X. Arthritis

Biofeedback and Relaxation Training as an Adjunctive Treatment for Severe Rheumatoid Arthritis: A Preliminary Investigation

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Sponsor: VA Medical Center and State University of New York—Albany

Purpose — Most studies on rheumatoid arthritis (RA) to date have focused on the issues of diagnosis and personality factors, rather than any potential adjunctive treatment procedures. Further, treatment procedures that fail to attend to underlying physiological factors (i.e. psychotherapy) have reportedly met with little success. The few studies that consistently report improvements have utilized a combination of relaxation, thermal biofeedback, or other self-regulation strategies. However, no direct attention has been afforded the more chronic, severe RA patient and the potential gain of such procedures with these persons, the role that relaxation may be having in the treatment apart from the effects of biofeedback, nor how the actual sites of greatest inflammation are affected by these techniques.

Progress — Four male patients (mean age 48.8 years) from the VAMC-Albany's Rehabilitation Medicine Service were obtained through physician referral for inclusion in this study. Three of the subjects were diagnosed as suffering from Stage III RA (American Arthritis Foundation criteria), while the fourth was similarly diagnosed as having Stage II RA. Mean history of the disorder was 10.4 years.

Subjects were interviewed during an initial intake evaluation where they were informed of the purposes and procedures of the study. Each subject then completed a battery of psychological tests, which included the MMPI, STAI, BDI, and the Multidimentional Health Locus of Control. Additionally, range of motion, muscle strength in affected areas, and grip strength measures were obtained. Subjects were also asked to estimate the mean number of awakenings per night due to pain and duration of morning stiffness.

Following pretreatment evaluations, subjects were randomly assigned to 1-, 2-, and 3-week baseline periods, during which time they were seen on a twice weekly basis to gather EMG and temperature readings. EMG readings were from the non-dominant forearm and medically diagnosed the most inflammed joint. Temperature was recorded from the left forefinger. Patients were also requested to keep thrice daily pain ratings during baseline and treatment; these were done on a 0 to 100 scale (0 = "no pain", 100 = "worst imaginable pain").

Treatment sessions were conducted in a sound-attentuated, air-conditioned chamber and consisted of 1) initial discussion with the therapist of treatment progress and adequacy of home practice; 2) a 1-minute integrated baseline EMG (two sites) and temperature reading; 3) a 15-minute instruction in passive muscle relaxation augmented with autogenic phases; 4) a 4-minute return to baseline condition (with EMG and temperature readings); and 5) a 15-minute instruction

and practice in temperature augmentation biofeedback. Treatment sessions generally took place on a twice weekly schedule, though timing of sessions was sometimes modified to accommodate patients schedules.

Preliminary Results — One subject completed 12 sessions, one subject 10 sessions, and two subjects only five sessions. One became involved in outside treatment and dropped from the study. Another reportedly dropped out due to the aggravation of his pain from the requisite driving to the hospital. Each of the subjects completed post-treatment measures. Results suggest that increased hand temperature was not related to decreased pain ratings or increased physical functioning. Rather, the EMG readings suggested that increased relaxation may well be the more important factor accounting for improvements in chronic RA patients. There was no apparent direct relationship between EMG readings from the most inflammed joint and the nondominant forearm. While a complicated pattern emerged, most psychological measures of all patients showed a positive relationship to ratings of improvement by the patient and investigators.

The results of this preliminary investigation suggest that the gains for the chronic, severe RA patient are more modest than those reported in the literature. Further, the improvement seems tied to an increased ability to effect a muscular rather than a vascular alteration. The psychological factors of "renewed hope" and ability to impact on a "hopeless" condition were suggested, as was improved psychological functioning following treatment.

The Use of Biofeedback in the Adjunctive Treatment of Rheumatoid Arthritis: Components of Change and Underlying Psychophysiological Processes

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Sponsor: VA Medical Center and State University of New York—Albany

Purpose — The major idea to be developed will be the investigation of active and necessary treatment components in a non-pharmacological, adjunctive treatment of severe rheumatoid arthritis. The impact would be to identify what components within previously investigated treatment methods were most effective as determined by treatment outcome measures, and what effect, if any, these methods had on underlying immune system changes.

This study would investigate in a controlled manner, the singular impact of previous treatment methods on similar treatment outcome measures. Rheumatoid arthritic patients would be matched and assigned randomly to one of three treatment groups, or a waitlist control group. Treatment would involve receiving either thermal biofeedback, relaxation training, or cognitive therapy. Pre- and post-treatment measures will include appropriate laboratory tests to investigate T and B cells, and all treatment measures determined to be appropriate from earlier investigations will be continued to determine overall effectiveness. Follow-up evaluation would be necessary to measure the long-term impact of treatment and to rule out the cyclical improvements found in this particular disease.

This study holds two important factors that need consideration before development of a proposal. First, the T and B cell laboratory values require an expensive laboratory procedure at present, and would require additional support

to become possible, as would the necessary staffing to further the development and clarification of biofeedback as an effective treatment component for the large group of rheumatoid arthritics. Second, a recent study suggested that, in order to find appropriate subjects for inclusion in the study, it may become necessary to open the subject pool to the local community rather than a strictly veteran population. However, the impact of the study would have direct and considerable application to the veteran population served both in this medical center and nationally.

Future Plans — By 5 years, successful completion of this study and long-term follow-up will have demonstrated the long-term effectiveness of this type of intervention, and established its appropriate place within a treatment regimen for the rheumatoid arthritic veteran.

Illness Cognition and Coping in the Elderly (Human)

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Sponsor: National Institutes of Health

Purpose — The proposed studies use multi-dimensional scaling and open-ended interviews to uncover the content and underlying dimensions of elderly people's illness cognition, i.e., the cues they use to identify specific illnesses and their ideas about the cause, time line, and consequences of illness. The procedures will also tap how they respond emotionally to illness and how they cope with it. Scales will be developed to measure these factors in clinical populations so we can compare elderly and middle-aged respondents and patients to one another and to patients with four different chronic diseases (hypertension, COPD, arthritis, and cancer in remission). We will study how illness cognition affects emotion and coping, how all three affect selection of symptoms for reporting at clinic visits, how the three affect confusions between different illnesses, and how they influence compliance with treatment for problems presented by the patients in comparison to unreported problems uncovered by the practitioner. We will assess whether patients misidentify the nature and cause of illness because their expectations regarding symptom presentations are appropriate to the natural history of disorders in the middle rather than the later years of life.

The final goals are to see whether illness representations and coping are related to feelings of age and to the development of dependency and to unnecessary physical and psychosocial disability. Seeing illness as progressing uncontrollably with age may provoke loss of hope and depressive feelings and lead to apathy and withdrawal from social relationships. These hypotheses will be tested in the four clinical populations of elderly patients.

Finally, an intervention study is proposed comparing a participatory interaction with a standard treatment control. The participatory interaction is designed to enhance the patient's perception that he/she is an active agent in the identification and treatment of illness problems and to increase his/her feeling of competence, reduce his/her sense of psychological age, and generalize improved coping skills to everyday problems so as to reduce physical and psychosocial disability.

Impact of Arthritis Self-Care Programs for Rural Persons

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Sponsor: National Institute for Handicapped Research

Purpose — Chronic diseases such as arthritis are often inadequately managed by the health care system. The intent of this research is to develop an effective and efficient supplement to the existing health care services provided for persons with arthritis, especially those residing in rural areas. The specific aims of the research are to clarify the circumstances under which self-care education and social support, natural/informal and contrived/formal, influence changes in the knowledge, behavior, function, depression, and pain of persons with arthritis who reside in rural areas of western and southwestern Virginia.

Progress — The study uses an experimental design. Subjects, adult volunteers with verifiable rheumatic diseases, will be assigned randomly to the experimental conditions. The experimental conditions are: 1) an individualized self-care program; and 2) a small group self-care program. The education component will be standardized across the experimental conditions. All subjects will eventually receive some form of self-care education. The social support component will vary across the experimental conditions and will include contrived/formal components that will be adapted to the self-care learning needs of a rural population. The efficacy of intervention will be assessed periodically over an 8-month period. The effects of natural social support, demographic variables, medical diagnosis, and duration of disease will be controlled. The data will be analyzed through a variety of univariate and multivariate methods. Non-parametric methods will be used when necessary.

The research will be conducted by an interdisciplinary team consisting of a nurse-sociologist, community psychologist, rheumatologist, statistician, anthropologist, and nurse-health educator.

Preliminary Results — Work completed to date includes: 1) an assessment of the educational needs of rural persons with arthritis; 2) a self-care curriculum and six tapes and six booklets containing the curriculum; 3) pre-tests of the psychometric properties of several research instruments; 4) development of our instrument set; and 5) numerous scientific and community (key) presentations.

Arthritis Rehabilitation Unit

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Sponsor: National Institute for Handicapped Research

Purpose — The Arthritis Rehabilitation Unit (ARU) consists of 5 beds on an existing 22 bed rehabilitation unit in the Towers Building at the University. The Rehabilitation staff consists of a rheumatologist, orthopedic surgeon, physiatrist, rehabilitation nurses, occupational and physical therapists, social workers, psychologists, and health sports and rehabilitation counselors.

Progress — To date, over 104 patients have been admitted to the rehabilitation program. The primary diagnosis is rheumatoid arthritis, although patients with

other diagnoses such as degenerative joint disease, juvenile rheumatoid arthritis, and ankylosing spondylitis are admitted. Demographic information on the patients shows that the mean age is 62, mean disease duration is 14 years, mean education level is 10th grade, and a number of these people have concurrent medical conditions which can complicate the rehabilitation program.

The staff of the Arthritis Rehabilitation Unit is using the Arthritis Impact Measurement Scale, an outcome measure developed at the Boston University Multipurpose Arthritis Center, to assess patients on nine scales: mobility, physical activity, dexterity, household activity, social activity, ADL, pain, depression, and anxiety. Three-month, 6-month, and 1-year follow-up data are collected on all of the patients at the rehabilitation unit to help determine the long-term benefits of the rehabilitation program.

Training efforts have included a nursing program in arthritis for the rehabilitation nurses on the unit, a physical therapy consultant to discuss management of musculorskeletal problems in arthritis for the entire staff, and a statewide program for public health nurses in rehabilitation of patients with arthritis.

The current projects at the Arthritis Rehabilitation Unit include a rehabilitation survey of more than 500 rehabilitation units to help determine the scope of arthritis rehabilitation in the U.S. and the need for staff training in management of arthritis patients. The ARU staff has also been engaged in a cooperative effort with the Virginia Division of Rehabilitative Services to place a part-time vocational counselor in the Arthritic Clinic and make available a program evaluator to interview patients. Information is gathered on their employment status or disability status to determine the extent to which people with arthritis are placed on disability and the extent to which rehabilitation services are utilized.

Investigations of Osteoarthritis and Bone Loss

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Sponsor: National Institutes of Health

Purpose — Osteoarthritis and bone loss are the two principal age-related changes of the human skeleton. Even though these changes are considered inherent to aging, they may result in incapacitation ailments. Bone loss and osteoarthritis are universal phenomena. The advanced cases of osteoarthritis (degenerative joint disease) produce severe restrictions of movement associated with pain. Advanced bone loss may result in osteoporosis and frequent bone fractures. At some time during the fourth decade of life the human skeleton begins to loose bone. That is, bone mass decreases in relation to bone volume. In tabular bones, bone is resorbed from the endosteal surface. Because of the thinning of the cortical bone shell, bones lose their mechanical integrity and fracture more readily. The trabecular bone mass of the vertebral column also decreases with age. The vertebral plates decrease in density, lose resistance to vertical compression stress, and are more vulnerable to vertebral collapse. Most prominent are vertebral compression fractures and fractures of the femoral neck. The following skeletal sites are involved in the present study: hand-wrist, ulna and radius, and vertebral column.

Progress — This project deals with the epidemiological, genetic, and longitudinal aspects of osteoarthritis and bone loss among the following: 1) the participants of the Baltimore Longitudinal Study; 2) in a sample of normal children and adult Guamanians (Chamorros); 3) among patients afflicted with Amyotrophic Lateral Sclerosis/Parkinsonism Dementia Complex of Guam; and 4) in a study of bone mineral density and effect of muscular activity on bone in rats.

Ferrographic and Biochemical Analysis of Wear Particles in Human Joints

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Sponsor: VA Rehabilitation Research and Development Service

Progress — Our first short-term objective in the presently funded proposal was to identify those components of cartilaginous wear particles that produce cellular activation and contribute to arthritic changes. Investigation involving tissue culture experiments *in vitro* and animal studies *in vivo* have confirmed the importance of cartilage proteoglycans as mediators of inflammation and arthritic changes. Recent estimates of the proteoglycan content of human synovial fluid during rheumatoid and osteoarthritis are compatible with the hypothesis that our experimental findings reflect the pathophysiological condition of human arthritic joints.

The second short-term objective, to evaluate catabolin release in response to wear particles, has also been met. As we saw for collagenase, synovial cells secrete more catabolin when challenged with wear particles.

Preliminary Results — Finally, we are continuing to look at further selected patient groups by synovial ferrography, as planned. Particular attention is being applied to rheumatoid fluid, which has hitherto received little analysis by ferrography. Our preliminary studies show that ferrograms prepared from rheumatoid synovial fluids are strikingly different from those prepared from the fluids of non-rheumatoid joints. Wear particles are few in number, but a heavy precipitate of magnetized cells is recovered.

Multipurpose Arthritis Center, Northwestern University

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Sponsor: National Institutes of Health

Purpose — This proposal engages scholars and scientists from various schools and departments of Northwestern University and from the community in a comprehensive arthritis program. Five feasibility projects are proposed: cell cytotoxicity in rheumatoid arthritis; phenytoin modulation of collagen and collagenese synthesis in synovial cells and effect on macrophages; connective tissue constituent immunogenicity in juvenile chronic arthritis; synovial pathology in early osteoarthritis; and analysis of osteoarthritic and rheumatoid bone for use in prothesis design. These projects will support new young scientists as well as allow three senior scientists to extend or redirect their work.

The second area of focus is an interdisciplinary educational program, utilizing a problem solving approach, aimed at both professionals and patients. The three projects proposed are: train and evaluate rheumatology fellows as teachers of

medical residents using a new curriculum to be developed in outpatient musculoskeletal disease; evaluation of a problem-oriented, aerobic-like exercise program for arthritics; and the use of a discussion group format to enhance problem solving skills in the older osteoarthritic. The interdisciplinary team includes professional educators, a medical education evaluator, and health professionals at the medical school.

The third area of focus, community and health services research, draws upon a strong base of community involvement combined with the research excellence of Northwestern's Center for Health Service and Policy Research (CHSPR). Three interrelated projects explore various aspects of knee pathology. The first will develop and validate a measure of outcome for a subsequent comparative study. The second will examine the costs of treatments for osteoarthritis of the knee. The third builds upon the work of the earlier two to compare costs and efficacy of arthroscopic surgery and alternatives. Three additional projects add breadth to the research agenda focusing upon musculoskeletal impairment in the elderly, status of families with juvenile arthritic children, and a multi-center study of Social Security payment allocation systems.

The Biostatistics and Data Management Core will provide individual project technical assistance as well as database management for a computerized case-finding patient index.

Robert B. Brigham Multipurpose Arthritis Center

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Sponsor: National Institutes of Health

Purpose — This grant is requested to develop three areas of special interest. The first is applied research in which we aim to: 1) develop a necessary and sufficient database for the rational planning of health services to arthritics; and 2) develop and evaluate model components of cost-effective health care delivery for arthritis patients. We propose to develop and critically evaluate a 7-day rehabilitation work schedule; a model health care system for arthritis disability; stepped-up rehabilitation services to homebound patients; a system of follow-up of rheumatic disease patients discharged from a tertiary care facility; a patient-oriented strategy to improve clinical outcomes; and an educational strategy for the primary prevention of low back injuries in the workplace. As one of the four major joint replacement centers in the world, we propose to evaluate the cost-effectiveness of joint replacement by a multi-dimensional outcome assessment. We seek to document the economic burden to arthritics and the shortfalls in the present health care reimbursement scheme. We propose to evaluate the means by which interventions can be evaluated by comparing the relative merits of existing health status functional instruments.

The second priority is the development of a Core Unit for quantitative research methods, Clinical Epidemiology, and Evaluation Research, which would overlap with many activities of the center and would aid the process of training and establishing investigators. The unit would support at least 10 projects from the day-to-day management of special disease registries to clinical studies directed at improving clinical strategies and decision-making in rheumatology, as well as improving applications of basic research.

Finally, we propose pilot studies in a neglected area of research, the management of severe rheumatoid arthritis patients who have failed all conventional therapy. This will involve the protocols addressing the critical evaluation of total nodal irradiation therapy and leukapheresis therapy of refectory rheumatoid arthritis.

UCSF Multipurpose Arthritis Center

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Sponsor: National Institutes of Health

Progress — The Multipurpose Arthritis Center conducts a broad range of activities in each of three areas—education, community programs, and research. A strong basic research program includes studies in the underlying mechanisms of the rheumatic diseases, particularly immunological mechanisms. Almost all of this research is supported by sources other than the center grant. Among the activities directly supported by the current grant highest priority is given to education, particulary education of primary care physicians, nurses, and allied health professionals. Our objective is to improve the knowledge and skills of students and practitioners of these disciplines in caring for people with arthritis.

High priority is also given to research on a variety of issues in the delivery of health care to people with arthritis. The objective of this research is to construct a database on topics such as the distribution of rheumatology manpower, the costs and utilization of health services, and the causes and consequences of work disability, and to analyze the data for its implications for public policy.

The center also conducts programs in patient and public education and is both an advocate in the community for people with arthritis and a source of authoritative information about the special needs of this group.

Multipurpose Arthritis Center, Downstate Medical Center

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Sponsor: National Institutes of Health

Purpose — Downstate Medical Center with the support of the NIH-sponsored Multipurpose Arthritis Center Grant has been studying various aspects of rheumatology education, research, and community health care in Brooklyn. Through year two, we have had three components (research, education, and community services.) In year three, there are no research components. 1) Our education component is the largest of our center grant and involves the training of medical students, housestaff, primary care physicians (in-patient and out-patient) and nurses in the hope of influencing the care of patients with arthritis-related conditions. An in-depth cost/benefit analysis is being undertaken to determine if such training is beneficial, cost effective, and what modifications in our present system of educating groups of health professionals need to be done. The level of care of the patients involved with groups of health professionals will increase. 2) Another component is our community services. We are attempting to determine the factors that influence a patient with an arthritis-related condition to choose an entrance into the health system. Some choices are more beneficial, more ex-

pensive, and more harmful than others. If the factors concerning the utilization of our health care system are determined, we then can modify them to deliver better, more cost effective health care. We have set up several "self-help" groups to study the nature of patients with rheumatologic disorders. Are these groups similar to or distinctly different from other self-help groups with chronic disorders?

Another project involves a comparison of care by rheumatologists and primary care physicians for patients with similar rheumatic diseases. Year three of our Multipurpose Arthritis Center Grant involves completing data collection; we have developed and are utilizing a number of questionnaires developed by us (and shared with other centers), chart auditing, and computer techniques for categorizing and evaluating the data.

Multipurpose Arthritis Center, University of Missouri

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Sponsor: National Institutes of Health

Purpose — We propose the following objectives under Education and Training: 1) training of arthritis specialist professionals to become educators; 2) providing high quality continuing education programs for all professionals; 3) developing improved curricula in musculoskeletal disease for undergraduate and graduate education of primary care professionals; and 4) studying the effect of patient education and team care in knowledge, attitudes, and behavior in rheumatoid arthritis.

The research objective is to determine if a computer-assisted program can increase the efficacy of the expert rheumatologist to influence favorably the medical management for arthritis patients.

The Community Program objective is to: 1) determine the needs of various communities as related to arthritis; 2) plan programs best suited to meet these needs; and 3) conduct community demonstration programs in public and professional groups.

Methods will include questionnaires on information, attitudes, and behavior; computer analysis; regional and national conferences; team visits to communities; and personal participation in a multidisciplinary team approach to patient care in arthritis.

Multipurpose Arthritis Center, University of Connecticut Health Center

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Sponsor: National Institutes of Health

Purpose — The NIH Multipurpose Arthritis Center is currently funding four major educational efforts. The computer-assisted patient education project has completed a successful program for patients and their families with rheumatoid arthritis. This has been well received by patients and is currently undergoing testing by both patients and their families. Editing of the program will proceed along with the evaluation process. The physician-assisted program has completed a longitudinal study in which physicians are in contact with patients with rheumatoid arthritis over a period of 7 years. This is being evaluated by various

types of physicians and by medical students. Editing of the program will continue as the evaluation proceeds. Another program involves developing methods for teaching Family Medicine Residents, and during the next year more data will be available and the testing methodology improved. Another program involves teaching methodology and content development in the area of physical therapy. Undergraduate teaching of rheumatology by our NIH Multipurpose Center-funded physical therapist educator is now in progress and will be evaluated during the coming year.

The research project on C3 phenotypes has led to interesting findings, such as juvenile onset systemic lupus erythematosus patients have a higher incidence of one phenotype than adult onset patients. Patients with other rheumatic diseases are currently being evaluated. The Administrative Unit is functioning adequately for the Center.

Multipurpose Arthritis Center, Boston University

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Sponsor: National Institutes of Health

Purpose — This proposal describes a detailed plan to expand and strengthen the Boston University Multipurpose Arthritis Center (MAC). A program of activities and specific projects will be pursued in three major components: Research, Education, and Community/Health Services Research. The proposal also describes a plan to support areas of special research interest by means of two Core Units, and to continue an effective Administration Component.

The Research Component will build on a strong base of work funded from other sources. In addition, four Developmental and Feasibility studies are proposed: 1) a study of vitamin A metabolism in prealbumin forms of amyloid disease; 2) the isolation of cDNA clones for serum amyloid A; 3) an investigation of stair climbing in arthritis; and 4) a study of the difficulty dimension in functional assessments.

MAC education efforts will continue to be aimed at a broad spectrum of arthritis health professionals in conjunction with the Schools of Medicine, Nursing, and Allied Health Professions of Boston University. Specific projects in the education component will include an evaluation of the current status of house officer education in rheumatology at internal medicine and family practice residency programs, a study of the effects of a targeted training program on interpersonal skills of physical therapy students, and an investigation of coping in chronic arthritis.

Activities in the Community/HSR component of the MAC will continue to focus on the inner-city community in conjunction with the Department of Health and Hospitals of the City of Boston. Seven specific community/health services research projects are proposed: 1) a project to modify the Arthritis Impact Measurement Scales for use in clinical practice; 2) a project to develop a computer-based community network for clinical rheumatology trials; 3) an inner-city nursing home project combining outreach and data collection for this important population; 4) a study of the rheumatology referral behavior of general internists and family practitioners; 5) an epidemiologic study of osteoarthritis in conjunction with the Framingham Heart Study; 6) an epidemiologic study of oral

contraceptives and rheumatoid arthritis in conjunction with an established drug epidemiology group; and 7) an investigation of the relationship between stressful life events and disease activity in rheumatoid arthritis.

Two Core Units are proposed: an Amyloid studies Core Unit and a Research and Evaluation Support Core Unit. These Core Units will support numerous investigations in areas of special interest to this Center.

Multipurpose Arthritis Center, University of Alabama at Birmingham

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Sponsor: National Institutes of Health

Purpose — The Multipurpose Arthritis Center (MAC) of the University of Alabama in Birmingham (UAB) is a multidisciplinary effort by faculty and staff of the Schools of Medicine, Dentistry, Nursing, Public Health, and Community and Allied Health, as well as the University Hospitals and Clinics. A broad spectrum of ongoing and proposed activities focuses on basic and clinical research, education, community activities, and health services research.

Research in MAC includes studies in the areas of immunology, virology, mycoplasmology, molecular biology, genetics, connective tissue biochemistry, and clinical rheumatology. The Education Component spans the spectrum of professional, allied health, postgraduate, and public and patient educational activities. The Community and Health Services Research Component highlights socioeconomic factors that influence the well-being of patients with rheumatic disease.

This application includes feasibility proposals in fundamental research from seven investigators to study basic mechanisms involved in the pathogenesis of the rheumatic diseases. Five new projects are proposed in patient and professional education. Six projects are proposed in the Community and Health Services Research Component, including critical evaluation analyses applicable to this important area. In addition, three Core Units are proposed—continuation of the Hybridoma Core Facility, development of a new Immunogenetics Core, and a new Evaluation, Biostatistics and Data Management Core Unit.

The overall goals are to coordinate existing arthritis programs and initiate new programs in arthritis so that we can achieve 1) greater knowledge of the etiologies, pathogeneses, and therapies of the rheumatic diseases; 2) better systems of health education; 3) documentation and improvement of future patient services; and 4) a more enlightened community attitude toward arthritis.

Multipurpose Arthritis Center, Indiana University-Purdue University at Indianapolis

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Sponsor: National Institutes of Health

Purpose — The Arthritis Center at the Indiana School of Medicine (IUMPAC) is comprised of components for (a) research, (b) education; and (c) community programs. The research component supports basic studies on connective tissue biochemistry, control mechanisms in connective tissue metabolism, pathogenesis of osteoarthritis, immunologic tolerance, amyloidosis, the effects of immunologic mediators on muscle physiology, and joint biomechanics. In addition, it

encompasses clinical investigations in such areas as post-intestinal bypass arthritis, polymyositis, amyloid disease, and hypogammaglobulinemia.

The education component augments rheumatology training of fellows, house officers, medical students, Allied Health Professionals (AHPs), and patients. Particular emphasis is directed toward improving the training in rheumatology of house officers who aim ultimately to practice as primary care physicians. A Nurse Educator will serve as a liaison between the Rheumatology Division and the Baccalaureate, Graduate Nurse, and Specialist Degree programs in the School of Nursing. A Pediatric Rheumatology Paramedical Team (supervised by an IUMPAC-trained pediatric rheumatologist) is being established, and education in juvenile rheumatoid arthritis will be emphasized at all levels.

The community program will ink IUMPAC with private and governmental health organizations. It will evaluate the efficacy of an AHP Team in providing long-term care. The impact of the team approach on function, disease activity, and psychosocial adaptation is being assessed. Use of informational support groups for patients with rheumatoid arthritis, spondylitis, and lupus will be expanded and efficacy of the groups assessed. Outreach clinics, staffed by a rheumatologist and AHPs, will be established in communities in which specialized expertise is now lacking. Also, a system for regionalization of health care for children and adolescents with arthritis, utilizing community-based AHPs, (Project COUPLE), is planned.

University of Michigan Multipurpose Arthritis Center

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Sponsor: National Institutes of Health

Purpose — This proposal sets forth a plan for further development of the University of Michigan Multipurpose Arthritis Center (UMAC). Osteoarthritis (OA) is to receive special emphasis in the pilot research area and in a major epidemiologic study. The overall objectives of UMAC continue to include: 1) basic and clinical research dealing with the pathogenesis and treatment of the several rheumatic diseases; 2) continuation of education/training programs for physicians and other health professionals to meet the academic and patient care needs in the field; 3) development of new education programs for specific target groups; 4) expansion of a unique program of community-based education for primary care physicians; and 5) evaluation of each education effort by the best available methodology. Established research programs will be complemented by nine new pilot research projects that deal with a new animal model of OA, biochemical mechanisms in OA, new imaging techniques relevant to OA, three different studies of immune cell receptor function, HLA-DR phenotypes in juvenile arthritis, and a virus-induced murine model of polymyositis. Six new educational projects target teachers in the field of physical education, University students with rheumatoid disease, adults with rheumatoid arthritis, primary care physician trainees, juvenile arthritis patients in the public school setting, and assessment of rheumatoid patients with boutonniere deformities treated by nonsurgical means.

In the community programs component, a new study of critical factors that determine primary care physician involvement in continuing medical education

(CME) in the field of rheumatology is proposed. It will utilize previously collected CME data and also determine how new information reaches the primary care practitioner. The population of Tecumseh, Michigan will be re-examined to measure the incidence, regression, and progression of osteoarthritis and osteoporosis as compared to findings 20 years previously (1962-65). A random probability sample of the entire state of Michigan also will be studied to provide estimates of these two conditions in the general population and to identify possible intervention strategies. These research, education, and community projects will be supported by an Administrative Unit that is integrated into the established organization of the University. A special Tissue Culture Core Unit is proposed for continuation since it supports several of the established research programs within this Center. UMAC has the external support of private and state agencies, as well as the required institutional, professional, physical, and patient resources to achieve its stated objectives.

A National Arthritis Data Source (ARAMIS)

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Sponsor: National Institutes of Health

Purpose — ARAMIS (the American Rheumatism Association Medical Information System) is a rheumatic disease computer data bank system containing longitudinal clinical data for approximately 19,000 patients and 120,000 patient encounters. ARAMIS represents more than 100,000 patient-years of observation. The system operates from an IBM 370/3081 computer at Stanford University and is accessed nationally through TYMNET or TELENET communications networks using the Time-Oriented Data Bank (TOD) data management system.

The program is based upon the premises that chronic diseases have become the most prevalent health problems, that study of such diseases requires observation of occurrences over prolonged time periods, that the expense of longitudinal study requires use of economies of scale, that patient outcome in chronic disease results from a complex interplay between multiple factors, and that many important questions need to be studied with observational, in addition to experimental, techniques. This program has the goal of improving knowledge, management, and patient outcome in arthritis by providing long-term information relating disease severity, patient characteristics, social factors, and treatment to patient outcome. The program has two major aims; first to continue to develop a national data resource of high quality, longitudinal, accessible clinical data, and second, to employ these data in a systematic, multicenter investigative program of major clinical questions in the rheumatic diseases.

Program priorities include the classification and definition of diseases, the systematic study of long-term (6 to 20 year) outcomes, the economic impact of illness and treatment, and the study of regional and national differences. Thirty clinical investigators and epidemiologists at 12 institutions undertake over 50 projects annually. The present proposal includes classification studies of osteoarthritis, rheumatoid arthritis, vasculitis, and systemic lupus erythematosus; economic impact studies in each major disease; comparative studies of arthritis at different sites; population-based studies of incidence and prevalence; and long-

term studies of outcome in rheumatoid arthritis, juvenile arthritis, scleroderma, systemic lupus, osteoarthritis, and following joint surgery. With this project, 15 years of data development at numerous institutions are brought to bear upon major clinical questions, and very large and detailed longitudinal patient data sets are made nationally available.

Northeast Ohio Arthritis Center Support

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Cleveland, OH 44106

Sponsor: National Institutes of Health

Purpose — The long-term objectives of this proposal are: 1) to expand efforts directed towards the education of health professionals, patients, families, and the general public; 2) to develop, implement, and evaluate proteotype community/health services programs at a high level of scientific endeavor; and 3) to expand clinical and basic research efforts. New programs in education include 1) an evaluation of use of the education-influential in teaching rheumatology to family practice training units; 2) studies of continuing graduate medical education in arthritis with emphasis upon involvement of the learner in the identification of objectives; and 3) augmentation of an audiovisual library as an umbrella educational resource. Specific new community programs include 1) a systems analysis of arthritis health care delivery in Northeast Ohio; 2) identification of the legal needs of arthritis (chronically ill) patients; 3) studies of the perceived needs of arthritis patients, and available resources to meet those needs as viewed by the patient and community health nurses; 4) the establishment of an industrial data-base pertaining to arthritis problems and management in Northeast Ohio; and 5) an evaluation of NEOMAC/community organizational behavioral interrelationships.

Research programs are targeted to study cartilage metabolism and osteoarthritis, mediators of inflammation, acute phase reactants, the immune response in arthritis, genetic/clinical interplays in ankylosing spondylitis, and myopathic disorders. Core programs include a cell/tissue culture unit and an evaluation/education core as an overall resource to Center project components. Administration includes administrative policy, executive steering (operations), and community advisory committees to fully interdigitate Center/University/Community interface.