical or emotional impairments; the patient is pain-disabled, lives alone with no relative to monitor him/her for home-based pain rehabilitation; patient is misusing opiates, sedative, and anti-anxiety agents; patient's general health conditions may require prolonged nursing care following various treatment modalities. The total cost of the outpatient program is around $1,500.00 in professional fees.

Contingency management requires teamwork. Members of the Emory Pain Team are: two full time physician Algologists; one part-time anesthesiologist; one full time psychologist; one full time behavior therapist; three physical therapists; two occupational therapists; and one vocational evaluator. Results from the CM program are monitored as follows: <u>Measures of Subjective Pain Intensity</u> (SPI), a 0 - 100 visual analog scale and the McGill Pain Questionnaire; <u>Activity Record,</u> daily records of participation in ADL; <u>Medication Record;</u> <u>Reports from Physical Therapists and Occupational Therapists</u> on graded 0 - 5 improvement scales. Results from the Center's CM Program for 100 randomly selected patients have been tabulated (Chapman et al. 1979). All of these patients completed an outpatient CM program of six weeks duration. Data at follow-up periods averaging twenty-one months posttreatment indicated significant decreases in SPI (mean decreaseequals 24.4 percent of pretreatment levels) and increases in ADL (mean increase equals minutes per day) with substantial reductions in use of medications for pain. Changes from pretreatment to follow-up were not significantly different among groups of patients with pending, current or no disability. Eight of nineteen unemployed persons who had pending disability claims had returned to work at followup. The discrepancy between these data and the previously reported study from Hammonds et. al. is likely to reflect the higher emphasis on patient education and counseling in the present structure of the CM program versus the earlier treatment program, which was rigidly based on operant conditioning alone, with no vocational intervention.

Teaching programs at the Emory Pain Control Center include: a postgraduate fellowship in Algology; monthly rotation of residents from the Anesthesiology and Rehabilitation Medicine training programs; a four-month rotation of interns from the Department of Psychology. An elective course in Algology is offered to second year medical students. Educational programs include: a monthly pain conference for the greater Atlanta area and two annual pain conferences which are part of the Emory University Continuing Medical Education programs. Research facilities for both clinical and basic studies are available through the Regional Rehabilitation and Training Center.

FOOTNOTE

[1] State of health as defined by the World Health Organization: "a state of complete physical, emotional and social well being."

REFERENCES

Bonica, J.J. The Interagency Committee on New Therapies for Pain and Discomfort, Report to the White House. U.S. Dept. of Health, Education and Welfare, May, 1979 pp IV-38.

Brena, S.F. and Koch, D.L. A "pain estimate" model for quantification and classification of chronic pain states. Anesthesiol Rev, 2: 8-13, 1975.

Brena, S.F., Koch, D.L., Moss, R.M. Reliability of the pain estimate model. Anesthesiol Rev, 3:28-29, 1976.

Brena, S.F., Chapman, S.L., Stegall, P.G., Chyatte, S.B. Chronic pain states: relationship to impairment and disability Arch Phys Med Rehabil, 60:387-389, 1979.

Brena, S.F., Chapman, S.L., Bradford, L.A. Conditioned responses to treatment in chronic pain patients:effects of compensation for work related accidents. Bull L.A. Neurol Soc. Volume 44, 1980 (in press).

Brena, S.F., Chapman, S.L., (eds.) Management of Pain in General Practice Menlo Park, CA: Addison-Wesley Pub. Co. (1980).

Chapman, S.L., Brena, S.F., Bradford, L.A. Treatment outcome in a chronic rehabilitation program. Presentation at the 56th Annual Session of the Amer Congr of Rehab Med, Honolulu, HA, 1979.

Fordyce, W.E., *Behavioral Methods for Chronic Pain and Illness.* St. Louis Mosby Press, 1976

Grossman, Honorable H.T. Personal communication.

Hammonds, W., Brena, S.F., Unikel, I. P. Compensation for work related injuries in rehabilitation of patients with chronic pain. *So. Med J,* 71: 664-666, 1978.

Sternbach, R.A. *Pain Patients: Traits and Treatment.* New York: Academic Press, 1974.

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Coordinated Out-Patient Management of Chronic Pain at the University of Virginia Pain Clinic

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ABSTRACT

The Pain Clinic at the University of Virginia Medical Center is a comprehensive facility providing a coordinated team approach to the management of chronic pain syndromes. The Clinic is primarily an out-patient facility, although in-patient therapy in clinic-assigned beds is available for special problems.

Approximately 1,500 new patients are seen annually in the Clinic's own facilities, resulting in approximately 3,500 patient visits. All diagnostic facilities are readily available, and all somatic modulation and psychotherapeutic techniques are utilized for pain management.

Referrals are accepted only from physicians and then only after all medical records, the Clinic's Patient Assignment Inventory Narrative (a screening brochure), and special studies are reviewed. The initial evaluation includes, as well, history taking, physical examination, psychological testing and interview, special studies, specialty consultations, and family interview. A therapeutic plan is then developed and discussed with the patientand family members.

The Clinic's philosophy is to encourage the patient to assume responsibility for all aspects of the treatment program including drug detoxification, activity and exercise programs, and functional perfomance.

The Pain Clinic at the University of Virginia Medical Center is a comprehensive facility providing a coordinated team approach to the amelioration of chronic pain in patients with a long history of disability who have proven unresponsive to management by any single clinical specialty. Experience has shown that the continued private consultation referral of this group of patients frequently ends in therapeutic mismanagement that includes further drug habituation or exploratory surgery. Seldom are the emotional, social, family, and occupational problems confronting the patient taken into account under such a system. It is this system of specialty management that in many instances has created the chronic pain sufferer.

Approximately 1,500 new patients are seen annually in the pain clinic as a part of the 3,000 to 3,500 total patient visits. Referrals to the clinic are from physicians outside of the Medical Center, specialty services within the center,and third party carriers through community physicians. Patients are not accepted other than through physician referral, with the majority of patients being referred from Orthopedics and Neurological Surgery. Increasing numbers are being referred by Neurology, Internal Medicine, Rheumatology, Oncology, General and Thoracic Surgery, and Nuclear Medicine. It is interesting that patients are rarely referred to the Clinic from primary physicians, since those, at least within the referral area of this institution, appear diffident in complying with the Clinic's request for full and comprehensive records.

On referralof a patient to the Clinic, the patient's physician is requested to supply copies of pertinent hospital records and a narrative summary encompassing physical findings, laboratory studies, and results of therapy as evidenced on the patient's last visit. On receipt of the referral, the patient is sent an evaluation brochure to complete (Pain Assessment Inventory Narrative) which is a 16-page questionnaire embodying a history of the painful condition, depression scale, social and occupational attitude questionnaire, drug history, and a four-view figure of the human body so that the patient can graphically depict origin and distribution of his pain. When all records have been accumulated, they are reviewed by a senior faculty member assigned to that patient. This staff member then prepares a summary of all positive historical and physical findings, and indicates areas of concern and recommendations for further investigative procedures. At this time, collateral consultations with other specialists are set up for the date of the patient's visit and further diagnostic studies arranged. Only after completion of this phase of the admission procedure is the patient given an appointment for the clinic.

On the first visit, the patient will undertake psychological tests, following which a complete history will be taken and physical examination performed. The patient will then be seen by the Clinic Psychologist and/or Social Worker who will also conduct interviews with the patient and spouse or other family members. The patient will then be referred for special studies and consultations as previously determined, and when reports on these are received (usually the same date of initial visit) the patient will be re-presented to a Pain Clinic conference. At this time,recommendations will be made for therapy, thorough explanations are given to the patient, and arrangements are made for implementation of the recommendations either in the Clinic or by appropriate consultants.

Because of the large patient load, the University of Virginia model is primarily an out-patient one, admitting only those patients from remote areas who have difficulty completing round-trip travel on the same day or, who, for physical reasons, are unable to stay at conveniently located hotel or motel facilities. Further, the out-patient model permits initial evalution and institution of treatmen at a much reduced patient cost. While there is no evidence to suggest the benefits of either in or out-patient models based upon outcome of therapy, there are indications that the in-patient model provides earlier ambulation and physical activities than does the out-patient model. To overcome this deficiency, a program is being established that willprovide for a 6-week, 1-day-per-week, out-patient program in the physical therapy department, where the patient will be taught body mechanics, exercise regimens, and methods of increasing physical activity. Group psychotherapy sessions will also be conducted during this time.

STAFFING

The Clinic is headed by the Director who also serves as Adminstrative Chief of the Clinic. He serves in the Clinic on a rotating basis with two other attending pain specialists so that the Clinic is covered by a senior physician 8 a.m. to 5 p.m. five days per week.The Director serves a minimum of three days per week in the Clinic to provide necessary continuity, and utilizes a portion of his remaining time for clinical research and administrative duties. The Clinic has one or two full-time fellows who participate in teaching, clinical care, research, and indoctrination of new personnel. All anesthesiology residents rotate through the Clinic for two months during their third post-graduate year of training and for longer periods electively during the fourth year. All Orthopedic Department residents spend one month in the clinic, as do Rheumatology, Neurological Surgery, and Neurology residents on an elective basis. Medical students rotate through the Clinic on a weekly basis as part of their anesthesiology elective.

A new program that has been initiated in the Pain Clinic is one of pain management for Nurse Practitioners in a Masters Degree program. During the first year, the majority of the graduate nursing student's time is spent in study and sociological and psychological training under the direction of the clinic psychologist. During the second year,the nurse practitioner evaluates new patients, discusses them with the attending physician, presents them to Clinic conferences, and is involved in continuing behavioral and psychological managenent of these patients. It is felt that this class of personnel can serve as a major resource to extend the ability of the Pain Clinic physician to care for a greater number of patients.

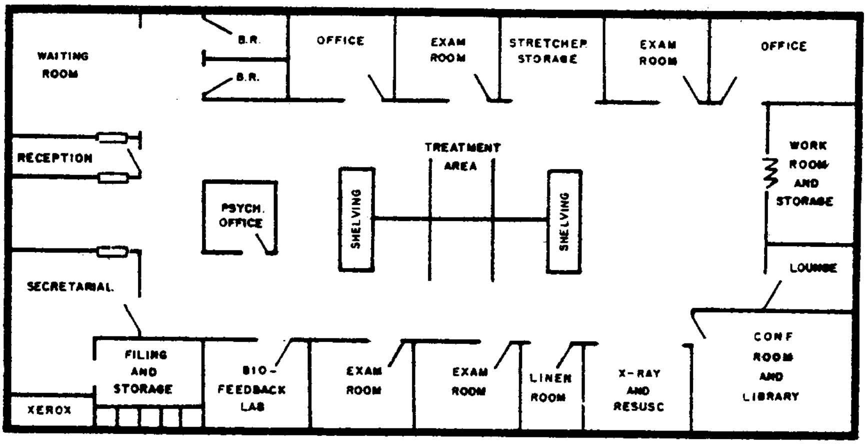
EDUCATION

There are thrice weekly conferences, one a didactic presentation pertaing to some area of either pain diagnosis or management, a second conference devoted to the psychological aspects of chronic pain and presentation of appropriate patients, and a third joint conference with the Departments of Orthopedics, Psychiatry, and Neurology for discussion of patients admitted to the Orthopedic Service

The Clinic maintains its own library of all current texts relating to pain diagnosis and management as well as current journals in the field. In addition, the Clinic has established a series of looseleaf binders indexed by pain sydromes and therapeutic techniques into which are collected reprints and copies of all current literature pertaing to pain problems. The clinic members also have access to the anesthesiology and medical school libraries.

PHYSICAL RESOURCES

The Clinic is currently located at approximately 1600 square feet of its own space within the main hospital structure. Plans have been approved and space allocated for a move to approximately 3500 square feet as depicted in the accompanying figure.This physical plan permits both patient evaluation and treatment and provides adequate space so that in-patients as well as out-patients can be seen in the Clinic for diagnosis and therapy. Psychological services are provided in the psychologist's office and in the biofeedback laboratory, and group therapy is conducted in the conference room or library Additional laboratory space is available for animal and clinical research.



PATIENT POPULATION

The patient population at the University of Virginia Pain Clinic is referred from throughout the state of Virginia, the Southeastern portion of West Virginia, and the Washington D.C.metropolitan area. The average age of patients referred to the Clinic is 43.6 years with approximately equal numbers of males and females. The average educational level is 6th grade, and the patients are predominantly from a rural area. Among the syndromes seen, low back pain comprises about 50% of the patient population. Cervical and shoulder pain are responsible for an aditional 20%, vasospastic disorders 10%, cancer pain 10%, and other conditions the remainder. 47% of patients have had prior surgery, 97% pharmacological management, 60% physical therapy, and only 5% have received prior psychotherapy. Reimbursement is approximately 60% from compensation sources and private insurance makes up an additional 30%. A small percentage of welfare patients are seen gratis, and private fees make up the balance. Costs of operation of the Clinic are approximately $170,000 per year for professional and secretarial support and another $150,000 for nursing, drugs, supplies, space rental, housekeeping, other services.

In the last fiscal year, approximtely 1,500 new patients were seen and the following procedures carried out.

1. return consultation and follow-up visits - 979
2. nerve blocks - 930
3. psychological services - 655
4. neurostimulation - 138

THERAPEUTIC MODALITIES

All therapeutic modalities are available in the Clinic and a holistic is used in the management of all patients. Among the procedures available are nerve blocks, pharmacological management including detoxification, physical therapy, neurostimulation, activity/social programs, and psychotherapy.

A major problem in the Virginia Pain Clinic population has been the degree of drug use and abuse. Prior to the clinic visit, approximately 98% of all patients had been placed on non-narcotic analgesics and 85% of these had been subjected to narcotic analgesics. The use of benzodiazepines by 85% of patients prior to Clinic visit has resulted in a 60% drug dependence for these pharmacological compounds and has made it necessary to provide for detoxication following the first visit as the initial step in therapy. Drug witdrawal is accomplished on an out-patient basis with almost total acceptance by the patients. Follow-up studies indicate that very few patients return to drug abuse. The patient is provided a written daily schedule of drug dose reduction combined with substitutive drugs to avoid withdrawal effects. Other psychotherapeutic agents are added to the schedule. Patients remain in contact with the Clinic through weekly or bi-weekly telephone calls or return visits.

Psychotherapy, consisting of individual, group,and family therapy with several experimental groups of the "self help" type under the direction of the clinic psychologist, is a major portion of the clinic's therapeutic program. This specialist also supervises the biofeedback programs that are useful in many cases.

EVALUATION OF RESULTS

The Clinic staff has conducted several comprehensive follow-up studies through mail questionnaires in addition to the use of return visits, telephone calls at regular intervals, and a post card at six months following the last visit. Published studies indicated that most problems encountered in the pain clinic behavioral and socioeconomic, rather than physical.They also defined the low back pain patient population as deriving from a rural economy, with an educational level of 6 years, with the patient involved in a repetitive,non-stimulating type of employment that was primarily physical in nature.

Long-term follow-up studies of physical and psychosocial adjustment of patients with chronic pain following treatment are rarely reported in the literature. Few studies report a long-term comparison of results over two time periods following the out-patient model of therapy as carried out in this clinic. A study was done, which was an extension of an earlier one, which reported generally positive therapeutic outcomes of low back pain treatment, especially in view of the chronicity and intractability of the patients treated. The study also noted extensive gender-associated differences in treament outcome, with women reporting generally more positive outcomes than men. Initial studies also emphasized the need for employing multiple criteria for assessing function and the effectiveness of pain clinic therapy, rather than a statement of improved, unchanged, or worse.

One study performed in the clinic extended in follow-up by three years an original survey to ivestigate whether the chronic pain state improves, stabilizes, or deteriorates on a variety of functional measures as a consequence of elapsed time following treatment. It was also used to determine sex-related differences and outcome and whether they maintain themselves over time. Final intent of this study was to determine the association between behavioral reports of improved functioning versus the more global rating of overall change in pain intensity and frequency once employed as the only outcome criteria in many studies reported in the literature.

A striking finding in the study was a substantial increase over time in the percentage of females classifying themselves as improved in their ability to work; 32% in 1974 and 62% in 1978. Males conversely showed only marginal improvement in disability with 39% improved in 1974 and 44% in 1978.

Although some 23 of the original 151 patients on the 1974 survey reported one or more additional surgeries for pain, on a five year follow-up, only three reported additional surgery, representing substantial reduction over time in this aspect of chronic pain behavior.

The data in this study indicate generally favorable long-term results among patients presenting themselves for treatment in an integrated pain clinic setting. Subjective ratings indicated improvement in several parameters: a low percentage of surgical intervention, enhanced ability to work, and positive outcomes of treatment attested to by over half of the patients.

Reasons for gender-related differences were unclear. It is possible that the males' pain states were associated with greater levels of physical impairment due to work-related accidents, a setting predictably associated with potential for severe back injury. Males also have a greater need to maintain the attitudes and behaviors consistent with more profound levels of impairment to offset cultural stereotypes requiring males to be more physically robust and vocationally productive than females.

The results from the five-year follow-up corroborated the observation made during the initial follow-up that the isolated criteria for pain reduction and return to work are too narrow for assessment of patient outcome.

Patients were inclined to judge improvement in terms of reduced exposure to pain and enhanced physical functioning, lending support to behaviorally based treatment programs which emphasize increased levels of physical activity and inattention to pain-related behaviors.

An additional intercultural study is being conducted with the pain clinic in Auckland, New Zealand, to determine those factors which influence return to work following low back injury. Preliminary data suggests that a "no-fault" compensation system, a greater spirit of individualism and physical fitness, and a more intense rehabilitation service are responsible for return to work of a greater number of back pain patients in New Zealand.

Laboratory research carried on in the pain clinic includes a recently published study on the effect of epidural steroids(a common treatment for low back pain)on the spinal cord, spinal meninges, and nevre roots. The study failed to reveal any significant changes at the level of injection, or one level above and below, when either vehicle or steroid-in-vehicle was compared to plain lidocaine injection.

Additional studies on local anesthetics as a systemic method of pain relief have also been published. Several studies on the use of neuroaugmentation for the relief of postoperative pain are in progress.

SUMMARY

The Pain Clinic's function in the university setting is that of education, patient care, and research. The clinic is an out-patient model with results comparable to those of in-patient careata far less cost to both patient and society in time and money. The Clinic's basic philosophy is to encourage the patient to assume the responsibility for all aspects of his/her treatment program including drug detoxification, increasing activity and exexcise programs, and functional performance. Assistance is provided in solving of the sccio-economic, familial, and psychological problems, either through therapy within the clinic or with in the patient's own geographic location.

The needs of the clinic are as follows:

1. Funding for trainees;
2. Better educational progrmns for medical students;
3. Better educational program for practicing physicians, to provide early recognition of the patient with chronic pain;
4. Third party recognition of pain as a disease and compensation for managenent thereof.

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The pain and low back rehabilitation program at the University of Miami School of Medicine is a component of the Department of Neurological Surgery, which has long been involved in the management of pain problems. A number of traditional surgical outcome studies (Rosomoff, Sheptak and Carroll, 1966; Rosomoff, 1969; Rosomoff, 1973), as well as studies on pain, its definition (Rosomoff, Bonica, et al., 1975b, 1975c, 1975d; Rosomoff, Green and Silbret 1980) and its relationship to personality and to emotional distress in pain of malignant or non-malignant origin have been completed. In addition to these particular studies, on-going program evaluation has been carried out and the results of this study, addressing a few selected issues, are presented in this report.

The current data were drawn on a group of patients who have gone through the program since August 1977. During this time, there have been a significant number of modifications in the program, leading to the present status which includes self-contained in-patient as well as out-patient units. The table of organization for the total program is presented in Figure 1. It may be seen that there is a medical director, who, in fact, could derive from any medical discipline, but in this case is a neurosurgeon. There is a director of rehabilitative services, in this case an individual with a lengthy background as a rehabilitation nurse/specialist. A psychiatrist, two psychologists and two physiatrists complete the core professional hierarchy of the program. The services listed are all available to the patients, according to their needs. The program is further subdivided into an in-patient grouping and an out-patient unit (Figure 2 and Figure 3). The in-patient program is under the direction of the psychiatrist, in association with the physiatrist, and the out-patient program is under the direction of another physiatrist. It is important to recognize that all personnel are employed on a full-time basis with total dedication to the pain and back rehabilitation program. Both in-patient and out-patient programs are self-contained. They employ their own personnel in the form of allied health science professionals who are under the full-time direction of the core faculty. In addition, the program relies heavily on the services of rehabilitation nurses

FIGURE 1

PAIN AND BACK REHABILITATION PROGRAM

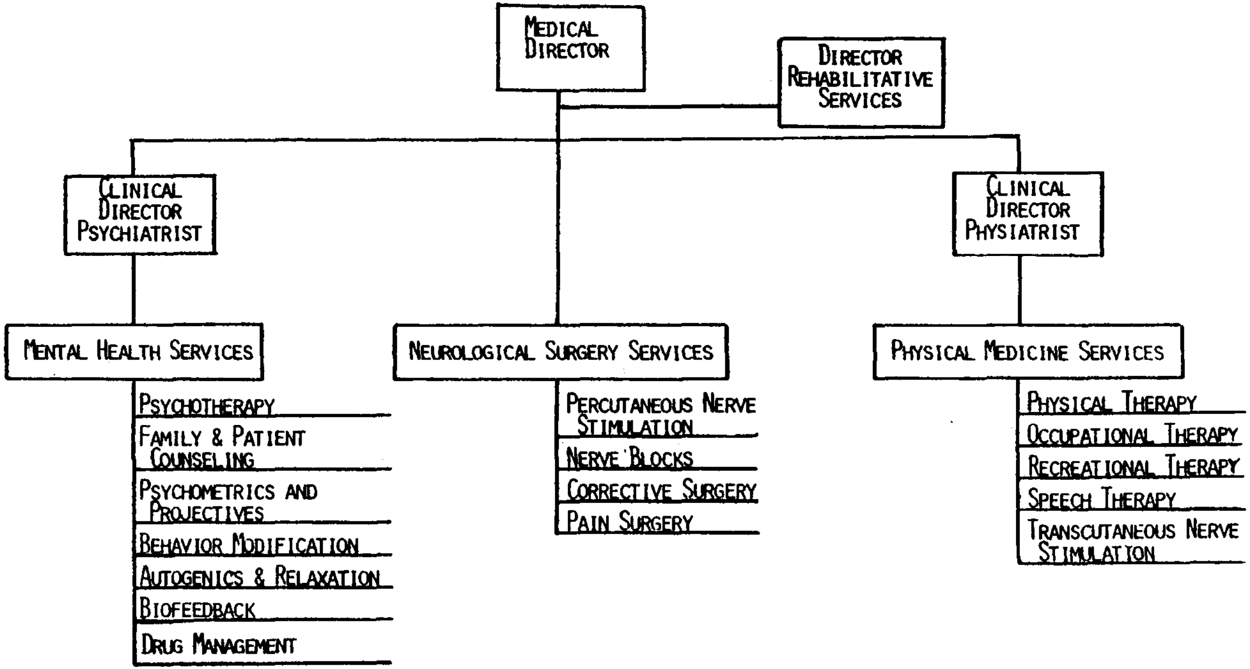


FIGURE 2

INPATIENT UNIT

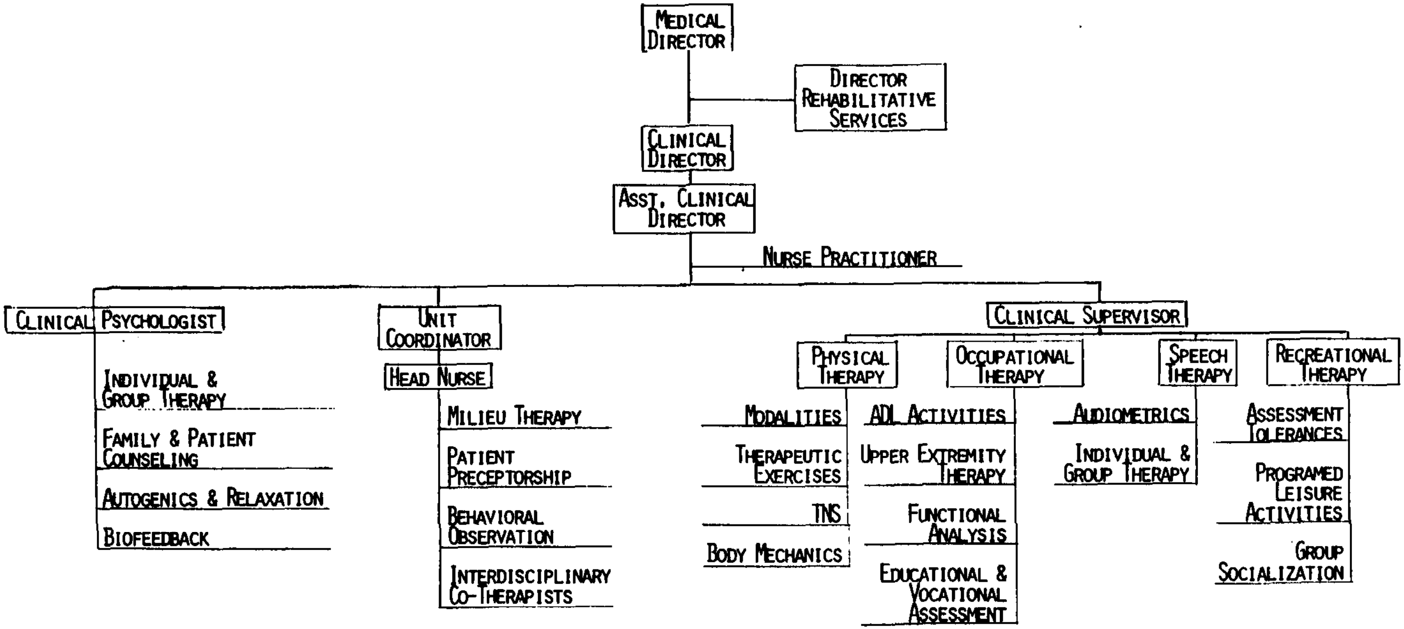
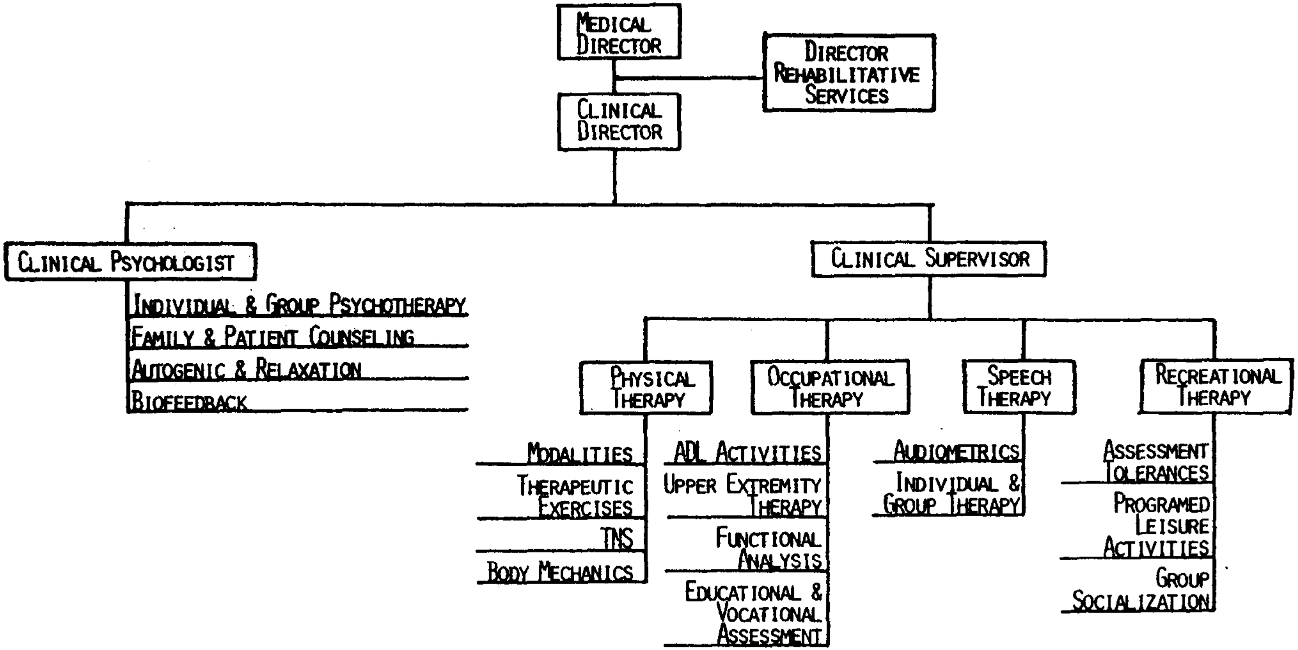


FIGURE 3

OUTPATIENT UNIT



or rehabilitation specialists for the management of the patients. These nurses or specialists are not employed by the program, but are provided from extra-mural sources through the State of Florida or commercial companies. They are involved with the pre-program gathering of medical information, including physician and hospital records, X-rays, special tests, etc., and they provide an analysis of the environmental factors at work and home which affect the patient's illness and management of this illness. They work with the team throughout the patient's stay, providing continuing input to and from the patient, family and employer, where appropriate, while entering early into planning for discharge and immediate return to work or other suitable goals of rehabilitation, should it not be gainful employment (Steele 1977). It is the goal of the program that each graduate finish the program and immediately enter into the goal-derived occupation without interruptions and without delay.

The initial evaluation is a three-day process completed on an in-patient basis so as to afford 24-hour observation and surveillance of behavior, analgesic intake, activity levels and social mannerisms, as they may affect entry into the full program in a community patient setting. During this time, pain questionnaires are utilized for description of complaints, psychological testing is accomplished, physician interviews and examinations are conducted by the neurologic surgeon, the physiatrist and the psychiatrist. Additional testing, as required, is obtained when medical issues care identified or special needs arise. These include radiological examinations, axial lumbar tomography and EMG analysis. At the end of this time, the patient is reviewed at conference, the findings are discussed with the patient and family and an outline for future management is developed. The patient usually is discharged for readmission at a later date, pending agreement by the patient, family, referring physician and health care provider. The principle of this evaluation is outlined as follows:

A complete re-evaluation of the patient's symptoms is desirable for several reasons. Previous treating physicians have invariably limited their approach to patient's symptomatology of "disc" disease, lumbosacral X-ray abnormalities, myelography, and clinical signs like motor strength, reflexes, and the straight leg raising signs. Less frequently recognized sources of persistent pain, such as lumbar stenosis, myofascial pain syndromes, and facet abnormalities have often been ignored.

Patients arrive with anxieties from previous and unsuccessful treatment for the pain problem. These must be reduced by an exhaustive, thorough review presented in simple graphic terms. The patient is much more willing to consider adapting to residual pain and thinking of pain control <u>after</u> being convinced that: a) all reasonable diagnostic attempts have been made; b) the advantages and disadvantages of any proposed invasive procedure have been fully explored; c) the patient has final responsibility and a free choice regarding any proposed treatments; and d) that they will not be further injured or "paralyzed" by an aggressive physical medicine program.

Given the choice of living with residual pain or trying to learn additional control measures, most patients will readily consider physical medicine and rehabilitation methods of management and mental and muscle tension relieving techniques, such as relaxation and biofeedback, without feeling that it implies that they are "crazy" or that their pain is "in the head."

Furthermore, it is important to identify and deal with psychological "noise" Maximal adaptation to residual pain is best achieved with a reduction or elimination of such "noise" which can include fear, depression, anxiety, hostility, superstitious beliefs, labile or impulsive mood, low frustration tolerance, tendency for violent or self-destructive behavior, sociopathic and manipulative personality styles, severe situational stress, and the use of such maladaptive coping mechanisms as denial, projection and displacement. An approach employing self-assessment and personality tests, clinical psychiatric and mental status evaluation, individual and "significant other" interviews, analysis of previous psychological assessment by mental health professionals and rehabilitation specialists together with a three-day observation period in a rehabilitative milieu, will usually be effective in identifying apparent psychological disturbances as well as "hidden agendas." Sometimes a week or two of further observation, along with treatment in an in-patient setting will clarify initially ambiguous cases. Pain complaints are channelled to daily morning rounds and weekly conferences. At all other times, the patients are encouraged to focus on ongoing tasks and activities rather than their pain complaints.

Once identified, psychological distortions are reviewed with the patient in a non-judgmental fashion and an individualized program is offered to deal with such problems. This includes such features as group discussions and therapy, individual relaxation training, as well as individualized counseling, psychotherapy, or family therapy. A full evening program is organized for education, distraction and recreation. The program is thus structured to emphasize daytime hours as task oriented and evening hours for socialization.

Patients are <u>not</u> excluded automatically from the program if they carry a previous diagnosis of schizophrenia or manic depressive illness. Rather, practical, operational criteria are used to determine eligibility. These include compliance, ability to understand and carry out instructions, positive attitudes towards rehabilitation, and an absence of aggressive or disruptive behaviors towards patients and staff members. When such criteria are applied, program results for such patients begin to approach those of other patients.

If patients are found to be obese, acceptance into the program is deferred until weight reduction to a reasonable level has been effected. Principles for decreasing and eliminating narcotic and sedative usage include establishment of baseline usages, stabilization periods are extended during periods of extensive diagnostic testing or the initial phase of physical medicine procedures, such as local injections and vigorous exercise. Once treatment routines are established, patient acceptance of detoxification schedules is more readily achieved.

True integration of coping techniques requires not only exposure to educational techniques, but constant rehearsal, probing and testing to insure true assimilation. For those returning to work, simulated job tasks are given to test whether concepts of body mechanics and energy conservation have become "second nature." Rehabilitation nurse or specialist follow-ups and/or home visits by occupational therapists are important to maximize environmental integration. A graded transition from total in-patient care, to a day rehabilitation setting, to gradually reduced number of outpatient visits has proved useful in minimizing relapses and in maximizing the shaping and integration of adaptive behaviors. The rehabilitation nurse or specialist working with the patient and program serves as an extender of care. This individual is intermediary with the family or home treating physician, who also monitors the home rehabilitation program, adaption to return to work or community environment at the local level. Should the patient regress or have a problem, the specialist can be informed immediately so as to participate in management. Most new crises are thereby aborted.

The study presented in this paper will concern itself only with the "low back" patient, the "salvage" case who has generally been presented to us as being totally disabled, as he or she enters our treatment program.

The patients range in age from late teens to seventies with a mean age of 52; 72 were men and 56 were women (Table 1).

Table 1

AGE DISTRIBUTION

(PERCENTAGES)

UP TO 20	1
20 TO 29	6
30 TO 39	25
40 TO 49	27
50 TO 59	23
60 TO 69	17
70 AND ABOVE	1

They come from a broad socioeconomic group. Occupations range from unskilled laborers to professionals, with the great majority involved in unskilled labor and semi-skilled labor requiring heavy work. This distribution has serious consequences for outcome evaluation regarding return to work. Physical limitations relevant to lifting will have far greater impact on a laborer than on a professional whose tasks are relatively sedentary.

Seventy-seven of these patients were receiving compensation benefits, while 51 were not. The compensation patients were almost exclusively formerly employed in unskilled or skilled, but heavy labor. Diagnostically, secondary soft tissue changes or myofascial syndromes were seen in almost all patients to a varying degree, while a substantial number showed bony pathology on X-ray or CT scan, with or without sigificant clinical findings. All patients had had previous treatment, ranging from having had single physical therapy interventions to a few who had attended other pain programs. The general pattern had been to try one modality and see modest improvement, with subsequent return of the problem, and then an attempt with another treatment approach or surgery. Many had been abandoned by the medical community or were considered "purely psychological." Thirty-three percent had one surgery with an additional 41 percent having had two or more surgeries, with single and multiple laminectomies being the most common surgical intervention. Most had little or no formal instruction in therapeutic exercises as a part of their post-surgical management. Upon evaluation for entry into our program, they generally described moderate to severe restrictions in work, recreational and family activities.

The program, as described earlier, is a multidisciplinary one, utilizing a variety of techniques and learning experiences to instruct the patient in effective mastery and adaptation to the pain problem. Time in the program is a function of rate of improvement, since patients remain as judged necessary, rather than entering for a fixed period of time. Predicting which patients will do well, easily, or which will require more intensive or alternative interventions has been a major research issue, addressed through both clinical studies and the use of psychological testing. The Millon Behavioral Health Inventory (Millon, Green and Meagher, 1979), a psychological inventory for medical patients, when used in conjunction with clinical evaluations, has proved helpful in identifying personality characteristics affecting outcome.

A RESEARCH STUDY OF "PROBLEM" AND "NON-PROBLEM" PATIENTS

Clinicians are well aware that some patients have greater difficulties with compliance than do other patients, i.e., "problem patients." In an effort to address this issue, the following study was conducted. All patients who had come into the program were listed. Each team member independently was asked two questions about these patients after they had completed the program. Did they know the individuals well enough to rate them in regard to the criteria established for a "problem" patient? If so, the evaluator was to state if each individual was or was not a problem patient. The criteria for a problem patient were either: they seemed to sabotage their own treatment program through behaviors such as non-compliance, breaking of appointments repeatedly, or continued inability to integrate the program; or they actively attempted to sabotage other patients through criticism of the team or fomenting non-compliance among patients. Problem patients were those given a rating of "problem" by a majority of therapists rating them, with at least two therapists having rated the patient. Those who could not be rated by at least two therapists were not included in this study.

Forty-four percent of those rated were listed by this definition as problem patients: 56 percent were non-problems (Table 2).

Table 2

PATIENT DISTRIBUTION

(N=88)

Problem	44%
Non-Problem	56%

Psychologically, problem patients were most likely to complain of difficulties, expectations from self and others beyond the patients' capacities to manage, depression and a sense of social alienation, and a belief that family and friends were not there to support them in times of need.

Those 88 patients who were known well enough to be rated were then compared across a number of selected, simple measures. An interesting pattern of the relationship of outcome, compensation and management problems emerged. Of the patients rated either problem or non-problem, 59 percent were on compensation, while 41 percent were not, in keeping with the percentages of this distribution in the total group (Table 3).

Table 3

PATIENT DISTRIBUTION

(N=88)

Compensation	59%
Non-Compensation	41%

Turning to those patients rated as problems, 64 percent were compensation cases (Table 4). Though this is slightly higher than the total group, it is not substantially greater, despite the popular belief that receiving compensation benefits increases management problems.

Table 4

PATIENT DISTRIBUTION
PROBLEM PATIENTS
(N=39)

Compensation	64%
Non-Compensation	36%

Treatment outcome cannot be assessed independently of the context in which patients have been evaluated and later treated. In this presentation we will focus on the issue of the rehabilitation of the patient with low back pain. In our program it is assumed that both organic and psychological components are issues in the diagnosis of the patient with chronic pain. The multidisciplinary evaluation given each patient addresses both sets of issues and includes self-report, physical examinations, diagnostic testing and baseline data with emphasis on the development of a structured, functionally goal-directed treatment program. Philosophically, the Pain Team is rehabilitation oriented with the team accepting responsibility for teaching and the patient assuming responsibility for change through the integration of learning. Criteria for admission to the program require only that the patient is medically stable, that the problem does not require immediate medical or surgical intervention, that no major psychopathology is present and that the patient is motivated to enter treatment.

Within this framework over 125 patients with low back pain have been evaluated and treated over the past 2-1/2 years. Patients ranged in age from their teens into the seventies with the majority in their thirties and forties. Approximately 60 percent were compensation patients while 40 percent were non-compensation cases. The large majority had had previous surgical interventions and a variety of conservative management approaches as well. Most patients were currently taking narcotics and describing severely limited activity levels at initial evaluation. The most frequent diagnosis was secondary soft tissue changes with or without bony pathology and with various degrees of limitation as a function of these problems. After completing the program the patients were rated as to whether or not they were "problem" patients following specific criteria. Patients were evaluated at follow-up in regard to functional level, work status, medication utilization and mood. These data were then analyzed for the total group and in relation to specific issues considered salient to the management of the pain patient including the issues of compensation and whether or not the patients were seen as "problem" patients. The results of this study will be presented.

Encouraging as these preliminary results are, what is of greater importance is the development of a systematic, multi-center study of patient populations, diagnoses, the specifics of treatment within the various settings and outcome over time, utilizing agreed-upon diagnostic criteria, instruments and evaluation techniques. The rationale of a cost-effectiveness model to address some of these issues will be presented. This index is useful in comparing alternative management methods, or as a means of following a single treatment across time. This model along with a unified diagnostic and evaluation armamentarium should serve to aid in clarifying the issue of chronic pain and its management.

The issue of cost required to create change in patients is a serious one. Allowing for variation within individual programs, one measure of this cost is the total length of time patients were in the program. The treatment length for patients who terminated AMA were not included in this calculations so as not to artifically abbreviate these figures Outcome figures did, however, include these patients. The average stay for all patients in this study was 48 days, combining both in-patient and out-patient treatment (Table 5). Not all patients required both forms of treatment, but treatment programs followed the same model, and days in treatment can be considered to be equivalent. It can be seen that non compensation patients remain in treatment six days longer than compensation patients. Although explanations are conjectural, it is posited that input from the rehabilitation specialists serves to increase efficiency in regard to movement through treatment and, more importantly, back to the home and work environment.

Table 5

MEAN LENGTH OF PROGRAM

(N=88)

Compensation Patients	45 Days
Non-Compensation Patients	51 Days
All Patients	48 Days

The problem patient has an average length of stay of 55 days, with, again, a markedly shorter stay for compensation than non-compensation patients (Table 6). Insurers, involved in a constant dialogue with the team, may encourage terminating treatment when therapies are unproductive, according to program report. This additional input may serve to keep the treating team more focused on real world issues than their compassion or idealism might allow.

Table 6

MEAN LENGTH OF PROGRAM

PROBLEM PATIENTS

(N= 39)

Compensation Patients	51 days
Non-Compensation Patients	61 days
All Patients	55 days

The non-problem patients stay a mean of 43 days, 12 less than for problem patients, with a modest difference between compensation and non-compensation cases (Table 7).

Table 7

MEAN LENGTH OF PROGRAM

NON-PROBLEM PATIENTS

(N=49)

Compensation Patients	42 days
Non-Compensation Patients	45 days
All Patients	43 days

The additional time for the problem patient is invested at the beginning of the program, getting the individual to adapt to becoming a participant, involved and motivated toward treatment. One of the most significant criteria for evaluating outcome is function. As mentioned earlier, a number of issues affect reentry into the job market. Most fully to appreciate program effectiveness, both functional activity levels and employment must be addressed. Data on activity levels for the total sample on whom extended telephone follow-ups were completed, numbering 52, are reported below.

The criteria for rating function are: Level I refers to full activity, including self-care, management of home, work and recreational activities. This may be in the presence or absence of discomfort and the patient may or may not be taking medications. The aim of our program is rehabilitation and function with no guarantee of pain relief, although strong efforts are made to reduce initial pain complaints and prevent increased pain with increased activity. Level II refers to a patient capable of self-care only, assuming no responsibilities for maintenance of home or caring for others, on a regular basis. Finally, Level III refers to that category of patients unable to fully manage self-care, who are dependent on others to meet basic needs.

Employing these criteria, 86 percent of the total group are at full function at follow-up which was completed two months to two years after treatment ended, with an average time elapsed of 11 months (Table 8). It cannot be assumed that treatment alone was the cause of this status; however, it can be stated that the patient has achieved this level. Twelve percent were at Level II, while only one of the 52 respondents described self as severely restricted.

Table 8

FOLLOW-UP

LEVEL OF FUNCTION, TOTAL GROUP

(N=52)

I = 86%

II = 12%

III = 2%

It has been thought in the past that compensation patients were less likely to improve than the general population. With regard to function, our data do not support this concept. At follow-up, 88 percent of compensation patients reported full levels of function (Table 9).

Table 9

FOLLOW-UP

LEVELS OF FUNCTION, COMPENSATION PATIENTS

(N=34)

I = 88%

II = 12%

III = 0%

Non-compensation patients, admittedly a small sample, showed similar results, with 84 percent at full levels of function (Table 10).

Table 10

FOLLOW-UP

LEVELS OF FUNCTION, NON-COMPENSATION PATIENTS

(N=18)

I = 84%

II = 8%

III = 8%

The issue of the problem patient in relation to outcome is a significant one (Table 11). Seventy-three percent of all problem

Table 11

FOLLOW-UP

LEVELS OF FUNCTION, PROBLEM PATIENTS

(N=22)

I = 73%
II = 23%
III = 4%

patients, in spite of difficulties in integrating the program, achieved follow-up outcome levels of full function, with 23 percent carrying on self care. One patient reported severe restrictions preventing even complete self care.

Ninety-seven percent of non-problem patients reported full levels of function (Table 12). It must be remembered that a variety of physical and psychosocial factors served to create these differences.

Table 12

FOLLOW-UP

LEVELS OF FUNCTION, NON-PROBLEM PATIENTS

(N=30)

I = 97%
II = 3%
III = 0%

Work activity, although related to level of function, is subject to a number of co-occurent variables, particularly previous employment and social network support (Table 13).

Those listed as working are gainfully employed on a full time basis. Homemaking was listed for those individuals for whom this choice was appropriate, given age and sex, not as a category covering their forced retirement. Those at age 65, or retired previous to injury or illness, were categorized as retired post-treatment, if active but unemployed. Again, this was not a category for the unemployed or underemployed male. Students were considered such, if full time, albeit occasionally with reduced course load. Not working were those with resources to be employed, but for whom no placement had been made. ADL refers to those whose activity included self care only. In the total group, 70 percent were effectively and appropriately occupied, 16 percent were unemployed, <u>but able to work,</u> and 12 percent were able to perform self care tasks only.

Table 13

FOLLOW-UP

WORK ACTIVITY,TOTAL GROUP

(N=52)

Working	29%
Homemaking	17%
Retired	13%
Student	11%
Not Working	16%
ADL	12%
Disabled	2%

Work activity, however, did show some real differences between compensation and non-compensation patients (Table 14).

Table 14

FOLLOW-UP

WORK ACTIVITY, COMPENSATION PATIENS

(N=34)

Working	29%
Homemaking	6%
Retired	15%
Student	15%
Not Working	20%
ADL	15%

Sixty-five percent of all compensation patients were carrying on appropriate work activities as previously defined. However, 20 percent were able to work physically, but have not been placed, and 15 percent describe themselves as only maintaining self care activities. Again, it must be remembered that these data are self reports and dependent on patients and their perceptions for accuracy. An interesting note in this regard is that there appears to be as great a relationship between the patients' belief that they could manage their problems and successful adaptation as between improved physical strength, mobility, and good adaptation.

Turning to non-compensation patients, 78 percent were employed, homemaking, or retired, while only one individual, or 5 percent, reported work had not been found in spite of ability and willingness (Table 15). Seventeen percent reported only ADL capabilities.

Table 15

FOLLOW-UP

WORK ACTIVITY, NON-COMPENSATION PATIENTS

(N=18)

Working	28%
Homemaking	39%
Retired	11%
Student	0%
Not Working	5%
ADL	17%

Work activity for the problem patient showed 69 percent productively occupied, with one patient reporting an inability to gain employment. Twenty-seven percent described restrictions allowing only self care (Table 16).

Table 16

FOLLOW-UP

WORK ACTIVITY, PROBLEM PATIENTS

(N=22)

Working	27%
Homemaking	9%
Retired	18%
Student	9%
Not Working	4%
ADL	27%

Seventy-seven percent of non-problem patients reported employment or activities consonant with their goals, while 23 percent reported a capacity and willingness to work, but difficulties in placement (Table 17). The issue of employment after treatment would appear to be a major one. Thoughtful, early and aggressive job planning and placement is a central component of treatment. The involvement of rehabilitation nurses or specialists is invaluable in this regard, especially, if the patient is to return to work immediately after concluding the treatment program.

Table 17

FOLLOW-UP

WORK ACTIVITY, NON-PROBLEM PATIENTS

(N=30)

Working	30%
Homemaking	23%
Retired	10%
Student	4%
Not Working	23%
ADL	0%

This study, along with earlier ones only served to highlight the fact that a more uniform method for assessing treatment effectiveness in the most general, as well as specific, sense is required. A model has been developed, in consultation with Dr. Howard Gitlow, Associate Professor of Marketing Science at the University of Miami, that addresses this issue, utilizing a number of effectiveness measures and outcome measures to arrive at an effectiveness index. This model will soon undergo a series of field trials to determine its utility in our clinical setting. Given this index and patient data, it may be possible to model management to determine if changes in treatment strategies can be found which would optimize treatment effectiveness.

The issue of the patient and optimal treatment is a complicated one, affected by both the nature of the problem and a myriad of concurrent psychosocial issues. Final conclusions in this regard await more extensive, comparable studies of this population than have yet been implemented. It is toward the development of such studies that our attention now turns.

SUMMARY AND CONCLUSIONS

The Pain and Back Rehabilitation Program at the University of Miami in the Department of Neurological Surgery has been described. An overview of the patient population has been presented. Outcome results have been analyzed for low back pain rehabilitation against patient compliance, compensation status, and level of function and work activity. The data show that 64 percent of patients who have been rated as problem cases are receiving compensation benefits. That percentage is not significantly different from that which is seen in non-compensation cases. If the cost of the program is gauged by time in treatment, the average patient is under treatment for 48 days; non-compensation cases stay in the program an average of six days longer.

The problem patient takes longer to treat effectively, an average of 55 days, but within this group, the time is shorter for compensation cases. Non-problem patients, on the average, are treated in 43 days, 12 days less than for the problem cases. These 12 additional days are taken at the onset of the program, when problem patients must become compliant and be stimulated toward motivation to cooperate in treatment and progress toward the goal of occupation at discharge.

Eighty-six percent of all patients return to full activity, 70 percent are fully occupied, and a further 16 percent would be occupied and are physically capable of being employed, but cannot be placed in work because of prejudice against their medical history of low back disorder. Therefore, the total of 86 percent could be fully active, provided all could be found positions consistent with their discharge status. An analysis of compensation versus non-compensation cases indicates that 88 percent of compensation cases are fully occupied following discharge, and 84 percent of non-compensation cases are fully occupied. It is clear that there is no difference between the two categories, from which it is concluded that compensation status does not bear upon final outcome of function.

Further analysis of the data indicates that there is a higher percentage of compensation patients then non-compensation patients who satisfactorily complete the rehabilitation program and are fit to work but for whom placement cannot be found because of their past medical history. This number is 20 percent for the compensation cases, whereas only 5 percent of non-compensation cases have difficulty in being placed in employment. When problem or non-problem cases are considered, it is seen that 97 percent of non-problem cases are at full activity, whereas only 73 percent of problem cases fulfull that designation. This difference is directly attributable to the non-compliant nature of the patient who is rated as a problem, so that personality style and mental status are important issues in respect to outcome. Early planning and aggressive pursuit of job planning are integral to achieving high levels of full occupation, particularly when every attention is given to return to employment immediately following completion of the rehabilitation program.

Finally, formulae have been developed to provide indices of treatment effectiveness and cost effectiveness. These are to be tested by field trials with the ultimate goal of providing measures to determine the influence of treatment modes on cost. It is recognized that pain and back rehabilitation is costly and available only to a privileged few relative to the numbers of patients that require this form of treatment. Every effort is being made to reduce cost and time under treatment as a means of increasing efficiency economically, as well as increasing the numbers of patients who can be managed per unit of time.

REFERENCES

Millon, T., Green, C., and Meagher, R. The MBHI: A new inventory for the psycho-diagnostician in medical settings. Professional Psychology, 10 (4): 529-539, 1979.

Rosomoff, H.L. Neurosurgical control of pain. Ann Rev Med 1969, 20: 189-200.

Rosomoff, H.L. Anatomy and techniques for the management of pain: Percutaneous cordotomy. Proceedings Biennial Western Conference on Anesthesia. In Pathological and Pharmacological Considerations in Anesthesiology edited by V.L. Brechner, M.D. Springfield: Charles C. Thomas: 1973, 16-28.

Rosomoff, H.L., with Bonica, J.J., Fordyce, W.E., R.W. Loesser, J.D., and Talbott, J.H. Pain: Its definition, its effect, and its mechanisms - Part I. Modern Medicine 42: 26-35, 1974.

Rosomoff, H.L., with Bonica, J.J., Fordyce, W.E., Houde, R.W., Loesser, J.D., and Talbott, J.H. Pain: Why the patient suffers: Theories and concepts of pain mechanisms, Part 2: Modern Medicine 42: 56-63, 1974.

Rosomoff, H. L., with Bonica, J.J., et al. Pain: Its definition its effects and its mechanisms - Part 1. Modern Medicine 42: 26-35, September 1974.

Rosomoff, H. L., with Bonica, J.J., et al. How to learn why the patient hurts - Part 3. Modern Medicine 43: 68-73, January, 1975.

Rosomoff, H.L., with Bonica, J.J., et al. The pain clinic--New Promise of relief for suffering patients - Part 4. Modem Medicine 43: 52-59, March, 1975.

Rosomoff, H.L., with Bonica, J.J., et al. The risks and benefits of cutting pain's pathways - Part 5. Modern Medicine 43: 74-87, April, 1975.

Rosomoff, H.L., with Bonica, J.J., et al. Helping the patient unlearn the habit of pain - Part 6. Modern Medicine 43: 58-72, September, 1975.

Rosomoff, H.L., Green, C., and Silbret, M. The multi-disciplinary team approach to the diagnosis and treatment of chronic low back pain, in Radiographic Evaluation of the Spine - Current Advances with Emphasis on Computer Tomography, J. Donovan (ed.) 1980.

Rosomoff, H.L., Sheptak, P., and Carroll, F. Modern pain relief-percutaneous chordotomy, JAMA 196: 482-486, 1966.

Steele, R. The obscure link. Association of Rehabilitation Nurses Journal 2: 3-6, March, 1977.

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Comparative Aspects of Chronic Pain in the Head and Neck Versus Trunk and Appendages: Experiences of the Multidisciplinary University of North Carolina Pain Clinic

John M. Gregg, D.D.S., Ph.D., and Jawahar N. Ghia, M.D.

ABSTRACT

The interdisciplinary University of North Carolina Pain Clinic, in existence since 1973, is a coordination center for research, pre and postdoctoral and resident training, and clinical services. It functions primarily as a tertiary care center for outpatients as a component of the North Carolina Memorial Hospital. Inpatient consultations and therapy direction are carried out on request. Approximately 400 new patient visits and 1,200 consults and return visits are made yearly. The clinic is administered by codirectors from the Departments of Oral and Maxillofacial Surgery and Anesthesiology. Consultants to the clinic include the disciplines of psychiatry, neurosurgery, family medicine, pathology-oral pathology, dentistry, physical therapy, social work and nursing. Support staff includes a head nurse, half-time transcription and half-time general secretary and a financial technician. Facilities consist of an 8-room clinic dual equipped for patient care and clinical research. An adjacent conference room is used for research and patient presentation conferences. In addition to routine examining and interview rooms, a minor procedure operating room is equipped with resuscitation equipment, suction, oxygen, anesthesia machine, a physiologic monitoring system with polygraph, a cryosurgical unit and a radiofrequency lesion generator. A second room is equipped for neurosensory studies of peripheral nerve functions including a battery of tactile-mechanical and thermal threshold stimuli tests, as well as nerve conduction and EMG. A system for psychophysical testing is available through tie-in with a computer, which is located in an adjacent laboratory used for data analysis and also subhuman primate experiments. Another room is equipped with psychophysiologic training equipment, particularly EMG biofeedback. A computer terminal on line to the University IBM 360 is located in the Pain Clinic for use in entering patient-research data. A library with dictating space is available for use by consultants, postdoctoral trainees, and residents.

PATIENT ENTRY

Patients are seen only after referral by a physician, dentist, or other comparable health officer. Incoming referral requests are surveyed by the clinic directors for acceptance and assignment of cases to the most appropriate primary manager-consultant, who will be the attending physician, seeking secondary consultations and carrying out correspondence. Only patients with pain of more than 1 month duration are considered for Pain Clinic screening. Demographic, past medical history, subjective pain inventories, baseline anxiety and depression inventories are gathered and assembled by the clinic nurse and secretary before the initial patient visit. A specialized pain survey questionnaire has been developed and adapted for computer data collection. Included are assessments of pain severity, drug use and abuse, patterns of health services (emergency room visits, surgical operations), and impairment of function (sleep, eating, walking, hygiene, social, vocational). A psychological screening is generated for each patient based entirely on questionnaires. Patients are selected for further psychological testing and interview on the basis of the screening and at the discretion of the patient's primary manager. Selected patients are presented at Pain Clinic Conferences, a 90-minute weekly session during which all consultants, residents, fellows and support staff are present for discussion and treatment planning. An average of three new patients per week are presented and discussed. They are selected primarily on the basis of: 1) refractoriness of problem, 2) teaching value, 3) research value, 4) miscellaneous patient factors (potential for rehabilitation, age, distance traveled, etc.). The diagnostic and treatment planning services of the clinic are viewed as its most important role in patient care.

PATIENT SERVICES

<u>Evaluative services</u> offered in or coordinated by the Pain Clinic include: 1) Neurosensory and psychophysical examination, 2) psychosocial adjustment evaluation, 3) peripheral vascular study, 4) differential nerve and spinal block, 5) multidisciplinary panel review. <u>Pharmacologic</u> services include: 1) detoxification coordination, 2) psychotropic therapy coordination. <u>Physiologic</u> services include: 1) transcutaneous neural stimulation, 2) stretch and spray physiotherapy, 3) and ultrasound. <u>Surgical</u> treatments include: 1) myofascial and neural anesthetic blocks. 2) radiofrequency neurolysis, 3) cryosurgical neurolysis. <u>Behavioral</u> services include: 1) relaxation therapy, 2) biofeedback (EMG and temperature), 3) counseling (psychological, family-marital, vocational), 4) group therapy, 5) operant conditioning.

REFERRAL SOURCES AND PREVIOUS TREATMENTS

Sources of patient referrals include: 1) family physicians, 32%, 2) family dentists, 29%, 3) North Carolina Memorial Hospital or School of Dentistry physicians and dentists, 13%, 4) private specialists and other clinicians (physical therapists, nurse practitioners), 26%.

Previous treatments received by patients prior to presenting at the pain clinic, in order of decreasing frequency, are seen in Table 1.

Table 1

MOST COMMON PREVIOUS PAIN TREATMENTS

Head & Neck Pain	Non Head & Neck Pain
1. Dental manipulations (extraction, pulpectomy, occlusal adjustment, splint or prosthesis construction)	1. Minor tranquilizers
2. Minor tranquilizers	2. Narcotics
3. Narcotics	3. Laminectomy
4. Neurectomy or alcohol block	4. Braces
5. Anticonvulsants	5. Nerve or muscle block
6. Temporomandibular joint surgery	6. Antidepressants
7. Intracranial neurolysis or rhizotomy	7. Chiropracty
8. Chiropracty	8. Tractotomy

The patients presenting to the U.N.C. Pain Clinic have the following demographic Profile.

Table 2

PATIENT DEMOGRAPHY: U.N.C. PAIN CLINIC

	(N=225) Head & Neck Pain	Non Head & Neck Pain
In State:Out State	90:10	95:5
25 mile radius	18%	15%
Family income	17,500	16,500
Male:Female	24:76	45:55
Age Male	48 (14-87)	43 (20-75)
Age Female	40 (12-89)	47 (21-80)
Inpatient:Outpatient	6:94	15:85
Black:White	16:77	8:91
Other Race	7%	1%
Pain duration	21+2.5 mos.	34+3.6 mos.
Pain-related operations	1.7+.9	2.5+1-1
Major operations, non pain related	1+2.1	1+2.2

The most striking demographic data were: 1) the rather high levels of family income, perhaps a reflection of the referral basis of clinic entry, 2) the preponderance of younger females presenting with head and neck pain, 3) the low percentage of black patients in proportion to the community population (approximately 30% black), 4) the similarity of pain durations and numbers of previous operations.

PRIMARY ADMITTING COMPLAINTS AND PAIN CLINIC DIAGNOSES

Primary pain complaints according to body region are: 1) head, face and neck 53%, 2) back and lower extremities, 23%, 3) chest 8%, 4) abdomen, 6%, 5) upper extremities, 5%, 6) inguinal 3%, 7) flank 1%, 8) pelvic 1%.

The admitting diagnoses, submitted by referring physicians were as follows:

Table 3

UNC PAIN CLINIC ADMITTING DIAGNOSES (N=232)

Head & Neck Pain	
Temporomandibular joint arthritis	35%
Myofascial pain	15%
Migraine	12%
Tic douloureux	6%
Psychogenic pain	7%
Atypical neuralgia	6%
Post-herpetic neuralgia	2%
Cancer pain	6%
Post-Traumatic neuralgia	11%

Low Back and Extremity Pain	
Degenerative Disease	23%
Post Traumatic	23%
Post Laminectomy	19%
Mechanical	9%
Musculoskeletal/Psychological	6%
Acute disc prolapse	6%
Others	6%
Phantom limb	4%
R.S.D.	4%

Upper Extremity Pain	
Reflex sympathetic dystrophy	36%
Rheumatoid arthritis & osteoarthritis	22%
Post mastectomy syndrome	14%
Post infectious neuritis	14%
Post incisional pain	7%
Post CVA pain	7%

Chest Pain	
Intercostal neuralgia (post infectious, traumatic degenerative joint disease)	47%
Cancer pain	30%
Costochrondritis-myofascial	10%
Post mastectomy syndrome	7%
Esophagitis, cardiac origin	6%

Abdominal	
Pancreatitis	33%
Unknown	21%
Post incisional	17%
Cancer pain	13%
Renal	8%
Psychological	8%

Table 4

UNC MULTIDISCIPLINARY PAIN CLINIC DIAGNOSES (N=232)

Head and Neck Pain		Low Back and Extremity Pain	
Myofascial pain dysfunction	39%	Psychological and compensation neuroses	61%
Post-traumatic neuralgia	11%	Degenerative disease and face joint involvement	11%
Atypical neuralgia (occipital neuralgia and periodic maxillary migrainous neuralgia)	24%	Arachnoiditis, peridural adhesion or scarring	10%
Migraine	4%	Myofascial pain dysfunction syndrome	6%
Tic douloureux	5%	Post-traumatic neuropathy	4%
Post-herpetic neuralgia	2%	Herniated disc	4%
Psychogenic pain	6%	Phantom limb	4%
Temporomandibular joint arthralgia	3%		
Rheumatoid or degenerative arthritis	6%		

Upper Extremity Pain	
Post-traumatic conversion dystrophy	29%
Rheumatoid arthritis and osteoarthritis	22%
Post-mastectomy syndrome	14%
Post-infectious syndrome	14%
Post-incisional pain	7%
Post CVA pain	7%
Reflex sympathetic dystrophy	7%

*Note: The majority of patients were found to have more than one source or basis for pain. Data are presented for the primary problem.

PATTERNS OF DRUG USE

Questionnaire analysis of drug use at the time of Pain Clinic admitting revealed that 32% were currently using 5 or more different drugs, 44% were using 1 to 4 different drugs and 24% were using no drugs. The average number of prescription and non prescription drugs used in the previous two years is 12.6. The drugs most commonly used, in decreasing order, were as follows.

Table 5

MOST COMMONLY USED DRUGS AMONG CHRONIC PAIN PATIENTS, RANK

1) Codeine or synthetic Codeine (most often in combination with acetaminophen)
2) Benzodiazepam (most often diazepam)
3) Meperidine (most often intramuscularly on emergency room basis)
4) Propoxyphene
5) Meprobamate
6) Amitriptyline
7) Ibuprofen
8) Cafergot
9) Carbamazepine
10) Diphenylhydantoin
11) Nembutal
12) Chlorpromazine
13) Pentazocine
14) Qualude
15) Phenelzine

In response to the question "Do you think you used too much of a drug of any kind during the last year because of pain," 87 percent of patients felt that they had used "too much" of some drug. The most commonly abused drugs, in the opinion of the patients were: 1) narcotics, 2) propoxyphene, 3) alcohol, 4) diazepam, 5) tobacco.

Patterns of drug abuse observed among this patient population included multiple use of drugs from the same pharmacologic class, procurement of drugs from multiple sources, and mixing of both CNS depressant and stimulant agents. A ranking by Pain Clinic consultants of drugs most abused by the U.N.C. chronic pain population revealed: 1) oxycodone, 2) meperidine, 3) benzodiazepam, 4) propoxyphene, 5) meprobamate, 6) alcohol, 7) tobacco, 8) coffee.

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Treatment of Osteoarthritis of the Spine and Herpetic Neuralgia at the Pain Center, Mount Sinai Medical Center

Frank Moya, M.D.

ABSRACT

This presentation will briefly describe the operation of this Pain Center and discuss the two chronic pain problems most commonly seen in our geriatric population: osteoarthritis of the spine and herpetic neuralgia.

Osteoarthritis of the spine is the most common radiologic finding in middle-aged and older people with low back pain. 32% of our patients have this diagnosis as the basis of their chronic pain. The typical patient is 72 years old and has a past pain history which includes several years of back pain treated by various physicians with anti-inflammatory agents and analgesics to no avail. Past history of surgery and drug abuse is rare; however, depression is common. Therapy at the Pain Center is primarily the use of an exercise program and epidural and/or subarachnoid steroids. At the last visit, approximately 70% of the patients have had significant improvement.

Herpetic neuralgia is found in 13% of all patients seen at the Mount Sinai Medical Center Pain Center. Our typical patient is 73 years old and has had PHN for 10 months unrelieved by various topical and oral medications. Although rarely is there a history of drug abuse or surgery, extreme depression is common. If the duration of the neuralgia is less than one year, 85% of patients get significant or complete relief from the use of sympathetic nerve blocks and/or the subcutaneous infiltration of steroids and local anesthetic. Once the PHN has been present for more than one year, only 55% of the patients are improved.

INTRODUCTION

The Pain Center of the Mount Sinai Medical Center on Miami Beach was organized eight years ago as a private practice outpatient facility. In 1979, almost 3000 consultations and procedures were performed in order to assist in the diagnosis and treatment of chronic pain problems. The patients primarily came from throughout the Eastern half of the United States and Canada, and all modern modalities of pain relief were used in their management. This presentation will briefly describe the operation of this Pain Center and discuss the two chronic pain problems most commonly seen in our geriatric population: osteoarthritis of the spine and herpetic neuralgia.

THE PAIN CENTER

Functionally, the Pain Center is an integral part of the Department of Anesthesiology. Geographically, it is located in the office area of the Department at the Mount Sinai Medical Center. Over the years, as the Pain Center has grown, it has cannibalized most of the Department's office space. Fortunately, this does have the advantage of permitting the operation of the Pain Center and the administration of the Department of Anesthesiology at virtually the same time and space--a highly efficient working relationship.

The Center is operated by a Medical Director assisted by two full-time physicians (including a resident in Anesthesiology). These physicians are in turn aided by a team of six assistants which includes two secretaries and a registered nurse, medical assistant, psychosocial worker, and hypnotherapist. In addition, consultative personnel are immediately available from all medical disciplines including physiotherapy.

Starting in 1972 with only a few patients a week, the Center has grown to one of the largest private practice outpatient facilities in the United States. In 1979, there were almost 3000 patient visits. The patients primarily came from throughout the Eastern half of the United States and from as far away as Europe and South America.

The most common problems seen are chronic back pain (38%), herpetic neuralgia (13%), skeletal/myofascial pain (13%), headaches (9%) and cancer pain (5%). The chronic pain syndromes found most amenable to therapy are back pain, herpetic neuralgia, headaches, pancreatic cancer and causalgia. On the other hand, the problems We found least amenable to therapy are thalamic pain syndrome, peripheral neuritis and phantom limb pain.

The most common therapeutic modalities used in Pain Center are trigger point blocks (20%), epidural or spinal steroids (18%), medical hypnosis (17%), herpetic neuralgia blocks (9%), acupuncture (9%), transcutaneous neural stimulation (6%) and psychosocial counseling, which is used in virtually all patients.

DEGENERATIVE HYPERTROPHIC SPONDYLITIS

Degenerative hypertrophic spondylitis (osteoarthritis of spine) consists of a degeneration of the intervertebral disc associated with reactive change in the vertebral body. It is the most common radiologic finding in middle-aged and older people with low back pain. 32% of our patients have this diagnosis as the basis of their chronic pain. The typical patient is 72 years old and has a past pain history which includes several years of back pain treated by various physicians with anti-inflammatory agents and analgesics to no avail. Past history of surgery and drug abuse is rare (3%); however, depression is common (43%).

The therapeutic regimen at the Pain Center includes the following:

1. Medication. Psychotropic drugs are routinely used in an effort to cope with the depression which is so commonly present. In addition, analgesics are prescribed whenever necessary and anti-inflammatory agents on occasion.

2. Exercise therapy including the occasional use of physiotherapy and heat is an important part of our program. The Kraus-Weber muscle tests are used to determine which specific Kraus exercises should be prescribed. All of these patients are given a specific exercise program.

3. Psychosocial counseling is used routinely in virtually all patients.

4. Steroids, administered in the epidural or subarachnoid space or into trigger points, are another important part of our therapeutic game plan. The steroids are usually injected along with a long-lasting local anesthetic such as bupivacaine (Marcaine).

5. Medical hypnosis and transcutaneous neural stimulation are also used in selected cases.

The average patient requires a total of 4 visits including the initial consultation. The total cost for these visits and therapy amounts to approximately $500 and the patient usually pays this directly (to be later reimbursed by third party carriers).

Therapeutic results. At the last visit, 70% of patients showed improvement ranging from definite improvement to complete relief. Followup calls placed up to 2 years later, found 58% of this improved group of patients still showed definite or better improvement.

HERPETIC NEURALGIA

Herpetic neuralgia is found in two forms, namely, acute herpes zoster and post-herpetic neuralgia (PHN). 13% of all patients seen at the Mount Sinai Medical Center Pain Center have this condition. Our typical patient is 73 years old and has had PHN for 10 months unrelieved by various topical and oral medications. Although rarely is there a history of drug abuse or surgery (1%), extreme depression is common (54%).

The therapeutic regimen consists of the following:

1. Sympathetic nerve blocks. If the duration of pain is less than 6 months, sympathetic nerve blocks are used.

2. A series of subcutaneous infiltrations of a steroid (triamcinolone) combined with a long-acting local anesthetic (bupivacaine) are used if the duration is greater than 6 months or if the sympathetic blocks failed to produce relief.

3. Anti-depressants (e.g., Elavil) and/or tranquilizers (e.g., prolixin) are often useful in difficult cases.

4. Analgesics are used as necessary. However, sometimes even the most potent narcotics are of little help to some of these patients.

5. Finally, psychosocial counseling is used routinely in most patients.

For refractory cases that have failed to respond to the above measures any or all of the following are used: epidural steroids, anti-viral agents, T..N.S., dimethyl sulfoxide (DMSO), medical hypnosis and even, as a last resort, surgery/neurosurgery.

The average patient requires a total of 5 visits including the initial consultation at a total cost of approximately $500. Most patients pay this sum themselves and are later reimbursed.

Therapeutic results. At the last visit 70% of all patients showed significant improvement (definite to complete relief). Following calls up to 2 years later found 70% of this improved group still showed significant improvement.

It is important to note that there is a close relationship between the duration of the neuralgia and therapeutic efficacy. If the duration of the neuralgia is less than one year, 85% of patients get significant or complete relief from the use of sympathetic nerve blocks and/or the subcutaneous infiltration of steroids and local anesthetic. Once the PHN has been present for more than one year, only 55% of the patients are improved. If the duration is less than one month, approximately 90% of patients experience significant relief.

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Profiles of Pain Patients, Including Chronic Pelvic Pain: University of Washington Clinical Pain Service

Terence M. Murphy, M.D.

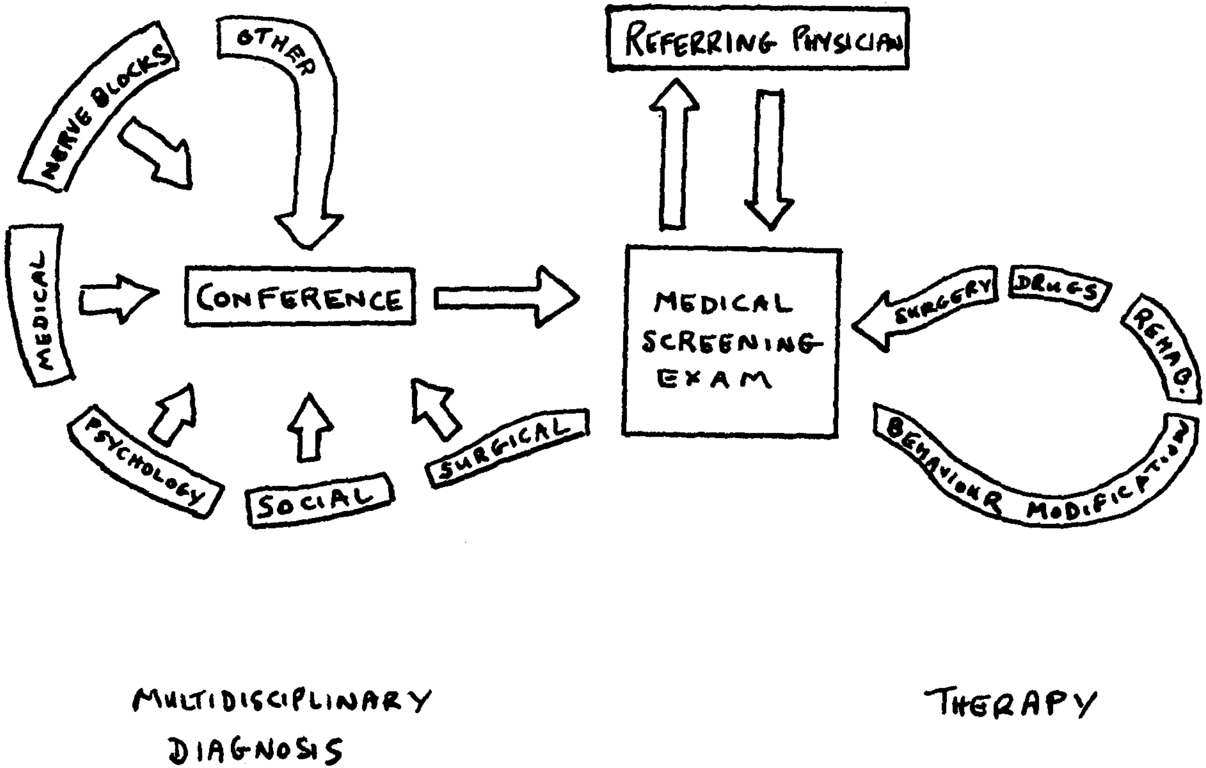
The University of Washington Pain Clinic has been in existence for two decades and has evolved during that period of time. Initially established by Bonica and White, espousing the concepts of multidisciplinary evaluation, it provided a comprehensive service to a limited number of patients by a multidisciplinary group operating on a part-time basis. Over the years, it has developed into a full-time Pain Clinic including daily evaluation of newly referred patients (500 a year), plus ongoing maintenance therapy on established patients (2,000 patient visits per year). There is also an inpatient service which has recently increased to a six-bed facility. Here the most complex patients are admitted for diagnostic evaluation and a proportion of these are maintained as inpatients for the formal Behavioral Modification Programs (Fordyce 1973).

The basic functioning of the clinic is as shown in diagram 1.

Patients are seen only by referral and the referring data is evaluated prior to offering an appointment. The facilities to deal with patients have expanded in recent years and this, associated with the increase in alternative pain treatment facilities, has resulted in an ability to be much more responsive to such referrals. Whereas in the initial years approximately 10 percent of patient referrals were seen and 90 percent rejected, the reverse is true at the moment, because the ability to see patients has expanded as the referral load in absolute numbers has decreased.

Prior to arrival, patients have been instructed to collect comprehensive past records of medical history and treatments. They have also completed a two-week diary, evaluation of which forms an integral part of their assessment. They are initially seen and screened by the "managing" physician and the clinical psychologist, and an MMPI is completed; and in those patients in whom it is indicated, a social service evaluation is obtained. With this information in hand, a "conference" is held between the clinicians involved and diagnostic impressions and therapeutic suggestions are made. These are conveyed to the patient and copies returned to the referring

DIAGRAM 1


REFERRING PHYSICIAN
NERVE BLOCKS
OTHER
MEDICAL
CONFERENCE
PSYCHOLOGY
SOCIAL
SURGICAL
MEDICAL SCREENING EXAM
SURGERY
DRUGS
REHAB.
BEHAVIOR MODIFICATION
MULTIDISCIPLINARY DIAGNOSIS
THERAPY

physician and the following decisions are usually made.

At this stage, it is sometimes feasible to recommend the patient to a specific treatment schedule, as outlined in diagram 1. This specific therapy may include medication adjustments, transcutaneous stimulation, physical therapy, formal operant conditioning, or some combination of the various modalities used for controlling chronic pain. If, however, at the end of the initial screening evaluation, diagnosis is still obscure and therefore treatment plans cannot be confidently recommended, further evaluation takes place. This is illustrated in the left-hand side of diagram 1. Further opinions are sought, usually from orthopedic, neurosurgical, or psychiatric colleagues. Regular referral is also made to other specialists (oral/general surgery, otolaryngology, etc.). When this additional information is in hand, usually at a later date, the patient is "reconferenced" and recommendations are made regarding treatment strategies.

PATIENT POPULATION AT THE UNIVERSITY OF WASHINGTON PAIN CLINIC

Demographic clinical and psychological data were collected on 264 patients seen consecutively at the University of Washington Pain Clinic by completing a series of questionnaires. These included Illness Behavior Questionnaire (Pilowsky 1975), Depression Scale (Zung), and Scale of Life Events (Holmes). Demogaphic data (sex, age, marital status, occupation) and clinical data (pain characteristics, diagnosis, etc.) were collected from the patient's chart.

The findings were as follows:

Demographic Data

Females (60 percent) outnumbered males (40 percent). Two-thirds of the patients fell between the ages of 30 and 60 years, yielding an average age of the total sample of 45 years, and the females tended to be slightly older than the males. Most of the patients (70 percent) were married at the time of their Pain Clinic evaluation; and of the remaining 30 percent, half were divorced and half single. Half of the sample had been in paid employment, a quarter had been housewives, and the remaining 25 percent comprised a mix of retired, 14 percent; unemployed, 5 percent; disabled, 5 percent; and students, 3 percent.

Clinical Characteristics

Back pain (and leg pain) and headache together accounted for two-thirds of the patient referrals.

There was no laterality predominance of pain. It occurred with equal frequency on both sides (Hall 1975). Eighty-six percent of the diagnoses were descriptive, indicating the anatomical site of the pain--for example, low back pain, headache, shoulder pain, etc. only 14 percent of the referral load had a specific pathological diagnosis evident such as carcinoma, arthritis, etc.

History of Pain

The mean duration of pain was four and one-half years, but there was a wide distribution in the sample from a low of several months to pain of duration of 50 or more years.

In 42 percent of the referred patients, the onset of pain was related to some physical injury, usually work related. 24 percent of the patients related their pain onset to some illness or surgical procedure or specific life crisis such as bereavement or divorce. There were 33 percent of the patients in whom no precipitating event could be identified for the pain complaint. 40 percent of the sample had undergone one or more pain-related procedures, although the average number of surgeries undertaken was higher than this (2.4).

Not surprisingly, the commonest pain-related surgeries were laminectomy and fusion procedures for low back pain, and laparotomy and cholecystectomy for abdominal pain, and various dental or oral surgical maneuvers for atypical face pain.

Medications

90 percent of the patients referred were using one or more medications. Two-thirds were using two drugs and one-third were using three drugs. Aspirin, proprietary compounds, and narcotics were the most commonly used classes of medication, and sedative hypnotics and antidepressants were frequently found. The data on this appear below.

DRUGS USED

Diazepam (Valium)	15%
Codeine with acetaminophen (Tylenol)	14%
Oxycodone (Percodan)	13%
Codeine with aspirin	11%
Meperidine (Demerol)	5%
Antidepressants	
Doxepin	22%
Amitriptyline	14%

It should be noted that the above medications are in patients preselected to be evaluated as outpatients. Patients with suspected major medication dependencies are usually admitted straight to the inpatient unit and would not be included in this group.

Psychological Data

The Illness Behavior Questionnaire testifies to significant disease conviction, affective disturbances, and denial of life's problems. These patients are convinced that they have some as yet undetected disease process, and they have a significant denial of life problems and the relationship of these to their suffering. With regard to the Zung Depression Inventory, these patients are more depressed than normal samples but not as clinically depressed as depressive patients seen in psychiatry clinics. On this test, normal patients have a mean score of 33 while the Pain Servie outpatient population has a mean score of 54. Depressed psychiatric patients score in the 64 to 74 range. This characteristic has previously been described in a similar survey on patients in this clinic by Pilowsky (1977). On the schedule of recent life events, there was significant difference between sexes, with males experiencing greater life changes than females.

The MMPI evaluation showed no difference between the sexes, and the well known conversion V phenomena of the depressed, tense, perplexed, and anxious individual was noted as has teen commented on previously by Fordyce (1973), Sternback (1973), and Cox (1978).

In summary, the typical patient at the University of Washington Clinical Pain Service is likely to be female, age 40 to 50, with a 4-year history of back pain or headache which has proved resistant to conventional therapies. Intensive investigations of these patients have failed to disclose a specific pathological diagnosis. They have usually undergone more than one pain-related surgery. Thirty percent of them take dependency-producing medications in significant amounts. They manifest considerable psychopathology, classified by mild to moderate depression, somatic preoccupation, illness conviction, and denial (failure to recognize what is often a significant pathological milieu as a generator of their symptomatology).

The question still needs to be answered as to whether the characteristics noted above are a cause or a result of the patient's chronic pain complaint.

It is speculated that these patients are typical of patients currently seen in Multidisciplinary Pain Clinics (Newman 1978). However, we cannot say how typical these characteristics are of people with pain problems who are not referred to Pain Clinics. It is likely that there is a selective referral to such clinics of the more difficult-to-manage patients. In a study undertaken comparing this Pain Clinic population with patients seen in a non-multidisciplinary private practice pain setting, these latter patients showed significantly less of the above-mentioned characteristics (Chapman 1979).

CHRONIC PELVIC PAIN

Dr. Guzinski, a gynecologist working in our clinic, has pursued a special interest in chronic pelvic pain. The data below represents the summary of her work on the first 100 patients.

None of these patients with debilitating pelvic pain was deemed to have any correctable pelvic pathology. Yet 95 percent of them demonstrated significant pathology on psychological evaluation, only 5 percent of them being deemed "normal." Basically they fell into four equally distributed psychological types. Thirty percent were clinically depressed, as was brought out by documentation on the MMPI and Zung Tests. Twenty percent were deemed to have character disorders, and 20 percent were borderline syndromes. All three subgroups had a surprisingly constant mean age of 23 to 24 years. The fourth main category were the Briquet's Syndromes (hysterics). Twenty-five percent of the patients fell into this group, and here there was a much wider age spread, from 19 to 60 years.

A significant aspect of the history was that of sexual abuse. Sixty-five percent of these patients with chronic pelvic pain gave a history of incest, rape, or sexual molestation. Forty percent of them had been subjected to an incestuous relationship, usually with stepfathers or brothers (not usually the natural father). The highest incidence of incest reported in other series is 25 percent, so this group appears to have a higher than usual incidence of this problem.

Lessons learned from patients with chronic pelvic pain are similar to those shared by most centers dealing with chronic pain, namely that a psychological evaluation must be presented as part of the initial endeavor. It is usually refused if introduced at a later stage when "organic pathology" has been ruled out. Because most of the patients have been referred in a crisis state, it is usually easier to obtain this sort of information when the patient is first seen. With regard to functional evaluation of these patients, they appear to be more active than patients with other chronic pelvic pathological states such as dyspareunia, chronic vaginitis, etc.

So far this group has been treated with regular follow-ups. Antidepressants have been prescribed for those patients deemed to be depressed. Biofeedback is being used with levator muscle retraining, mainly in the hysterical group, and ongoing supportive care for the borderline and character disorders. Conventional gynecological treatment such as hormone replacement, antipruritics, etc., is used in conjunction with the above therapy.

Operant Conditioning

Behavioral modification as a therapeutic effort for chronic pain patients has been a major component of the treatment options in the University of Washington Pain Clinic for the last decade. Dr. Fordyce and his colleagues in Rehabilitation have pioneered this particular form of therapy (Fordyce 1973).

Some variation on this theme is frequently an integral part of many Pain Center approaches and has proven to be effective in reducing medication and health care utilization, in reducing the interference of pain-limited activities, and in increasing exercise performance and general activity. These observations have been borne out by the findings in other clinics.

The initial enigma noted by Beecher (1959) that there is no simple relationship between stimulus and response has been well borne out in observations of the chronic pain patient. A recent study pursued at the University of Washington Pain Clinic (Fordyce 1980) has attempted to correlate observed pain complaints with the amount of prescribed exercise performed by chronic pain patients when exercising to tolerance during their evaluation or early treatment phases in the clinic. In this situation, patients were instructed to repeat specific exercises until pain, weakness, or fatigue cause them to cease; and observations of the amount of exercise performed were correlated with the observed visible or audible indications of pain or suffering. The results of this indicate a consistent negative relationship, i.e., the more exercise performed, the fewer the pain behaviors.

Patient Selection for Lumbar Discectomy

Dr. Spengler and Freeman (1979) have presented a method for Selecting patients with low back pain and sciatica for lumbar discectomy based on specific objective criteria. The four categories are neurological signs, sciatic tension signs, personality factors (MMPI scores), and lumbar myelography. Operative findings of 50 consecutive cases selected using this method reveal complete nucleus pulposis herniation in 43 cases. This is in contrast to a series of 26 patients undergoing lumbar discectanies before the method was introduced in whom only 5 showed evidence of complete herniation. This has reduced the number of negative disc explorations and improved early surgical results.

REFERENCES

Beecher, H.K. Measurement of subjective responses. New York: Oxford University Press, 1959

Chapman, C.R., Sola, A.E. and Bonica, J.J. Illness behavior and depression compared in Pain Center and private practice patients. Pain, 106:1, 1979.

Cox, G.B., Chapman, C.R. and Black, R.G. The MMPI and chronic pain: The diagnosis of psychogenic pain. J Behav Med 1:437-443, 1978.

Fordyce, W.E., Fowler, R.S. and Lehmann, J.F. Operant conditioning in the treatment of chronic pain. Archives Phys Med and Rehab 54:399, 1973.

Fordyce, W.E., McMahon, R. Rainwater, G. et al. Pain complaint - exercise performance relationship in chronic pain. (Pain, in press).

Guzinski, G. (work in preparation).

Hall, W., Bokan, J. and Murphy, T.M. Patterns of illness behavior in patients with intractable pain. J Psychom Res 19:279, 1975.

Newman, R.I., Seres, J.L., Yospe, L.P. et al. Multidisciplinary treatment of chronic pain: Long-term follow up of low back pain patients. Pain 4:283-292, 1978.

Pilowsky, I. and Spence, N.D. Patterns of illness behavior in patients with intractable pain. J Psychom Res 19:275), 1975.

Pilowsky, I., Chapman, C.R. and Bonica, J.J. Pain depression and illness behavior in a Pain Clinic population. Pain 4:183, 1977

Spengler, D.M. and Freeman, C.W. Patient selection for lumbar discectomy. Spine 4:129, 1979.

Sternbach, R.A., Wolf, S.R., Murphy, R.W. and Akeson, W.M. Traits of pain patients: The low-back "loser." Psychosom 14:226-229, 1973.

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A Headache Clinic's Experience: Diamond Headache Clinic, Ltd.

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INTRODUCTION

This paper discusses our experience in observing and treating headache patients at the Diamond Headache Clinic. Our patient population includes about 2,000 initial visits and 14,000 followup visits per year.

Headache is a great social burden. Between June 1980 and September 1980, we have studied the social importance of headache in 200 consecutive new patients who were employed. Of these new patients, 76 were male and 114 were female. Their ages ranged from 18 to 63 (average: 36). These patients answered a survey which questioned any work-related disability caused by the headaches during the past 12 months, the number of medications taken for the headaches, the number of physicians consulted, any hospitalizations, and marital problems possibly caused by the headaches. The patients were also asked to comment on the possibility that they were risking their jobs because of the headaches. Three percent of the patients did not work during the entire year because of disabling headaches. Sixty-three percent missed 1 to 150 working days (average: 18.1 days) during the past year. Since the onset of the headaches, they had taken 0 to 12 various medications (average: 3.5) and had consulted 0 to 12 physicians (average: 2.9). Twenty-seven percent of the patients had been hospitalized 1 to 10 times (average: 2 times) for 1 to 14 days (average: 5.5 days). One percent of the patients had lost jobs due to the headaches, and 21 percent felt they may be risking their jobs because of absenteeism due to the headaches. Only two percent of the divorced patients stated that their headaches were a contributing factor. We have observed a very selective headache population, but it illustrates the seriousness of this problem.

In addition to the social significance, the chronic headache sufferer is a potential drug abuser.[1] Between March 1, 1975 and January 31, 1976, we questioned all new patients about their drug intake. The patients included in the study were using narcotics or a combination of analgesics and barbiturates and fulfilled the following criteria: (a) the medication was prescribed by a physician; (b) the drug had been used for over 6 months; and (c) the drug was taken at least 4 days per week.

A psychological dependency was considered if the patient's desire to continue the drug was due to one or more of the following: (a) euphoria; (b) reduction of nervousness, tension or anxiety, or (c) experiencing feelings of increased physical or mental capacities. Only those patients with withdrawal symptoms were considered to have a physical dependency on the medications. Patients were classified as abusers if no symptoms of psychologic or physical dependence were present, but the daily intake of medication exceeded by 50 percent or more the maximum recommended dose.

Of 2,369 new patients, 62 patients fulfilled the criteria for inclusion in this study. Thirty-eight patients were using a combination of butalbital, aspirin, phenacetin and caffeine (Fiorinal); 17, codeine; 6, propoxyphene (Darvon); and 1, meperidine. Of ten patients (26 percent) treated with Fiorinal, two were considered abusers, two psychologically dependent, and six physically dependent. Two patients were considered abusers of codeine and one of propoxyphene. The patient on meperidine did not answer the questionnaire.

In light of the previous discussion, it is apparent that the treatment of headache should not be undertaken lightly. Our first concern is to obtain a very careful headache history.[2] Initially, we ask the patient if he has more than one type of headache. Quite often the patient can differentiate two different types of headache, a daily, continuous ache and an intermittent, throbbing headache. The characteristics of each headache should be specified: location, frequency, severity, duration, associated symptoms, and aura. It is vital to elicit the sleep pattern. The patient with daily headache almost invariably has a sleep disturbance. This may include difficulty falling asleep, or frequent or early awakening. A positive family history is relevant in migraine, as well as the relationship of the headache to the menstrual cycle. Medical and surgical history and a list of previous tests performed should be recorded. The history should also include allergies and cite the possibilities of food, alcohol or medications as provocative factors in headache. A complete physical and neurological examination is mandatory. Laboratory data should include routine blood tests, skull X-ray and electroencephalogram.

It is advisable for the patients to record all their headaches in a calendar. They should indicate the severity of the headaches, the medications used, and the time of relief. A significant number of patients return to the clinic with a calendar which records, instead of the two or three headaches per month noted on the initial visit, a list of daily headaches. This factor would greatly alter the initial diagnosis.

Headaches can be simply classified as migraine, muscle contraction headache, and traction headache. The most common type seen by a headache specialist is a combination of migraine and muscle contraction headache. Ninety-five percent of the patients who come to our headache clinic are suffering from migraine, muscle contraction headache, or a combination of both.

MIGRAINE

Migraine occurs more often in women than in men and is a disease of young people. The age of onset ranges from 5 to 30 years. A family history of migraine is found in 65 percent of migraineurs. Although genetic traits play a strong role in migraine, the type of inheritance is not well known. Migraine can be classified as common, classical and cluster migraines. Their relative frequency of occurrence is as follows: common, 84 percent; classical, 11 percent; and cluster, 5 percent. Presently, migraine is considered to be an abnormal reaction to a number of factors.

A study[3] indicated the relative significance of various factors in migraine: anxiety and tension preceded about 70 percent of the attacks; relaxation, 45 percent; sleeplessness, 45 percent; menstruation, 39 percent; and dietary factors, 30 percent. Migraine may be precipitated by drugs such as reserpine, nitroglycerin, or contraceptive pills. The latter is a recent major factor increasing the severity, frequency, and complications of migraine. Migrainous women should be advised to avoid any contraceptive pill.

Previously, migraine was felt to disappear during the menopause, but doctors are employing estrogens to combat hot flashes, and this factor accounts for the high number of migraine headaches during menopause.[4] Another drug, ergotamine, may also induce migraine. Patients will often use ergotamines on a daily basis for migraine headaches, usually 3 or 4 pills per day. Initially these pills are effective, but then they no longer offer relief, the patients continue to increase their intake of ergotamine. A vicious circle is created, since the medication causes an increase in the pain. The only solution is discontinuance of the drug.

Role of Diet in Migraine

There is not a consensus about the role of diet in migraine. The controversy led us to conduct a study on this aspect.[5]

During a six-week period, the patients maintained a diet on foods that contained high amounts of tyramine and avoided items with insignificant amounts of vasoactive substances. They then switched to the opposite diet for another six-week period; that is, avoiding food containing tyramine, and consuming foods with little or no vasoactive substances. They were instructed to maintain a calendar in this manner: the time of onset of the headache; severity; duration; type of food consumed, and the time of its consumption. We studied the relationship of the headaches to a particular food intake. On a scale of 10 points, alcoholic drinks rated highest as a provocative factor with a potency of 10 points. Other factors were: chocolate, 7; fasting, 5; citrus juices, 5; and dried fruits, 4.5.

Pharmacological Treatment of Migraine

Our approach to the pharmacological treatment of migraine is the prevention of the headache.[6] If migraine occurs as frequently as once per week, a prophylactic treatment is recommended. The choice of medications includes propranolol, methysergide, cyproheptadine, ergotamine, clonidine and antidepressants. We often use propranolol since it has been found to be the most effective drug in the prevention of migraine, with significant headache relief in about 68 percent of the patients. Dosage starts at 20 mg, 4 times per day and if needed, is increased to 40 mg, 4 times per day. Methysergide relieves migraine in about 64 percent of migraineurs but has more side effects than propranolol. The preferred methysergide dosage is usually 2 mg, 3 times per day. Ergotamine tartrate is used as a prophylactic agent in menopausal migraine. Since these women are usually receiving estrogen, we discontinue the hormone and prescribe a combination of small amounts of ergotamine and barbiturate (Bellergal). Cyproheptadine is very effective in migrainous children, but it does not usually work in adults. Clonidine may be effective, especially in dietary migraine. Tricyclic antidepressants are particularly useful in those patients with a combination of migraine and muscle contraction headache. Phenelzine (Nardil) has been used efficaciously, as a “last resort” in treatment of intractable migraine, with good results. Unfortunately, a high percentage of patients can not tolerate this medication.

Many patients suffer only an occasional migraine headache. They will require only symptomatic treatment. In mild headaches, aspirin or acetaminophen are the analgesics of choice. Both drugs are taken at a dosage of 600 mg a few times per day, as needed. If a patient’s headache is moderate or severe, ergotamine tartrate is prescribed at 2 mg orally at the onset of the headache, may repeat 1 mg in 1/2 hour, if needed. If ergotamine does not relieve the headache within 1 hour, it will not be effective. Its effectiveness depends on the speed at which the drug is absorbed in the blood. Oral administration relieves pain in 50 percent of the headaches, and intramuscular or subcutaneous injection, 85 percent. In some patients, the acute headache is continuous for days despite ergotamine therapy. This is called “migrainous status.” It is most effectively treated by avoiding ergot preparations, as they will exacerbate nausea and vomiting, and by prescribing both a common analgesic with codeine and steroids for about two days.

CLUSTER HEADACHE

A particularly resistant variety of migraine is cluster headache. This type of headache usually occurs in males, is severe, unilateral, orbital, and periorbital in nature, with all attacks occurring on the same side. It has a duration of 10 minutes to three hours and a frequency of one to several attacks per day. The headache is accompanied by associated symptoms: conjunctival injection, lacrimation, nasal congestion, rhinorrhea, and Horner’s syndrome. Characteristically, the headaches occur in groups of several attacks daily over periods of two to eight weeks, these periods of attacks developing one to four times yearly. The most effective therapy for this headache consists of a combination of methysergide and steroids. Recently we have found lithium carbonate effective, especially in those patients with complaints of almost daily cluster headache for a year or longer.

MUSCLE CONTRACTION HEADACHE

The muscle contraction headache is a daily, continuous pain often described as a tight band around the head. Although the pathophysiology of the pain may be muscle contraction, its etiology is depression in about 90 percent of the cases. In this type, patients will indicate work or family problems as a precipitating factor. Associated symptoms such as emotional disorders, sleep disturbances, sexual problems, and alterations in weight are often observed. Sometimes the depression is masked or the patient relates it to the headache itself. The depressed patient is socially restricted but is able to work. Response to tricyclic antidepressants is excellent.

BIOFEEDBACK TRAINING

At the Diamond Headache Clinic, many patients are treated with biofeedback training. A combination of hand-warming and electromyograph (EMG) feedback techniques is used, since many patients suffer from more than one type of headache. The use of both modalities aids in achieving greater reduction of vascular and muscle contraction headaches.

A minimum of eight sessions are usually needed to train a patient. The sessions are composed of three stages. The first stage is skin temperature feedback with autogenic phrases. The autogenic phrases are autosuggestive in nature, focusing on feelings of warmth and relaxation, and are practiced before initiating skin temperature feedback. In addition to these phrases, patients are encouraged to focus on warm and relaxing images. Then the patient practices raising hand temperature with a thermal feedback instrument for ten minutes. The second stage of the session is progressive relaxation exercises, in which the patients practice tensing and relaxing various muscles. The third stage is electromyograph feedback. Three electrodes are placed across the frontalis muscle. The patients receive EMG feedback for 20-minute sessions, during which time they try to learn to identify certain tensor points in the facial, neck, and shoulder areas. The EMG monitors are equipped with various sensitivity levels so that the patient can reduce his tension. We emphasize daily home practice.

We indicate biofeedback for those patients who are responding to preventative medication for over a year and plan to discontinue these medications. Biofeedback allows them to stop the medications with confidence. Another indication is for those patients whose headaches are partially controlled with medication, that is, an improvement of 50 percent or more, who cannot tolerate additional medication. Biofeedback can usually provide a decrease in the frequency and severity of the headaches. Patients with intractable headaches may also benefit from biofeedback. These patients will not respond to any medication until biofeedback is added to their therapeutic regimen. Finally, another candidate for biofeedback training wishes to avoid all medication because of his age or innate fear of drugs. This category also includes women who are pregnant, or desiring pregnancy, and children with migraine.

We have studied 27 patients with migraine or mixed migraine and muscle contraction headache who were unresponsive to medications.[7] They were trained in EMG and skin temperature control at least 6 months prior to followup. The patients continued the same preventative medication before, during, and after training. All patients kept complete records of the number and intensity of headaches and the amount of abortive medications taken. These records were compared with those of the 2 months prior to biofeedback training. Significant reductions on all three measures were noted in 13 of the 27 patients.

A retrospective study on both electromyograph and temperature feedback was completed by mailing a questionnaire to all 556 patients trained within the preceding 5-year period.[8] Patients were asked to comment on the effectiveness of their therapy, and 413 patients answered the questionnaire. One hundred fifteen patients responding had migraine; fifteen, muscle contraction headache; and 283, mixed migraine and muscle contraction headache. Ninety percent of the patients indicated that the biofeedback techniques had helped them to relax. One hundred sixty patients (39 percent) believed that biofeedback had helped their headaches permanently, 133 patients (32 percent) found temporary relief, lasting from 1 to 36 months, and 120 patients (29 percent) did not feel that biofeedback had helped their headaches. We feel that biofeedback is a major advance in therapy for chronic headache.

TRACTION HEADACHE

Traction headaches are caused by organic brain disorders producing painful distortions of intracranial structure. In these patients, the headache is usually associated with focal neurological symptoms. Its treatment depends on the etiology of the condition. Fortunately, this kind of headache is not frequent.

REFERENCES

1. Medina, J.L., and Diamond, S. Drug dependency in patients with chronic headache. Headache 17: 12-14, 1976.

2. Diamond, S., and Medina, J.L. The headache history-key to diagnosis. In: Appenzeller, O., ed. Pathogenesis and Treatment of Headache. New York: Spectrum Publications, Inc., 1976. pp. 1-7

3. Pearch, J. General review, some etiological factors in migraine. In: Cumings, J.N., ed. Background to Migraine. London: Heinemann Books Ltd., 1971. pp. 1-7.

4. Kudrow, L. Hormones, pregnancy and migraine. In: Appenzeller, O., ed. Pathogenesis and Treatment of Headache. New York: Spectrum Publications, 1976.

5. Medina, J.L., and Diamond, S. The role of diet in migraine. Headache 18: 31-34, 1978.

6. Diamond, S., and Medina, J.L. Review article: Current thoughts on migraine. Headache 20: 208-212, 1980.

7. Medina, J.L., Diamond, S., and Franklin, M. Biofeedback therapy for migraine. Headache 16: 115-118, 1976.

8. Diamond, S., and Medina, J.L. Value of biofeedback in the treatment of chronic headache: The patient's opinions. Res. Clin. Stud. Headache 6: 155-159, 1978.

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Chronic Pain Syndrome Four Aspects of the Problem:

New Hope Pain Center and Pain Research Foundation

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The problems concerning chronic pain are manifold and cannot be covered comprehensively in any one monograph. Among the problems that prevent a more complete understanding of chronic human pain are those associated with a lack of agreed definitions and classifications of pain syndromes (the "taxonomy" problem); problem stemning from a still rudimentary understanding of the underlying neurochemistry and neurophysiology (pain as a sensation vs. a perception); and the problems inherent in organizing any health care delivery system (increasing numbers of "pain clinics" and "pain centers," many utilizing multidisciplinary pain teams but divided between those with a "peripheralist" viewpoint and those utilizing a "centralist" position).

The present authors would like to address four specific aspects of the treatment of patients with chronic pain syndrome. Two will be reviewed in summary; more extensive views have been reported by us elsewhere. These two aspects are a physiological view of the psychology of pain, the peripheralist vs. the centralist position (1,2,3); and taxonomy for diagnosis and information storage relating to patients with chronic pain (4). The other two, to be treated more extensively, are long-term evaluation of pain unit treatment for patients with chronic intractable benign pain syndrome (5) and the team concept in management of pain in patients with cancer (6).

I. A PHYSIOLOGICAL VIEW OF THE PSYCHOLOGY OF PAIN-- THE PERIPHERALISTS VS. THE CENTRALIST POSITION

The relationships between psychological and physiological models, when applied to the study of human chronic pain, remain difficult to correlate. Generally, the use of the term "real" or "organic" pain continues covertly to represent the presence of ongoing pathophysiology. The suffering aspects of human pain states are more often relegated to represent the psychologic aspects of the pain experience and often are referred to as "psychogenic pain" or the "reactive component" of the pain. As can be seen, the division of "real," "organic," from "imagined," "hysteric," and "functional" descriptions tends to give a skewed perspective about the biopsychosocial nature of the chronic pain syndrome in man. In addition, this dichotomy etymologically intimates that there is "more science," hence more useful treatment knowledge available (and fewer unfavorable social stigmata) when one pursues an "organic" view. However, other views and treatment outcome studies, based upon currently available knowledge, do not suggest that this "organic" direction is the more correct or heuristic one (5,7).

Most physiologists and psychologists have related to chronic pain in man as though there is continued nociceptive input from the periphery into the central nervous system. It is assumed that the latter then "responds with pain behavior." Essentially, this is the position of the peripheralist. The centralist's position is to question and doubt the necessity for postulating this continued peripheral input in chronic pain. We regard chronic pain syndrome as a result of central nervous system phenomena without the need for an ongoing peripheral nociceptive arm to complete the clinical picture. Again, this view is covered in more detail in other publications (1,4).

With this as background, when we study pain in relation to imperfectly understood brain neurophysiological functioning, using psychological conceptualizations, we have even further difficulties. We do not have a good working definition of pain that covers all aspects of all situations and is acceptable to both clinicians and experimental investigators. From a clinical standpoint, working with patients with chronic pain, the best pragmatic definition of pain upon which we have been able to agree is: "Pain is anything that the patient says it is."

From a physiological standpoint, we do not know whether pain is a sensation or a perception; it has aspects of both. Chronic pain (with its obvious central mechanisms, in spite of a usual past peripheral etiology) can better be considered a perception; but it is entirely possible that even acute pain (including pain experimentally produced in the laboratory, in either man or animal) is also not truly a sensation but, even in this context, is a central nervous system phenomenon that is better considered as a percept. Therefore, when some try to consider pain as a response and attempt to correlate it with a behavioristic psychological conceptualization of pain, there is often an obvious but variable gap between "pain behavior" and the subjective nature of the specific individual's total suffering experience.

II. TAXONOMY FOR DIAGNOSIS AND INFORMATION STORAGE RELATING TO PATIENTS WITH CHRONIC PAIN

Workers in the field face complex problems in comparing the diagnostic, prognostic, and treatment outcome results of patients who suffer from chronic pain syndromes. Much of this situation results from a woefully inadequate classification system for the storage of relevant information concerning individuals' pain histories. Trials at this have been made by our group and are reported in more detail elsewhere (4). However, obtaining this information remains so cumbersome and time consuming as generally to prevent accumulation of this data.

Also, it continues to be difficult to avoid the problem of recreating the mind/body, organic/functional dilemmas with which we have always to contend. The increasing importance of the centralist conceptualization of chronic pain syndromes in man leads one to the necessity of recognizing in these syndromes the most frequent and overwhelming importance of psychological factors. Psychologic nosology must come to be regarded as a unifying factor; it cannot be treated as a foreign but necessary ingredient whose presence is reluctantly tolerated.

III. LONG-TERM EVALUATION OF PAIN UNIT TREATMENT FOR PATIENTS WITH CHRONIC INTRACTABLE BENIGN PAIN SYNDROME (CIBPS) (5)

At our comprehensive, multidisciplinary, and interdepartmental pain center, we have evolved two different pain teams over the last 20 years. The programs had their origin at the City of Hope National Medical Center in 1960 and continue at our current New Hope Pain Center and Research Foundation (7,8,9,10). One, for the treatment of chronic intractable benign pain syndromes, is centered around a therapeutic milieu inpatient program with a multimodal treatment approach directed by a psychiatrist. The second works to ensure optimum treatment for patients with pain due to cancer. It is under the direction of neurosurgery, neurology, and anesthesiology, and has been functioning as a separate team entity for 3 years. The work of the cancer pain team is treated in section IV, below.

Chronic pain is the complaint of pain and suffering that persists regardless of a long history of medical and paramedical treatments. In chronic pain no detectable significant active pathophysiological processes can be identified as the sources of ongoing afferent nociceptive stimuli, similar or analogous to those stimuli generated by demonstrable active tissue pathology (or altered physiology) that are commonly associated with acute pain in man. When thorough and multilevel medical-surgical attention has been given to a person with ongoing, usually constant, non-cancer pain, there must be clinical recognition and acceptance at some point that there no longer is any ongoing peripheral pathology to be corrected. Yet there is the complaint of chronic pain that is ongoing, and often constant, with many of the epiphenanena associated with suffering and pain. In addition, chronic pain and its attendant epiphenomena threaten to, or actually become, the central focus of the sufferer's existence and, thus, form a more complete chronic intractable benign pain syndrome (CIBPS). This syndrome has been defined as an ongoing problem with pain that:

1) cannot be shown to be causally related in the here-and-now with any active pathoanatomic or pathophysiologic process;
2) has an antecedent history of generally ineffective medical and surgical interventions for the pain problem; and
3) has come to be accompanied by a disturbed psychosocial functioning that includes the pain complaint with the epiphenomena that accompany it.

Included in the common epiphenomena of CIBPS are:

1) mood and affect changes that are in themselves significantly dysphoric;
2) drug dependency or abuse, of varying severities, with their attendant CNS side effects;
3) multiple surgeries or pharmacologic treatments with their own morbid side effects, separate from the drug dependency issue;
4) escalating psychosocial withdrawal with increased loss of gratifications from these interactional inputs;
5) interpersonal conflict with significant others;
6) increasing hopelessness and helplessness as increasing dysphoria does not give way in the face of mounting numbers of "newer" or different therapies;
7) decrease in feelings of self-esteem. self-worth, and self-confidence;
8) decreasing ability to obtain pleasure from the life process, contributing to profound demoralization and, at times, significant anhedonia, if no depression;
9) escalating physical incapacity secondary to disuse because of fear of increasing pain discomfort. at the least, and a fear of causing more bodily harm–based on the belief that their ongoing pain is a signal of increasing bodily damage; and
10) conflicts with medical care delivery personnel (doctors, nurses, therapists, technicians) with resulting dissatisfactions and/ or hostilities.

This paper describes self-report outcome data from consecutive patients with CIBPS at our Pain Center who have been admitted to the Inpatient Pain Unit treatment program after evaluation in our Outpatient Pain Clinic (from January 1974 through November 1978), where and when it was clinically decided that their problems with chronic pain could not be treated successfully on an outpatient basis. Criteria for admission have been reported elsewhere (9).

The inpatient treatment program consists of an 8-bed (currently 12-bed) unit in which a group therapeutic milieu approach is used, phenomenologically similar to a well-functioning open psychiatric unit, in the midst of a general medical-surgical setting. The treatment is multimodal and uses physical and occupational therapy, autogenic training, progressive muscle relaxation training, imagery techniques, and biofeedback training-all embedded in a heavy time commitment to group psychotherapy with an eclectic approach. This report refers to outcome results when the program was of 7 weeks duration. As in any good multimodal treatment approach to chronic pain, it involves a multidisciplinary team with medical leadership. Each member of the team is an expert in his or her own field and strives to become increasingly sophisticated in the overall human problems in these patients with chronic pain. A full description of the varied personnel and modalities of treatment in this program has been presented in an earlier publication (9).

Demographics

The complaint of chronic pain is ubiquitous in the adult medical care delivery system. Because of this, it is sometimes assumed that chronic pain is a coherent and unitary entity that can be viewed in the same way by all who interact with people who have an ongoing chronic intractable pain problem. It has been stressed that an ongoing problem with pain that represents a person's major life focus is a multifaceted biopsychosocial problem. Therefore it is necessary to examine demographic characteristics of the people with these pain problems, so that comparisons of any significant differences in populations and treatment outcome can be studied among the patient population treated within one center, as well as differences between populations treated at different treatment facilities. Tables 1, 2, and 3 include the numbers of patients in our admission and followup data; the general descriptors of our population with regard to age, duration and location of pain; and the number of pain-related surgeries.

Outcome data from follow-up patient-mailed questionnaire responses and pain ratings were analyzed at various stages of follow-up for 151 out of 211 patients admitted for treatment during the period from January 1974 through November 1978 (see Table 1). This represents 72% of all patients who were admitted for treatment, and 83% of those patients who completed treatment. The percentage of those completing treatment and remaining in follow-up can be seen to have been only slightly greater for women than for men. For the studied period, the treatment program has an 87% completion rate (183 patients) and a 13% (28 patients) dropout rate of those who left against medical advice or before completion of treatment.

The ratio of patients admitted was 28% male to 72% female, and the percentages at completion of treatment were 25% and 75% respectively. The women ranged in age from 17 to 77, with a mean age of 54 years, while the men ranged in age from 25 to 79, with a mean age of 53 years. The reason for the larger percentage of women in our treatment program seems best answered by the fact that younger male patients whose pain complaint is related to on-the-job injuries (with unsettled litigation or disability status) have not been eligible for our treatment program. We made a clinical research judgment in this regard in an attempt to somewhat decrease some variables that confront all clinical researchers.

The maximum number of patients in treatment (beds available) and the length of our treatment program dictated the number of patients we were able to treat, and we always had a bed-waiting list for treatment. As our treatment program was based in an eleemosynary and research institution, we felt our admission policy was a reasonable position for us to take. There is an undeniable need for treatment programs including those patients we excluded. In fact, this was available in other facilities. The same general circumstance also seems to be a reason for the older average age of our patients, in that our patients have either already been declared totally disabled before applying for treatment, or they have not been in the work force for years (women with families and home work), or they have been retired from the work force through total disability, natural attrition, or other reasons.

Table 2 presents percentage breakdowns by sex for duration of pain, as well as for anatomical distribution of pain, for 151 patients who completed the treatment program. Table 3 presents data on the mean number of pain-related surgeries by anatomic location of chronic pain. When we consider the pre-admission incidence of surgeries related to the pain complaint, 60% of the sample had

had such surgery, with 41% having had two or more pain-related surgeries. Overall, the 127 patients with pain syndromes (other than cephalgia) had a mean of 1.9 pain-related surgeries per patient, with a range of 0 to 30.

Results

This report analyzes several categories of patient data including: 1) reported medication usage; 2) medical-surgical treatment for pain post-discharge; 3) pain ratings; and 4) results of an open-ended question about chronic pain, general life outlook, and attitude.

The outcome data to be discussed here are from admission data and post-discharge follow-up questionnaire data responses. Individual patients included in this report are at various levels of follow-up from 3 months to 5 years post-discharge. Therefore, the number of patients at each time period post-discharge varies. While our earliest patients (1973, 1974) did not receive questionnaires early post-discharge, as use of the full questionnaire was begun in 1975 and has been continued for all patients since that time, each patient has been asked to respond to questionnaires at the 3-month, 6-month, 1-year, 2-year, 3-year, 4-year, and 5-year times post-discharge. Therefore, an individual patient in this follow-up study my have responded to from 1 to 3 follow-up questionnaires. Results are reported for 151 patients who responded to a total of 299 questionnaires.

1) Reported Medication Use:

The medication study compared our Pain Unit pharmacy records at admission with self-reported medication usage taken from the follow-up questionnaire. All medications included in Table 2 were admistered in a patient single-blind manner, in opaque capsules 4 times a day, on a time-contingency basis only (on a fixed interval schedule), except as noted below. At discharge, virtually all patients are receiving no analgesic or psychoactive medication. Table 4 presents the medication groups and dose levels selected by one of the authors (JJP) to define the level of drug use by patients in this study. This was done prior to the availability of any of these outcome results, and with a view toward concordance with generally clinically used, minimally effective, therapeutic dosages for some drug groups (i.e., tricyclic antidepressants, etc.); and toward minimizing low-dose use of others (i.e., opioids), where the problem of misuse or abuse are legitimate concerns.

Tables 5a,b,c compare admission drug use for all patients with follow-up data for subsets of patients at each time interval. It should be noted here that all those patients at the 4-year time interval of follow-up, and approximately one-half of those at the 3-year time interval, did not receive medication in the abovementioned, single-blind, time contingency form. At that time in the past, this single-blind form of drug treatment for all medications was not available to us. However, the goal of clinically decreased drug use pursued.

(text continues on page 148)

TABLE 1

GENERAL ADMISSION, COMPLETION, AND FOLLOW-UP DATA

	Admitted to Treatment	Completed Treatment	Failed to Completed Treatment	In Follow-Up Post-Treatment
WOMEN	152	134	18	113
Mean age: 54: Range: 17-77 years				
MEN	59	49	10	38
Mean age: 53: Range: 25-79 years				
TOTALS	211	183	28	151

TABLE 2

PRE-TREATMENT PAIN HISTORTES: DUPATION AND LOCATION OF PAIN

		Male (n=38)	Female (n=113)
Duration:	1-3 years	18%	16%
	4-7 years	34%	3%
	> 7 years	4%	50%
Location:	Back	24%	38%
	Neck	1%	1%
	Neck and Back	21%	6%
	Head	8%	20%
	Other (includes thoracic, abdominal, pelvic and extremity pain syndromes)	26%	20%

TABLE 3

MEAN NUMBER OF PAIN-RELATED SURGERIES PRIOR TO ADMISSION

	Chronic Pain-Related
Total	1.7
Back	2.7
Neck	1.2
Neck and Back	1.6
Head	0.7
Other (includes thoracic, abdominal, pelvic, and extremity pain syndromes)	1.4

TABLE. 4 DRUG DOSAGE AND DOSAGE CRITERIA*

		Dosage per 24-hour period
Morphine and morphine-equivalent opioids		
Morphine		Any reported usage
Meperidine		
Hydromorphone		
Dolophine		
Oral opioids and other prescription analgesics		
Percodan or Percocet-5	>	2 tabs
Codeine	>	90 mg.
Pentazocine		
- parenteral	>	60 mg.
- oral	>	150 mg.
Propoxyphene	>	200 mg.
Non-prescription analgesics		
Aspirin group	>	1950 mg.
Acetaminophen	>	1950 mg.
Barbiturates		
Phenobarbital	>	100 mg.
Secobarbital	>	100 mg.
Pentobarbital	>	100 mg.
Butabarbital	>	100 mg.
Butalbital	>	100 mg.
Chloral hydrate	>	1 gm.
Major tranquilizers		
Chlorpromazine	>	75 mg.
Thioridazine	>	75 mg.
Trifluoperazine	>	4 mg.
Prochlorperazine	>	15 mg.
Perphenazine	>	6 mg.

		Dosage per 24-hour period
Minor tranquilizers		
Chlordiazepoxide	>	30 mg.
Diazepam	>	30 mg.
Oxazepam	>	90 mg.
Flurazepam	>	30 mg.
Meprobamate	>	1200 mg.
Tricyclic antidepressants		
Doxepin	>	50 mg.
Amytriptyline	>	50 mg.
Imipramine	>	50 mg.
Phenelzine	>	15 mg.
Tranylcypromine	>	20 mg.
Muscle relaxants		
Methocarbamol	>	1 gm.
Orphenadrine	>	200 mg.
Carisoprodol	>	700 mg.
Chlorzoxazone	>	500 mg.
Anticonvulsants		
Phenytoin		List, with dose
Carbamazepine		
Low-level multiple drug use		
Multiple drug use, short of criteria in at least three groups		

*Use in excess of criteria is defined as major drug use for this study.

TABLE 5A

POST-TREATMENT FOLLOW-UP OF SELF-REPORT DRUG USE

FOLLOW-UP GROUP	Morphine & morphine-equivalent opioids			Oral opioids & other prescription analgesics			Morphine, oral opioids & prescription analgesics			Non-prescription analgesics			Barbiturates		
	None	Below	Above	None	Below	Above	None	Below	Above	None	Below	Above	None	Below	Above
Admission	146	0	5	86	22	43	82	22	47	77	29	45	131	14	6
n	97%	0%	3%	57%	15%	28%	54%	15%	31%	51%	19%	30%	87%	9%	4%
3-month	67	0	1	52	11	5	51	11	6	32	31	5	62	5	1
n	98%	0%	2%	77%	16%	7%	75%	16%	9%	47%	46%	7%	91%	7%	2%
6-month	65	0	2	51	8	8	51	7	9	34	27	6	60	7	0
n	97%	0%	3%	76%	12%	12%	76%	11%	13%	51%	40%	9%	90%	10%	0%
1-year	71	0	4	55	11	9	53	11	11	45	27	3	68	5	2
n	95%	0%	5%	73%	15%	12%	70%	15%	15%	60%	36%	4%	91%	7%	2%
2-year	56	0	1	36	14	7	35	14	8	24	25	8	46	8	3
n	98%	0%	2%	63%	25%	12%	61%	25%	14%	42%	44%	14%	81%	14%	5%
3-year	27	0	2	16	9	4	15	9	5	18	8	3	21	4	4
n	93%	0%	7%	55%	31%	14%	52%	31%	17%	62%	28%	10%	72%	14%	14%
4-year	12	0	1	6	3	4	6	3	4	8	5	0	10	3	0
n	92%	0%	8%	46%	23%	31%	46%	23%	31%	62%	38%	0%	77%	23%	0%

POST-TREATMENT FOLLOW-UP OF SELF-REPORT DRUG USE
(continued)

FOLLOW-UP GROUP	Major Tranquilizers			Minor tranquilizers			Tricyclic antidepressants			Muscle relaxants			Anticonvulsants		
	None	Below	Above	None	Below	Above	None	Below	Above	None	Below	Above	None	Below	Above
Admission	140	3	8	83	60	8	113	7	31	142	1	8	142	0	9
n	93%	2%	5%	55%	40%	5%	75%	5%	20%	94%	1%	5%	94%	0%	6%
3-month	66	1	1	49	16	3	60	4	4	65	2	1	66	0	2
n	98%	1%	1%	72%	24%	4%	88%	6%	6%	96%	3%	1%	97%	0%	3%
6-month	65	1	1	49	17	1	56	4	7	66	1	0	64	0	3
n	98%	1%	1%	73%	25%	2%	84%	6%	10%	99%	1%	0%	96%	0%	4%
1-year	70	2	3	52	22	1	64	2	9	74	0	1	75	0	0
n	93%	3%	4%	69%	29%	2%	85%	3%	12%	99%	0%	1%	100%	0%	0%
2-year	53	4	0	36	16	5	45	6	6	55	1	1	57	0	0
n	93%	7%	0%	63%	28%	9%	78%	11%	11%	96%	2%	2%	100%	0%	0%
3-year	26	3	0	14	12	3	24	3	2	27	1	1	29	0	0
n	90%	10%	0%	48%	42%	10%	83%	10%	7%	92%	4%	4%	100%	0%	0%
4-year	11	2	0	5	8	0	11	1	1	12	1	0	13	0	0
n	85%	15%	0%	38%	62%	0%	84%	8%	8%	92%	8%	0%	100%	0%	0%

POST-TREATMENT FOLLOW-UP OF SELF-REPORT DRUG USE

All groups

FOLLOW-UP GROUP	None	Below	Above
Admission n	18 12%	25 17%	108 71%
3-month n	17 25%	34 50%	17 25%
6-month n	15 23%	31 46%	21 31%
1-year n	19 25%	31 47%	21 28%
2-year n	7 12%	25 44%	25 44%
3-year n	4 14%	11 38%	14 48%
4-year n	5 38%	4 31%	4 31%

At admission, the most commonly used medication groups were non-prescription analgesics, opioids, minor tranquilizers, tricyclic antidepressants, and barbiturates, in that order. The percent of patients using oral opioids at admission would appear to be low for patients newly admitted to an intractable pain treatment Program. However, the overwhelming majority of all patients admitted have immediate and distant past histories of having used narcotic-type medications. These may have been discontinued because of undesirable side effects, disinclination on the part of their treating physicians to continue to prescribe for them, or fearfulness on the patient's part about "addiction." Also, if narcotic use at admission was at or below the criterion level shown in Table 4, the patient was started in our therapy program with no narcotics, and his or her recorded use listed as "none". Our data do not appear to be significantly different in this regard than that reported by others working with patients with chronic pain who used their modified classifications of drug use and drug dependency.

There is a definite shift in opioid use over time that reflects a continued "none" or "below" criteria use of these drugs, when compared to the status pre-treatment. There is a corresponding shift over time to an increased, but below criteria, use of non-prescription analgesics. The 4-year group has a low "n" and is not typical in this light, but their differences as a treatment group have been mentioned above.

The minor tranquilizers, tricyclic antidepressants, and barbiturates were the next most frequent drug groups used at admission by our patients. As can be seen, there is a high report of "none" for all three groups across time. Again, for the minor tranquilizers and barbiturates, when the pre-admission use was reported as at or below criteria as per Table 4, the patient was often given "none" at admission. Also, the admission use of "below" criterion level for the minor tranquilizers includes those patients who may have been using barbiturates at a "below" or "above" level pre-admission who were given minor tranquilizers in replacement at a "below" dosage level at admission. It is clear that when reported use of these two drug groups is viewed over time, there is no significant increase in use until the 3-year post-treatment level, at which time the pattern is less clear, although there then seems to be an increased "below" criterion level use.

The tricyclic antidepressant use in this study needs special comment. This group of drugs is widely used in chronic pain management. The reasons for this are understandable, but it is not in the scope of this paper to discuss this issue. It is also not within the scope of this report to comment in a statistical frame of reference about the overall usefulness of this group of drugs in the management of chronic pain. However, those patients who have been referred to our inpatient program generally have had a clinical trial with these drugs, usually without significant improvement in their pain syndromes. Therefore, we have seen a number of patients who are taking "above" criterion levels (whom we maintain at that level at admission), and then decrease and discontinue their use within 7 to 10 days after admission. The post-treatment use of this group of drugs remained infrequent over time.

When all the medication groups surveyed are viewed overall, there is a greater percentage of patients using no medication post-discharge, which maintains well past the 1-year level, when compared to the use at admission. There is also a shift to lower dose medication usage generally, and a specific shift away from the oral opioid group to low-dose use of the non-prescription analgesic group post-discharge. When one views total drug use in all the medication groups in Table 4, the picture is more mixed; but there is a definite tendency for the "above" criteria use to remain well beneath that used at admission, although there is an increased (but apparently plateaued-off) use at the "below" criteria level.

2) Post-Discharge Report of Medical Treatments for Pain:

Table 5 summarizes a review of the self-reported treatment in these areas that patients received at all follow-up levels after discharge from the Pain Unit. It must be recalled that in the histories of patients with CIBPS there are many forms of medical intervention. The reported changes over time in drug use have been covered above. When the other forms of treatment are considered, as listed in Table 6, it can be seen that there has been an apparent major change for this population in medical-surgical treatment received that persists over the span of our follow-up time.

Earlier we indicated that the portion of our patient population whose pain complaint was other than cephalgia had had almost two surgeries per patient for pain. Overall, 60% of the 151 patients in this study had had at least one surgery for their basic pain compliant. A most striking element in this sphere of follow-up data is that post-treatment more than 90% of our total population have not had any surgery and/or nerve block procedure for their chronic pain problem. Only 13 out of 151 patients (or 9%) have had one or both of these types of medical treatment (3 patients had surgery alone, 1 patient had a nerve block and surgery, and 9 patients had nerve blocks). The numbers of patients' responses, and the percentage of each group at different time intervals of follow-up who had not had any invasive procedures, indicate that there is no clear evidence of any significant change in this pattern over time. These results seem to reflect the "take" of the Pain Unit treatment process that emphasizes solutions to the CIBPS other than peripheral site "fix-it" pmcedures in the acute pain medical model.

3) Self-Report Pain Ratings:

The next section of the study (see Figure 1) examined patient self-report pain ratings at admission, discharge, and follow-up on an analog pain estimate scale, which is converted to a 0-100 scale for scoring. Difficulties in assessing results of complex treatments for pain by the use of pain scales have previously been reported and discussed.

TABLE 5

POST-DISCHARGE MEDICAL TRERATMENTS FOR PAIN - EXCLUDING DRUG TREATMENT

	Invasive Medical Treatment		"Non-Invasive" Medical Treatment	No Invasive Medical Treatment	No Medical Treatment
	Surgery	Nerve Blocks	TNS, Acupuncture, etc.	Surgery, Nerve Blocks	
3-month					
n	0	1	2	67	65
	0%	1%	3%	99%	96%
6-month					
n	0	1	5	66	61
	0%	1%	8%	99%	91%
1-year					
n	3	4	12*	69*	59
	4%	5%	16%	92%	79%
2-year					
n	3	3	11**	51**	41
	5%	5%	19%	89%	80%
3-year					
n	0	0	5	29	24
	0%	0%	17%	100%	83%
4-year					
n	0	2	2	11	9
	0%	15%	15%	85%	70%

* ** Note: Some patients appear in more than one category. Each patient is coded once per category, i.e., YES at any follow-up level or NO at all follow-up levels.

FREQUENCY DISTRIBUTION FOR SELF-REPORT PAIN RATING

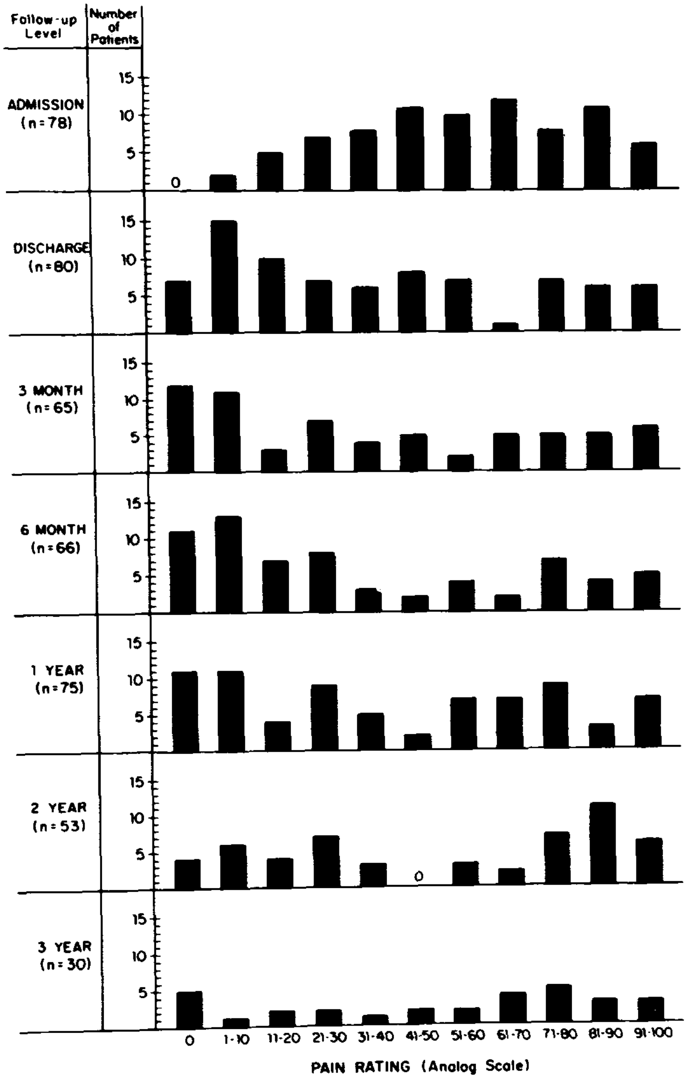


Figure 1

The frequency distribution of analog pain estimate ratings for admission, discharge, and each time interval of follow-up had been plotted. The frequency distributions of scores are not normal distributions. Some are skewed, and others are bi-or multimodal. Therefore, the analog pain estimate ratings were analyzed using non-parametric sign tests with two-tailed probabilities. We cannot say whether such non-normal distributions are typical for only our groups of patients, or whether such distributions are found with analog pain ratings from other pain centers, who also do long-term follow-ups, or whose pain patient populations may differ from ours.

Data were available for admission; discharge; and the 3-month, 6-month, 1-year, and 2-year follow-up time intervals. For the analog pain estimate, <u>all</u> admission vs. discharge comparisons were significant at or below the .01 level of probability, with only one significant at the .05 level. A much greater proportion of patients reported a <u>decrease</u> in pain ratings from admission to discharge than reported an increase. All admission vs. follow-up comparisons were also significant at the .01 level or less, with the exception of a small number of patients who were in the 2-year follow-up group. However, the change in this group was also in the direction of a pain decrease.

We would expect these patients to give high pain ratings at admission and somewhat lower ones at discharge, and hope that some patients would maintain the decreased level of pain at follow-up. Therefore, it is not surprising that all follow-up intervals indicated showed no significant changes in self-reported pain when compared to the levels at discharge, as measured by analog pain estimate ratings. The pain decreased after treatment and no further <u>major changes</u> in self-reported pain rating occurred.

4) <u>Pain, Attitude, and Life Outlook-Self-Report:</u>

A central goal addressed in our treatment approach is an improved quality of life in spite of any residual pain and suffering. Therefore, we felt it was important to record relatively spontaneous attitudinal responses of patients. The last section of this report examines the results of a content analysis of 299 open-ended patient responses (of 151 patients) spread over the time of this study. The form of the question, by design, did not direct the patient that he must make a response. To a general question about chronic pain, general life outlook and attitude, responses were rated for pain as worse, the same, improved, or no mention. Attitude was rated as negative, neutral, positive, or no mention (see Table 7). What we have labeled as attitude seems to represent a mixture of mood and coping skills.

Figure 2 shows the distributions of rated patient self-report responses at each time interval of follow-up. Overall, post-treatment, 18% had pain rated as improved, 41% as the same, 13% as worse, and 28% as no mention. Corresponding figures for attitude post-treatment were 57% positive, 7% negative, 1%

TABLE 7

RATING GUIDE FOR OPEN-ENDED QUESTION ABOUT PAIN, LIFE OUTLOOK, AND ATTITUDE

PAIN

Worse:	Worse Incapacitating Excruciating Nothing Helps
Same:	It can't be avoided Unchanged I still have _________ pain I have learned to live with it The pain is still there
Improved:	I still have pain, but not as much Intermittent Very little pain Intensity of pain diminished

ATTITUDE

Negative:	Doing poorly emotionally Lonely Nothing to look forward to Depressed Discouraged - I hurt More and more tense
Neutral:	I'm plugging along Same problems with __________ Coping with it as I did before the program
Positive:	Coping better More self-understanding Increased self-esteem Not letting small things upset me Not fearful Better mental attitude Self-confidence Willpower

Questionnaire Responses about Pain, Life Outlook and Attitude
Rated Patient Self-Reports

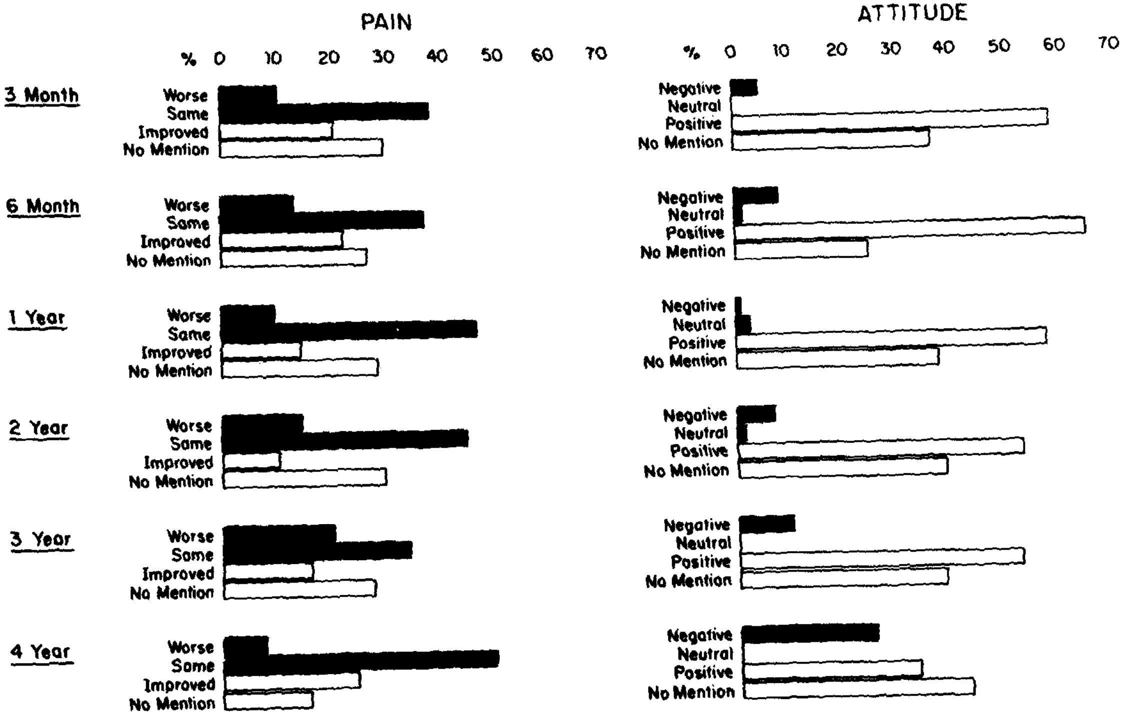


Figure 2

neutral, and 55% no mention. As you will note, there is a strong bias that when attitude is expressed, it is likely to be positive, and next likely to be not mentioned at all. A cross-tabulation of attitude in relation to pain indicates that while there is some trend for positive attitudes and improvement in pain to correspond, the relationship is not simple.

Of those patients with a pain rating of worse, 34% also have a positive attitude rating; of these patients whose pain is rated as unchanged, 75% have a positive attitude rating; and more predictably, of those with a rating of improvement in pain, 75% have a positive attitude rating. Therefore, a positive attitude rating can occur with all categories of self-reported pain, from worse to improved, and it is almost always coincident with self-reports of increased or maintained psychosocial and physical activities. A very common result post-treatment is that of significantly increased activity levels of "up time." This appears to be the most easily achieved treatment goal. This probably relates to the highly structured and prominent physical and occupational therapy regimen common to our own as well as other known pain treatment programs.

For further data analysis, we plan to compare these pain and attitude ratings with the patients' self-reported pain ratings on the analog pain estimate scale, to see whether or not there is a consistency between what we get from an open-ended question and what we get via direct patient self-report on rating their own level of pain, when requested to do just that. This will also help clarify what is happening in the "no mention" category. With this initial data analysis complete, we new plan an in-depth analysis of groups of patients, for whom we have multiple levels of follow-up, in a repeated measures design, utilizing additional psychometric tests and clinically pertinent data.

Discussion

Defining the population of patients with chronic benign pain syndromes who are selected for special treatment programs is essential. For example, in some reports the treatment, gender, and age are not mentioned. In another treatment facility, current litigation (Workman's Compensation, or others) related to the pain complaint did not affect admission to treatment, as it did in our program. Also, in the studies mentioned above, over 25% of the patients admitted to the chronic pain treatment program had surgical treatment for their pain problem subsequent to admission to the program whose outcome results were being reported. This, for example, is in stark contrast to the total of only 9% incidence of surgery for the pain complaint across all treatment and follow-up in our clinical experience (Table 6).

Long-term follow-up is another central issue with these clinical states. In one of the studies cited above, there were less than 25 patients in the study after 1 year of follow-up. Also, there was no information about the varying length of hospital stay for treatment, with a range of 13% to 36% of those who started treatment present at any subsequent level of follow-up, from 6 months to 2+ years.

Earlier studies reported by the Mayo Clinic group refer only to a 6-month follow-up of 21 of 50 patients admitted for treatment for chronic pain in a prescribed chronic pain management program. In a continuing study reported more recently, results of treatment of 200 patients admitted in their inpatient treatment program were presented. Only 38% of the total 200 patients treated had participated in follow-up at 1 year post-discharge. This included only those patients who had moderate improvement, or better, at discharge. In contrast, 7% of our total admissions responded to at least one level of follow-up, and this amounted to 8% of those who completed treatment. The Mayo Clinic program also included a patient population different from ours. These differences include a greater percentage of men; patients with Workmen's Compensation and medicolegal complications; a significantly shorter, less intensive treatment period (20 days average vs. 46 days in our program); and more patients requiring some mechanical assistance (one-third as opposed to less than 5 percent in our ambulatory inpatient program).

Apparently common all reported treatment programs is an emphasis on increased physical functioning, usually including performance and endurance. In our experience, when a patient remains in treatment, his or her general physical conditioning and level of activity almost universally improve significantly. This category of improvement seems onmipresent in all types of pain treatment program, regardless of patient population or treatment program biases. There seems to be a high incidence of short-term improvement in most parmeters monitored, when there have been reasonable pre-admission understanding of the treatment program by the patient and an acceptance of such treatment.

Differences in patient populations and treatment setting are likely to include intervening variables of major proportions, thus making outcome comparisons difficult. In addition, these problems of outcome evaluation do not take into account the individual weighting of improvement in one sphere over that in another, in any given individual patient with pain. Because of the differences discussed above, it is difficult to compare one treatment setting with another unless many factors with appropriate weighting are included in judging outcome results. We might add, however, that the authors of studies mentioned above, and others, have indicated that special inpatient treatment situations were indicated for and helpful to patients with intractable chronic pain problems. We feel our data indicate that there may be an even greater increase in long-term effectiveness of treatment if the multidisciplinary, multimodal, treatment team program is of sufficient length and intensity in all aspects of the biopsychosocial spheres.

Conclusion

The general clinical syndrome of chronic, non-cancer, intractable pain is the main concern of this portion of our report. The generally recognized human suffering related to this syndrome is of paramount concern. However, the concomitant problems of families, medical, and paramedical people, who always are present struggling with the problems generated by the process of ongoing pain, are also part of this process. because of the chronicity of the problem, the effect of therapeutic interventions must be viewed primarily in a long-term perspective, in order to learn about the lasting nature of the interventions. Short-term changes, even when therapeutically Positive, have been experienced by all involved-only often to be followed by the return of the painful pre-existing state and its epiphenomena.

For an initial overview of the results of our multimodal, multidisciplinary, medically based treatment approach to this difficult medical problem, in the truest sense a biopsychosocial problem, we have focused on some of the changes in the most common phenomena accompanying these pain syndromes: 1) drug use, 2) continuing medical-surgical treatment, 3) subjective pain reports, and 4) general life outlook and attitude.

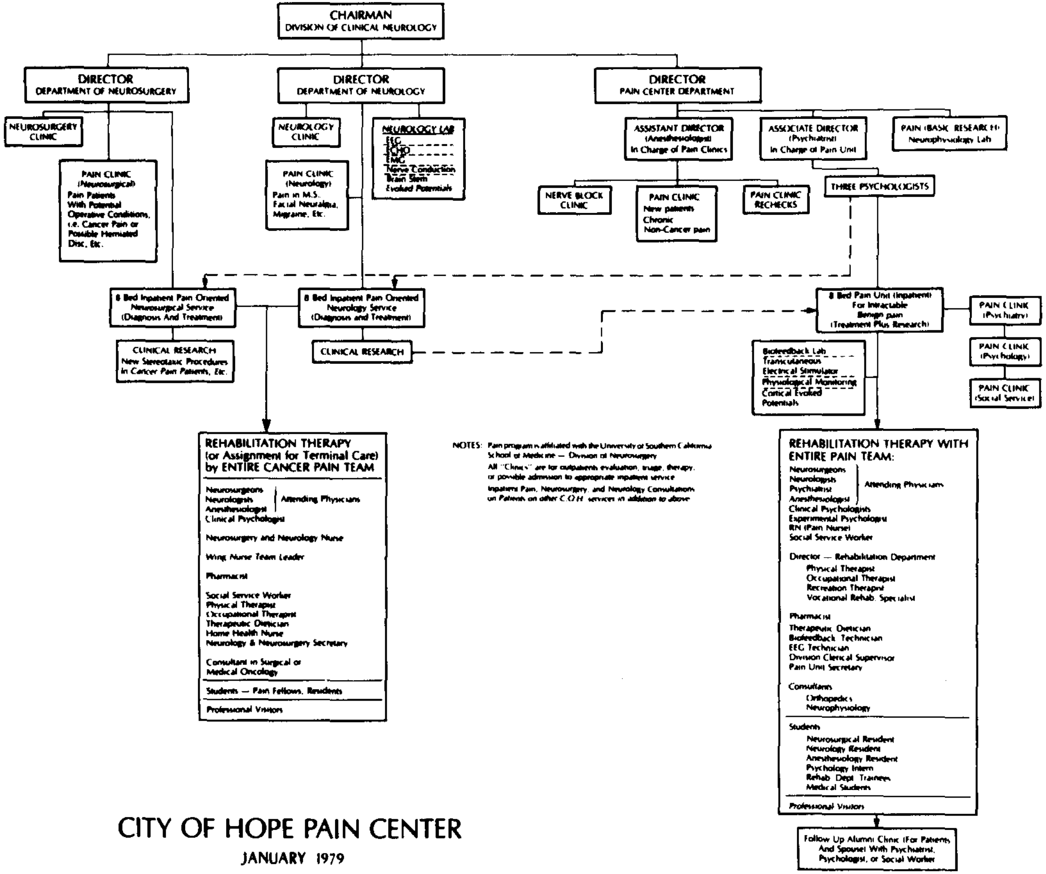
In each of the above-mentioned areas, we have assessed the data shared with us by a rather large percentage of our patients. The general thrust of this data indicates that long-term, positive, therapeutic changes have occurred for a large segment of these patients, who usually had not had histories of such prolonged therapeutic occurrences prior to their Pain Unit treatment.

The benefits of long-term diminution and de-escalation of opioid analgesics and CNS depressants, as well as an overall decrease in use of pharmacologic agents, are readily apparent to patients, families, and treating physicians. The apparent relative decrease in patients attempting to resolve their chronic pain state by tissue invasive or destructive procedures, or ever-escalating narcotic or mood-altering drug use, are perhaps the most interesting and medically significant outcomes of the teaching and treating of patients with CIBPS. This is particularly the case when there is a concomitant increase in sense of well-being, that is reflected in more positive life attitudes, mood, and goals involving increased psychosocial activities. The fact that all of this can and does occur, with or without a significant reduction in self-assessed pain, further underscores the intricacies of establishing therapeutic goals and assessing their outcomes for these truly biopsychosocial syndromes.

We feel that these results represent a major, fairly long-term, positive, clinical shift in groups of patients who notoriously have had significant problems in previous attempts to favorably alter their chronic pain experience.

IV. TEAM CONCEPT IN THE MANAGEMENT OF PAIN IN PATIENTS WITH CANCER (6)

As our Pain Center developed over the last two decades, it became obvious that the patients with pain due to intractable malignant disease were, in general, easier to treat "successfully" than were the patients with chronic intractable benign pain syndromes. Therefore, the neurosurgeons found it necessary, mainly for optimum treatment of chronic benign pain patients, to enlist the expertise of other individuals, both professional and paraprofessional; and, the team concept for the treatment of chronic benign pain evolved (as has subsequently been the case at many other pain centers). While the majority of personnel, time and resources in our Pain Center were committed to the evolution of the chronic benign pain team, at the same tine the Neurosurgical Service continued to treat the pain syndromes in patients with underlying malignant disease. These patients were often seen on other services at our Medical Center, referred to the Pain Center through our inhouse Tumor Board, or referred to the Neurosurgical Department of the Pain Center directly from a number of outside referral sources. A variety of neurosurgical procedures such as posterior approach stereotactic percutaneous cordotomy and percutaneous trigeminal tractotomy, as well as open operative intervention such as sacral rhizotomy, have been carried out by our Neurosurgical Department for patients with cancer pain at our Pain Center, with an acceptable "success" rate over the intervening years. However, as the pain team concept was successfully applied to patients on the chronic intractable benign pain unit in the Pain Center, there was often considerable overlap with both the professional and paraprofessional members also assigned to the Neurosurgery and Neurology Departments who were managing the patients with pain due to cancer. Almost serendipitously, and admittedly with little conscious forethought at times, many of the team concepts of treatment (that had been learned in the treatment of the chronic intractable benign pain patients) were then found to be satisfactory as they inextricably spread back into the treatment regimen of the patients with cancer pain, on both the Neurosurgery and Neurology inpatient services here at our Pain Center. A formal Monday morning weekly conference of the entire staff related to the treatment of the patients with cancer pain on the Neurosurgery and Neurology inpatient services was established in 1977. As the conference members began to interact at their weekly conference, it became obvious that we had, in fact, a second pain team in existence in our Pain Center, this one for the cancer pain patients. It was composed of some overlapping (but, in general, different) professional and paraprofessional personnel; but, it included many of the same goals and treatment techniques that we had cane to utilize in the chronic benign pain team. Therefore, it was decided to recognize this second team effort, for patients with pain related to underlying malignant neoplasms as the cause of their pain and suffering, as a distinct separate pain team entity, functioning under the combined direction of the Neurosurgery and Neurology Services. The present administrative framework of our Pain Center is depicted, as of January 1979 (Figure 3).



NOTES: Pain program is affiliated with the University of Southern California School of Medicine — Division of Neurosurgery

All "Clinics" are for outpatients evaluation, triage, therapy, or possible admission to appropriate inpatient service

Inpatient Pain, Neurosurgery, and Neurology Consultations on Patients on other C.O.H. services in addition to above

CITY OF HOPE PAIN CENTER
JANUARY 1979

Figure 3

Goals of the Cancer Pain Team

The main goals of the cancer pain team, as it now functions on the Neurology and Neurosurgery Services, can be placed under two headings: 1) evaluation for therapy; and, 2) patient support. The patient support aspect can likewise be divided into two headings: a) attempted pain relief and rehabilitation; and, b) attempted pain relief and terminal care.

1) The cancer pain team per se does not do as much investigative evaluation for appropriateness of treatment on the inpatients with pain from malignancy (already admitted in a neurology or neurosurgery bed within the Pain Center) as is comparably done by the pain team for the patients being admitted to the Pain Unit with chronic intractable benign pain. In the chronic benign patients, there has always been considerable triage and screening within the outpatient clinic before going on the tentative bed-waiting list, and then further screening by psychometric evaluation, as well as interviews with the social worker, pharmacist, and psychiatrist prior to being admitted to the final bed-waiting list for admission to the benign Pain Unit. However, a considerable amount of the investigation of the idiosyncratic psychodynamics that leads to planned individual and group psychotherapy on the Pain Unit is then accomplished after admission by all the benign pain team members, as well as by the individual attending physicians.

Conversely, on the Neurosurgery Service, the patients with cancer pain are usually not admitted for treatment of their particular intractable pain problem unless a specific attempt at neurosurgical therapy to relieve the pain has been tentatively decided on, and directly discussed with the patient, and usually his family, prior to admission. This is less true on the patients with pain problem admitted for diagnosis on the Neurology Service where, on occasion, an underlying malignancy is discovered, and then a decision has to be made regarding further treatment. This usually involves more of the cancer pain team, of course, as the patient is discussed at the Cancer Pain Team Conference. However, the majority of the cancer pain patients who are seen by the cancer pain team members are on the Neurosurgery Service, and they are then discussed at the weekly Monday morning conference. These patients have usually been admitted for a tentative specific therapy. Many of these patients have already been on other services at the Medical Center (such as the Oncologic Surgery or Hematology Service), where the neurosurgeons have originally been called in to see the patient in consultation. Often psychotherapeutic support from Social Service, Nursing, Rehabilitation, and consultation with the Neurology-Neurosurgery Service clinical psychologist has been obtained before the patient is advised concerning admission, or transfer, for a specific recommended neurosurgical pain-relieving procedure (such as sacral rhizotomy, percutaneous cordotomy, etc.). If the recommendation is accepted by the patient and his original attending physician, the patient is then transferred to our Pain Center on the Neurosurgical Service. This has worked so well in the past, with several trained neurosurgeons interested in cancer pain problem (who have each been at the Pain Center for many years), that it perhaps delayed the realization of what other cancer pain team members might well have to contribute to further improve the total treatment situation. The care of the patient with cancer pain had not often seemed to be as complex a problem as had been the arranging for interdepartmental and multidisciplinary care for the chronic intractable benign pain patient on the Pain Unit.

The second way that the patients with cancer pain are admitted on the Neurosurgery Service is by referral from one of the in-house Tumor Boards. There, a professional member from our pain team is always in attendance; and the recommendation for possible admission for a neurosurgical or anesthesiological blocking procedure to relieve pain occurs at this level. There is thus concurrence by the Onwlogy Surgical staff, as well as by the chemotherapists, immunotherapists, radiation therapists, pathologists, etc., at the regular Tumor Board conference. In addition, if these patients are referred to Neurosurgery, they are then screened after Tumor Board in the Neurosurgery Outpatient Clinic, <u>before</u> acceptance and admission on the Neurosurgery Inpatient Service for a specific procedure.

The third source of cancer pain patient admission is by direct referral from the outside, when we have adequate records from the referring physician (as no patient is seen at our Pain Center except on written referral from his/her present treating physician). If there is any question about either the diagnosis or any further indicated tumor treatment, the patient (who is always seen in the Outpatient Neurosurgical Clinic <u>before</u> admission to the inpatient service for a specific operation can always be referred to our Tumor Board for further multidisciplinary professional oncological advice.

Therefore, regardless of which of the three routes leads to the patient with cancer now being housed on the Neurosurgery (and occasionally on the Neurology) Service of our Pain Center, there has already been considerable knowledge acquired and investigation done concerning the diagnosis and past and proposed further treatment of his malignant disease. This occurs before the projected tentative anesthesiological or neurosurgical intervention, prior to the patient being presented to our cancer pain team on the ward in the weekly conference. However, this in no way should be taken to minimize the demonstrated value of the additional information that is now gained, <u>after</u> admission, from other professional team members, as well as the input from the Nursing Service, Social Service, or the various members of the Rehabilitation Department. The patient is investigated in further depth as an inpatient, and then presented to the cancer pain team at the Monday morning weekly conference. This presentation makes possible more useful information about his total picture as a suffering human and makes possible the start of a more complete biosocial treatment necessary in many near-terminal situations (this will be discussed further below under the individual duties of the various specific cancer pain team members).

2) When it cares to the support goal, the value of the combined pain team approach cannot be overemphasized. The neurosurgeon, neurologist, and anesthesiologist are ultimately responsible (as individual attending physicians) for the patient's medical care, and it is they who usually decide tentatively on the projected treatment for which the patient has been hospitalized. However, there is no question but that the further input from the team members often has a profound influence on altering the tentative projected specific pain-relieving intervention, or its timing. This has definitely been in the best interest of the patient.

There is also an overwhelming value in the support role that the trained and informed paramedical staff can give to the busy attending physician, in supporting not only the patient, but also his or her significant other (as well as other members of the family) during this period of usually undeniable life crisis and inevitable stress. The final decision regarding further care to be recommended to the patient is usually reached jointly at the weekly team conference by the attending physician and the other pain team members. The initial treatment plan has, by then, often been subsequently and appropriately changed or updated. This occurs as the patient is observed further, new information is obtained, or his clinical situation changes (often by improvement in the pain complaint while on conservative management, antidepressants, and team reassurance)– which on many occasions obviates the need for (or at least postpones) any surgical pain-relieving procedure.

The patients, when initially discussed at weekly cancer pain team conference, usually fall into one of two broad categories from the standpoint of therapeutic goals as well as pain relief:

a) Those patients who have potential for significant rehabilitation. The evaluation of such potential can then be done. This includes consideration of where the patient will go after leaving the Pain Center. He may be transferred to a convalescent hospital, return home or, on rare occasion, even be rehabilitated so that he can return to useful, gainful employment (perhaps even to his premorbid occupation).
b) The second group includes those severely ill, cancer pain patients where it involves only an attempt at pain relief (by a nerve block or surgical procedure), followed by supportive terminal care, as the patient is not truly classifiable as being rehabilitatable.

All of this evaluation for possible pain relief therapy presupposes, of course, that the attending physician and all of the pain team members have agreed that every possible attempt has already been made to ameliorate the suffering by treatment of the primary underlying neoplastic condition (or, at times, other pain-potentiating medical conditions). This is again made easier by having available, in addition to the regular cancer pain team members, consultants who are called in whenever there are specific problems relating to the possibility of further surgical eradication, radiation, chemotherapy, or immunotherapy; also, additional consultation that further investigation of medical conditions, such as cardiac failure, anemia, poor nutrition, etc., are not indicated. The patients with cancer pain are thus evaluated by the team, usually in a neurosurgical preoperative mode, assessing risks as seems indicated. This will be discussed further under the duties of the specific pain team members to be described below.

Make-up of the Cancer Pain Team - - Job Descriptions of Members

The attending physician in charge of each patient on the Neurology, Neurosurgery, or Pain Anesthesiology Service is really the cancer pain team leader, as far as the treatment of that specific individual patient with pain from cancer is concerned. In addition to the neurosurgeons and neurologists, our full-time pain anesthesiologist also acts as an attending physician and admits patients for evaluation for possible therapeutic nerve block as indicated. The medical function of the physicians in the investigation and the establishment of diagnoses, the evaluation of risk, and the decision concerning the optimum pain relief procedure indicated, are all medical decisions familiar to the readers of this journal and will not be discussed further here.

The clinical psychologist routinely attends the Monday morning cancer pain team meeting and sees those patients on the Neurology, Neurosurgery, or Pain Anesthesiology inpatient services when asked by the attending physician for consultation. These services are available for evaluation of the presumed underlying psychodynamics and their relationship to the pain and suffering problem, or for help with any acute crisis situation. This may be accomplished either by interview or, when indicated, by more formal psychometric evaluation. Consultation is also available for neuropsychological assessment of cognitive functioning which can aid both patient and staff in adaptation to changes in the patient's ability, behavioral capacity, and resultant affect. The clinical psychologist is often utilized in helping support the individual patient and family through consultation with the attending physician and contact with the entire pain team, and, more directly (when occasionally indicated), through more prolonged psychotherapeutic contact with the patient and his or her family.

The role of the Social Service worker in our Pain Center has been described previously in relation to the chronic intractable benign pain team and Pain Unit. This same Social Service worker assigned to the Pain Center also spends considerable time and effort with, and is an invaluable member of, our pain team relating to patients with cancer pain on the Neurology and Neurosurgery Services. Investigation and evaluation of the patient's autobiography, past history, family history, work history, and financial concerns is ascertained in a detailed clarity that the attending physician seldom obtains. In many instances this information has been invaluable in decisions concerning the proper medical modality for further therapeutic attempts at relieving pain, as well as a decision concerning the possibility of rehabilitation and further management of the individual cancer pain patient. The Social Service worker also supplies considerable psychotherapeutic support to the patient and his family.

Another important pain team member is the neurology and neurosurgery nurse specialist. The nurseworks in a supervisory and teaching role, and coordinates the treatment of the patient with pain on the Neurology, Neurosurgery, and Pain Anesthesiology inpatient services. This specialist must coordinate with the floor nurse team leader for patients within the Pain Center and act in a teaching role in education concerning specific nursing problems encountered in this type of neurosurgical patient, both pre- and post-operatively. The neurosurgery and neurology nurse specialist, furthermore, functions in an advisory capacity by evaluating the nursing aspects of the pain patients (with neurosurgical pain-relieving procedures) as they are followed after surgery in both the recovery room and in the intensive care unit (geographically located elsewhere within our medical facility). For these patients who are only having diagnostic tests that necessitate hospitalization (particularly those procedures having high anxiety potential, such as myelography or angiography), the nurse does pre-procedure instruction, as well as follow-up.

Furthemore, all of the nursing members assigned on the Neurology, Neurosurgery, and Anesthesiology Pain Services have often proved invaluable in the evaluation and treatment of pain patients, both pre- and post-pain-relieving operative procedures. The regular day shift nursing floor team leader assigned to the neurology and neurosurgical service is also a regular member of the weekly cancer pain team conference. Another frequent participant is the clinical nursing supervisor who is in charge of the neurology/ neurosurgery floor among other responsibilities.

The pharmacist on the Pain Center is familiar with all of the patients in the 24-bed Pain Center and with the "purple capsule" single-blind routine used on the chronic benign Pain Unit. Therefore, in the total treatment of patients with drug abuse problems (or where the pain, in spite of the known underlying cancer, is considered to be largely psychodynamic, with much fear and anxiety, etc.), the pharmacist works very closely, on an individual basis, with the patient's attending physician. The patient-blind medication regimen is often used in the care of patients with pain and suffering due to cancer. This can thus provide a necessary, temporary lifting of responsibility from the patient with regard to his or her dilemma between hope for pain relief and psychologically feared drug dependency. On many occasions, by the use of appropriate tranquilizers or antidepressants, and by discontinuing specific unwise narcotic use, the pain (even in patients with cancer) can often be adequately reduced without nerve block or neurosurgical operative intervention.

The members of the Rehabilitation Department on the cancer pain team are routinely the physical therapist and occupational therapist. The physical therapist does a thorough evaluation of the patient's present abilities and rehabilitation potential from a physical standpoint and helps evaluate and record the disability status cause by the physical impairment. The occupational therapist investigates the patient and does a thorough evaluation and an estimation of the patient's potential for rehabilitation. Whether the patient has a nerve block, or a neurosurgical procedure, for the relief of pain, the physical therapist and occupational therapist follow through in treatment as prescribed by the attending physician, after consultation and discussion at the weekly pain conference with the entire cancer pain team. The vocational rehabilitation counselor and recreation therapist are also available when needed from the Rehabilitation Department as assigned to the Pain Center for either pain team, and are often utilized in the treatment of specific cancer patients with pain.

The discharge planning nurse, also a regular member of the pain team, supervises discharge planning and evaluates from a nursing viewpoint the probable need for ongoing care after the patient has left the Pain Center. The importance of this discharge planning cannot be overemphasized. It is correlated with the Social Service worker's treatment plan, for the patient and his family, for post-discharge care of the individual cancer pain patient. Correlation with visiting nurses in the home is thus expedited, and a better transition experience is provided for the patient, while far less time is required from the attending physician.

Lastly, the neurology and neurosurgery secretary is a regular member at the pain team conference and takes notes for the patient charts, keeps the pain conference records, and also sees that they are promptly entered in the charts so that questions of third-party payors, PSRO, or in-house utilization committee reviewers can have an adequate clinical base for their reviews. The secretary also remains an invaluable aid in reminding pain team members concerning the status of the follow-through on the decisions reached at the weekly pain team conference.

Other specialty consultants such as physicians in Radiation Therapy, Oncological Surgery, or Medical Oncology are asked to come to the weekly cancer pain team conference as individually indicated by the cases under discussion. The weekly conferences are also attended by the pain fellows, or residents in Anesthesiology, Neurology, or Neurosurgery, as they rotate through our Pain Center. Individual professional visitors often also attend the conferences. This relates to our commitment to the importance of teaching and the widening of professional skills in the understanding of patients with pain.

Results

The authors, after experience over the last two years with the function of this multidisciplinary cancer pain team (with its weekly conference) under the auspices of Neurosurgery, Neurology, and Pain Anesthesiology, have been pleased with the way the team has functioned to provide demonstrated improverment in cancer patient evaluation and care. This is the reason for writing the present article. The aid given by this team approach to each attending physician in the evaluation and increased total care of patients with cancer pain, who may require nerve block or neurosurgical intervention, in ascertaining the psychodynamics of the suffering process in each patient (where there is often a large psychological overlay and where family anxieties, probable job loss, and other econanic concerns all play their role) cannot be over-emphasized.

While the patient is cared for at the Pain Center as an inpatient, plans are also made for continuing patient care after discharge. These plans include routine follow-up by a physician at the outpatient clinic and, as necessary, continuing follow-up by Physical Therapy, Occupational Therapy, or Social Service. Psychological support for the patient and his family, when indicated, is also arranged. At times the patient with uncontrolled cancer, even with some residual pain, can be rehabilitated to leave the hospital for a considerable period of time. Tentative plans for future rehabilitation, with presumed limitations due to progression of the underlying malignant disease, are contemplated and discussed.

In patients where no significant level of rehabilitation appears possible, the terminal care (either after operative attempts at pain relief, or at times without the necessity of anesthesiological or neurosurgical pain relief intervention) has certainly been facilitated by the use of the pain team concept in these cancer patients with pain. While this institution at the present time does not have an intermediate care, continuing care, or a custodial facility, and, while we do not have an area set aside as a "hospice" per se, several beds on the Neurosurgical and Neurological Services within our inpatient pain center over the last several years have been utilized for patients treated here pre-terminally who then evolve a more terminal advanced malignant disease state where severe pain is often a feature of their total symptom complex. These patients are often maintained for a considerable time, and it is fortunate that at our former eleemosynary institution we were able to keep a small number of patients for terminal care, as well as for attempted pain relief.

Patients with severe cancer pain, even if they probably cannot be rehabilitated, are evaluated by the attending physician and the entire cancer pain team to see if the pain can be helped in spite of the advanced nature of the underlying condition. No operative intervention, or even nerve block, is considered until the patient has been totally evaluated and attempts made to favorably modify the life situation and to relieve anxiety by the use of anti-anxiety agents such as tranquilizers and the newer pharmacological antidepressants, etc., along with psychotherapeutic support from the trained social service, nursing, and psychological personnel. However, by the use of nerve blocks (such as alcohol injection retroperitoneally for cancer of the head of the pancreas, etc.); or, by the use of stereotactic neurosurgical procedures (that are now often done percutaneously), we can offer patients with pain from terminal cancer <u>(even in far-advanced stages)</u> some pain relief for their terminal weeks or months without open operative intervention, as would have been necessary a few decades ago.

When pain persists in spite of all attempted psychological support, tranquilizers, and antidepressants, and where neurosurgical intervention has either been contraindicated or is no longer totally effective, then the patients are maintained on analgesics and narcotics (at times by self-administration in the form of letting the patient regulate his own dose of Schlessinger's solution - which we use instead of Brompton's mixture). This has often been adequate for pain relief while letting the patient maintain an optimum mental quality for his remaining days and weeks. While the above-described way of working with a few terminal cancer patients with pain, at any one time, is in no way a substitute for a larger hospice, it has certainly improved the care of the terminal patient with cancer within our own institution, both for the unfortunate cancer victim and for his surviving family.

In the opinion of the authors, results have demonstrated the usefulness and effectiveness of the multidisciplinary team concept in the approach to therapy of pain and suffering in patients with cancer, either terminal or pre-terminal. It is well understood by the authors that this preliminary article is being written without adequate controls, or even detailed statistics. It is believed, however, that the pain team concept as applied to cancer patients with pain has been rewarding enough medically that this article is justified. Of course, no specific financial study was done, and no comment can be made on the "cost-effectiveness" factor. It is understood by the authors that the National Cancer Institute is presently considering funding several pain centers around the country to help in the formation of similar cancer patient pain texts, for the type of approach described above. In the proposed NCI study there reportedly will be attempts made at control groups, to see if verification of the results of the team effort in such cancer pain patients can be substantiated. It is the opinion of the present authors that such a value will be found. We believe it has already been demonstrated over the last few years by our cancer pain team that had operated at City of Hope Medical Center Pain Center, and continues to function in essentially the same manner at our New Hope Pain Center. This is verified by the results in our cancer pain patients, as observed by both their families and our team members. However, the ethical problem of withholding standard treatments believed to be of benefit to cancer Patients in order to have a true control group will probably be a very difficult one to solve.

REFERENCES

1. Crue, B.L. A physiological view of the psychology of pain. Bull Los Angeles Neurol Soc, 44:3-18, 1979.

2. Pinsky, J.J. Chronic, intractable, benign pain: a syndrome and its treatment with intensive short-term group psychotherapy. J Human Stress, 17-21, Sept. 1978.

3. Nemiah, J.C. In "Somatoform Disorders," Ch. 21.2, Vol. 2, p. 1538, Comprehensive Textbook of Psychiatry/III. Third edition edited by Kaplan, H.I.; Freedman, A.M.; and Sadock, B.J. Baltimore: Williams & Wilkins, 1980.

4. Agnew, D.C.; Crue, B.L.; and Pinsky, J.J. A taxonomy form for diagnosis and information storage for patients with chronic pain. Bull Los Angeles Neurol Soc, 44:28-37, 1979.

5. Pinsky, J.J.; Griffin, S.E.; Agnew, D.C.; Kamdar, M.D.; Crue, B.L.; and Pinsky, L.H. Aspects of long-term evaluation of pain unit treatment program for patients with chronic intractable benign pain syndrome (CIBPS): Treatment outcome. Bull Los Angeles Neurol Soc, 44:150-181, 1979.

6. Crue, B.; Felsööry, A.; Agnew, D.; Kamdar, M.; Randle, W.; Griffin, S.; Sherman, R.; Menard, P.; and Pinsky, J. The team concept in the management of pain in patients with cancer. Bull Los Angeles Neurol Soc, 44:196-210, 1979.

7. What is the current thinking of chronic pain treatment? Editorial in Behavioral Medicine, February 1981, p. 9.

8. Crue, B.L., ed. Pain and Suffering-Selected Aspects. Springfield, Ill.: Charles Thomas, 1970. 204 pp.

9. Crue, B.L., ed. Pain--Research and Treatment. New York: Academic Press, 1975. 413 pp.

10. Crue, B.L., ed. Chronic Pain--Further Observations from City of Hope National Medical Center. New York: Spectrum Publications, 1979. 581 pp.

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Current Issues in the Management of Cancer Pain: Memorial Sloan-Kettering Cancer Center

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ABSTRACT

Recent attention to the management of cancer pain in the mass media (TV, books, newspapers) and the medical press provides ample evidence to suggest that many cancer patients are not receiving appropriate therapy for their pain. Since cancer therapy is often not curative, only palliative, specific attention to the management of pain in such patients is essential. However, the management of cancer pain requires a specific approach and expertise. Narcotic analgesics are the mainstay of therapy in the management of such patients, yet physicians lack sufficient knowledge of narcotic pharmacology to use these drugs appropriately. Recent controversy has arisen in 3 specific aspects of narcotic drug therapy: 1) the choice of a narcotic drug and its method of administration; 2) the development of tolerance, and 3) the risk of substance abuse, drug dependence, and addiction.

<u>Choice of Narcotic Drug a Method of Administration:</u> Comparative studies of heroin and morphine in cancer patients with pain at MSKCC (Houde et al.) demonstrate that, using equianalgesic doses, heroin and morphine have comparable analgesic and mood effects. No controlled studies have addressed the efficacy of oral liquid narcotic solutions compared to other forms of available oral analgesics. More importantly, the role of long-acting analgesics such as methadone remains unclarified. There is a tremendous need to develop guidelines based on careful clinical studies, not limited experience and anecdotal data.

<u>Development of Tolerance:</u> In contrast to Twycross' experience, tolerance occurs in cancer patients with pain and progression of disease, representing a significant practical management problem.

Escalation of drug dosage, switching to alternate drugs, and the use of combination drug therapy represent empirical approaches to provide adequate pain relief. What factors influence tolerance remain unstudied in this population.

Risk of Substance Abuse, Drug Dependency a Addiction: From a review of patterns of drug abuse in 103 patients (86 with cancer) followed in MSKCC's Pain Clinic, escalation of drug dosage was associated with the progression of disease, and successful anti-tumor therapy with reduction or cessation of drug use. Substance abuse and addiction did not occur in the cancer group (Kanner et al.). Although fear of addiction limits narcotic use by both physicians and patients, there are no published long-term data to support the thesis that chronic use of narcotic analgesics causes addiction.

Recent attention to the management of cancer pain in the mass media (television, books, newspapers) and the medical press provides ample anecdotal evidence to suggest that many cancer patients are not receiving appropriate therapy for their pain. Since therapy directed toward cancer is often not curative and only palliative, specific attention to the management of pain in such patients is essential. However, the approach to and management of cancer pain requires a specific expertise. This expertise can only be gained from a clear understanding of the nature of the pain and the medical, psychological, physiological, pharmacological and social variables influencing the pain complaint in this group of patients. An extensive body of data on these variables is currently lacking, and this lack of information has partially thwarted the approach to and management of pain in such patients. Before considering cancer pain as a distinct entity, it is important to place it in the framework of other types of acute or chronic pain states.

In the management of any patient with pain, it is of paramount importance to recognize that pain is only a symptom, not a diagnosis. Pain perception, then, is not simply a function of the amount of physical injury sustained by the patient. Rather, it is a complex state determined by multiple factors including age, sex, cultural and environmental influences, and multiple psychological factors. The methods of pain management and the goals of adequate therapy vary for each individual patient. Patients suffering from pain can be divided into 2 major groups: those with acute pain and those with chronic pain. The point at which acute pain becomes chronic is not known, but pain lasting for more than 6 months is usually considered a chronic pain. Patients with acute pain are characterized by a well-defined temporal pattern of pain onset, usually associated with subjective and objective physical signs. These signs are commonly associated with hyperactivity of the autonomic nervous system and include tachycardia, hypertension, diaphoresis, mydriasis, and pallor, which serve as objective signs to the physician, substantiating the patient's complaint of severe pain. In contrast, chronic pain is the persistence of pain with a less well-defined temporal onset in which the signs of autonomic nervous system hyperactivity are absent. Evaluation of the pain complaint is often difficult because the physician has limited objective signs on which to determine the severity of the patient's pain. It is this lack of a useful diagnostic tool to confirm the severity of pain that makes pain such a difficult symptom to evaluate and to treat. Recognition of these 2 different types of pain is particularly important in the management of patients, and their responses to treatment are often different for each of these groups. Acute pain is relatively easy to recognize and more amenable to therapeutic approaches. Patients with acute pain can usually be treated for the cause of their pain and are more likely to respond to analgesic drugs and to a series of other available modalities.

In chronic pain, the persistent pain has usually failed to respond to those modalities directed at the treatment of the cause of the pain. In general, these patients respond poorly to the use of analgesic agents and have developed significant changes in personality, lifestyle, and functional ability. Such patients need a management approach which encompasses not only the treatment of the cause of their pain but also of the complications which have ensued in their functional ability, their social lives, and their personalities. It is this particular group of patients that challenges physicians in the management of pain. It is also this group that colors physicians' attitudes toward the management of patients with acute pain problems. Within the group of patients with chronic pain, 3 types of patients emerge: the first type is the patient with chronic medical illness in whom pain is an intinate part of the disease process , e.g., pain with metastatic disease, pain with rheumatoid arthritis, sickle cell anemia, or hemophilia. These patients may have pain-free intervals or may live with a continuous mild degree of pain with acute exacerbations of severe pain. This latter group responds to a series of modalities including analgesic drugs. The second type of patient is the patient with chronic pain in whom the pain, which began as a definable pain syndrome, has become a disease unto itself. Although the site may vary from face to lower back, it is the pain that consumes daily life and limits activity. The third type is the patient with chronic pain without a definable cause. These patients characteristically complain of diffuse myalgias and arthralgias, have multiple diagnostic studies and often multiple surgical procedures without any clear evolution of a definable pain syndrome. Patients with cancer have both acute and chronic pain. The management of acute pain in this group of patients includes the treatment of the cause of their pain, most commonly metastatic tumor, and the use of analgesic drugs. The management of chronic pain presents a more difficult clinical problem. Such management includes the use of analgesic drugs and a series of other specific modalities directed at the particular pain problem, e.g. nerve blocks, transcutaneous electrical stimulation, etc. In general, the majority of cancer patients with pain fit into the group of patients with chronic medical illness and pain. However, there is a very small percentage of patients (from our experience, less than 5%) in whom the pain becomes the patient's focus, separate and distinct from their underlying illness, and in these patients it is the management of their chronic pain state that deserves full attention. The predictive factors determining who will complain of pain and who will develop chronic pain in this group of patients remain undetermined. There are no prospective studies of cancer patients prior to the onset of their pain, and the existing studies are on patients who had pain at the time of their psychological assesment. From our own studies (Pasternak & Foley, 1980) of the personality traits and cognitive style in chronic pain patients, we could not distinguish patients with cancer and chronic pain from patients with chronic pain from non-malignant causes. Using a battery of psychological tests, there were no significant differences between these two groups.

However, there were significant differences between chronic pain Patients with cancer and a control population of patients with cancer and chronic non-painful illness. These preliminary studies sugqest the profound influence of pain in altering psychological variables, but do not provide the necessary prospective data. Since cancer patients often move from an acute pain state to a chronic one, they represent the experimental model of human pain and offer tremendous opportunity for longitudinal studies assessing the impact of chronic pain on the psychological state of such patients.

From our current state of knowledge, then, recognition of the differences among the particular group of patients with pain does not allow a hard and fast approach to their treatment. Any approach must be modified depending upon the underlying nature of the patient's disease and the patient's response to initial attempts at therapy. In an attempt to study some of these variables in patients with cancer pain, we undertook a series of surveys to obtain data on the nature and prevalence of pain in this population at Memorial Sloan-Kettering Cancer Center (MSKCC).

Data on the <u>prevalence of pain in patients with cancer</u> come predominantly from terminal care facilities; 50%-60% of patients are reported to have pain (Lipman, 1975; Exton-Smith, 1961). These data do not report the incidence of pain in patients undergoing active therapy for cancer and do not attend to the causes of the pain. Of the 36,800 admissions to MSKCC between January 1974 and January 1978, 4,240 (or 9%) of patients had pain of significant magnitude and complexity that required a specific consultation from the Pain Service. A survey of the entire in-patient population of MSKCC during a one-week period revealed that, of 540 patients evaluated, 156 (or 29%) had pain requiring the use of analgesic drugs. Postoperative pain was not included in this study. Certain tumors were associated with a high incidence of pain. For example, 85% of the patients with primary bone tumor and 52% of the patients with carcinoma of the breast had pain, whereas only 5% of patients with leukemia had pain. On the pediatric ward, 13 of the 39 in-patients had pain, and in 8 of the 13, primary bone tumors were the major cause of pain. In a second review, 397 of 420 patients approached for study agreed to personal interviews. Of these, 152 (38%) complained of pain; 39 of these 397 patients were terminal, and 23 of the 39 (or 60%) had pain (Foley, 1979). From these 2 surveys and from a review of our outpatient clinic population and inpatient consultation service, the specific syndromes in patients with cancer have been classified into 3 major categories. The rationale for this categorization was twofold: 1) to detail a series of specific pain syndromes, facilitating their diagnostic approach, and 2) to provide a common ground for discussing therapeutic approaches used in the management of such patients. It is readily apparent from the literature on cancer pain that there is no common data base to discuss diagnostic and therapeutic approaches used in the management of cancer patients. From our clinical experience, it is obvious that there is a series of common pain syndromes which occur in this population, but they are often misdiagnosed because general physicians are unfamiliar with their modes of presentation. For example, 18% of patients in our outpatient clinic had an incorrect diagnosis at the time they presented with their clinical pain syndrome. Awareness of these common pain syndromes has led us to detail the nature of pain as it occurs in cancer patients into a series of pain syndromes. They include (see Table 1):

(A) Pain syndromes associated with direct tumor involvement. This group) accounts for approximately 78% of pain problems in our in-patient population and approximately 62% of patients in an out-patient clinic study (Kanner & Foley, 1981). Metastatic bone disease, nerve compression or infiltration, and hollow viscus involvement are the most common causes of pain from direct tumor involvement. These pain syndromes generally present as an acute pain problem which, when appropriately diagnosed and treated, result in dramatic resolution of the pain.

(B) Pain syndromes associated with cancer therapy. This group accounts for 19% of pain problems in an in-patient survey and approximately 28% of patients in an out-patient survey, and includes those patients in whom pain occurs in the course of or as a result of surgery, chemotherapy, or radiation therapy. Each of these syndromes has a characteristic pain pattern and clinical presentation. The pain is often chronic and severe, and treatment for these patients is often difficult and disappointing. Identification of the cause of the pain as not due to tumor clearly alters the patient's therapy. For example, in a patient with aseptic necrosis of the hip occurring during the course of treatment of Hodgkin's disease, hip replacement and not further chemotherapy or radiation therapy provides dramatic relief of the pain and markedly alters the patient's psychological state, relieving him of fear of recurrent disease. Within this category is a series of patients who develop chronic pain in the setting of a history of cancer; and for some of these patients it is the chronic pain problem, not their underlying disease, that becomes the major issue. For such patients, then, the approach must include not only attention to their pain but also to the manage-

TABLE 1. SPECIFIC PAIN SYNDROMES IN PATIENTS WITH CANCER

A. PAIN SYNDROMES ASSOCIATED WITH DIRECT TUMOR INFILTRATION

1. Tumor infiltration of bone
    - a. base of skull syndromes
        - 1) juqular foramen metastases
        - 2) clivus metastases
        - 3) sphenoid sinus metastases
    - b. vertebral body syndromes
        - 1) C2 metastases
        - 2) C7, T1 metastases
        - 3) L1 metastases
    - c. sacral syndrome

2. Tumor infiltration of nerve
    - a. peripheral nerve
        - 1) peripheral neuropathy
    - b. plexus
        - 1) brachial plexopathy
        - 2) lumbar plexopathy
        - 3) sacral plexopathy
    - c. root
        - 1) leptomeningeal metastases
    - d. spinal cord
        - 1) epidural spinal cord compression

3. Tumor infiltration of hollow viscus

B. PAIN SYNDROMES ASSOCIATED WITH CANCER THERAPY

1. Postsurgery syndromes
    - a. postthoracotomy syndrome
    - b. postmastectomy syndrome
    - c. postradical neck syndrome
    - d. phantom limb syndrome

2. Postchemotherapy syndromes
    - a. peripheral neuropathy
    - b. aseptic necrosis of the femoral head
    - c. steroid pseudorheumatism
    - d. postherpetic neuralgia

3. Postradiation syndromes
    - a. radiation fibrosis of brachial & lumbar plexus
    - b. radiation myelopathy
    - c. radiation-induced second primary tumors
    - d. radiation necrosis of bone

C. PAIN SYNDROMES NOT ASSOCIATED WITH CANCER OR CANCER THERAPY

1. Cervical & lumbar osteoarthritis
2. Thoracic & abdominal aneurysms
3. Diabetic neuropathy

ment of many of the psychosocial problems that arise because of the continuous painful illness. Treatment of these patients remains difficult and controversial at best.

(C) Pain syndromes unrelated to the cancer or the cancer therapy. From our in-patient survey, approximately 3% of patients have pain unrelated to'their cancer or their cancer therapy. As high as 10% of patients in an out-patient clinic survey had pain unrelated to their cancer or cancer therapy. The pain syndromes in this group of patients include the wide variety of common pain problems that occur in the general population, including diabetic neuropathy, rheumatoid arthritis, osteoarthritis, and osteoporosis. Similarly, accurate diagnosis in this group of patients clearly alters both their therapy and prognosis.

Since the majority of pain problems in patients with cancer tend to be acute or subacute, analgesic drug therapy represents the mainstay of therapy for this group of patients. From our 1977 survey of the in-patient population at MSKCC, of the 152 patients complaining of significant pain: 126 were receiving analgesics, 94 patients were receiving a narcotic analgesic alone or in combination with a non-narcotic, 32 patients were receiving a non-narcotic analgesic alone, and in 26 patients no analgesics were prescribed. Of interest, 23 of these 26 patients were receiving steroids as part of their chemotherapy regimens. Only 5 patients were receiving antidepressant drugs, specifically amitriptyline. Of the 94 patients receiving narcotic analgesics, 63 patients were receiving them for less than 3 weeks, 21 were receiving them for less than 15 weeks, and 10 patients had been taking narcotic analgesics for greater than 20 weeks. The most commonly used narcotic analgesics in this population included Darvocet (propoxyphene plus acetaminophen), Percodan (oxycodone plus aspirin), Percocet (oxycodone plus acetaminophen), levorphanol, and methadone. For parenteral use, the most commonly used drugs included morphine, neperidine, levorphanol, methadone, and hydromorphone. 85% of the patients who received analgesics reported good to excellent relief of their pain; 5% reported only mild relief, and 10% reported no relief. Of interest, of those patients reporting no relief, mild analgesics (propoxyphene plus acetaminophen, or meperidine) had been prescribed for complaints of severe pain, suggesting undermedication as an important cause of inadequate analgesia.

In order to assess the patterns of analgesic drug use in an out-patient cancer pain clinic, we then reviewed the charts of all new patients seen in the out-patient clinic at MSKCC during a 2-year period from January 1, 1977 to December 31, 1978. Of 119 patients, 103 charts were available for detailed analysis. 86 patients had pain and a cancer diagnosis; 17 patients had chronic, non-malignant pain diagnoses. At the time of their first evaluation in the Pain Clinic, 65 patients were receiving narcotic analgesics alone or in combination with other medications. 22 patients were not taking any analgesics; 5 were taking only non-narcotic analgesics, and 11 patients were taking either sedative, psychotropic, or anticonvulsant drugs. Aspirin and acetaminophen were the most commonly used non-narcotic analgesics, whereas Percocet (oxycodone plus acetaminophen) and meperidine were the most commonly used narcotic analgesics. The other narcotic analgesics in use included Percodan (oxycodone plus aspirin), codeine, and levorphanol. All drugs were prescribed for oral use, and no patient was receiving drugs parenterally. The amount of drug intake ranged from the analgesic equivalent of 5-150 mg of parenteral morphine sulfate per 24 hours (MS/24 hrs) and varied with the nature of the pain. Patients with tumor-related pain were taking significantly higher doses of narcotic analgesics than were the patients with non-tumor pain. Of the 38 patients not receiving any narcotic analgesics, 3 were begun on such drugs following their initial evaluation in the Pain Clinic. These 3 patients had metastatic bone disease. At the end of 3 months, follow-up data were available on 81 of the original 103 patients. 45 patients were receiving narcotic drugs, 42 of whom had been taking narcotic analgesics at the initial evaluation. Within this group of 45 patients, 3 patterns of drug use were evident. Group 1 consisted of 14 patients who had increased or doubled their amount of narcotic analgesic in the 3-month period. 13 of these patients had a malignant origin of their pain, and 12 of 13 were dead by the 6-month follow-up. Escalation of their drug intake was associated with rapidly progressive disease. This sharply contrasts with only 11 deaths in that same period among 62 cancer patients who did not increase their drugs. Group 2 included 14 patients who either reduced their drug intake (N=11) or discontinued their drugs (N=3). In this group the reduction of drug intake was associated with concurrent anticancer therapy and pain relief. In the 17 patients who maintained their stable drug intake, all had evidence of non- progressive disease or a non-malignant pain syndrome. 36 patients were not receiving narcotic drugs at the end of 3 months. Six-month follow-up data were available on 76 patients of the original 103 patients. 23 patients were dead, and 53 were still alive. Drug intake data were available on 53 patients at this 6-month follow-up, and 28 (or 53%) were still taking narcotic analgesic drugs. Of the 28 patients receiving narcotics, 25 had tumor-related pain and 3 had benign pain. In the cancer patients receiving narcotic analgesics for pain relief, there was no evidence of drug abuse. No patients overdosed with their medication, took more than was prescribed, or illicitly tried to buy or sell their narcotic drugs. In contrast, 2 of 17 patients with chronic non-malignant pain abused their drugs, continually took more than prescribed amounts, and overdosed on the drugs prescribed. Both these patients had a long history of drug abuse behavior prior to their admission into the Pain Clinic.

This limited survey provides some useful clinical data on the patterns of analgesic drug use in a cancer population and poses some interesting questions. What is the best analgesic reqimen for such patients? To what degree does the development of physical dependence and tolerance occur? How complete is cross tolerance? Does chronic narcotic administration for the treatment of pain result in psychological dependence or drug abuse? The answers to these questions remain unknown but lie in carefully controlled clinical studies on patients receiving narcotic analgesics for pain, such as the cancer patient. However, it is this lack of data that has led to controversy about the use of analgesic drugs in patients with cancer pain. The controversy is focused on three main issues:

1) The choice of an analgesic and its method of administration. The English hospice movement promulgated the use of an oral analgesic cocktail - the Brompton cocktail or mixture - in the management of patients with terminal illness and pain. This mixture, consisting of a narcotic analgesic, heroin, a phenothiazine, cocaine,and alcohol in a sweetened syrup, was given to patients on a regular basis with the dose of the analgesic adapted to the individual needs of the patient. Clinical studies of this mixture by Twycross led to the removal of cocaine from the cocktail, as it did not provide additive analgesia. Further studies by Twycross demonstrated that morphine in equianalgesic doses could be substituted far heroin with comparable analgesic effects. Mount (1976) also reported the successful use of oral morphine in controlling pain in patients with terminal illness, and he used only liquid oral morphine in a 10% alcohol solution, flavored for the individual needs of the patient. Kaiko et al. (1980) studied the analgesic efficacy of heroin in patients with both postoperative and chronic cancer pain and showed that there were no significant differences between morphine and heroin in their analgesic efficacy, effects on mood, or side effects. Heroin did have a more rapid onset of action and a shorter duration of effect as compared to morphine. It did not, however, appear to offer any special advantages to morphine in the management of the cancer pain patient. Therefore, there is no demonstrable clinical study to support the thesis that legalization of heroin will improve the analgesic management of the cancer pain patient. Similarly, no controlled studies have compared the efficacy of oral liquid narcotic solutions to other forms of available oral analgesics. More importantly, the role of analgesics with a long plasma half-life, e.g., methadone, 17-24 hrs; levorphanol, 15-17 hrs (Dixon et al. 1980) remains unclarified. How does the long plasma life relate to the duration of effect and development of side effects? Anecdotal reports have suggested that methadone has limited usefulness in cancer pain management (Ettinger 1979). Our own studies have demonstrated that the pharmacokinetics of methadone vary by 50% among cancer patients receiving the drug for pain relief (Inturrisi 1981). These are only a few examples of the tremendous need to develop guidelines based on careful clinical studies, not limited experiences or anecdotal data.

2) The development of tolerance. In contrast to Twycross' experience, tolerance occurs in patients with pain and progression of disease, representing a significant practical management problem. Previous studies by Houde (1967) have demonstrated the development of tolerance in cancer patients receiving narcotic analgesics for pain relief. The relationship of increasing pain

severity, with increasing requirements for narcotic drugs, to the development of tolerance to such drugs represents an important and unanswered question; and specific studies to further assess these clinical phenomena are in order. In our group of patients without progression of disease who were stabilized on a set dose of narcotic drug and had adequate pain control, tolerance did not appear to represent a major clinical problem. Perhaps this group of patients is comparable to those reported by Twycross. In certain patients, however, it is necessary to increase amounts of narcotic drug to control pain adequately, as exemplified in the 13 patients in our series who markedly escalated their drug use with evidence of increasing pain and progression of disease. Escalation of drug dosage, switching to alternative drugs, and use of combination drug therapy represent empirical approaches to provide adequate pain therapy. For example, in patients with intractable pain who become tolerant to the analgesic effects of increasing dosages of druqs such as levorphanol, switching to an alternative narcotic, such as methadone, at a dose of one-half the equianalgesic dose often provides adequate analgesia. Is this phenornenon incomplete cross tolerance or does it reflect inherent differences in druqs or specific receptor affinities?

3) <u>Risk of substance abuse, druq dependency and addiction.</u> Although fear of addiction limits narcotic use by both physicians and patients, there are no published long-term data to support the thesis that chronic use of narcotic analgesics causes addiction.

Yet it is this profound fear of addiction that plays a major role in physicians' underuse of narcotic analgesics in medical illness. In fact, there is limited available published data to determine the degree of tolerance, physical dependence, substance abuse or addiction in patients receiving narcotic analgesics for any type of chronic medical illness and pain. Many of the published studies do not adhere to strict definitions for drug use and abuse, making any review of such data practically impossible. However, in an attempt to review the available data on the subject of chronic pain and addiction, information on narcotic drug use could be obtained from several sources. In 1925, Kolb described the personality types of 230 narcotic addicts and reported that 9% of these addicts were "persons of a normal nervous constitution to whom an opiate had been prescribed to the point of addiction to relieve the suffering of some prolonged physical condition." Pescor in 1939 reported that 3.8% of patients admitted to the Drug Addiction Center at Lexington, Kentucky, had been addicted to morphine given for "legitimate" reasons. Rayport (1954) used the term "medical addict" and defined such a patient as "one who states that he first received narcotics from a physician to the point of addiction in the course of treatment of illness." He divided medical addicts into 3 subclasses based on the fate of their illness: Group 1 with self-limited illness, Group 2 with reversible illness, and Group 3 with irreversible illness. Studying a representative group of 1,020 male opiate addicts consecutively admitted to the Public Health Service Hospital in Lexington, Kentucky, he found the incidence of medical patients addicted to narcotics was 27% among whites and 1.2% among blacks. This high incidence figure is often quoted to support the anecdotal data that the use of narcotic analgesics in patients with chronic illness leads to narcotic addiction. However, these data present a very biased view of the subject. In a more recent prospective study (Porter & Jick, 1980) monitoring the incidence of narcotic addiction in 39,946 hospitalized medical patients, of 11,882 who received at least one narcotic preparation, there were only 4 cases of reasonably well-documented addiction in patients who had no history of addiction. Their data, taken from a survey on a general population, suggests that medical use of narcotics is rarely, if ever, associated with the development of addiction. Further studies of prescription drug abuse provide other indirect data. The studies by Swanson (1973), Maruta (1979), Gault (1968), Bakewell & Wikler (1966), Ewing & Bakewell (1967) studied the abuse of analgesics in patients with chronic illness and found the abuse of non-narcotic analgesics or combination drugs to be a more common event than the use of narcotic analgesics. In fact, there are no data available on the patterns of drug use in patients with chronic pain in which specific attention has been paid to the degree of tolerance, physical dependence, or addiction in any of the patients receiving narcotic analgesics. This lack Of carefully defined retrospective or prospective drug studies offers limited support to the belief that chronic narcotic use for analgesia is associated with a high risk of addiction. Analysis of the patterns of drug intake in our series of cancer patients suggests that drug abuse and drug addiction should not be the primary concern of the prescribing physician. Our data suggest that drug use alone is not the major factor in the development of addiction, but other medical, social, and economic conditions seem to play an important role. This phenomenon has been well-supported by the studies of the US military personnel addicted to opiates in Viet Nam (Robins 1973). This natural experiment demonstrated that drug-using behavior was strongly dependent on a series of factors, including underlying personality and social, environmental, and economic issues, all of which greatly influence and alter the risk of addiction. Studies designed to evaluate these issues and to answer the questions are sorely needed. In summary, the evaluation and treatment of patients with cancer pain requires a specific expertise which should include a clear understanding of the nature of the pain and the various approaches of pain management. Carefully controlled clinical studies are lacking, and there is a need for a strong impetus to develop guidelines of care based on facts, not anecdotes.

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REFERENCES

Bakewell, W.E., Jr., and Wikler, A. Incidence in a university hospital psychiatric ward. J Amer Med Asso 196:710-713, 1966.

Dixon, R., Crews, T., Mohacsi, C., Inturrisi, C.E., and Foley, K.M. Levorphanol: radioimmunoassay and plasma concentration profiles in dog and man. Res Comm Chem Path Pharm 29:535-548, 1980.

Ettinger, D.S., Vitale, P.J. and Trump, D.C. Important clinical pharmacologic considerations in the use of methadone in cancer patients. Cancer Treat Rep 63:457-459, 1979.

Ewing, J.A., and Bakewell, W.E. Diagnosis and management of depressant drug dependence. Am J Psychiat 123:909-917.

Exton-Smith, A.N. Terminal illness in the aged. Lancet 2:305-308, 1961.

Foley, K.M. Pain syndromes in patients with cancer. In: Bonica, J.J., and Ventafridda, V., eds. Advances in Pain Research and Therapy. Vol. 2. New York: Raven Press, 1979. pp. 59-15.

Foley, K.M. The management of pain of malignant origin. In: Tyler, H.R., and Dawson, D.M., eds. Current Neurology. Vol.2, Chapt. 18. Boston: Houghton Mifflin, 1979. pp.279-302.

Gault, M.H., Rudwall, T-C., and Redmond, N.I. Analgesic habits of 500 veterans: incidence and complications of abuse. Canad Med Ass J 98:619-626, 1968.

Houde, R.W. Systemic analgesics and related drugs. In: Bonica, J.J., and Ventafridda, V., eds. Advances in Pain Research and Therapy. Vol. 2. New York: Raven Press, 1967.

Inturrisi, C.E., Foley, K.M., Kaiko, R.F., Colburn, W.A., and Houde, R.W. Methadone: pharmacokinetics and effects in cancer and chronic pain patients. (submitted for publication)

Kaiko, R.F., Wallenstein, S.L., Rogers, A., Grabinski, P., and Houde, R.W. Relative analgesic potency of intramuscular heroin and morphine in cancer patients with postoperative and chronic pain. National Institute on Drug Abuse Research Monograph, Proc 42nd Annual Sci Meeting, Comm Prob Drug Dep, Inc., 1980 (in press).

Kanner, R.M., and Foley, K.M. Patterns of narcotic drug use in a cancer pain clinic: recent developments in chemotherapy of narcotic addiction. Ann NY Acad Sci, 1981.

Kolb, L. Types and characteristics of drug addicts. Ment Hyg 9:300, 1925.

Lipman, A. Drug therapy in terminally ill patients. Am J Hosp Pharm 32:270-276, 1975.

Maruta, T., Swanson, D.W., and Finlayson, R.E. Drug abuse and dependency in patients with chronic pain. Mayo Clin Proc 54:241-244, 1979.

Mount, B.M., Ajemian, I., and Scott, J.F. Use of Brompton mixture in treating the chronic pain of malignant disease. Canad Med Ass J 115:122-124, 1976.

Pasternak, S.R., and Foley, K.M. Personality traits and cognitive style in chronic pain patients. Doctoral dissertation, Teachers College, Columbia University, 1980.

Pescor, M.J. The Kolb classification of drug addicts. Publ Health Rep, Supp 155. United States Public Health Service, Division of Sanitary Reports and Statistics, 1939.

Porter, J., and Jick, H. Addiction rare in patients treated with narcotics. New Eng J Med 302(2):123, 1980.

Rayport, M. Experience in the management of patients medically addicted to narcotics. J Am Med Ass 156(7):684-691, 1954.

Robins, L.N. A follow-up of Vietnam drug users. Special Action Office Monograph. Sci. A:1-23, 1973.

Swanson, D.W., Weddige, R.L., and Morse, R.M. Abuse of prescription drug. Mayo Clin Proc 48:359-367, 1973.

Twycross, R.G. Clinical experience with diamorphine in advanced malignant disease. Int J Clin Pharmacol 9:184-198, 1974.

Twycross, R.G. Value of cocaine in opiate containing elixers. Br Med J 2:1348, 1977.

Twycross, R.G. Choice of strong analgesic in terminal cancer: diamorphine or morphine. Pain 3:93-104, 1977.

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Appendix
Workshop Recommendations

Research

- Kathleen Foley, M.D.

Strongly supported the finely detailed recommendations of the Interagency Committee in the areas of urgent research needs. (The Interagency Committee on New Therapies for Pain and Discomfort-Report to the White House May 1979). In addition, submission was made by the Research subgroup as follows:

I. That chronic pain (acute pain also) be recognized as an important medical problem in this country and receive priority rating in the evaluation and treatment of patients in research funding.

II. Develop a taxonomy for chronic pain states to allow a series of further studies to follow.
    1. Presently there are taxonomy studies in pain being developed by The International Association for The Study of Pain (IASP).Request NIH support to implement-and facilitate work of this committee.

III. Study natural history of acute and chronic pain.
    1. Include epidemiology of pain
    2. Develop a national study in which various chronic pain states are evaluated.
    3. Patterns of care, economic, social, political impact of chronic pain would be part of study.

IV. Recognition of chronic pain as a disease state with its own characteristics.

V. Chronic pain should be recognized as having research goals:
    1. neuroanatomical
    2. neurophysiological
    3. neuropharmacological
    4. behavioral-psychological
    5. socio-economic
    6. ergonomic

VI. Establish specific committee for supervision of pain research grants.
    1. Specific funds for research in pain to be alloted to this committee.
    2. Not dependent on money from other agencies.

VII. Develop series of specific pain centers with specific expertise.
    1. Training center for physicians for research and clinical training in acute and chronic pain.
    2. Development of new methods for treatment of pain.

VIII. Develop National Data Bank for all pain studies.

Professional Education and Training -

Hubert Rosomoff, M.D.

I. Supports the premise that chronic pain be recognized as a disease entity.

   1. Separate funding for education, research, public information,and clinical management.

   2. Separate study section and council.

   3. Separate clinical management categories.

II. Education short term goals:

   1. Funding to be available for training programs for all categories of health professionals.

   2. Start with funding to establish pain programs to start soon.

III. Accept Dr. John Bonica's recommendations as follows:

A. Preliminary Tasks

   1. Epidemiologic studies on acute and chronic pain.

   2. Survey by DHHS in collaboration with the IASP and APS and U.S. school of medicine, dentistry, nursing and other allied health professions.

      a. What education and training students are receiving about pain in their schools.

   3. Survey of directors of residency programs of various specialties requesting similar information.

   4. For 2 and 3 use forms easy to fill out.

   5. Survey of AMA Committee on Education and, finally followup by emphasizing the importance of pain as a public health problem and the reasons for deficiencies and importance of teaching and education and training.

      a. Use articles in medical journals.

      b. Materials sent out to the above groups.

B. Undergraduate Education and Training (students of medicine, dentistry. nursing, psychology, social work, and other allied health professions)

   1. Core curriculum for medical students

      a. Lectures on basic aspects of pain by basic science and clinical algologists.

         1. The importance and magnitude of pain as a public health, sociologic, and economic problem.

2. Definition between acute and chronic pain.

3. Lectures on neuroanatomy, neurophysiology, biochemistry, psychology, and behavioral aspects of acute pain emphasizing wholistic approach.

    a. Emphasis of deleterious physical, psychologic, and behavioral effects and complications of inadequately relieved severe acute pain.

4. Lecture on mechanisms of chronic pain and the psychologic, social, and behavioral effects on patient and family.

5. Description of special acute pain problems and chronic pain syndromes including etiology, mechanisms, pathophysiology, and symptomatology.

b. Clinical aspects (to be taught in clinical years)

1. Press for retention of basic knowledge.

2. The review of various aspects of acute and chronic pain problems.

3. Basic principles of managing acute and chronic pain.

4. Evaluation and proper use of analgesics and related drugs--narcotics, non-narcotics, psychotrophic drugs, etc., including advantages, disadvantages, indications, contradictions, and complications.

5. Evaluation and proper use of psychologic techniques, behavior modification, hypnosis, biofeedback, psychiatric care.

6. Evaluation and proper use of diagnostic and therapeutic nerve blocks.

7. Evaluation and proper use of neuro-stimulating techniques, TNS, brain stimulation, and spinal cord.

8. Evaluation and proper use of neuro-surgical techniques.

9. The multidisciplinary approach to pain problems.

2. <u>Selective Courses</u>

a. Pretest of knowledge presented in-core curriculum.

b. Lectures, seminars, conferences to discuss specific pain problems.

        1. Acute pain such as postoperative, postburn, post-traumatic, acute pancreatitis, etc.

        2. Chronic pain syndromes, trigeminal neuralgia, causalgia and other reflex sympathetic dystrophy, low back pain, arthritis, cancer, etc.

C. <u>Test After Clerkship</u>

    I. Elective clerkship for dental students.

    2. Elective clerkship for nurses, social workers, etc.

    3. Sources of information

        a. Copies of lectures

        b. Reprints of key articles

        c. Small (100-500 pages) monograph or syllabus on pain and its aspects as taught in the core curriculum clerkship.

        d. Motion pictures

        e. Audio-visual techniques

        f. Audio tapes

        g. Attendance of symposia on pain held locally.

    4. Examination

        a. Written or practical examination to evaluate educational and training effort.

D. <u>Graduate Students</u> (Interns and Residents in Family Medicine or Special Training)

    1. Examination to evaluate retention of knowledge presented in undergraduate courses.

    2. Didactic course of lectures and seminars with focus and emphasis on pain problems encountered by each group.

    3. Team conferences (e.g., surgeon, anesthetist, nurse, social worker) for postoperative pain.

        a. Lectures and seminars on aspects relevant to pain care.

        b. Discretion of specific patients with various pain problems.

        C. Teaching rounds.

4. Sources of Information

    a. Same as A. 5

    b. Syllabus or monograph for each specialty.

    c. Postgraduate courses on pain at state regional, and national meetings.

    d. Attendance of pain clinic conference considering pain relevant to particular specialty.

E. <u>Graduate Courses for Practicing Physicians and Other Health Professionals</u>

1. One- to two-day courses, intensive, basic and clinical aspects.

2. Series of lectures over period of two months.

3. Week-long refresher course, intensive review of basic and current aspects and clinical demonstration by panel of basic scientists and clinical algologists.

4. One month clinical refresher course in pain clinic.

5. Fellowship for training of clinical algologists for periods of 6 months, 12 months, and 2 years.

6. N.B. all above should have examinations before and after course to evaluate efforts.

7. Circuit courses, one-day course by team of basic and clinical algologists.

    a. Develop panels of basic scientists and clinical algologists to put on two- to five-day course in different parts of country, pre-course and post-course testing.

8. Panel of basic and clinical algologists to participate in meetings of county, state, national societies, and community hospital staffs.

9. Develop audio tapes and audio-visual tapes on special topics, e.g., postoperative pain, causalgia, neuralgia, back pain, etc.

10. Attendance of APS and IASP meetings.

11. Health agencies, legal professionals, legislators, insurers, etc.

F. <u>Establish and Sponsor Special Workshops on Pain</u>

  1. Economics
      a. cost containment
      b. quality control
      c. providers
      d. beneficiaries
  2. Legislation
  3. Medical-legal aspects of pain

G. <u>Long Term Goal</u>

  1. Funding of program
      a. Clinical pain management
      b. Clinical pain management facilities

Public Education -- Joel Seres, M.D.

I. Specific Goals

1. Dissemination of Information

   a. Define chronic pain as a major health, social, and economic problem.

   b. Classify the problem in broad terms for public understanding of:

      1. acute pain

      2. chronic pain

      3. cancer pain

   c. Design educational programs on differences in treatment of acute and chronic pain.

   d. Survey public on present state of knowledge of pain.

   e. On the availability of a second opinion regarding medical care:

      1. how obtained

      2. where obtained

      3. what to do when second opinions are difficult to get.

   f. Identify existing resources regarding dissemination to public.

   g. Differentiate between impaired function versus limitation for public

   h. Identify family role and significant others on pain and its therapy.

   i. Identify effects of chronic pain on totality of person and their environment (family, social relationships, vocational).

   j. Educate as to seeking of help-no need to sit and suffer.

   k. Create clearing house specifically for pain similar to NCI Cancer Information Clearing House, but separate from that which exists for other diseases states.

II. Agree with Subcommittee's suggestion that ad-hoc working groups be formed depending on issues to be considered. As suggested in Subcommittee's report, <u>participants in the ad-hoc working group might include:</u>

1. Persons who have experienced various degrees of pain and discomfort associated with terminal illness
2. Persons who have experienced various health-related practices associated with terminal care
3. Boards of public and private education agencies
4. Civic, religious, and social groups
5. Employers and labor organizations
6. Health education specialists
7. School teachers and administrators
8. Adult educators
9. Community organizers
10. Outreach workers and counselors
11. Social service specialists
12. Communications media personnel
13. Psychologists, sociologists, and anthropologists
14. Health and education professional associations
15. Community councils
16. Medical school administrators
17. Medical association officials
18. State and local medical society representatives
19. State and local public health officers
20. American Public Health Association representatives
21. Health planners and organizers of health education programs
22. Insurance industry representatives
23. State compensation officials
24. Attorneys defense and plaintiff
25. Federal agencies--Social Security, etc.

III. Audience

1. Members of Congress
2. Staff of NIH and other Federal health agencies
3. Staff of state health agencies
4. Committees on education and training of undergraduate, graduate, postgraduate studies of AMA, state and county medical societies
5. Staffs of nongovernmental health agencies and groups interested in various health problems in which pain is a special problem:
    - a. American Cancer Society and other cancer groups
    - b. American Arthritis Association
    - c. American Heart Association, etc.
6. Biomedical science writers and other news media
7. Key TV people
8. Staff of insurance companies and-third party bearers of health services
9. Members of various large national and international organizations, e.g. Kiwanis, Lions, etc.
10. The public in general

IV. Mechanism for Public Education

1. Newspaper articles
2. Special articles in lay journals
3. TV programs
4. TV documentaries
5. Short brochures for lay people containing information about:
    - a. the general aspects of pain
    - b. special pain problems
6. Develop panels of speakers for personal presentations
7. Write small books for lay diffusion of information
8. News magazines
9. Telethons

V. Content of Information to Public

1. Current status of pain diagnosis, therapeutic modalities and agents
    a. Drugs and their use-control of nausea due to chemo and radiation therapy
        1. Marijuana and THC
    b. Management of pain
        1. Early (Aspirin, DMSO etc.)
        2. Terminal (heroin, morphine etc.)
    C. Proper administration of medication
        1. Drug abuse
        2. Drug dependence
        3. Addiction
2. Modalities for pain
    a. Acupuncture, biofeedback, hypnotherapy, etc.
3. Status of programs emphasizing humanitarian care of terminally ill, i.e., hospices
4. Pain centers and how they work

VI. Short Term Coals

1. Provide mass media presentation to public
    a. problems
    b. availability of treatment
    C. education
2. Funding
    a. public (government agencies)
    b. private (insurance companies, etc.)
3. Data gathering of public state of knowledge
4. Ad-hoc committee to develop programs, content organization
5. Early meeting date to continue process

VII. Long term goals

1. Develop programs based on data received
2. Develop material to meet these specific needs
3. Develop approach for dissemination of this material
4. Hire public education people to implement all of the above.

National
Institute on
Drug
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Research

monograph series

While limited supplies last, single copies of the monographs may be obtained free of charge from the National Clearinghouse for Drug Abuse Information (NCDAI). Please contact NCDAI also for information about availability of coming issues and other publications of the National Institute on Drug Abuse relevant to drug abuse research.

Additional copies may be purchased from the U.S. Government Printing Office (GPO) and/or the National Technical Information Service (NTIS) as indicated. NTIS prices are for paper copy. Microfiche copies, at $3.50, are also available from NTIS. Prices from either source are subject to change.

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NTIS
National Technical Information Service
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1 FINDINGS OF DRUG ABUSE RESEARCH. Not available from NCDAI.
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Vol. 2: GPO out of stock NTIS PB #272 868/AS $27.50

2 OPERATIONAL DEFINITIONS IN SOCIO-BEHAVIORAL DRUG USE RESEARCH 1975. Jack Elinson, Ph.D., and David Nurco, Ph.D., eds. Not available from NCDAI.
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