Walden University ScholarWorks

Walden Dissertations and Doctoral Studies

Walden Dissertations and Doctoral Studies Collection

2017

Impact of Osteoarthritis Self-Efficacy Toolkit on Adults with Osteoarthritis

Connie Hutley Kiser

Walden University

Follow this and additional works at: https://scholarworks.waldenu.edu/dissertations

Part of the Nursing Commons

This Dissertation is brought to you for free and open access by the Walden Dissertations and Doctoral Studies Collection at ScholarWorks. It has been accepted for inclusion in Walden Dissertations and Doctoral Studies by an authorized administrator of ScholarWorks. For more information, please contact ScholarWorks@waldenu.edu.

Walden University

College of Health Sciences

This is to certify that the doctoral study by

Connie Hutley Kiser

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Patricia Schweickert, Committee Chairperson, Health Services Faculty
Dr. Francisca Farrar, Committee Member, Health Services Faculty
Dr. Edna Hull, University Reviewer, Health Services Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2016

Abstract

Impact of Osteoarthritis Self-Efficacy Toolkit on Adults with Osteoarthritis

by

Connie Hutley Kiser

MSN, Walden University, 2014

BSN, University of Cincinnati, 2009

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2017

Abstract

Over 26 million U.S. citizens have a form of arthritis; osteoarthritis (OA) is the most common form. Self-efficacy (SE) is defined as a psychological construct which identifies an individual's confidence when performing a behavior. SE is deemed a vital judge of self-management (SM) in those with OA. The purpose of this evidence-based practice, quality improvement project was to improve SE in OA patients. The identified gap in nursing practice was the lack of SE in OA patients. The project question asked whether a toolkit with information regarding SE in OA can improve SE of management of disease-associated symptoms in adults with OA as evidenced by improved Arthritis Self-Efficacy Scale (ASES) scores pre- to post-program. Concepts and theory used to inform the doctoral project were SE, pain, SM and OA, and Bandura's theory of SE. The sources of evidence were obtained from a variety of peer-reviewed journals related to OA management, and the outcome was measured using the ASES. Thirty-five participants (16 males and 19 females) with a mean age of 62 from a physical medicine and rehabilitation clinic in San Antonio, Texas participated in the project. The National Institute of Arthritis and Musculoskeletal and Skin Disorders 2015 Handout on Health: OA was used as the SE OA toolkit. Mean scores from pre- and post-program were tabulated and compared to determine the outcome. Results showed improved ASES levels by 11.84%. Implications for nursing practice and positive social change include the enhancement of SE levels, which can improve compliance in SM by use of a toolkit and further as policy implementation for OA patients to improve SE and SM abilities.

Impact of Osteoarthritis Self-Efficacy Toolkit on Adults with Osteoarthritis

by

Connie Hutley Kiser

MSN, Walden University, 2014

BSN, University of Cincinnati, 2009

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2017

Dedication

This project is dedicated to my father, Richard Jon Hutley. From your mink.

Acknowledgments

I would like to thank Dr. Andrea Lindell, Dr. Patricia Schweickert, Dr. Jody Minnick, Dr. Murielle Beene, and all family and friends who have helped me reach this point in my academic career. The greatest thanks goes to my husband, Matt, for his unwavering support.

Table of Contents

Section 1: Overview of the Evidence-Based Project

Introduction

Over 26 million U.S. citizens have a form of arthritis (Centers for Disease Control and Prevention [CDC], 2014), and osteoarthritis (OA) is the most common form of arthritis (Litwic, Edwards, Dennison, & Cooper, 2013). Self-efficacy (SE) is a psychological characteristic which can improve and is a significant factor for those suffering with pain and other symptoms of OA (Marks, 2014; Somers, Wren, & Shelby, 2012). More specifically, SE is an individual's belief of their ability to manufacture a performance level which influences life events (Bandura, 1994). Bandura (1977) argued that the definition of SE is a person's confidence in their aptitude to accomplish activities essential to create precise routine fulfillments. Somers et al. (2012) argued that it has been found that patients suffering with OA are more likely to have low levels of SE due to pain, pain-related disability, and pain-related psychological distress.

There is significant correlation between SE and health status measures showing that SE levels predict health behaviors such as pain coping strategies, eating behaviors, and physical activity (Brady, 2011; Swift, 2012). Thus, the higher the SE level, the greater physical activity performed, the more effective pain coping strategies are, and the easier people can perform eating behaviors (Brady, 2011; Swift, 2012). Pain, function, mood ratings, depression, stiffness, physical well-being, and mental well-being are all affected in the disease process of OA (Brady, 2011). Allegrante and Marks (2003) posited that SE is associated with health behaviors, to include compliance, and heightened SE can enhance interventions for OA. Benyon, Hill, Zadurian, and Mallen

(2010) performed a systematic review to evaluate SE and coping strategies in adults with OA. SE was identified as a strong predictor in disability (Benyon et al., 2010). Allegrante and Marks found that SE has been strongly correlated with pain coping mechanisms by OA sufferers. Benyon et al. concluded that SE is an important prognostic factor for those suffering with OA. Furthermore, Benyon et al. urged that research be done to assess how important coping tactics are in caring for OA due to the minimal data in the literature. Finally, Benyon et al. believed that with additional research, the health care world will gain a better understanding of how coping tactics relate to OA suffering. This information could lead to a greater delivery of patient care and respectively, positive patient outcomes.

In this project, I evaluated the impact of a SE toolkit on patients living with OA as assessed by pain, pain-related disability, and pain-related psychological distress levels. Due to the chronic nature of OA, multiple interventions are often required to combat these symptoms for patients to have a high quality of life (Somers et al., 2012). These interventions include communication abilities, problem solving, cognitive management, relaxation, and pain instruction (Somers et al., 2012). These interventions relate to this project because they have been identified as directly related to a person's SE in managing pain and other disease symptoms (Somers et al., 2012). Intervention protocols have been identified as common treatment forms for patients with OA (Somers et al., 2012). By examining these intervention protocols, low levels of SE in OA patients could be identified. I will discuss this further in the following subsection. The goal of this project was to improve SE in persons suffering with OA. This project can provide society with positive outcomes by enhancing SE levels in relation to pain, pain-related disability, and pain-related psychological distress levels in OA sufferers.

SE is defined as a psychological construct that identifies an individual's confidence when performing a behavior (Allegrante & Marks, 2003). Approximately 27 million U.S. citizens age 25 and older are currently suffering with OA (National Institute of Arthritis and Musculoskeletal and Skin Diseases [NIAMS], 2015). SE is deemed a vital judge of pain coping means in those suffering with OA (Allegrante & Marks, 2003). A strong inverse link has been found between pain severity and SE (Blamey, Jolly, Greenfield, & Jobanputra, 2009). Furthermore, a systematic review performed by Reid et al. (2008) concluded that OA patients who confidently perform self-management measures report lower pain levels and make less provider visits. Benyon et al. (2010) argued that SE in relation to coping strategies is significant in foretelling factors for those suffering with OA (as cited by Swift, 2012). They concluded that lower SE levels can be problematic for OA sufferers.

The local nursing practice problem that I focused on in this doctoral project identified low SE levels in people with OA. The local relevance of the need to address the problem was to improve this population's SE so that they may better care for themselves. The results of this doctoral project hold significance for the field of nursing practice by providing additional information to assist in elevating SE levels in OA patients. Higher SE levels have the potential to improve patient outcomes (Swift, 2012). I aligned this doctoral project with the types of scholarly projects conducted by DNP-prepared nurses by developing and planning for quality improvement, performing a secondary data analysis to inform decision making and an evaluation of a current healthcare practice or program. By obtaining, examining, and implementing information on SE in patients with OA, nurses and interprofessional colleagues will have additional information about how patients with OA are impacted with the implementation of a SE toolkit.

Purpose Statement

The purpose of this evidence-based practice (EBP) quality improvement project was to evaluate the promotion of SE in patients with OA. I identified the lack of a SE toolkit for OA patients as the meaningful gap in practice. The project question asked whether a toolkit with information regarding SE in OA improves self-management of the disease-associated symptoms of pain, pain-related disability, and pain-related psychological distress levels in adults with OA. This doctoral project had the potential to address that gap-in-practice by contributing to the literature that the OA information included in the toolkit does improve SE, pain, pain-related disability, and pain-related psychological distress levels. Therefore, the goal of this project was to improve SE in OA patients.

Nature of the Doctoral Project

I found evidence foundational to this project in peer-reviewed journals, search engines, and national healthcare organizations. To provide information on educational programs and SE, the following evidence was used to support this project. Unsal and Kasikci (2010) explored whether an educational program on SE acuity would create a positive effect for individuals with arthritis. The Arthritis Self-Efficacy Scale (ASES) scale showed a significant change in ASES scores between the experimental and control group suggesting that the educational program was effective (Unsal & Kasikci, 2010). A similar study conducted by McKnight, Afram, Kashdan, Kasle, and Zautra (2010) evaluated SE on physical functioning in those with OA. They found that treatment which enhances a patient's SE can end the sense of helplessness. This finding supports therapies to promote SE to improve patient outcomes.

To achieve the purpose of this doctoral project, the evidence I collected to assess the outcome was ASES levels. Scores were obtained initially when an individual began treatment at a physical medicine and rehabilitation (PMR) clinic for their OA and again after 12 visits, or one month's time, of treatment and education with the SE toolkit. The scores were then compared to assess how the introduced education of the NIAMS (2015) OA: Handout on Health and McKenzie exercises used at the PMR clinic change ASES scores (The McKenzie Institute USA, 2016). The percentage difference was the main subject of evaluation. The design and method I chose to accompany this project was a before and after quality improvement project. I will provide a more detailed discussion of The NIAMS Handout and McKenzie exercises in Section 2.

To expound on ASES, this measure is a common scale utilized to evaluate participants' SE when dealing with OA and was developed by Lorig, Chastain, Ung, Shoor, and Holman (1989). This scale primarily evaluates SE in relation to pain, pain-related disability, and pain-related psychological distress which results from the OA disease process (Stanford Patient Education Research Center, n.d.). Barry, Guo, Kerns, Duong, and Reid (2003) argued that pain and SE are strongly related which provides further evidence that ASES is a notable measure for this project. The identified potential positive social change implications of this doctoral project were an enhancement of SE levels in relation to pain, pain-related disability, and pain-related psychological distress levels in OA sufferers. This doctoral project’s purpose was to connect the gap-in-practice of a SE toolkit to patients with OA and the use of an educational program to elevate SE levels.

Significance

It is estimated that more than 90 million people living in the United States are plagued with one or more chronic disorders (Hoffman, 2014). In the nursing field, this signifies a large patient population that requires a high level of patient empowerment so that they can better live with their disease (Hoffman, 2014). While patients are often expected to handle their symptoms with the help of their health care team, only a small portion has the mental, emotional, or physical ability to do so (Hoffman, 2014). This problem has been seen throughout other disciplines as well. The Institute of Medicine (2003) recently argued that managing symptoms for chronic diseases can improve patient care outcomes. Enhancing a person’s ability to manage a chronic health condition was a priority recently identified as a quality improvement measure (Institute of Medicine, 2003). Similarly, Askham, Coulter, and Parsons (2008) reported that the World Health Organization promotes that those suffering with chronic illnesses need to be empowered and educated to manage their health care situation. The agreement between the Institute of Medicine, Hoffman (2014), the World Health Organization, Somers et al. (2012), and Askham et al. illustrates the growing need for SE in chronic disease patient populations.

By making this topic a focus of discussion and active involvement, new research could significantly enhance health care outcomes for all Americans (Institute of Medicine, 2003).

SE promotion can assist learning new behaviors by adapting a maladaptive behavior to a positive behavior through positive reinforcement (Zulkosky, 2009). The significance of this project to nursing practice lies in a form of education to be used to assist patients in achieving greater control over their disease process and ultimately improve patient outcomes. When educating patients, multiple aspects about the person needs to be assessed to ensure the most effective form of teaching is provided (Adams, 2010). These aspects include education level, literacy level, readiness to learn, the presence of a strong support system, home environment, and the need of community resources (Adams, 2010).

OA often causes patients to report high levels of pain, disability, and distress (Somers et al., 2012). When determining which treatments will be most effective, biopsychosocial models are often the most researched (Somers et al., 2012). SE, as a psychological concept, has been identified as the most helpful construct in managing OA symptoms (Somers et al., 2012). Somers et al. (2012) claimed that pain, pain-related disability, and pain-related psychological distress levels show a strong correlation with reported SE levels. If nurses can elevate patients’ SE levels, then it can be hypothesized that higher SE levels can improve OA symptoms and ultimately improve patient outcomes.

Increasing health care costs have influenced all health care team members to encourage patients’ use of disease symptom self-management (Hoffman, 2014). Patients are now expected to take a greater role in the management of their health (Hoffman, 2014). The identified stakeholders for this project include all health care providers that treat patients suffering with OA. These providers include medical doctors, doctors of osteopathy, physician’s assistants, nurse practitioners, chiropractors, and physical therapists. By addressing OA and SE levels, these stakeholders can use this information to better serve and care for OA patients. A potential contribution of this doctoral project to nursing practice is the provision of an effective educational toolkit to OA patients that can improve patient’s OA symptomology. Since patient teaching is a core nursing responsibility, this toolkit will provide the nursing field with additional resources for their patients. Furthermore, this project has a high potential to transfer the information to other practice areas such as medicine, chiropractic, physical therapy, and even psychology. This project can provide these specialties with additional information in relation to behavioral and psychosocial interventions that have become an area of increasing research interest (Somers et al., 2012).

This project has the potential to improve people’s lives through elevating their SE so they can more effectively live with their OA. If pain, pain-related disability, and pain-related psychological levels can improve, patients should be better able to better care for themselves through self-management. By identifying an educational toolkit that increases SE for people with OA, mental, physical, and emotional disorders can be minimalized or even eliminated by showing patients that they are still able to care for themselves. This would provide positive social change. For persons coping with OA, SE could be especially significant for managing pain and other symptoms because SE can impact whether patients try to manage their disorder and whether they continue their management attempts when faced with challenges (Somers et al., 2012).

Summary

The CDC (2015) estimated that nearly half of the U.S. population may develop symptomatic OA by the age of 85. The CDC argued that in 2005, approximately 27 million adults were plagued with OA. This problem does not only cause personal issues through physical and lifestyle effects, but OA is also an economic burden for the patient, insurance companies, and nation-wide health care system (CDC, 2014, 2015; Litwic et al., 2013). The economic burden of OA is in dire need of attention due to the high frequency of its distribution in the population (Litwic et al., 2013). Total OA individual patient costs annually average $5,700 in 2000 (CDC, 2014). OA accounts for approximately 6% of all arthritis-related deaths (CDC, 2014). Increases in morbidity and mortality related to OA are large signifiers for the need of supplementary attention to this health concern (CDC, 2014). By further examining these factors, it is possible that morbidity and mortality rates could decline.

The purpose of this DNP project was to promote SE in patients with OA using a toolkit and then evaluate the toolkit’s effectiveness by ASES. The desired outcome was to view an increase in SE levels after implementation of patient education with a SE toolkit. This project will further nursing practice through the development and planning for quality improvement, conducting analysis of supplementary data to inform decision making, and providing an evaluation of a current healthcare program or practice. The results of this project could assist in the development and planning for quality improvement in health care settings for patients suffering with OA. Decision making could be assisted by the results of this project filling in the nursing practice gap related to this pressing issue. Finally, the results of this project will provide an evaluation of a current health care program being used in current practice. I believe this project will assist other fields of practice, such as psychology, medicine, physical therapy, and chiropractic, by providing additional information about a current health care program and showcasing the patient's journey through the OA process with their SE beliefs. Enhancing SE beliefs raises the chance of conduct development critical to a successful self-management process (Marks, 2014). Multiple experts in the medical community have strongly endorsed to assess SE in OA patients often (Marks, 2014). By regularly assessing SE, health care members and researchers obtain extra information about moods, thought patterns, impulse levels, and emotive causes that can prompt actions which promote health (Marks, 2014).

To further comprehend this issue and the project, the idea of concepts, models, and theories will need to be discussed in greater detail to successfully understand and implement this project. I will provide this information in the next section. After reviewing the problem, the corresponding plan for project implementation is the next step in the process for a quality improvement project. This problem showcases a strong mandate for further intervention to explore the possibility of a solution. This solution could be as simple as the addition of an educational toolkit which could improve pain,

pain-related disability, and pain-related psychological distress. I researched this hypothesis to view how it will assist OA sufferers. In the next section, I will discuss the background and context of this issue.

Section 2: Background and Context

Introduction

Nurses are known for their positive patient advocacy efforts. The local nursing practice problem that I focused on in this doctoral project was low SE levels in people with OA. The purpose and goal of this EBP, quality improvement project was to promote SE in patients with OA. I identified the lack of a SE toolkit for OA patients as the meaningful gap in practice. The identified question asked whether a toolkit with information regarding SE in OA improves self-management of the disease-associated symptoms in adults with OA. This research problem and question were consistent with nursing investigation procedures to create positive patient outcomes.

Theory and Concepts

Ideas such as concepts and theories are often used to guide research to keep a similar organization style to communicate knowledge (University of Florida, 1996). I chose pain, OA, SE, and self-management as the concepts to center this doctoral project around. The theory used to advise this DNP project was Bandura's theory of SE. This theory has shown to be an effective guide in varying levels and domains of research (Artino Jr., 2012). Furthermore, OA, SE, pain, and self-management have been the topic of investigations in numerous studies to contribute to society and impact social change.

Concepts

I chose Bandura's theory of SE (1977) to guide this project. Bandura (1977) argued that the definition of SE is a person's confidence in their aptitude to accomplish activities essential to create precise routine fulfillments. Pain has many definitions but should be looked at as being truly subjective; furthermore, pain relief is a legal and basic human right (Cheng, Foster, & Huang, 2003). Pain is slightly different than OA, SE, and self-management because it is the foremost motivation that people pursue healthcare (Cheng et al., 2003). The concept of self-management in the healthcare setting denotes a person's capability to cope with symptoms, treatment, physical and psychosocial concerns, and lifestyle alterations characteristic of living with a long-lasting disorder (Omisakin & Ncama, 2011). Finally, OA is a joint disease that can lead to loss of quality of life and severe disability (Uchoa de Rezende, Constantino de Campos, & Pailo, 2013). These concepts were guiding factors toward the successful completion of this project and knowledge dissemination.

My rationale for using SE as a concept for this doctoral project was due to SE being a mental representation of a person's ability to perform a task. Measuring self-management can monitor an individual's situation (Omisakin & Ncama, 2011). This acts as an assessment step. Furthermore, measuring self-management can provide feedback which can directly relate to enhancing quality of life (Omisakin & Ncama, 2011). These concepts are extremely important to nursing practice so that nurses can adequately and competently use the nursing process successfully. If nurses can properly assess these concepts in their patients, then they will be able to use the nursing process to act with interventions to optimize patient outcomes (Bay & Algase, 1999; Howe, 2012).

Bandura's Theory of SE

The theory I chose for this project was Bandura's theory of SE. This theory encompasses behaviors, environment, and personal and cognitive factors which influence

SE (Nursing Theories, 2012). While these factors all affect each other, the cognitive factors are the most important (Nursing Theories, 2012). This theory relates to this project by discussing human functioning, motivation, behavior, and beliefs that are strongly connected to what a person does and does not accomplish (Pajares, 2009).

Bandura's theory of SE explains the relationship between personal beliefs and daily functioning (Pajares, 2009). The belief of SE is more likely to determine behavior than the belief of an outcome (Pajares, 2009). Wood and Bandura (1989) argued that Bandura's theory of SE illustrates a person's self-reliance in their capability to demonstrate the enthusiasm, achievement strategies, and intellectual properties required to successfully accomplish the procedures in their life. Furthermore, Daltroy (1993) claimed that elevated levels of SE for executing health activities are conjectured to enable people's enhancement of their wellbeing. When this theory was developed, it was initially utilized to check the hypothesis that exposure to treatment conditions could result in behavioral modification by modifying an individual's strength and level of SE (Smith & Liehr, 2003). Results showed that SE was foretelling of succeeding conduct, and endorsed achievement caused more powerful and more widespread SE prospects (Smith & Liehr, 2003).

Synthesis of Primary Writings: Bandura's Theory of SE

In 1986, Bandura published the initial writings on the critical factors of human motivation and behavior (Pajares, 2009). This writing discussed the social learning theory, which then turned into the social cognitive theory (Nursing Theories, 2012; Pajares, 2009). The SCT states that learning happens in a social atmosphere with a vigorous and mutual interaction of the behavior, environment, and person (Boston University School of Public Health, 2013). The concept of SE was added after the evolution of the social learning theory to the social cognitive theory in 1997 (Boston University School of Public Health, 2013; Pajares, 2009). The theory of SE furthered the discussion about capabilities, self-perceptions, and personal judgments (Pajares, 2009). Investigative findings have identified this theory as an instrumental component in human beliefs, motivation, and action (Pajares, 2009). Clearly, this theory can continue to be used to close further gaps-in-practice in relation to SE.

The concept of SE. The concept of SE has recently been analyzed for further use. Zulkosky (2009) performed a concept analysis of SE using Roger's model which included the concept definition, explanation of surrogate terms, a description of the concept attributes, identified concept antecedents and consequences, and a discussion of a model case of the concept. Bandura (1995) secured the concept definition of SE as a component of thought that influences a person's motivation, behavior, thought, and feelings (as cited by Zulkosky, 2009). Zulkosky claimed that the significance of SE is extremely elevated; the greater the degree of perceived SE, the more advanced the goals will be that individuals set for themselves, which steers to a more sophisticated echelon of commitment to the goals. The identified concept attributes are cognitive processes, affective processes, and locus of control (Zulkosky, 2009). Cognitive processes allow for a person to use their thought processes to control aspects that affect their daily lives (Bandura, 1989). Affective processes can indirectly and directly alter cognitive processes and are dependent on how effective an individual believes they can cope (Zulkosky, 2009). Locus of control, also known as destiny, can be described as a person's thoughts about the primary reason of events in their lives (Zulkosky, 2009). An individual who effectively uses affective and cognitive processes to achieve a wanted outcome is one who has a high level of SE (Zulkosky, 2009). This is an illustration of having confidence in an internal locus of control (Zulkosky, 2009). If SE levels can be increased, individuals will be more likely to set higher goals and be committed to achieving those goals.

Social experiences ultimately affect someone's SE (Zulkosky, 2009). A person cannot obtain SE before they learn the behavior and believe they can carry out the behavior (Zulkosky, 2009). SE antecedents are social experiences, vicarious experiences, performance accomplishments, verbal persuasion, and physiological cues (Bandura, 1977). When a person can rely on physiological cues, accurately complete a task, watch another person accomplish a skill, or obtain positive reinforcements about completing a skill, they can achieve a sense of SE (Zulkosky, 2009). SE consequences are events that follow the concept of low levels of SE (Zulkosky, 2009). Identified low levels of SE are higher levels of depression and stress, lower motivation levels, focusing on potential complications, judgments of SE, and avoiding complex responsibilities (Zulkosky, 2009). Thus, higher SE levels should decrease the amount of SE consequences.

A model case of the SE concept was analyzed to identify proper usage (Zulkosky, 2009). Schunk (1981) performed a research study on children with a decreased level of arithmetic accomplishment to view whether perceived SE was a truthful prognosticator of mathematical presentation (as cited by Zulkosky, 2009). Schunk's hypothesis ultimately rendered correct–perceived SE was an accurate predictor of mathematical performance (as cited by Zulkosky, 2009). Furthermore, the model case showcased the three major SE attributes: locus of control, affective processes, and cognitive processes (Zulkosky, 2009). It is possible that elevated performance can stem from higher perceived SE levels.

The concept of pain. The concept of pain was originally described by Plato, Aristotle, and Descartes (Cheng et al.2003). Plato described pain as soulful emotional experiences from peripheral noxious stimuli (Cheng et al., 2003). Aristotle also described pain as a type of emotion–the opposite feeling of pleasure (Cheng et al., 2003). This unpleasantness included a condition of feeling and a feature from the soul (Cheng et al., 2003). Finally, Descartes illustrated pain as more of a connection or disconnection between the soul and mind (Cheng et al., 2003). These early philosophers all had the same pain theme with the similarity of including both mind and soul.

The concept of self-management. The concept of self-management has been a wide topic of discussion for the past 40 years (Ryan & Sawin, 2009). Initially, it was used to describe the phenomena of process, program, or outcome (Ryan & Sawin, 2009). Concept development has emerged so that there are multiple meanings of self-management in various specialties (McCorkle et al., 2011). In the psychology domain, self-management can be described as approaches utilized by individuals that effectively direct activities toward objective achievement (Omisakin & Ncama, 2011). Identified objectives include self-development, scheduling, planning, focusing, setting goals, making decisions, self-evaluation, and self-intervention (Omisakin & Ncama, 2011). Self-management has been identified as a concept which can facilitate and endow individuals and their families to care for themselves in a way to meet patient and provider concerns (McCorkle et al., 2011). Thus, improving self-management of disease-associated symptoms can enhance patient wellbeing which can result in positive social change.

The concept of OA. OA can be described as the most common form of joint disease which often affects feet, hands, knees, and hips (Uchoa de Rezende, Constantino de Campos, & Pailo, 2013). The first description of joint disease was identified by Hippocrates in the Fifth Century AD (Arthrolink, 2016). This joint disease, described by Hippocrates, included joint pain, inflammation, and joint dislocations (Arthrolink, 2016). These are all current identified symptoms and signs of OA (Uchoa de Rezende et al., 2013). Treatment modalities for this concept include medication administration, exercise, nutrition, use of durable medical equipment, and surgical interventions (Uchoa de Rezende et al., 2013).

Terms with Multiple Meanings

Self-esteem and self-confidence are concepts which can be easily connected to SE (Zulkosky, 2009). Self-esteem and self-confidence differ from SE because they refer to a person’s general measure of self-value or self-worth (Zulkosky, 2009). SE is more directly concerned with their judgment or perception of ability to attain a specific goal (Zulkosky, 2009). These two concepts obviously have dissimilar characteristics and thus can be separated from SE (Zulkosky, 2009).

Perceived SE is considered a surrogate term that is used interchangeably to express the concept of SE (Zulkosky, 2009). Perceives is a term explained by Zulkosky (2009) as to become cognizant of, through perception. Zulkosky argued that the word *perceive* is inferred in the definition of SE and does not alter the meaning. Furthermore, Zulkosky continued that an accurate description of concepts helps clarify key components for proper concept use.

Self-care and self-management are also two concepts which need to be outlined to avoid confusion. Self-care has been identified as culturally and situationally influenced (Omisakin & Ncama, 2011). Self-care includes an individual’s skill to care for oneself and their act of undertakings needed for wellbeing (Omisakin & Ncama, 2011). Self-management is an individual’s ability, with the help of others, to manage consequences of chronic disease (Omisakin & Ncama, 2011). Identified others include community members, health care professionals, and family members (Omisakin & Ncama, 2011). Identified consequences include symptoms; lifestyle changes; treatments; and cultural, spiritual, and psychosocial effects (Omisakin & Ncama, 2011). It is imperative to understand the differences between these concepts to effectively plan and intervene in patient care.

Arthritis and rheumatoid arthritis are concepts which can be connected to OA. Arthritis is an overarching term to describe all inflammatory joint disorders (Drug Health Review, n.d.). While arthritis encompasses OA, OA does not encompass arthritis (Drug Health Review, n.d.). The differences in these concepts not only include the pathophysiological aspects but also treatment and other self-care measures.

Relevance to Nursing Practice

In any nursing setting, nurses will encounter patients suffering with pain. Additionally, with the incidence of OA being so high, the probability for a nurse to not encounter a patient suffering with OA is extremely low. Nurses advocate for the entire patient to include physical, emotional, spiritual, social, financial, and safety care aspects (University Alliance, n.d.). The three core values that nurses encompass are patient equality, preserving human dignity, and freedom from suffering (University Alliance, n.d.).

Observational knowledge is the primary means for learned behavior and is communicated through displaying (Zulkosky, 2009). Ziegler (2005) argued that promoting SE is significant in order to assist patients to understand new activities through learning or demonstrating to change current maladaptive behavior through altering the anticipated reinforcement. The topic of this study is relevant to nursing practice because it assists in identifying the gap in research and nursing practice which involves improving SE in OA patients.

The current state of nursing practice for improving SE in OA patients is the encouragement of active and passive coping strategies (Nursing Times, 2012). These have been standard practices used previously to approach this issue. Active coping strategies include physical activity (Nursing Times, 2012). Examples of passive coping strategies are resting, retreating, worrying, and trusting on others (Nursing Times, 2012). Passive coping strategies have been linked to higher levels of disability and pain (Nursing Times, 2012). Active coping and SE strategies can decrease disability levels and improve overall mood (Benyon, Muller, Hill, & Mallen, 2013). This shows that current nursing practice needs to be altered to encourage active coping strategies and SE rather than passive coping strategies. Furthermore, passive coping strategies could even be discarded altogether.

This doctoral project advances nursing practice by providing active coping strategies in a standard educational format for OA suffers so that their SE levels can improve. The Handout on Health: OA information presented by the NIAMS (2015) was chosen for this project. While there are multiple different educational resources available via internet, magazines, pamphlets, and books, there is not one solid resource utilized to educate and improve SE in OA sufferers. To further expound on the active coping strategies, NIAMS encourages individuals plagued with OA to become educated on the subject, consume healthy foods, maintain a positive attitude, have fun, make sleep a priority, and stay active through strengthening, aerobic exercise, and flexibility. Therefore, the NIAMS educational handout has the potential to improve SE levels for those dealing with OA and hopefully become the standard of care for OA teaching.

Local Background and Context

A gap in knowledge was identified upon an established patient's progress evaluation related to treatment she received for low back and bilateral knee OA in a PMR office. The patient had initially entered the office with a chief complaint of constant lower back and lower extremity pain rated as 9/10 via the Visual Analog Scale (VAS); she used a walker to assist in mobility and showed signs of depression. After a complete evaluation, she began a PMR treatment program for bilateral knee OA. After 4 weeks of PMR treatment, a reevaluation was completed to show condition progression. Upon examination, it was determined that the patient had subjectively and objectively improved immensely. The patient reported a 25% decrease in frequency, intensity and duration of pain described as intermittent pain 5/10 VAS. She was also able to walk freely and without assistance However, during the examination a gap in knowledge was identified when the patient had become distraught; she began crying and asking if she would ever be pain-free again so that she could perform previously enjoyed activities. This illustrated a nursing practice problem by visualizing that she was unaware of her ability to perform physically at a higher level. SE levels were an issue here because she thought she still had pain-related disability even though she progressed to walking without an ambulatory aid. While pain is subjective, her levels decreased even though she still complained of pain. Objectively, her pain and pain-related disability improved. Her pain-related psychological distress had not changed from her initial evaluation. Her severely low levels of SE were the main reason for this scholarly project.

A before and after quality improvement project was chosen for this doctoral study because of patient encounters illustrating severely low levels of SE. With the fast pace of PMR clinics, many patients do not get the full attention they need in regards to performing home self-management measures to treat their OA. This situation is highlighted by the patient example explained in the prior paragraph. Improving her SE levels could have shown the individual the progress that she made in the short period of treatment she received. This could have pushed her to continue to work toward becoming healthier and happier in her disease state.

This project was completed in the city of San Antonio, Texas in a PMR clinic. The mission of this PRM clinic is to treat as many people as possible to get them out of their pain and suffering so that they may live a purpose filled life. The strategic vision of this PMR clinic is to provide high quality care and to help others live healthy, active lives. This vision aligns with the purpose of PMR and the goal of this project to improve SE heights in individuals plagued with OA. PMR is a healthcare specialty that promotes the return of full body function loss due to injury or disorders (Campellone et al., 2014). This clinic treats acute and chronic pain with non-narcotic pain therapies such as rehabilitation exercises, medical treatments such as large joint injections, and chiropractic services. This clinic's main patient population is individuals with OA, ranging in age from 24 to geriatric age. The average patient age ranges around 65 years old. In PMR, patients learn how to better care for themselves which in turn leads to better patient outcomes (Campellone et al., 2014). PMR is a specialty that can take this type of nursing practice problem and develop it into an idea that can guide EBP to better patient outcomes.

Operational processes relevant to understanding the doctoral project include the flow of patient care from an individual's initial visit. When a person entered the PMR clinic for OA treatment, they most commonly begin actual treatment on their second visit. Their first visit includes a full history, physical, and radiographic studies. Their second visit always includes their review of findings from the radiographs and often receives a therapeutic injection to relieve pain and improve functionality. Visits three through 11 include completing a minimum of two PMR exercises to include the McKenzie Method Mechanical Diagnosis and Therapy (MDT), therapeutic injections, and chiropractic care (The McKenzie Institute USA, 2016). The therapeutic injections include small to large joint injections, nerve block injections, and trigger point injections. Visit 12 is when the reevaluation takes place. This exam is another history and physical which is utilized to view a patient's progress toward wellness and their goals. These operational processes allow the best possible care to be given to patients by the health care team. This information related to this project by highlighting the common treatment for an individual who approaches a PMR office for OA treatment. Because this project focused on individuals with OA, understanding patient flow measures and interventions through a PMR office was paramount. These local processes highlighted that a PMR office can facilitate the development of SE levels using a multidisciplinary approach (Barlow, 2010).

Role of the DNP Student

I was currently employed at this clinic as a family nurse practitioner during the project timeline. I completed this project on a major problem that affects almost 100% of the clinic's patient population. As stated above, I encountered a patient extremely distraught about their lack of progress. I compared the patient's clinic notes to the patient so that the patient could view the objective progress shown. Furthermore, the patient's subjective VAS was compared from her first visit to the date of her reevaluation. At this time, I became passionate about this topic and desired to review it further to improve patient outcomes. It was important to understand that patient perspectives on care are major factors for both patients and key stakeholders (Agency for Healthcare Research and Quality [AHRQ], 2014). While positive patient experience and health care delivery can be significantly challenging, the focus was to improve the quality of health care for all encompassing positive solutions (AHRQ, 2014).

Any potential biases I may possess were patients illustrating a questionable subjective pain score with corresponding examination. Often times, patients report 10/10 VAS while they sat in the waiting room and carried on a laughable conversation with a family member. This made me question the patient’s pain level and complaints. In order to address this bias, I implemented a daily reminder on my project folder that stated that pain is whatever the individual experiencing the pain states it is, existing whenever the individual states it does (Cheng et al., 2003). Whether the bias was implicit or explicit, taking steps to refrain from biases can rid a person from their negative thoughts (Boyes, 2015).

Role of the Project Team

A small project team was needed for the successful completion of this project. I was the identified project director coordinating this scholarly project. The project director led the team toward successful project completion. This project director used a Chiropractor and executive associate of the PMR clinic team, as a project team member. This individual was presented with background information and evidence of this gap in practice throughout my DNP practicum. This project team member assisted with the population selection as well as the distribution and collection of the ASES questionnaire and NIAMS (2015) hand out. Weekly conferences were held between this project director and project team to share experiences and insights related to the project. Pertinent information was shared during non-scheduled meetings for a positive communication loop. The timeline of this individual’s responsibilities was to assess the need for her services daily and ensure the amount of obtained data was collected within the timeline. This project team member’s assistance was paramount to the success of this project and to further the progression of nursing and EBP.

Summary

SE and OA are shown to be interconnected when referring to patient care. Concepts used to inform the doctoral project include SE, pain, self-management, and OA. The theory used to inform the doctoral project is Bandura’s theory of SE. I linked this project with its relevance to nursing practice by caring for patients with OA, pain, and providing patient education which is directly linked to their level of SE. The role of the DNP project director was discussed as she was an employee of her practicum site with the passion to create a positive social change for her patients. It was necessary to discuss the plan for the collection and analysis of evidence for this DNP project. I will present the sources of evidence, analysis, and a synthesis of generated evidence in Section 3.

Section 3: Collection and Analysis of Evidence

Introduction

I identified decreased levels of SE in persons suffering with OA as the local nursing practice problem for the focus of this DNP project. This project’s purpose, completed as an EBP quality improvement task, was to appraise the advancement of SE in patients with OA by assessing their SE levels, provide an educational toolkit on OA with subsequent PMR OA treatment, and then reassess the patients’ SE levels. The background and context of this topic was fully developed in Section 2 after the gap in practice was identified. An established patient's progress evaluation post-PMR treatment she received for low back and bilateral knee OA illustrated extremely low levels of SE. Even though her subjective complaints of pain and her objective examination significantly improved, the individual was displaying a need for a different type of intervention. This background and context can be supported by Bandura’s theory of SE, SE, OA, pain, and self-management. In this section, I identify sources of evidence, published outcomes and research, archival and operational data, evidence generated for the doctoral project, and data collection procedures.

Practice-Focused Question

I recognized reduced levels of SE in people with OA as the local nursing practice problem in this project. The pinpointed gap-in-practice showcased that there is a deficiency of SE in OA patients. The project question asked whether a toolkit with information regarding improving SE in OA improved SE in patients with OA. The outcome of the project was evaluated for effectiveness by ASES. I believe that providing answers to these questions may further nursing practice and other professions by filling the gap in knowledge.

With this project, my target was to address the gap in practice by promoting SE in patients with OA through an EBP quality improvement project. I chose a PMR clinic in San Antonio, Texas as the study site location for this project using ASES to collect data. ASES scores were obtained initially when an individual began treatment at a PMR clinic for their OA symptoms and again after 12 visits, or one month's time, of treatment and education with the SE toolkit. The scores were then compared to assess how the introduced education of the NIAMS (2015) OA Handout in a PMR setting affected ASES scores (The McKenzie Institute USA, 2016).

Quality improvement as an outcome of EBP is the ultimate goal of knowledge transformation (Stevens, 2013). This approach aligns directly with the practice-focused question by transforming knowledge from health care team members to patients so that the patient may have improved symptoms and quality of life. Quality improvement approaches have been linked to creating new knowledge resources through EBP (Stevens, 2013). Applying quality improvement is a core competency for health care professionals (Stevens, 2013). Lastly, quality improvement can assist in answering the practice-focused question of this project by assessing organization, progression, and results for patient and public necessities through comprehension and dimension (Stevens, 2013).

Operational Definitions

Arthritis Self-Efficacy Scale (ASES): ASES is a measure targeted at persons diagnosed with arthritis, provided in the form of a questionnaire that identifies SE levels

(Stanford Patient Education Research Center, n.d.). The measure addresses pain, pain-related disability, and pain-related psychological distress (Stanford Patient Education Research Center, n.d.). The ASES has been modified many times to address the need for ease in completing the measure. The ASES measure that I used for this project was the 8-item ASES measure. To discuss the tool's validity and reliability, Wilcox, Schoffman, Dowda, and Sharpe (2014) recently investigated the ASES measure. Cronbach's alpha (0.87 to 0.94), omega (0.87 to 0.93), and greatest lower bound (0.90 to 0.95) internal consistency measures were high (Wilcox et al. 2014). Concurrent validity of ASES scores was significantly correlated with all assessed measures ($p < 0.05$; Wilcox et al., 2014). No modifications were needed for this instrument.

Before and after quality improvement project: This is a systematic action which leads to measurable changes in patient groups and health care services (Health Resources and Services Administration, n.d.). A successful project focuses on patients, data use, team collaboration, and systematic processes (Health Resources and Services Administration, n.d.).

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) Handout on Health: OA: This publication was created for persons suffering with OA by the NIAMS domain of the National Institutes of Health (NIAMS, 2015). This publication is not copyrighted as NIAMS (2015) encouraged readers to copy and distribute as many duplicates as needed. The document provides a wealth of information regarding the disease including self-management interventions (see Appendix A).

New patient welcome packet (NPWP): This NPWP was developed by the PMR clinic for the purposes of the clinic's purpose, goals, objectives, and subsequent treatment programs (see Appendix B). While the NPWP is administered by staff members who have been trained in administering it, the overall validity of the NPWP has not been established. The main Chiropractor at the PMR clinic, a leading expert in PMR, provides expert testimony in the face validity of this tool. It has assisted her practice with valuable information to appropriately and successfully treat her patients. Howard (2008) argued that nonvalidated instruments should be validated prior to use but this does not mean that diseases cannot be assessed. Howard continued that there are many clinical research cases without an existing validated instrument for a proposed population or disorder.

Osteoarthritis (OA): OA is also known as 'wear and tear' arthritis or degenerative joint disease (Arthritis Foundation, n.d.). OA is characterized by decreased space in a joint when the cushion or cartilage breaks down and causes swelling, stiffness, and pain (Arthritis Foundation, n.d.).

Physical medicine and rehabilitation (PMR): PMR, also known as physiatry, is a medical specialty that treats musculoskeletal and nervous system ailments (American Academy of Physical Medicine and Rehabilitation, 2016). Common PMR treatments include rehabilitation exercises/physical therapy, use of durable medical equipment, massage, stretching, medications, and referral to other specialists as needed (American Academy of Physical Medicine and Rehabilitation, 2016).

Self-efficacy (SE): SE relates to an individual's thoughts on their ability to perform specific performance levels which influence their life events (Bandura, 1994).

These ideas influence how an individual’s feelings, thoughts, behaviors, and motivations affect their daily lives (Bandura, 1994).

Toolkit: A resource which guides an individual on how to use their resources to improve the corresponding subject (Higgins, Kokotsaki, & Coe, 2012). Toolkits are created with information gathered from research (Higgins et al., 2012).

The NPWP that is given to each patient on their initial visit was developed by the executive staff at the PMR clinic which follows the Physician’s Business Solutions (PBS, 2015) program for clinic operations and management. The NPWP was created by utilizing paperwork from PBS (2015) while also adding clinic specifics to streamline patients through a comprehensive health history and physical. PBS offers thorough guidelines in their program to ensure that private clinic ownership and operations run smoothly in all aspects of office management.

Sources of Evidence

The identified source of evidence that I relied on to address the practice-focused question was before and after intervention data from the ASES scale. These data were collected from program participants. Viable patients were defined as those diagnosed by examination and radiographs with OA who also complain of pain, pain-related disability, and pain-related psychological distress.

The Arthritis Self-Efficacy Scale (ASES)

ASES is a scale focused on those suffering with arthritis; assessing SE levels; and targeting pain, pain-related disability, and pain-related psychological distress levels (Stanford Patient Education Research Center, n.d.). This handout was created by Lorig, Chastain, Ung, and Holman (1989), and this publication is not copyrighted. At the time of the study, it was being distributed by the Stanford Patient Education Center (n.d.) as free to use without permission (see Appendix C). This questionnaire has been reduced from 43 items, to 20 items, and then again to eight items (Medical University of South Carolina, 2015). In this project, I used the 8-item questionnaire. The questions were as follows:

1. How certain are you that you can decrease your pain quite a bit?
2. How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with your sleep?
3. How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with the things you want to do?
4. How certain are you that you can regulate your activity so as to be active without aggravating your arthritis or fibromyalgia?
5. How certain are you that you can keep the fatigue caused by your arthritis or fibromyalgia from interfering with the things you want to do?
6. How certain are you that you can do something to help yourself feel better if you are blue?
7. As compared with other people with arthritis or fibromyalgia like yours, how certain are you that you can manage pain during your daily activities?
8. How certain are you that you can deal with the frustration of arthritis or fibromyalgia? (Stanford Patient Education and Research Center, n.d., para. 3)

I performed the scoring by using a 1 to 10 scale where 1 begins with "very uncertain" and 10 is "very certain." If two numbers were circled, then the lower number was coded (Stanford Patient Education and Research Center, n.d.). Overall scale scoring is the mean of the 8-item scores (Stanford Patient Education and Research Center, n.d.).

NIAMS (2015) Handout on Health: OA

This document was available on the NIAMS (2015) website and provides readers with information on the disease state of OA (see Appendix A). This informational toolkit was not copyrighted. The main headings in this publication included:

1. Who Has Osteoarthritis?
2. How does Osteoarthritis Affect People?
3. Osteoarthritis Basics: The Joints and Its Parts
4. How Do You Know if You Have Osteoarthritis?
5. How Do Doctors Diagnose Osteoarthritis?
6. How Is Osteoarthritis Treated?
7. Who Provides Care for People With Osteoarthritis?
8. What You Can Do: the Importance of Self-Care and a Good-Health Attitude
9. Research Highlights
10. Hope for the Future
11. For More Information
12. Key Words (NIAMS, 2015, pp. 1)

Furthermore, this publication provided visual tools to illustrate the most common areas for OA, a healthy joint, a joint with severe OA, and the different type of exercises recommended for persons with OA (NIAMS, 2015). This document also provided a disclaimer in the initial paragraph that directed the reader to their provider if they had additional questions after reading the document (NIAMS, 2015). Additional resources on OA are located at the bottom of the document.

Patients were given the NIAMS (2015) Handout on Health: OA after their ASES levels were assessed. The ASES was given to patients on their third visit and then again on their 12th visit, or one month’s time. I compared the scores to answer the practice-focused question of whether an OA toolkit regarding SE improved self-management disease-associated symptoms of pain, pain-related disability, and pain-related psychological distress levels in adults with OA.

The relationship of this evidence to the overall project purpose can be clarified by my theorized positive correlation that an OA SE toolkit would improve overall pain and suffering of OA patients in ASES measured scores. The collection and analysis of this evidence provided me with an appropriate way to address the practice-focused question by illuminating that with the help of patient education as a SE toolkit, OA sufferers will improve their overall quality of life and functionality so that they may live a purpose-filled life. ASES assisted me in gathering evidence to illustrate this relationship.

Published Outcomes and Research

When performing the literature review for this project, a plethora of relevant published findings and conclusions from other scholars and researchers was found. Sources of evidence ranged from peer-reviewed journals and organizations that specialize in OA and SE. Search engines such as Google, Bing, CINAHL, MedLine Plus, PubMed, and the Cochrane Database of Systematic Reviews were searched. Evidence was collected from journals including *Pain, Musculoskeletal Care, BMC Musculoskeletal Disorders, Journal of Orthopedic Sports Physical Therapy, Arthritis and Rheumatology, Rheumatology, Journal of Advanced Nursing, International Journal of Caring Sciences, European Journal of Physiotherapy, Journal of Gerontology, British Medical Bulletin, Health Psychology,* and *Journal of Behavioral Medicine*. Organizations that are national leaders in OA and SE include NIAMS, CDC, National Institutes of Health Senior Health, and Stanford Patient Education and Research Center. The three main educational sources found for OA SE have been developed by the Arthritis Foundation (2015), Arthritis Research UK (n.d.), and NIAMS (2015).

Literature search strategies utilized for this document were extensive in nature. I included the terms *osteoarthritis, pain, self-efficacy, self-management, concept of osteoarthritis, concept of pain, concept of self-efficacy, concept of self-management, patient education, behavior, disability, pain-related disability, pain-related psychological distress, arthritis scale, arthritis symptom measurement, acute pain,* and *chronic pain*. These key words assisted in the identification and development of this literature review.

Publications from years 1977 to 2016 were utilized for references. Searching the Walden University (WU) databases CINAHL and MedLine Plus, PubMed, and the Cochrane Database of Systematic Reviews, 110,534 articles were found. The Google search retrieved 38,200 results and the Bing search retrieved 682,000 results. Of these, nine from WU databases, 55 from Google, and two articles from Bing were used respectively. Finally, this literature review will cover the discussion of the relationship between OA, pain, SE, and self-management, current EBP guidelines for addressing SE in OA patients, and patient education programs or teachings for elevating SE levels in OA patients.

The purpose of the literature review was to identify whether there were any previously identified EBP guidelines to address low SE levels in OA patients with an educational toolkit or program. Over 27 million people age 25 and older living within the United States are diagnosed with debilitating degeneration of the joints known as OA (Lawrence et al., 2008). This statistic highlights a major population ranging from young adults to elderly adults suffering from the same diagnosis. If even a small portion of this population experienced low SE levels, this could significantly affect national processes from prescribing medications and durable medical equipment to disability/ability to work statuses. In contrast, by elevating SE levels in even a small portion of the identified 27 million, there could be less prescribing of pain medications and durable medical equipment and increase individual functionality. This could result in nationwide positive social change. Due to the lack of an established primary SE toolkit for persons suffering with OA, this topic needs to be fully explored.

Some learning programs have been put into use for those suffering with OA. Unsal and Kasikci (2010) explored whether an educational program on SE acuity would create a positive effect for individuals with arthritis. The ASES measure showed significant change in ASES scores between the experimental and control group suggesting that the educational program was effective (Unsal & Kasikci, 2010). While this was only one study involving the topic of arthritis, ASES measure, and educational program, it still correlates with this project director’s hypothesis that an educational toolkit can elevate SE levels in OA sufferers. A similar study conducted by McKnight, Afram, Kashdan, Kasle, and Zautra (2010) evaluated SE on physical functioning in those with OA. They found that treatment which enhances a patient’s SE can end the sense of helplessness (McKnight et al., 2010). While a decrease in physical functioning could relate to feelings of helplessness, a contrasting perspective of an increase in physical functioning could relate to no or lowered feelings of helplessness. This evidence supports therapies to promote SE to improve patient outcomes.

Somers et al. (2012) identified that arthritis pain can cause distress in those suffering with the disorder. Somers et al. researched whether current intervention studies affected psychosocial and behavioral interventions on SE for symptom management in a systematic review. Results illuminated that exercise interventions can improve SE levels for managing pain and other symptoms (Somers et al., 2012). Instructor-led group exercise and self-directed exercise were both found during research investigation. It was found that both interventions can improve SE. However, the intervention showing the greatest impact was beginning with instructor-led exercise and transitioning to self-directed exercise in improving SE levels for pain and symptom management of arthritis (Somers et al., 2012). Many individuals argue that they would exercise if they could, but their pain is what prevents them from exercise. Initial exercise led by an instructor could redirect thoughts of pain and reductions in physical functioning. Instructors could provide verbal SE interventions to improve individual self-management of the disease. In this project, the intervention of the NIAMS (2015) Handout on Health: OA was initially verbally taught to patients. They were then encouraged to read it again at home and return with any questions as needed. Somers et al. supported the initial verbal contact with patients then continue with self-driven interventions.

Recommendations from Somers et al. (2012) include examining minority populations with psychosocial and behavioral arthritis interventions due to the lack of this research in the literature. Minority populations were identified as those with differing ethnic and racial backgrounds (Somers et al., 2012). Somers et al. concluded that ASES is one measure which could be utilized in clinical practice in order to identify arthritis sufferers with low SE levels. Somers et al. supported the purpose and action of this project.

There is significant correlation between SE and health status measures (Brady, 2011). Pain, function, mood ratings, depression, stiffness, physical well-being, and mental well-being are all affected in the disease process of OA. Brady (2011) argued that SE has been shown to forecast health activities such as pain coping approaches, eating manners, and physical activity. Thus, meaning if someone believes that they can manage their pain, then the results of their pain management actions are effective. Allegrante and Marks (2003) continued on that SE is associated with health behaviors, to include compliance, and heightened SE can enhance interventions for OA. Therefore, increased SE levels can improve OA symptoms after OA interventions. Furthermore, Blamey, Jolly, Greenfield and Jobanputra (2009) studied arrays of pain and SE for patients who attended an outpatient rheumatology clinic who had any form of pain or arthritis. They found a strong inverse link between pain severity and SE. While this study was not inclusive for OA only, it still provided a strong correlation and pain is a major factor in OA. Benyon, Hill, Zadurian, and Mallen (2010) argued that SE in relation to coping strategies is significant in foretelling factors for those suffering with OA. Benyon et al. (2010) urge that extra research be done to assess how valued coping tactics are in the OA battle. Low SE levels can lift the odds of negative patient outcomes for OA patients (Swift, 2012). Since individuals receive health care treatment to improve their symptoms and disease process, then high SE levels will be necessary for positive patient outcomes.

Several studies in the systematic review utilized gender as a specific factor in their population. Harrison (2004) took a sample of women to determine the relationships between balance, pain, level of OA, and SE, and the relative effects of SE, balance, pain level, and level of OA on function. Harrison utilized ASES along with the Functional reach test and the Western Ontario and McMaster Universities Arthritis Index. The Functional reach test was developed by Duncan, Weiner, Chandler, and Studenski (1990). The Western Ontario and McMaster Universities Arthritis Index was developed by Bellamy in 2002 (American College of Rheumatology, 2015). Evidence from this study suggested that SE is an important factor affecting the functional performance outcome for knee OA sufferers (Harrison, 2004). One suggestion from this study's results is that SE must be addressed in health care management (Harrison, 2004). This suggestion aligns with Swift's (2012) statement that low SE levels are directly related to negative patient outcomes. This project's goal was to improve SE in OA patients so that they may have improved outcomes. The evidence continues to identify that SE is a major contributor of symptoms and functionality. SE should be an element of healthcare that is monitored closely. This project’s results were hopeful in influencing the health care world to monitor SE levels to better serve their patients and elevate their health status.

There are a variety of patient education programs that have been utilized for patient care regarding OA. Ekvall-Hansson et al. (2010) took the patient education program for OA (PEPOA) from Primary Health Care in Malmo to evaluate its effects. The purpose was to evaluate PEPOA’s impact on SE, self-perceived health, and function (Ekyall-Hansson et al., 2010). This study was constructed as a single-blind, randomized controlled trial using ASES and the EuroQol-5D scales to measure SE and self-perceived health (Ekyall-Hansson et al., 2010). Function was measured separately for lower extremities using five different functional examinations (Ekyall-Hansson et al., 2010). The Grip Ability Test was utilized to measure function in the upper extremities (Ekyall-Hansson et al., 2010). Results showed differences in the control and intervention groups with the EuroQol-5D and in standing on one leg with eyes closed groups at baseline and after six months (Ekyall-Hansson et al., 2010). These results favored the intervention group (Ekyall-Hansson et al., 2010). These groups showed no other differences (Ekyall-Hansson et al., 2010). Conclusions suggest that patient education for patients with OA can improve self-perceived health and function to an extent, but not SE (Ekyall-Hansson et al., 2010). Results could have been different if the participants viewed the initial and final results of their self-perceived health status and functional balance. By showing an individual that they progressed even though they were unaware of the forward progression could have improved the results. Final suggestions for further research argue that the effect of exercise performance on function and SE is still needed (Ekyall-Hansson et al., 2010).

Systematic reviews provide the highest level of evidence for EBP guidelines. A systematic review performed by Marks (2014) reviewed whether SE related to arthritis can increase, and if so, what are the best possible practice interventions. This systematic review also investigated SE arthritis elements, the relationship between SE attributes and arthritis symptoms, and whether there is a dose-related effect between SE thoughts related to arthritis outcomes, management behaviors, coping, and pain control (Marks, 2014). Marks found that there is a dose dependent manner between an individual’s SE thoughts and magnitude of arthritis disability. Furthermore, developing SE in individuals can increase SE levels (Marks, 2014). The literature continued that developing SE, whether with direct or indirect methods, can increase SE levels (Marks, 2014). This systematic review illustrates that this topic needs additional testing through nontheoretical and theoretical approaches to determine the role of SE in specific patient outcomes such as physical, social, emotional, and functional statuses (Marks, 2014). The literature continues to argue that SE is directly related to an individual’s level of OA disability. This information urged a further look in to this topic.

Somers et al. (2010) utilized the Arthritis Impact Measurement Scales 2 and the ASES measure to assess whether SE and severity of disease explained overall functioning and pain in those suffering with rheumatoid arthritis. SE domains were identified as pain, functioning, and other symptoms (Somers et al., 2010). Disease severity was defined as abnormal joint count, physician’s rating, and C-reactive protein levels (Somers et al., 2010). Findings of this study show that severity of disease was directly related to each SE domain, physical functioning, and pain (Somers et al., 2010). Furthermore, each domain of SE was related to its respective functioning domain (Somers et al., 2010). Somers et al. concluded that SE and severity of disease both impact the overall functioning of one suffering with rheumatoid arthritis. Intervening in SE and severity of disease could improve patient outcomes (Somers et al., 2010). While this study did not classify participants by their disease severity such as Grades 1through 4 of OA, it would be interesting to view whether the results matched Somers et al.'s results of disease severity matching pain, physical functioning, and SE domain.

Arthur et al. (2009) investigated whether education and rehabilitation improved behavioral conditions in arthritis sufferers. The identified behaviors include pain control, managing stress, beginning physical exercise, controlling fatigue, consuming a nutritious diet, using devices to protect joints, effectively communicating, becoming knowledgeable about arthritis, taking prescribed medications as directed, and getting restful sleep (Arthurs et al., 2009). All of these interventions match common treatment modalities within the specialty of PMR. The outcome measures utilized were the Readiness to Manage Arthritis Questionnaire, the Centre for Epidemiologic Studies-Depression Scale, ASES, Health Assessment Questionnaire, and a medical status and demographic questionnaire (Arthur et al., 2009). Results illustrated that readiness to manage symptoms was significantly associated with psychological well-being (Arthur et al., 2009). This allowed those administering the outcome measures to intervene in helping patients adopt a new behavior when they were ready to handle the behavior change (Arthur et al., 2009).

This monitoring brings patient care to a whole new level – intervening when one is ready to handle behavior change. While this project did not monitor for an individual’s readiness to change, it is a topic that needs to be more fully explored. Once an individual adopts the behavior and can perform the behavior, this translates to self-management behaviors (Arthur et al., 2009). Many studies exclusively targeted knee OA. Specifically, Rejeski, Craven, Ettinger, Jr., McFarlane, and Shumaker (1996) reported that SE contributed significantly to understanding perceived ability for knee OA. Knee OA sufferers have a reasonable level of confidence for physical activity but knee pain can significantly impact those beliefs and effect SE levels (Rejeski et al., 1996). Brand, Nyland, Henzman, and McGinnis (2013) performed a systematic literature review and meta-analysis about knee OA, arthritis self-management education, and ASES. Results showed small to moderate positive effects (Brand et al., 2013). Brand et al. (2013) argued that educational programs with exercises need to be established to better augment SE for knee OA. Yip et al. (2007) performed a randomized controlled trial for knee OA sufferers by implementing a self-management arthritis program. Yip et al. concluded significant improvements in arthritis SE levels after the implementation of the self-management program. Finally, Sunden, Ekdahl, Magnusson, Johnsson and Gyllensten (2013) used the ASES when evaluating hip OA, physical function, and SE. Sunden et al. found that positive SE and good physical ability are highly important factors in health-related quality of life in hip OA sufferers. Many of these studies utilized the ASES measure to monitor a participants SE levels with the reports of individual interventions. This project director understands that ASES is a strong measure to continue with closing the knowledge gap on SE levels in persons with OA. The researchers listed above and others which were not included in this manuscript have spent countless hours, days, and even years studying these topics. They have proved and disseminated significant evidence that SE levels are directly related to those suffering with OA. These results support the need for an OA SE toolkit to improve patient care outcomes and ultimately affect positive social change.

Archival and Operational Data

Archival Data

Archival data that the PMR clinic already collected included an individual's initial NPWP, initial history and physical, and VAS to determine potential subject. The NPWP is a five-page document which gathers information about why the individual arrived for treatment. Page 1 includes basic patient information such as name, age, home address, e-mail address, telephone number, occupation, social security number, and number of hours worked per week. The individual then checked what symptoms they have experienced within the past 6 months and to describe their worst symptom, length of having the worst symptom, what the symptom feels like, what they have done to help the problem, and what activities they would like to do if it was not a problem. Further questions include how the symptom affects their mental and emotional wellbeing, how does it affect their work, and how does it affect their life. It concludes with what interventions have been used to help relieve the problem and how much did the intervention(s) help.

The second page of the NPWP is a review of systems. These systems are: constitutional, respiratory, musculoskeletal, gastrointestinal, neurological, cardiovascular, skin, endocrine, psychological, and ear, eyes, nose, and throat. The patient then signs and dates the form stating that all above information is true.

Page 3 of the NPWP is the past medical, surgical, family, and social history form. The patient checks a box next to the medical disorder that they have been diagnosed with, medical treatment they are currently receiving, body location where they had prior surgery, any allergies that they have been diagnosed with, family history from their biological parents and siblings, and social history to include smoking, alcohol, recreational/illegal drugs, their employment/retirement status, and hobbies. The medical provider reviews this information with the patient to ensure information accuracy.

Page 4 of the NPWP asks for a list of their medications, the reason for taking the medication, dosage, length of time taking the medication, and who prescribed the medication. Beneath this box, there are 17 questions regarding extremity/neurological changes. Finally, Page 5 is the PMR clinic’s informed consent, patient consent for use and disclosure of protected health information, consent to evaluate and treat a minor, and a female pregnancy/X-Ray release with corresponding signatures of the patient and/or the patient’s legal guardian.

Inclusion criteria for operational processes were adult age, diagnosed with OA in at least one joint, primarily English speaking, complete 12 office visits in approximately one month’s time, and complain of pain, pain-related disability, and pain-related psychological distress on their initial visit. Exclusion criteria were persons denying

English as their primary language, completed less than 12 office visits in approximately one month’s time, age under 18 years, no clinical evidence of OA, and no complaints of pain, pain-related disability, and pain-related psychological distress. These three complaints were identified on the patient’s initial visit when they fill out their intake questionnaire, history, and review of symptoms.

Pain was identified by their VAS score. The VAS is a 0 to 10 scale where 0 means “no pain” and 10 means “the worst possible pain imaginable” (Hawker, Mian, Kendzerska, & French, 2011). The respondent was asked to draw a line perpendicular to the VAS line which accurately represents their pain intensity (Hawker et al., 2011). The scorer utilized a ruler to determine the distance on the 10-centimeter line between “no pain” and the patient’s mark (Hawker et al., 2011). The range is from 0 to 100 (Hawker et al., 2011). Measurements of zero to four centimeters are considered “no pain”, five to 44 centimeters are considered mild pain (Hawker et al., 2011). Moderate pain measurements are 45 to 74 centimeters and severe pain measures 75 to 100 centimeters (Hawker et al., 2011). No normal values have been established for this measure (Hawker et al., 2011).

Pain-related disability was identified by their complaints of “decreased productivity”, “restricted in your daily activity”, “restricted household duties”, “hinders exercise/sports”, “interferes with ability to do hobbies” and “other activities and unable to work longer hours”. These were identified on the NPWP instrument. Pain-related psychological distress was identified by their complaints of “moody”, “irritable”, and “poor attitude”. Pain-related disability and pain-related psychological distress was measured by a “yes” or “no” answer. These answers were collected by whether the individual checked the corresponding circle to the left of the symptom. If the circle was marked, then the answer was “yes” to having pain-related disability or pain-related psychological distress. If the circle was not checked, the answer was “no” to having pain-related disability or pain-related psychological distress. All new patients complete this paperwork prior to seeing any health care team member. This new paperwork assisted in initially identifying potential subjects by their subjective complaints. If their examination aligned with their subjective complaints and the individuals met the inclusion and exclusion criteria, they were potential subjects.

Operational Data

This section discusses the analysis of the organization’s operational data that was collected in an organizational context but was not analyzed until after data collection. This data was collected from adults who presented to the PMR clinic diagnosed with OA who complained of pain, pain-related disability, and pain-related psychological distress levels. Operational data included ASES scores before and after the educational toolkit intervention and demographic data. After patients were diagnosed with OA and complaints of pain, pain-related disability, and pain-related psychological distress, they were given ASES to complete on their third office visit. The purpose of introducing ASES then was to evaluate the before- aspect of the before-and-after EBP quality improvement project. After approximately 12 patient visits or 30 days of treatment at a PMR clinic and the introduction of the NIAMS (2015) Handout on Health: OA patient education sheets on the patient’s third visit, a re-evaluation was completed in the form of ASES. This evaluated the after- aspect of the EBP quality improvement project.

Demographic data included an individual’s age and sex. To gain access to this operational data, this project director conversed with the PMR clinic’s executive team. The NPWP is kept in the respective patient’s paper chart under the “Reports” tab. Furthermore, I needed to access subjective, objective, and assessment data to ensure that all inclusive and exclusive criteria were met. This data also included the ASES questionnaire pre- and post-NIAMS (2015) handout. To conclude, these archival and operational data were relevant to the practice problem in this project by targeting adults with OA to evaluate the promotion of SE in this population.

Evidence Generated for the Doctoral Project

Participants

The chosen population for this project were adults with OA who suffer from pain, pain-related disability, and pain-related psychological distress. Since this clinic is in San Antonio, Texas, the corresponding population was specific to the San Antonio greater metropolitan area. The population was a mixture of men, women, Caucasians, Hispanics, African Americans, and those of Pacific Islander descent. No ethnic or racial characteristics were excluded from the quality improvement project. The adult age range began at age 18 years. Their diagnosis of OA included any joint in the body with a minimum of Grade 1 OA. For any vertebral OA, the corresponding diagnosis was spondylosis, intervertebral disc disease with degeneration, and diffuse idiopathic skeletal hyperostosis of the cervical, thoracic, or lumbar vertebrae. Their complaints of pain, pain-related disability, and pain-related psychological distress were identified when filling out the NPWP upon their initial arrival to the clinic.

The goal was to have a total of 20 participants to complete the project. Inclusion criteria were adult age, diagnosed with OA in at least one joint, primarily English speaking, complete 12 office visits in approximately one month's time, and complain of pain, pain-related disability, and pain-related psychological distress on their initial visit. Exclusion criteria were persons denying English being their primary language, completed less than 12 office visits in approximately one month's time, age under 18, no clinical evidence of OA, and no complaints of pain, pain-related disability, and pain-related psychological distress. While this patient population appears limited, these criteria ensured that participants were characteristic of the subsequent market populace (Silverman, 2011).

Procedures

This proposal provided the basis for Institutional Review Board and facility approval. The PMR clinic did not have an Institutional Review Board (IRB) committee nor was affiliated with a hospital with this requirement. After Walden University IRB and facility approval, patients were identified through inclusion and exclusion criteria as to whether they were a candidate for this project. New patients came in for treatment through various routes. Some received referrals from another provider and the remainder came in for treatment after seeing an advertisement. Both sets of patients were appropriate for this project if they met the inclusion and exclusion criteria. The relevance of these participants to the practice-focused question directly related by ensuring the participants were appropriate candidates for this project.

Upon arriving to the PMR clinic, patients were given the intake paperwork, the NPWP, and were asked for an identification and insurance card. After the forms were complete, they had their vital signs taken while speaking to a medical technician and then spoke to the case manager to discuss any concerns before their free consultation was complete. If the patient decided to continue with care, the medical or chiropractic provider completed a history and physical. During the history, the provider reviewed the patient's complaints, performed a physical examination, and then ordered appropriate radiographs. The patient had radiographs taken within the clinic. After radiographs were taken, the patient was scheduled for a follow up office visit to review the examination and radiograph findings.

At the end of each clinic day, the project team member and I reviewed new patient information to assess whether the new patients were a candidate for this project through inclusion and exclusion criteria. This was decided by the project team member and I prior to the patient's second visit. When returning to the clinic on their second day of treatment, the patient had vital signs taken upon arrival. The patient was placed in a patient room to have a review of findings of their physical examination and radiographs that were taken during their first office visit. Then they were consented for medical treatment and an appropriate medical procedure was often performed in the clinic the same day. On the participant's third visit, I or the project team member discussed the DNP project with the potential participant. The project team member or I verbalized to the potential participant that there is a project within the clinic for persons suffering with OA.

The individual was told that the project coincides with the treatment outlined on their care plan which was created by the case manager from their health care provider's orders after their initial visit to include McKenzie rehabilitation exercises, medical injections, and chiropractic adjustments. The care plan outlined the first month of treatment. The individual was told that the only extra work that they are required to do for the purpose of this study is to take the ASES questionnaire twice which takes a total of up to 20 minutes and review the NIAMS (2015) Handout on Health: OA once with the project director or project team member on their third visit, which takes approximately ten minutes. With the measure only compiled of eight questions, the participant was given 10 minutes to complete the questionnaire. The project team member or I were available for help if questions arose. The participant was encouraged to review the educational toolkit weekly at home but it was not a requirement. Home self-reviewing of the toolkit would take approximately ten minutes per week for a total of 40 minutes. The consent, which was completed before any project-related activities were performed, included project purpose, goal, assessments, ASES measure, educational toolkit and project process. The potential participant was told that the process takes approximately one month's time or 12 visits of treatment. The individual was told that it can be partially completed at the PMR clinic and partially at home.

While following the Health Insurance Portability and Accountability Act and the Privacy Rule, this student reviewed the consent form with the patient and answered any further questions. Any patient agreeing to participate then signed consent for the project. The DNP project discussion and consenting did not take longer than 10 minutes.

Participants were asked to sign a release for the DNP project team to view their NPWP, radiograph findings, VAS scores, and ASES forms to complete the project. This release of information allowed this student to address whether a toolkit with information regarding SE in OA improves self-management of pain, pain-related disability, and pain-related psychological distress levels. After individual consent approval, the participant was given ASES to complete. The participant’s patient identification number and corresponding date were handwritten on the ASES form by the project director or project team member. Then the form was given to the participant. The individual was given 10 minutes to fill out the ASES. I or the project team member was available for questions in case any arose. Questions were answered in an objective manner to avoid any skewed results. Then the individual was given a paper form of the NIAMS (2015) Handout on Health: OA. This was verbally reviewed with them by the project team member or I while having the individual follow it by reading along. They were encouraged to read this handout at a minimum of weekly during treatment. Then they began their treatment at the clinic such as McKenzie Phase I rehabilitation exercises, medical treatment injections, and chiropractic adjustments. McKenzie Phase I rehabilitation exercises were prescribed based on the individual’s chief complaint with corresponding diagnosis of OA. Phase I modalities included stretching and pain relief. Medical treatment injections such as joint injections, nerve blocks, and trigger point injections were prescribed for the patient based on their individual condition and findings. Joint injections included small to large joint, administering Lidocaine 2%, Ketorolac, and/or a viscosupplementation preparation. Steroids were rarely utilized. Nerve block injections included treatment from central to peripheral nerves administering Marcaine 0.5% and rarely, steroids. Trigger point injections included injecting directly into a muscle spasm anywhere in the body with Lidocaine 2%, Marcaine 0.5%, Ketorolac, or a mixture of these. Chiropractic adjustments included manipulation of the cervical, thoracic, and/or lumbar spine and/or the manipulation of a small to large joint back into socket. Visits 4 through 11, during their first month of treatment, continued treatments of McKenzie rehabilitation exercises, medical treatment injections, and chiropractic adjustments. At Visit 12, or the end of their first month of treatment, ASES was administered again to the participant by the project director or project team member. The individual was given 10 minutes to complete the ASES. Securement and protection of this data will be discussed below under Protections.

The ASES tool, NAIMS (2015) handout, and NPWP align with the concept of OA, SE, self-management and pain. Furthermore, these tools align with Bandura’s theory of SE by working toward assessing and promoting SE. The NIAMS (2015) handout, NPWP, and ASES are available for viewing in the appendices (see Appendix A, B, C). This step by step procedure provided a systematic approach to successful data collection.

Protections

The Walden University Institutional Review Board (IRB) granted DNP project approval and project proceedings began shortly after this action. My IRB approval number is 08-16-16-0344132. The WU IRB reviewed and approved this project after the completion and submission of the Standard Application for Research Ethics Review. In regards to facility approval, this project director continued updating the facility executive team on project interventions. Only after the PMR clinic and the Walden University IRB approval did I initiate DNP project activities.

Ethical considerations for this project were instituted by not putting identifiers on the ASES measure forms which is also called de-identifying information. Patients were tracked by utilizing their patient identification numbers which are initially given by the clinic upon their initial visit. Under the Health Insurance Privacy and Accountability Act, the Privacy Rule allows registries to obtain authorization from each patient (Gliklich, Dreyer, & Leavy, 2014).

To recruit and develop working relationships with participants, noteworthy strategies to follow include engaging in the community, educating individuals about the barriers and benefits to being a participant, and planning an appropriate timeline for both the researcher and participant (National Institute of Mental Health, 2005). The National Institute of Mental Health (2005) encouraged that staff receive appropriate training to communicate with potential participants and align recruitment measures with the purpose of the project. To retain participants, this student clarified the long-term commitment to the participant and community, communicated the study requirements including follow up care, and ensured schedule flexibility (National Institute of Mental Health, 2005). These strategies assisted in participants' recruitment and retention to successfully complete this project.

For participants, there were various measures that needed to be addressed to ensure the participants were protected. The incentive for a patient to be involved in this study was to potentially increase their SE in relation to their OA. For a secure plan of data retention, the corresponding clinic had a secure server in place with encryption (Iron Mountain Incorporated, 2016). The secured data included the participant’s age, sex, ASES scores and VAS scores. This along with shredding of paper files ensured privacy safeguarding of all data. The ethical protection of consenting was performed in a secure environment and filed in a folder until scanning into a secure encrypted server.

The project team member or I secured the measures right after participant completion and store them in a file folder labeled ASES measures. The project team member or I then secured the labeled folder in the clinic storage cabinet which was in a constantly monitored room. The cabinet had a key lock. The only staff members who had access were the providers due to their responsibility of keeping supplies locked up for protection. These were then scanned into the clinic’s secure server which was encrypted. The ASES assessments and consents were scanned into the computer and saved to the “e (\\cerebrum) (Z:)” drive along with any files created to organize and analyze the data. This ensured privacy safeguarding of all data. After this data was introduced into a secured encrypted computer file, the paper files were shredded via First-Shred confidential shredding after keeping them for 2 months after collection of the last data. The ethical protection of consenting was performed in a secure environment and filed in a folder until scanning into a secure encrypted server.

Participants could withdraw from study participation and this information was included on the consent form (U. S. Department of Health and Human Services, 2010). The plan to tackle this issue was to have all research activities involving that participant’s participation in the project be discontinued (U. S. Department of Health and Human

Services, 2010). These measures of data retention, incentives, privacy safeguarding, consent process, and subject study withdraw guaranteed that subjects were protected throughout this project. The only persons with access to this data included the PMR's Chief Executive Officer, the project team member, and myself.

Analysis and Synthesis

This project was distributed to individuals who meet inclusion and exclusion criteria and consented to participation in the project on their second visit to the PMR clinic to their 12th visit or one month's time after beginning treatment at the PMR clinic. This project was distributed via paper printout of the NPWP, ASES measure, and NAIMS (2015) Handout on Health: OA. The results from the NPWP, VAS, and the ASES measures were the main points of interest for the analysis and synthesis of this project. Data to be analyzed were the age and sex collected from the NPWP, VAS pain levels, and SE levels from the ASES measure. As previously stated, I did not discriminate due to the individual's demographics if they met the inclusion and exclusion criteria. I correlated their age and sex with their responses to investigate whether age and sex directly or indirectly relate to SE levels. No other demographic data was analyzed for this project.

The system used for recording, tracking, organizing, and analyzing the evidence was completed by this project director with the use of Microsoft Excel software. This project director utilized Microsoft Excel to create a spreadsheet to record and track all evidence. The spreadsheet was titled "KiserDNP-SETK". The vertical columns were labeled ASES, VAS, SEX, and AGE. The horizontal rows were labeled P1, P2, P3, P4,

P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20 to align with Participant 1, Participant 2, through Participant 20. I then took the results and typed them into this spreadsheet. This form of recording and tracking also served to organize the data and progression of the project toward successful completion. Microsoft Excel was utilized to analyze the demographics from the NPWP, VAS, and ASES scores. After scanning the ASES measures into the “e (\\cerebrum) (Z:)” drive of the encrypted secure server, the project team member or myself recorded age, sex, VAS level, and SE measurement in Microsoft Excel. The horizontal row was titled participant with their corresponding patient identification number. The vertical column had titles age, sex, VAS level, and ASES score. This allowed for another form of tracking and organization. Analyzing the evidence was completed to view the ranges and means of age, VAS level, and ASES score. Because age, VAS level, and ASES score are all numerical data, the number provided by the participant was the same number input into Microsoft Excel. Sex is not numerical, but can be afforded a numerical score. Men were labeled as “1” and women were labeled as “2”. With the criteria for participation being at least 18 years of age, the age range was no lower than 18. VAS begins at zero and ends at 10. ASES begins at one and ends at 10. Microsoft Excel allowed for an organizational aspect for analysis of collected evidence.

Arthritis Self-Efficacy Scale

ASES is a measure targeted at persons diagnosed with arthritis, provided in the form of a questionnaire (Stanford Patient Education Research Center, n.d.). ASES accurately establishes SE levels in the form of pain, pain-related disability, and pain-related psychological distress (Stanford Patient Education Research Center, n.d.). The scoring is completed by using a one to 10 scale where one begins with "very uncertain" and 10 is "very certain". If two numbers are marked, the lower number is to be collected (Stanford Patient Education and Research Center, n.d.). Inclusive measure recording is the mean of the eight item scores (Stanford Patient Education and Research Center, n.d.). Wilcox, Schoffman, Dowda, and Sharpe (2014) argued the validity and reliability of the ASES as Cronbach's alpha (0.87 to 0.94) omega (0.87 to 0.93), and greatest lower bound (0.90 to 0.95) internal consistency measures were high (Wilcox et al. 2014). Synchronized validity of ASES tallies were significantly correlated with all assessed measures ($P<0.05$) (Wilcox et al., 2014). No modifications are needed in this instrument.

Visual Analog Scale

The VAS is a common scale which measures pain. (Hawker et al., 2011). The scale is from zero to 10 where zero means "no pain" and 10 means "the worst possible pain imaginable" (Hawker et al., 2011). The respondent will be asked to draw a line perpendicular to the VAS line which truthfully represents their level of pain (Hawker et al., 2011). The scorer utilizes a ruler to establish the distance on the 10-centimeter line between "no pain" and the patient's mark (Hawker et al., 2011). The range is from zero to 100 (Hawker et al., 2011). Measurements of zero to four centimeters are considered "no pain" and five to 44 centimeters are considered mild pain (Hawker et al., 2011). Moderate pain measurements are 45 to 74 centimeters and severe pain measures 75 to 100 centimeters (Hawker et al., 2011). Hawker et al. (2011) argues that there have been no normal values for this numerical scale.

Evidence Synthesis

To assure the evidence integrity, the project team member and I warranted that the subject understood the corresponding information by answering all verbal questions that arise during the course of the study. These questions were related to the ASES measure, VAS measure, or NIAMS (2015) handout. To manage outliers, I did include them into the results. Keeping the outliers in any study has been argued to benefit the study (Osborne & Overbay, 2004). The reasoning is that as a result the study findings are more representative of the entire population (Osborne & Overbay, 2004). Missing information, a common issue in the research world, can cause concerns of skewed results and confidentiality. Prevention is the fighting factor against missing information (Dziura, Post, Zhao, Fu, & Pedruzzi, 2013). During implementation, it was important to follow, collect, and safeguard complete data to reduce the risk for missing information (Dziura et al., 2013). As with anything, unexpected issues may arise. Having a plan to circumvent or revise the consequence is a necessity for research.

The analysis and synthesis of the target outcome was completed by assessing change in ASES scores using percent change calculations. VAS results were also assessed to determine the patient’s perception of pain. The analysis and synthesis of ASES will provide an accurate message to address the practice-focused question by showcasing the change in SE levels of persons suffering with OA. To analyze and synthesize the data, I took the pre- and posttoolkit administration ASES measure results and calculated the percentage and numerical difference to show change. ASES scores begin at “1” equaling very uncertain and “10” equaling very certain. The observed range is “1-10” (Stanford Patient Education Research Center, n.d.). If the percentage difference is positive, it will correlate with a more confident response. Similarly, if the percentage difference is negative, it will correlate with a less confident response. Furthermore, age, sex, VAS, and ASES means and ranges were classified. These analyses and syntheses will illustrate whether the NIAMS (2015) toolkit regarding SE in OA improves SE in patients with OA.

Summary

This DNP project describes the identified problem of low SE levels in persons suffering with OA. A real-world experience with an OA suffer sparked my interest in this topic. This project outlines a plan for the entire mission from initial thoughts and hypothesis to data collection. This before and after EBP quality improvement project used ASES scores to assess whether SE improved in these OA patients. In the following sections, I will discuss project findings, recommendations, and the plan for dissemination.

Section 4: Findings and Recommendations

Introduction

In this section, I will discuss the findings of the project with correlating recommendations. To review, the local nursing practice problem that I focused on in this doctoral project was identified low SE levels in adults with OA. The identified gap in practice was the lack of a SE toolkit for adults with OA. The practice-focused question asked whether a toolkit with information regarding SE in OA improves the self-management of disease-associated symptoms in adults with OA as assessed by the ASES. Finally, in this doctoral project I used a before and after quality improvement project to evaluate SE in adults suffering with OA.

The sources of evidence I used were the ASES measure which was operation data collected to assess the target outcome. The evidence was obtained on the participants' third visit and on their 12th visit, in approximately one month's time. Furthermore, the VAS was assessed along with demographic data including the participant's age and sex Finally, the analytical strategies that I used in this doctoral project calculated the percentage difference of the pre- and posttoolkit ASES scores for a change with toolkit use.

Findings and Implications

In this project, I enrolled 45 participants, 20 participants were men and 25 participants were women. At approximately 30 days, or by their 12th visit, only 35 participants had followed through with their plan of care, completing the project and providing outcomes data. Therefore, there were 35 participants (78%) that completed the program and contributed data to assess the outcome. Of those who completed the project, 16 were men and 19 were women. Their ages ranged from 27 years to 91 years. The mean age was 62 years. The median and mode age respectively were 65 years and 65 years. I used the ASES to determine the project outcome. Preproject ASES mean, median, and mode were 6.979, 7.625, and 10. Postproject ASES mean, median, and mode were 7.406, 7.812, and 8.75. Simple calculations using percent difference pre- and postproject intervention provided the project results. The pretoolkit values of the ASES were subtracted from the posttoolkit ASES values to determine the difference pre- and postproject. Because ASES is a numerical measure with a 10-number scale, the calculation is simple on a 100% level. The pretoolkit mean ASES, being 6.979, subtracted from the posttoolkit mean, 7.406, equals 1.184. This can be translated to a positive change of 11.84%.

The identified changes from preproject intervention to postproject intervention showed that there was a positive change between the ASES scores of pre- and posttoolkit intervention. The project outcome was reflected via the ASES measure and the results show a positive outcome of 11.84% improvement. This means that I captured data of improved ASES levels after toolkit intervention. These results indicate that the intervention with the NIAMS (2015) Handout on Health: OA was successful in improving ASES levels.

The results of this project suggested a positive outcome as ASES scores improved, showing increased SE. This project can be duplicated to further evidence on increasing SE in OA patients. For example, the posttoolkit ASES scores could be assessed after a longer length of treatment. An example of this would be after 2 months of treatment rather than after 1 month. This suggestion is plausible because during the first month of treatment, the individual follows rehabilitation exercises from the McKenzie Phase 1 program. This phase focuses on pain reduction and stretching (Mooney, 2005). Phase 2 is more targeted on strengthening of the affected area because a strong muscle is less likely to become reinjured than a weak muscle (Mooney, 2005). Individuals show greater improvement in SE if they have more time to review the NIAMS (2015) toolkit either in their home setting or with a member of the healthcare team. While participants were not required to review the toolkit at home, they were encouraged to read it once per week during treatment. A realistic expectation for a follow-up project would be to review the toolkit with the participant in the clinic setting weekly during treatment. This intervention may show even higher improvement in ASES scores.

I also collected VAS to determine pain levels. The VAS was included in this project due to published literature stressing the common link between pain and SE levels. Interestingly, the VAS scores did not show a reduction of overall pain scores. Overall VAS scores ranged from 1/10 to 10/10. The overall mean, median, and mode VAS scores were 6, 7, and 8. Preproject VAS scores were 6.222, 7, and 8. Postproject VAS scores were 5.778, 6, and 10. The posttoolkit mean VAS, being 6.222, subtracted from the posttoolkit mean VAS, 5.778, equaled -0.444, which was a negative change of 4.44%. So while the results of this project did show a positive project outcome with an increase in the SE level via the ASES, they did not show a reduction of the pain scores. I recommend further studies going forward to determine the correlation between the ASES and VAS scores in improving SE in OA patients. In relation to changes in VAS levels, there was a negative change between the VAS scores of pre- and posttoolkit interventions. This means that I captured data of higher VAS levels after toolkit intervention in this project.

My analysis and synthesis of the collected evidence suggested that the results may have been more favorable if this project was directed in a different manner. For example, VAS results may have been more favorable if the posttoolkit VAS scores were taken after a longer length of treatment. An example of this would be after 2 months of treatment rather than after 1 month. This suggestion is plausible due to the regular flow of PMR treatment described above to include rehabilitation, medical injections, and chiropractic care. These are all realistic reasons for the VAS results as well as plausible recommendations for change in future quality improvement projects to obtain the best possible outcomes to influence positive social change.

In terms of individuals and the community of San Antonio, Texas, from this project I can conclude that individuals may benefit from an OA toolkit to improve SE in OA patients. Recommendations for further study include allowing more than 1 month of time to use and learn from the toolkit. The findings of this project have the potential to impact positive social change. Since these results showed that there was a positive change in ASES measure levels pre- to posttoolkit intervention, this information can be used by various researchers and health care specialists as a reference toward further projects in this area of interest. It is also possible that this project be replicated with the suggested recommendations to attempt obtaining further evidence as to how to best increase SE in OA patients.

Recommendations

My proposed solutions to furthering the aims of this project in future studies include lengthening the project by at least 1 month, reviewing the NIAMS (2015) handout weekly in the clinic with the participants, and reducing the number of variables in project participants. Lengthening the project and reviewing the NIAMS handout weekly could allow additional time for the patient to benefit from their care and trying out the suggestions in the toolkit. Furthermore, reducing the number of variables in project participants would allow the project to be much more specific and to reduce outlier interaction which could skew the results.

Another recommendation of mine would be to use the 20-item ASES questionnaire rather than the 8-item ASES questionnaire that was used for this project. By collecting additional related data, it is possible that the results would be more diverse, making the project results significantly different from the results of this study. A further recommendation would be to use the updated NIAMS (2016) Handout on Health: OA. This toolkit was updated by experts within the National Institute of Health. While this newer toolkit does not include self-care measures, it still may provide significant benefit to adults suffering with OA. If these changes were made and a similar project was completed, it is possible that the results would be significant that the SE OA toolkit reduced VAS and improved ASES scores.

The following proposed solutions would potentially address the gap-in-practice, as informed by the findings that I discussed earlier in the section to include the NIAMS (2015) Handout on Health: OA into the plan of care for every individual diagnosed with OA. My proposed policy would state:

1. Identify an individual who complains of joint pain and joint stiffness as a complaint for needing to be seen for medical treatment. The joint pain and joint stiffness does not need to be their chief complaint; it can be identified in their review of systems. Then, have the patient complete the VAS and ASES measures.
2. Bring this information to the attention of the patient’s medical provider. After a diagnosis of Grade 1 to Grade 4 OA of joints, spondylosis of the spine, intervertebral disc disease with degeneration, or diffuse idiopathic skeletal hyperostosis, provide the patient with the NIAMS (2015) Handout on Health: OA packet. Review this packet with them at their visit via verbal and visual stimulation. If possible, review this packet with them weekly. If that is not possible, encourage that the patient review this packet a minimum of weekly before their follow-up visit.
3. At the patient’s follow-up visit, answer any questions regarding the toolkit. Evaluate the effectiveness of the toolkit. If any concerns, notify the medical provider to discuss concerns with the patient. Reevaluate the patient with the VAS and ASES measures. Record and monitor this information within the

patient record at least once throughout their care at the healthcare setting in question.

My recommended implementation procedures for this project include making an implementation plan, having a central point of contact for questions, ensuring a strong contact for communicating with stakeholders, having copies of the final approved policy and implementation plan for those involved in the process, using various communication methods for policy announcement, and finally, procuring information to supplement the need for following the new policy (International Resource Center, n.d.). The central point of contact for questions and the strong contact for stakeholder communication would be the nurse manager/leader. Copies of the policy and plan as well as supplemental information for policy use would be available throughout the health care arena. Finally, the policy could be communicated through e-mail, health care organization web sites, electronic and print newsletters, and face-to-face presentations (International Resource Center, n.d.).

My recommended evaluation procedures for this project are engaging stakeholders, explaining the program, focusing the design of evaluation, collecting credible evidence, justifying conclusions, and ensuring the use and sharing of learned lessons (Koplan et al., 1999). To engage stakeholders, the executive team would be briefed on the project and evaluation process so that they may guide and assist with necessary procedures (Koplan et al., 1999). The program would be explained to all those involved in the evaluation. The evaluation design would need to focus on the evaluation purpose, uses, users, methods, agreements, and questions (Koplan et al., 1999). This would give more information to guide the evaluation process to all involved. Collecting credible evidence is the fourth step because high quality data are required for decision making (Koplan et al., 1999). Those collecting data must ensure proper protocols and precautions are taken so that data are as pure as possible. Conclusions must be validated prior to use so that these results can be utilized (Koplan et al., 1999). This action could be completed by the evaluation team and stakeholders. Principles, exploration and synthesis, clarification, reasoning, and approvals all need to be identified with the evidence to rationalize conclusions (Koplan et al., 1999). Finally, safeguarding use and sharing learned lessons are actions which need to be taken deliberately to appropriately use and disseminate information (Koplan et al., 1999). Confidentiality and educating others about the evaluation process will ensure that data were kept safe and knowledge is shared throughout the community (Koplan et al., 1999).

Contribution of the Doctoral Team

The success of this project would have been diminished without the help of the doctoral project team member. This individual was assigned as a project team member to assist in consenting participants, tracking information, and disseminating and collecting the ASES questionnaire and NIAMS (2015) handout. I held weekly conferences with the team member to discuss project progress and insights. Nonscheduled meetings were unnecessary. The team member’s responsibilities were carried out daily to obtain participants and for project activities.

The team member and I had very similar beliefs on final recommendations postproject. These beliefs included making patients partly accountable for their care. This means that an individual should take responsibility to use the self-management techniques taught by the health care team members coordinating their care. At the end of the project and after seeing the numbers, the project team member was also surprised at the results but agreed with the recommendations about altering project processes in a follow-up project to have a tighter grasp on putting the project in the correct direction.

I plan to extend this project beyond the DNP doctoral project through dissemination. I will further discuss dissemination strategies in Section 5. With the information disseminated, I hope to have all medical and health care specialties who treat adults with OA contemplate the project results and consider a follow-up project while following the recommendations to continue the forward movement of improving patient care, EBP, and influencing positive social change.

Strengths and Limitations of the Project

With any type of project, strengths and limitations are a part of the real-world setting. One identified limitation was that more often than not, PMR patients need more than just 12 visits or one months' worth of treatment in order to successfully manage their condition. This project did not allow for that to be tracked. Another limitation related to clinic proceedings was that on busy days, not every patient received every type of therapy offered. This could have hindered the individual's progress toward a higher SE levels. Due to the minimal changes in ASES levels, a limitation could be that the participants did not fully understand the ASES measure and thus the reason why there was little change in scores. Limitations are always tried to be minimized but oftentimes 'life happens' and alternations need to be made to make the best of a situation.

One strength of this project was the high level of organization kept throughout the entire project. I kept all pertinent paperwork in its assigned area to avoid confusion and to assist with project ease. Another strength of the project was the positive communication loop between the project director and project team member. This communication was reviewed on a minimum of a weekly basis but was often performed daily. A high number of participants were recruited for this project which is labeled as another strength. While a few individuals declined, most agreed. The consenting process became smoother with each potential participant. While the entire project was planned to be strong, some aspects stand out as being stronger than others.

Recommendations for future projects addressing similar topics and using similar methods include lengthening the time between toolkit implementation and the final evaluation of any changes in ASES, reducing patient/participant load per day to successfully treat each individual with all of the care that was ordered, using the 20-item ASES questionnaire rather than the 8-item ASES questionnaire, reviewing the NIAMS (2015) handout weekly in the clinic with the participants, and reducing the number of variables in project participants. These recommendations could improve project processes and thus improve patient outcomes by improving ASES scores.

Summary

To summarize, this study resulted in elevated SE levels after implementation of an OA SE toolkit by 11.84%. A recommendation for use in practice is to implement a protocol to identify and enhance low SE levels in adults with OA. This protocol can be implemented in a variety of settings. The project team member was paramount in assisting toward project operations and the goal of this project which was to improve SE in persons suffering with OA. Strengths and weaknesses are conditions that arise in project completion. As long as we learn from these strengths and weaknesses and learn from them, we are better able to grow as nursing leaders.

Section 5: Dissemination Plan

Dissemination Plan

It is my goal to disseminate these findings via manuscript publication. Manuscript publications can provide the audience with the full scholarly project (Bordeaux et al., 2007). The PMR office study site for this project found low SE levels in adult OA sufferers. This manuscript publication of the results of my project will provide the executive team of all health care organizations the entire project process. This information would assist in guiding future projects and tailoring patient care.

The audiences and venues that would be appropriate for dissemination of the project to the broader nursing profession include medicine, chiropractic, physical therapy, and even psychology. Venues for this information include outpatient clinics, inpatient wards, surgical centers, and health care schools. This information would be useful in these specialties by showing how important patient education can be to an individual’s plan of care.

Analysis of Self

As a practitioner, I always have tried to treat the patient the way that I or my family would want to be treated. While most of the time, I know I have accomplished this, I also know that there is room for improvement which I plan to work on as a long-term professional goal. Sometimes in a time-sensitive situation, I may not have addressed every patient need. I am sure to follow up with these patients at their next visit. This project experience has altered my practice by ensuring that individuals understand the instructions I give them prior to proceeding with any activity. My present state of practice has been altered to take my time with each patient to ensure that they receive the best possible care.

As a scholar, I have always strived to stay abreast of my responsibilities to avoid procrastination and to ensure that I am aware of all my necessary duties. This skill assisted with the project experience by not allowing me to be behind schedule. I keep a to-do list in my active work area so that I may review it several times per day and work on tasks during any downtime. As a project manager, I did my best to follow my prior plan with data collection tracking, meeting with my project team member, and having an organization system in place. Again, having my tasks out in my active work area ensured that it was always in my view. This helped the project experience move in a smooth manner by following up with every participant. I also use this skill in my present state. Finally, as a long-term professional goal, I plan to continue using this skill and perfecting it to become as efficient as possible.

The completion of this project marked a very special day for me. I finally completed my doctoral project. There were challenges along the way. One challenge was that the NIAMS (2015) Handout on Health: OA was updated to the NIAMS (2016) Handout on Health: OA in May 2016. This was not noticed until the project had begun because the research for this toolkit was performed at the end of 2015 and the beginning of 2016. I decided to keep the NIAMS (2015) Handout to keep everything the same across the board. I had to make copies of copies which needed some fixing with the toner text exposure on the copy machine. The 2016 version had cut information from the 2015 edition. I do not know why the editions included deletions of the prior toolkit. Maybe

NIAMS had new research that encouraged a greater amount of teaching on other subtopics in the specialty area.

Another challenge was that I saw some very high SE levels in patients that just began care at the clinic. One reason I could contribute to this was because most of these patients have had to deal with their pain and suffering for days to decades and had most often been seen by other health care providers before having any PMR treatment. They most likely had previously learned self-management strategies that boosted their SE levels. I still included these outliers in the project numbers.

I gained many insights on this scholarly journey. The first one is to be patient and to use all of the help at your disposal. There is so much work to be done as a scholar and using someone else’s assistance will take some work off your load. Second, it is okay to be particular. For example, it may have been helpful for me to be more selective on the inclusion and exclusion criteria for the participants in this study. Another insight is to not rush anything. Rushing can lead to mistakes or misinformation which helps no one and can cause more work in the long run. Finally, stay organized. Even if you think cutting a corner will save some time, you will regret it. Make notes along the way in an organized manner and that information will help immensely throughout the project process. I will carry these insights along and use them again in the future to make myself become more successful in all that I do.

Summary

This document has served as the proposal and final study for the before and after quality improvement project to guide project implementation and to report final study results. To review, the purpose of this project was to promote SE in patients with OA. The identified gap in nursing practice that I addressed with this project was the lack of SE in OA patients. The project question I developed asked whether a toolkit with information regarding SE in OA can improve the self-management of disease-associated symptoms in adults with OA. My goal with this project was to improve SE in OA patients. SE, pain, self-management, and OA were the concepts used to inform this doctoral project. Bandura’s theory of SE was used as the theoretical framework of the doctoral project. The study site was a PMR clinic in San Antonio, Texas where I conducted this project using ASES. VAS data were also tracked throughout the project. The SE OA toolkit I chose to use for the project was the NIAMS (2015) Handout on Health: OA. The guiding analytical strategy was calculating the percentage difference of pre- and posttoolkit ASES scores for a change with toolkit use. The results indicated that there was a positive change of ASES scores of 11.84% between pre- and posttoolkit intervention. Implications for nursing practice and for positive social change include using this information as an indicator for the implementation of my proposed project to improve SE levels in OA patients and as a reference for future research in this area of domain to continue to combat the destructive social-cognitive effects of OA.

References

Adams, R. J. (2010). Improving health outcomes with better patient understanding and education. *Risk Management and Healthcare Policy 2010*(3), 61-72. doi:10.2147/RMHP.S7500

Agency for Healthcare Research and Quality. (2014). CAHPS: Assessing health care quality from the patient's perspective. *Program Brief.* Retrieved from https://cahps.ahrq.gov/about-cahps/cahps-program/14-p004_cahps.pdf

Allegrante J. P., & Marks, R. (2003). Self-efficacy in management of osteoarthritis [Abstract]. *Rheumatic Diseases Clinics of North America 29*(4), 747–768, vi–vii. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14603581

American Academy of Physical Medicine and Rehabilitation. (2016). About physical medicine and rehabilitation. *About Physiatry.* Retrieved from http://www.aapmr.org/about-physiatry/about-physical-medicine-rehabilitation

American Association of Colleges of Nursing. (2006). The essentials of doctoral education for advanced nursing practice. *Advancing Higher Education in Nursing.* Retrieved from http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0ahUKEwj005PKzLvJAhXCRiYKHbkwBT4QFgghMAA&url=http%3A%2F%2Fwww.aacn.nche.edu%2Fdnp%2FEssentials.pdf&usg=AFQjCNHhUWv_gUy3me11lFTe_yWj_t3NoQ&sig2=VWhQBj5-qEpVLujNlYmBGw&bvm=bv.108538919,d.eWE

American College of Rheumatology. (2015). Western Ontario and McMaster Universities osteoarthritis index (WOMAC). *Clinician Researchers.* Retrieved from http://www.rheumatology.org/I-Am-A/Rheumatologist/Research/Clinician-Researchers/Western-Ontario-McMaster-Universities-Osteoarthritis-Index-WOMAC

Artino Jr., A. R. (2012). Academic self-efficacy: From educational theory to instructional practice. *Perspectives on Medical Education 1*(2), 76-85. doi:10.1007/s40037-012-0012-5

Arthritis Foundation. (n.d.). Osteoarthritis. *Types.* Retrieved from http://www.arthritis.org/about-arthritis/types/osteoarthritis/

Arthritis Research UK. (n.d.). *Arthritis and daily life*. Retrieved from http://www.arthritisresearchuk.org/arthritis-information/arthritis-and-daily-life.aspx

Arthrolink. (2016). The history of osteoarthritis – Episode 2. *Osteoarthritis Folders.* Retrieved from http://www.arthrolink.com/en/osteoarthritis-folders/all-folders/osteoarthritis-and-history-ep-2

Arthur, A. B., Kopec, J. A., Klinkhoff, A. V., Adam, P., M., Carr, S. L., Prince, J. M.,… Nigg, C. R. (2009). Readiness to manage arthritis: A pilot study using a stages-of-change measure for arthritis rehabilitation. *Rehabilitation Nursing Journal 34*(2), 64-73, 84. doi: 10.1002/j.2048-7940.2009.tb00250.x

Askham, J., Coulter, A., & Parsons, S. (2008). Policy brief: Where are the patients in decision-making about their own care? Copenhagen, Denmark: World Health

Organization Regional Office for Europe and European Observatory on Health Systems and Policies.

Bandura, A. (1977). *Self-efficacy: Toward a unifying theory of behavioral change*. *Psychological Review, 84*(2), 191–215. doi:10.1037/0033-295x.84.2.191

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist 44*, 1175–1184. doi: 10.1037/0003-066x.44.9.1175

Bandura, A. (1994). Self-efficacy. *Stanford University.* Retrieved from https://www.uky.edu/~eushe2/Bandura/BanEncy.html

Bandura, A. (1995). *Self-efficacy in changing societies.* New York, NY: Cambridge University. doi: 10.1017/CBO9780511527692

Barlow J. (2010). Self-efficacy in the context of rehabilitation. *International Encyclopedia of Rehabilitation.* Retrieved from http://cirrie.buffalo.edu/encyclopedia/en/article/35/

Bay, E. J., & Algase, D. L. (1999). Fear and anxiety: A simultaneous concept analysis. *Nursing Diagnosis. 10*(3), 103–111. doi: 10.1111/j.1744-618X.1999.tb00036.x

Benyon, K., Hill, S., Zadurian, N. & Mallen, C. (2010). Coping strategies and self-efficacy as predictors of outcome in osteoarthritis: A systematic review [Abstract]. *Musculoskeletal Care, 8*(4), 224-236. doi:10.1002/msc.187

Blamey, R., Jolly, K., Greenfield, S., & Jobanputra, P. (2009). Patterns of analgesic use, pain and self-efficacy: A cross-sectional study of patients attending a hospital rheumatology clinic. *BMC Musculoskeletal Disorders, 10*(137), 1–9. doi: 10.1186/1471-2474-10-137

Bordeaux, B. C., Wiley, C., Tandon, S. D., Horowitz, C. R., Brown, P. B., & Bass, E. B. (2007). Guidelines for writing manuscripts about community-based participatory research for peer-reviewed journals. *Progress in Community Health Partnerships: Research, Education, and Action, 1*(3), 281–288. doi:10.1353/cpr.2007.0018

Boston University School of Public Health. (2013). The social cognitive theory. *Behavioral Change Models.* Retrieved from http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/SB721-Models/SB721-Models5.html

Boyes, A. (2015). 6 ways to overcome your biases for good. *Psychology Today.* Retrieved from https://www.psychologytoday.com/blog/in-practice/201508/6-ways-overcome-your-biases-good

Brady, T. J. (2011). Measures of self-efficacy. *Arthritis Care & Research, 63*(S11), S473–S485. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/acr.20567/pdf

Brand, E., Nyland, J., Henzman, C., & McGinnis, M. (2013). Arthritis self-efficacy scale scores in knee osteoarthritis: A systematic review and meta-analysis comparing arthritis self-management education with or without exercise. *Journal of Orthopedic Sports Physical Therapy, 43*(12), 895–910. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/24175602

Campellone, J. V., Zieve, D., Obilvie, I., & Animated Dissection of Anatomy for Medicine Editorial Team. (2014). Physical medicine and rehabilitation. *U.S.*

National Library of Medicine. Retrieved from https://www.nlm.nih.gov/medlineplus/ency/article/007448.htm

Centers for Disease Control and Prevention. (2014). Osteoarthritis. *Arthritis Types*. Retrieved from http://www.cdc.gov/arthritis/basics/osteoarthritis.htm

Centers for Disease Control and Prevention. (2015). Arthritis-related statistics. *Data and Statistics.* Retrieved from http://www.cdc.gov/arthritis/data_statistics/arthritis-related-stats.htm

Cheng, S., Foster, R. L., & Huang, C. (2003). Concept analysis of pain. *Tzu Chi Nursing Journal, 2*(3), 20-30. Retrieved from http://app.tzuchi.com.tw/file/DivIntro/nursing/content/92-3/3.pdf

Daltroy, L. H. (1993). Doctor-patient communication in rheumatological disorders. *Ballieres Clinical Rheumatology, 7,* 221–239.

Drug Health Review. (n.d.). The basic variations of arthritis and arthritis symptoms. *Drug Safety and Health Effects Resources.* Retrieved from http://drughealthreview.com/arthritis/the-basic-variations-of-arthritis-and-arthritis-symptoms/

Duncan, P. W., Weiner, D. K., Chandler, J., & Studenski, S. (1990). Functional reach: A new clinical measure of balance [Abstract]. *Journal of Gerontology, 45*(6), M192–M197. Retrieved from: https://www.ncbi.nlm.nih.gov/pubmed/2229941

Dziura, J. D., Post, L. A., Zhao, Q., Fu, Z., & Pedruzzi, P. (2013). Strategies for dealing with missing data in clinical trials: From design to analysis. *Yale Journal of*

Biology and Medicine, 86(3), 343–358. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3767219/

Ekvall-Hansson, E., Jonsson-Lundgren, M., Ronnheden, A. M., Sorensson, E., Bjarnung, A., & Dahlberg, L. E. (2010). Effect of an education programme for patients with osteoarthritis in primary care – A randomized controlled trial. *BMC Musculoskeletal Disorders, 11*(244), 244.

Gliklich, R. E., Dreyer, N. A., & Leavy, M. B. (2014). *Registries for evaluating patient outcomes: A user's guide [Internet]*. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK208620/

Harrison, A. L. (2004). The influence of pathology, pain, balance, and self-efficacy on function in women with osteoarthritis of the knee. *Physical Therapy, 84*(9), 822–831. Retrieved from https://academic.oup.com/ptj/article/84/9/822/2857569/The-Influence-of-Pathology-Pain-Balance-and

Hawker, G. A., Mian, S., Kendzerska, T., & French, M. (2011). Measures of adult pain. *Arthritis Care & Research, 63*(S11), S240–S252. doi:10.1002/acr.20543

Health Resources and Services Administration. (n.d.). Quality improvement. *U.S. Department of Health and Human Services.* Retrieved from http://www.hrsa.gov/quality/toolbox/methodology/qualityimprovement/

Higgins, S., Kokotsaki, D., & Coe, R. (2012). The teaching and learning toolkit. *Education Endowment Foundation.* Retrieved from https://v1.educationendowmentfoundation.org.uk/uploads/pdf/Teaching_and_Learning_Toolkit_(July_12).pdf

Hoffman, A. J. (2014). Enhancing self-efficacy for optimized patient outcomes through the theory of symptom self-management. *Cancer Nursing, 36*(1), E16-E26. doi:10.1097/NCC.0b013e31824a730a

Howard, K. (2008). Validating questionnaires. *Kestrel Consultants, Inc.* Retrieved from http://kestrelconsultants.com/reference_files/Validating_Questionnaires.pdf

Howe, C. (2012). Concept analysis of fear: Focus on childhood fear and implications for endocrine nursing. *Journal of Pediatric Nursing, 27*(3), e3. doi:10.1016/j.pedn.2012.03.004

Institute of Medicine. (2003). Priority areas for national action: Transforming health care quality. *Committee on Identifying Priority Areas for Quality Improvement.* Washington, DC: National Academies Press. doi:10.17226/10593

International Resource Center. (n.d.). Implementing and communicating policies and procedures. *National Association of College and University Business Officers.* Retrieved from http://irc.nacubo.org/home-campus/implementing-and-communicating-policies-and-procedures.html

Iron Mountain Incorporated. (2016). Best practices for creating a comprehensive healthcare data retention plan. *Knowledge Center.* Retrieved from http://www.ironmountain.com/Knowledge-Center/Reference-Library/View-by-Document-Type/General-Articles/B/Best-Practices-for-creating-a-comprehensive-healthcare-data-retention-plan.aspx

Koplan, J. P., Milstein, R. L., Wetterhall, S. F., Christenson, G. M., Harris, J. R., Pegg, N. F.,… Neal, J. J. (1999). Framework for program evaluation in public health.

Morbidity and Mortality Weekly Report, 48(RR11), 1–40. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm

Lawrence, R. C., Felson, D. T., Helmick, C. G., Arnold, L. M., Choi, H., Deyo, R. A.,… Wolfe, F. (2008). Estimates of the prevalence of arthritis and other rheumatic conditions in the United States: Part II. *Arthritis and Rheumatology, 58*(1) 26–35. doi: 10.1002/art.23176

Litwic, A., Edwards, M., Dennison, E., & Cooper, C. (2013). Epidemiology and burden of osteoarthritis. *British Medical Bulletin, 105*(1), 185–199. doi:10.1093/bmb/lds038

Loeb, S. J., Steffensmeier, D., & Kassab, C. (2011). Predictors of self-efficacy and self-rated health for older male inmates. *Journal of Advanced Nursing, 67*(4), 811–820. doi:10.1111/j.1365-2648.2010.05542.x

Lorig, K., Chastain, R.L., Ung, E., Shoor, S., & Holman, H.R. (1989). Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. *Arthritis & Rheumatology, 32,* 37–44. doi: 10.1002/anr.1780320107

Marks, R. (2014). Self-efficacy and arthritis disability: An updated synthesis of the evidence base and its relevance to optimal patient care. *Health Psychology, 1*(1), 1–18. doi:10.1177/2055102914564582

McCorkle, R., Ercolano, E., Lazenby, M., Schulman-Green, D., Schilling, L. S., Lorig, K., & Wagner, E. H. (2011). Self-management: Enabling and empowering patients living with cancer as a chronic illness. *CA: A Cancer Journal for Clinicians, 61*(1), 50–62. doi:3322/caac.20093

McGowan, P. (2005). Self-management: A background paper. *University of Victoria Centre on Aging*. Retrieved from http://www.selfmanagementbc.ca/uploads/Support%20for%20Health%20Professionals/Self-Management%20support%20a%20background%20paper%202005.pdf

McKnight, P. E., Afram, A., Kashdan, T., Kasle, S., & Zautra, A. (2010). Coping self-efficacy as a mediator between catastrophizing and physical functioning: Treatment target selection in an osteoarthritis sample. *Journal of Behavioral Medicine*, *33*(3), 239–249. doi:10.1007/s10865-010-9252-1.

Medical University of South Carolina. (2015). Arthritis self-efficacy scale. *Department of Family Medicine.* Retrieved from http://academicdepartments.musc.edu/family_medicine/rcmar/arthritisSE.htm

Mooney, V. (2005). What is the McKenzie Method for back and neck pain? *Spine-Health*. Retrieved from http://www.spine-health.com/wellness/exercise/what-mckenzie-method-back-pain-and-neck-pain

National Institute of Arthritis and Musculoskeletal and Skin Diseases. (2015). Handout on health: Osteoarthritis. *Osteoarthritis.* Retrieved from http://www.niams.nih.gov/Health_Info/Osteoarthritis/#9

National Institute of Mental Health. (2005). Points to consider about recruitment and retention while preparing a clinical research study. *National Institutes of Health.* Retrieved from http://www.nimh.nih.gov/funding/grant-writing-and-application-process/recruitment-points-to-consider-6-1-05_34848.pdf

Nursing Theories. (2012). Albert Bandura. *Self efficacy theory (SET).* Retrieved from http://nursingplanet.com/theory/self_efficacy_theory.html

Nursing Times. (2012). Osteoarthritis 3: Impact on patients. *Long-term conditions.* Retrieved from http://www.nursingtimes.net/clinical-subjects/long-term-conditions/osteoarthritis-3-impact-on-patients/5042032.fullarticle

Omisakin, F. D., & Ncama, B. P. (2011). Self, self-care and self-management concepts: Implications for self-management education. *Educational Research, 2*(12), 1733–1737. Retrieved from http://www.interesjournals.org/full-articles/self-self-care-and-self-management-concepts-implications-for-self-management-education.pdf?view=inline

Osborne, J. W. & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research & Evaluation, 9*(6), 1–8 Retrieved from http://pareonline.net/getvn.asp?v=9&n=6

Pajares, F. (2009). Self-efficacy theory. *School and academics.* Retrieved from http://www.education.com/reference/article/self-efficacy-theory/

Physicians Business Solutions. (2015). Materials. *Training materials.* Retrieved from http://pbs500.com/training

Reid, M. C., Papaleontiou, M., Ong, A., Breckman, R., Wethington, E., & Pillemer, K. (2008). Self-management strategies to reduce pain and improve function among older adults in community settings: A review of the evidence. *Pain Medicine, 9*(4), 409–424. doi:10.111/j.1526-4637.2008.00428.x

Rejeski, W. J., Craven, T., Ettinger, Jr., W. H., McFarlane, M., & Shumaker, S. (1996). Self-efficacy and pain in disability with osteoarthritis of the knee. *Journal of Gerontology: Psychological Sciences, 51B* (1), 24–29. Retrieved from http://psychsocgerontology.oxfordjournals.org/content/51B/1/P24.full.pdf

Resnick, B., & Jenkins, L. S. (2000). Testing the reliability and validity of the self-efficacy for exercise scale. *Nursing Research, 49*(3), 154–159. Retrieved from http://www.udel.edu/PT/PT%20Clinical%20Services/journalclub/noajc/09_10/Nov09/Testing%20the%20Reliability%20and%20Validity%20of%20the%20Self-Effica..%5B1%5D.pdf

Ryan, P., & Sawin, K. J. (2009). The individual and family self-management theory: Background and perspectives on context, process, and outcomes. *Nursing Outlook, 57*(4), 217–225.e6. doi:10.1016/j.outlook.2008.10.004

Sand-Jecklin, K., Murray, B., Summers, B., & Watson, J. (2010). Educating nursing students about health literacy: from the classroom to the patient bedside. *OJIN: The Online Journal of Issues in Nursing 15*(3). Retrieved from http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol152010/No3-Sept-2010/Articles-Previously-Topic/Educating-Nursing-Students-about-Health-Literacy.html

Santoro, D., Bellinghieri, G., & Savica, V. (2011). Development of the concept of pain in history. *Journal of Nephrology, 24*(S17), S133–S136. doi:10.5301/JN.2011.6481

Schunk, D. H. (1981). Modeling and attributional effects on children’s achievement: A self-efficacy analysis. *Journal of Educational Psychology, 71*(1), 93–105.

Silverman, M. (2011). Clinical development: The clinical trial protocol patient population. *BioStrategics Consulting Ltd Blog – A Clinical Development Blog Site*. Retrieved from https://biostrategics.wordpress.com/2011/05/02/clinical-development-the-clinical-trial-protocol-patient-population/

Smith, M. J., & Liehr, P. R. (2003). *Middle range theory for nursing* (2nd ed.). New York, NY: Springer Publishing Company, Inc. Retrieved from https://books.google.com/books?id=tubcsgWSBIQC&pg=PA49&lpg=PA49&dq=theory+of+self+efficacy+barbara+resnick&source=bl&ots=tLbXnL7JjM&sig=8WMEEY0PTGvAOhV1zOQdc3G39W4&hl=en&sa=X&sqi=2&ved=0ahUKEwj07MCvrvzJAhWH0iYKHXj6ABUQ6AEILjAC#v=onepage&q=theory%20of%20self%20efficacy%20barbara%20resnick&f=false

Somers, T. J., Shelby, R. A., Keefe, F. J., Godiwala, N., Lumley, M. A., Mosley-Williams,… & Caldwell, D. (2010). Disease severity and domain-specific arthritis self-efficacy: Relationships to pain and functioning in patients with rheumatoid arthritis. *Arthritis Care & Research, 62*(6), 848–856. doi:10.1002/acr.20127

Somers, T. J., Wren, A. A., & Shelby, R. A. (2012). The context of pain in arthritis: self-efficacy for managing pain and other symptoms. *Current Pain and Headache Reports, 16*(6), 502–508. doi:10.1007/s11916-012-0298-3

Stanford Patient Education Research Center. (n.d.). *Arthritis self-efficacy*. Retrieved from http://patienteducation.stanford.edu/research/searthritis.pdf

Stevens, K. R. (2013). The impact of evidence-based practice in nursing and the next big ideas. *Online Journal of Issues in Nursing 18*(2). doi:10.3912/OJIN.Vol18No02Man04

Sunden, A., Ekdahl, C., Magnusson, S. P., Johnsson, B., & Gyllensten, A. L. (2013). Physical function and self-efficacy – important aspects of health-related quality of life in individuals with hip osteoarthritis. *European Journal of Physiotherapy 2013*(15), 151–159. Retrieved from http://www.tandfonline.com/doi/full/10.3109/21679169.2013.830331

Swift, A. (2012). Osteoarthritis 3: Impact on patients. *Nursing Times.* Retrieved from: http://www.nursingtimes.net/osteoarthritis-3-impact-on-patients/5042032.fullarticle

The McKenzie Institute USA. (2016). Information for patients. *The McKenzie Method.* Retrieved from http://www.mckenzieinstituteusa.org/method-patients.cfm

U. S. Department of Health and Human Services. (2010). Withdrawal of subjects from research guidance. *Policy & Guidance.* Retrieved from http://www.hhs.gov/ohrp/policy/subjectwithdrawal.html#

Uchoa de Rezende, M., Constantino de Campos, G., & Pailo, A. F. (2013). Current concepts in osteoarthritis. *Acta Ortopedica Brasileira, 21*(2), 120–122. doi:10.1590/s1413-78522013000200010

University Alliance. (n.d.). Nurses advocating for patients. *Jacksonville University.* Retrieved from http://www.jacksonvilleu.com/resources/nursing/nurses-advocating-for-patients/#.VmCZz3arSM8

University of Florida. (1996). *What is theory?* Retrieved from http://faculty.jou.ufl.edu/mleslie/spring96/theory.html

Unsal, A., & Kasikci, M. K. (2010). Effect of education on perceived self-efficacy for individuals with arthritis. *International Journal of Caring Sciences, 3*(1), 3–11. Retrieved from http://internationaljournalofcaringsciences.org/docs/Vol3_Issue1_02_Unsal.pdf

Walden University. (2013). How to write for positive social change. *Walden University Writing Center.* Retrieved from http://waldenwritingcenter.blogspot.com/2013/10/how-to-write-for-positive-social-change.html

Wilcox, S., Schoffman, D. E., Dowda, M., & Sharpe, P. A. (2014). Psychometric properties of the 8-item English Arthritis Self-Efficacy Scale in a diverse sample. *Arthritis 2014*(385256). Retrieved from https://www.hindawi.com/journals/arthritis/2014/385256/

Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of Management Review, 14*(3), 361-384. Retrieved from http://www.jstor.org/stable/258173?origin=crossref&seq=1#page_scan_tab_contents

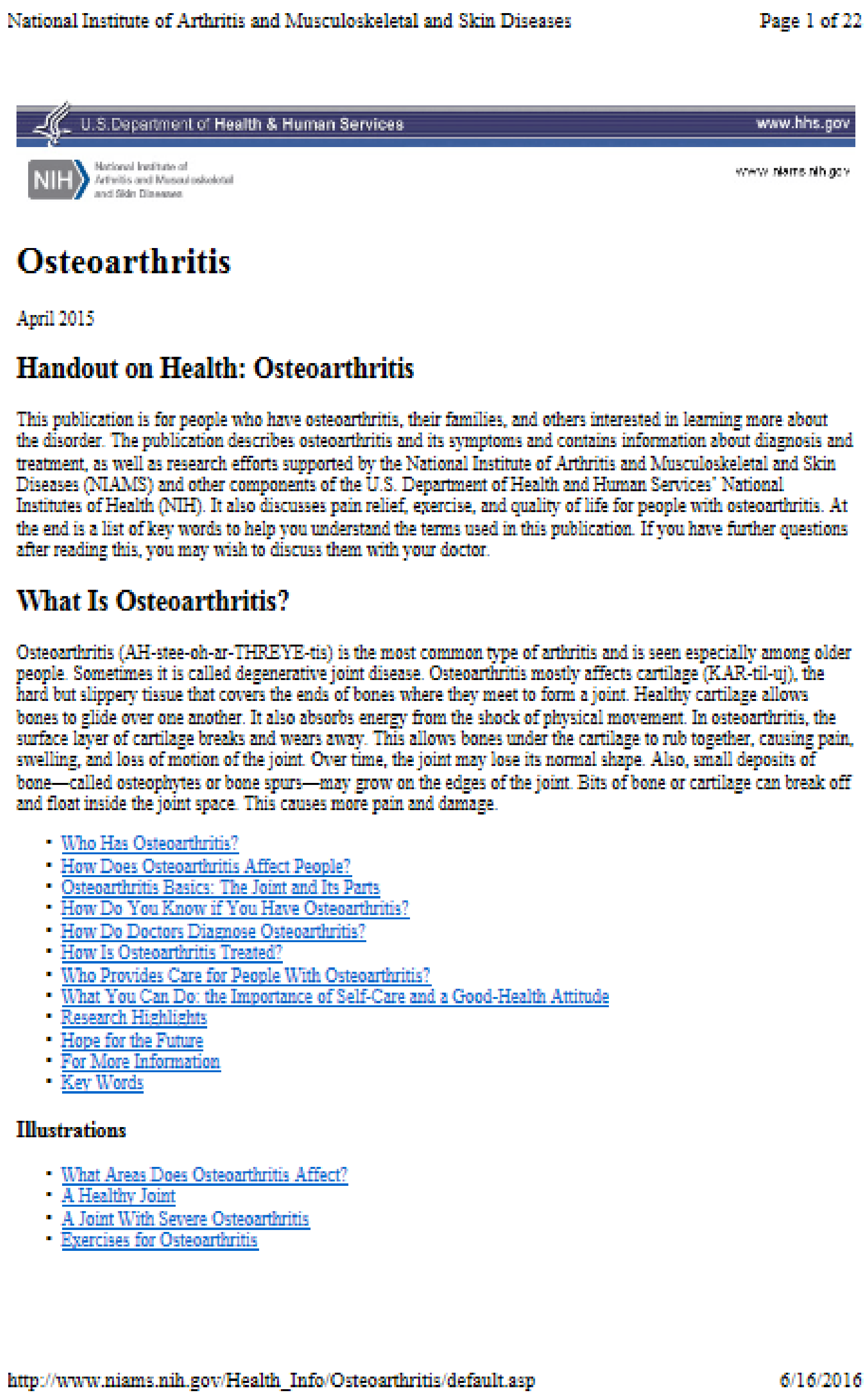
Yip, Y. B., Sit, J. W. H., Fung, K. K. Y., Wong, D. Y. S., Chong, S. Y. C., Chung, L. H., & Ng, T. P. (2007). Effects of a self-management arthritis programme with an added exercise component for osteoarthritic knee: Randomized controlled trial.

Journal of Advanced Nursing, *59*(1), 20–28. doi:10.111/j.1365-2648.2007.04292.x

Ziegler, S. M. (2005). *Theory-directed nursing practice* (2nd ed.). NY: Springer.

Zulkosky, K. (2009). Self-efficacy: A concept analysis. *Nursing Forum 44*(2), 93-102. doi:10.1111/j.1744-6198.2009.00132.x

Appendix A: OA SE Toolkit: NIAMS (2015) Handout on Health OA



National Institute of Arthritis and Musculoskeletal and Skin Diseases Page 1 of 22

U.S. Department of Health & Human Services www.hhs.gov

NIH National Institute of Arthritis and Musculoskeletal and Skin Diseases www.niams.nih.gov

Osteoarthritis

April 2015

Handout on Health: Osteoarthritis

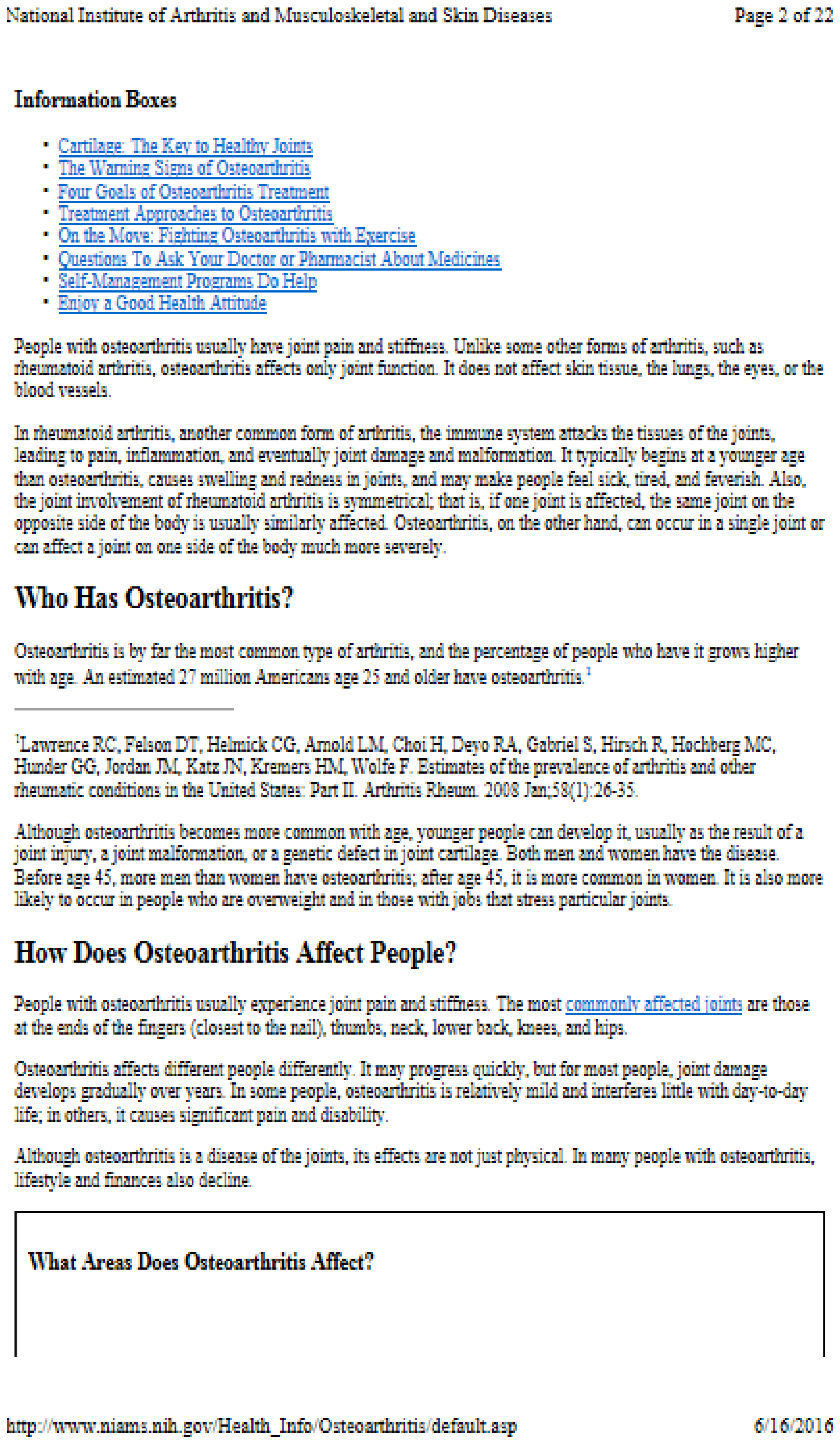
This publication is for people who have osteoarthritis, their families, and others interested in learning more about the disorder. The publication describes osteoarthritis and its symptoms and contains information about diagnosis and treatment, as well as research efforts supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and other components of the U.S. Department of Health and Human Services' National Institutes of Health (NIH). It also discusses pain relief, exercise, and quality of life for people with osteoarthritis. At the end is a list of key words to help you understand the terms used in this publication. If you have further questions after reading this, you may wish to discuss them with your doctor.

What Is Osteoarthritis?

Osteoarthritis (AH-stee-oh-ar-THREYE-tis) is the most common type of arthritis and is seen especially among older people. Sometimes it is called degenerative joint disease. Osteoarthritis mostly affects cartilage (KAR-til-uj), the hard but slippery tissue that covers the ends of bones where they meet to form a joint. Healthy cartilage allows bones to glide over one another. It also absorbs energy from the shock of physical movement. In osteoarthritis, the surface layer of cartilage breaks and wears away. This allows bones under the cartilage to rub together, causing pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, small deposits of bone—called osteophytes or bone spurs—may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space. This causes more pain and damage.

Illustrations

http://www.niams.nih.gov/Health_Info/Osteoarthritis/default.asp 6/16/2016



Information Boxes

- Cartilage: The Key to Healthy Joints
- The Warning Signs of Osteoarthritis
- Four Goals of Osteoarthritis Treatment
- Treatment Approaches to Osteoarthritis
- On the Move: Fighting Osteoarthritis with Exercise
- Questions To Ask Your Doctor or Pharmacist About Medicines
- Self-Management Programs Do Help
- Enjoy a Good Health Attitude

People with osteoarthritis usually have joint pain and stiffness. Unlike some other forms of arthritis, such as rheumatoid arthritis, osteoarthritis affects only joint function. It does not affect skin tissue, the lungs, the eyes, or the blood vessels.

In rheumatoid arthritis, another common form of arthritis, the immune system attacks the tissues of the joints, leading to pain, inflammation, and eventually joint damage and malformation. It typically begins at a younger age than osteoarthritis, causes swelling and redness in joints, and may make people feel sick, tired, and feverish. Also, the joint involvement of rheumatoid arthritis is symmetrical; that is, if one joint is affected, the same joint on the opposite side of the body is usually similarly affected. Osteoarthritis, on the other hand, can occur in a single joint or can affect a joint on one side of the body much more severely.

Who Has Osteoarthritis?

Osteoarthritis is by far the most common type of arthritis, and the percentage of people who have it grows higher with age. An estimated 27 million Americans age 25 and older have osteoarthritis.[1]

---

[1] Lawrence RC, Felson DT, Helmick CG, Arnold LM, Choi H, Deyo RA, Gabriel S, Hirsch R, Hochberg MC, Hunder GG, Jordan JM, Katz JN, Kremers HM, Wolfe F. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States: Part II. Arthritis Rheum. 2008 Jan;58(1):26-35.

Although osteoarthritis becomes more common with age, younger people can develop it, usually as the result of a joint injury, a joint malformation, or a genetic defect in joint cartilage. Both men and women have the disease. Before age 45, more men than women have osteoarthritis; after age 45, it is more common in women. It is also more likely to occur in people who are overweight and in those with jobs that stress particular joints.

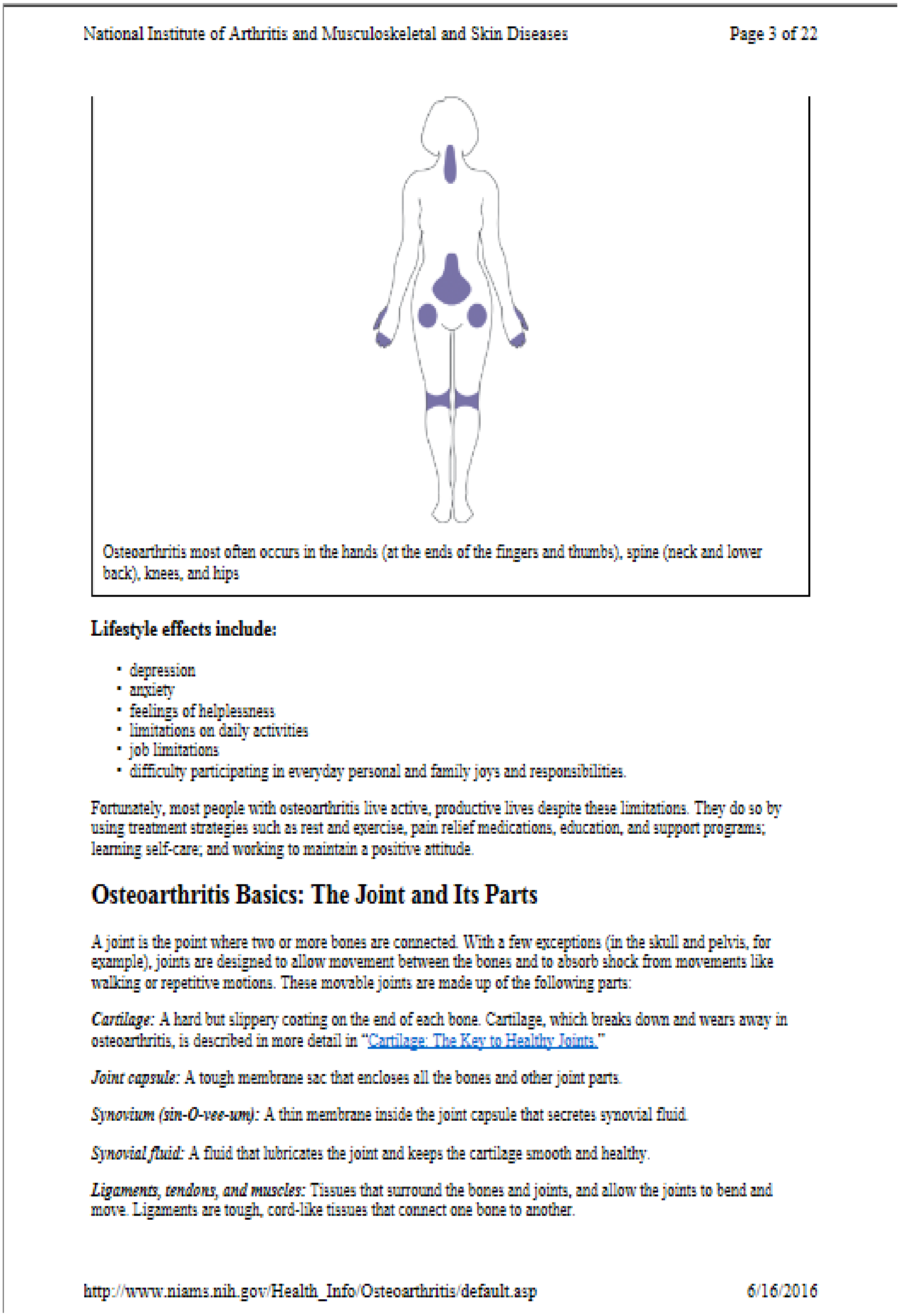
How Does Osteoarthritis Affect People?

People with osteoarthritis usually experience joint pain and stiffness. The most commonly affected joints are those at the ends of the fingers (closest to the nail), thumbs, neck, lower back, knees, and hips.

Osteoarthritis affects different people differently. It may progress quickly, but for most people, joint damage develops gradually over years. In some people, osteoarthritis is relatively mild and interferes little with day-to-day life; in others, it causes significant pain and disability.

Although osteoarthritis is a disease of the joints, its effects are not just physical. In many people with osteoarthritis, lifestyle and finances also decline.

What Areas Does Osteoarthritis Affect?



Osteoarthritis most often occurs in the hands (at the ends of the fingers and thumbs), spine (neck and lower back), knees, and hips

Lifestyle effects include:

- depression
- anxiety
- feelings of helplessness
- limitations on daily activities
- job limitations
- difficulty participating in everyday personal and family joys and responsibilities.

Fortunately, most people with osteoarthritis live active, productive lives despite these limitations. They do so by using treatment strategies such as rest and exercise, pain relief medications, education, and support programs; learning self-care; and working to maintain a positive attitude.

Osteoarthritis Basics: The Joint and Its Parts

A joint is the point where two or more bones are connected. With a few exceptions (in the skull and pelvis, for example), joints are designed to allow movement between the bones and to absorb shock from movements like walking or repetitive motions. These movable joints are made up of the following parts:

Cartilage: A hard but slippery coating on the end of each bone. Cartilage, which breaks down and wears away in osteoarthritis, is described in more detail in "Cartilage: The Key to Healthy Joints."

Joint capsule: A tough membrane sac that encloses all the bones and other joint parts.

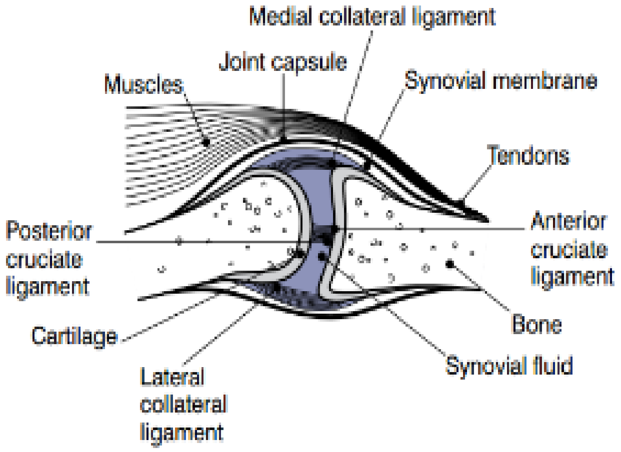
Synovium (sin-O-vee-um): A thin membrane inside the joint capsule that secretes synovial fluid.

Synovial fluid: A fluid that lubricates the joint and keeps the cartilage smooth and healthy.

Ligaments, tendons, and muscles: Tissues that surround the bones and joints, and allow the joints to bend and move. Ligaments are tough, cord-like tissues that connect one bone to another.

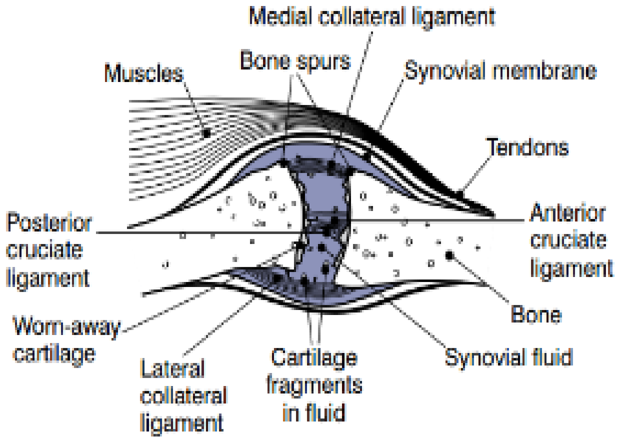
Tendons: Tough, fibrous cords that connect muscles to bones. Muscles are bundles of specialized cells that, when stimulated by nerves, either relax or contract to produce movement.

A Healthy Joint (Representation)

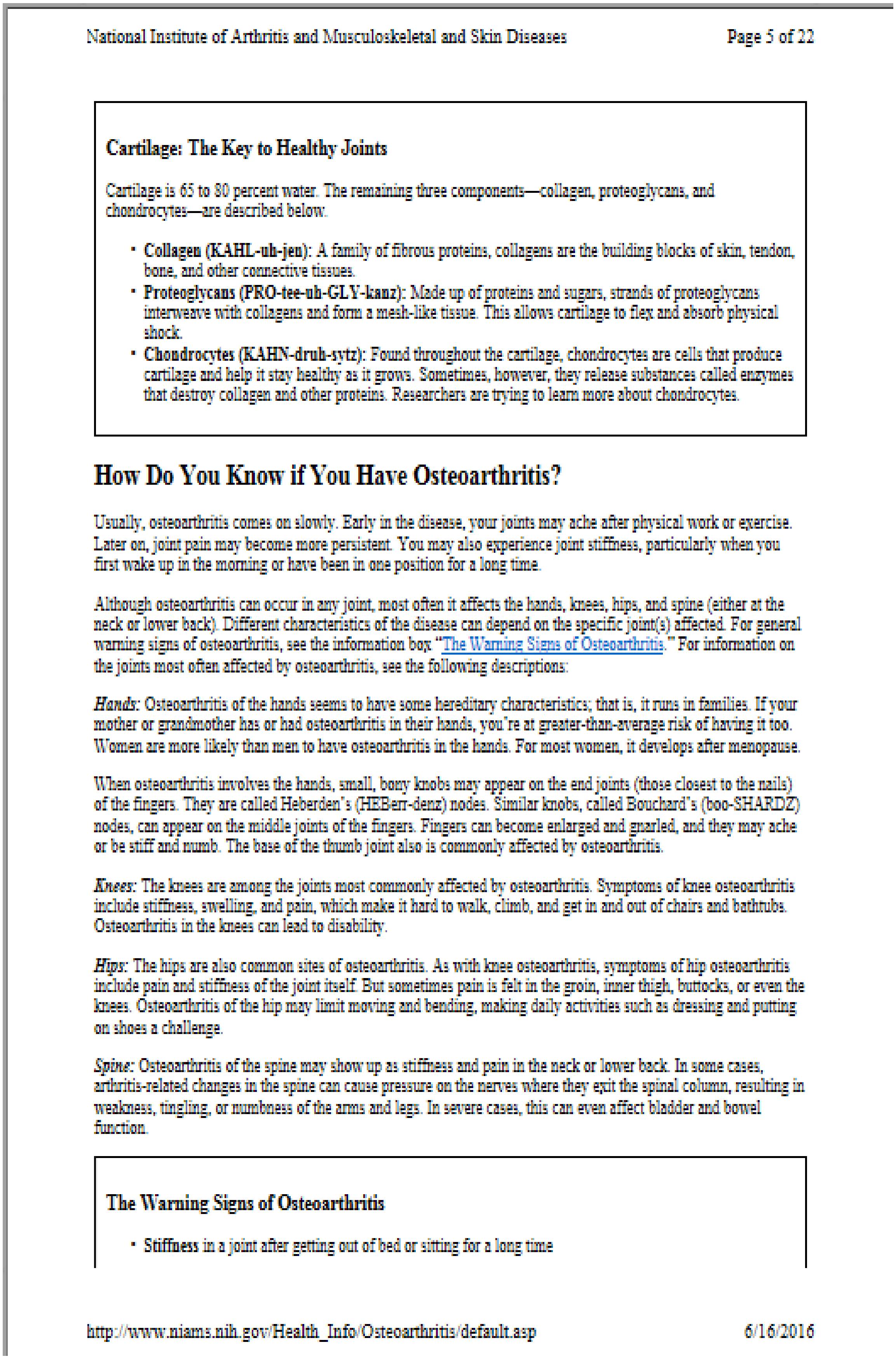


In a healthy joint, the ends of bones are encased in smooth cartilage. Together, they are protected by a joint capsule lined with a synovial membrane that produces synovial fluid. The capsule and fluid protect the cartilage, muscles, and connective tissues.

A Joint With Severe Osteoarthritis (Representation)



With osteoarthritis, the cartilage becomes worn away. Spurs grow out from the edge of the bone, and synovial fluid increases. Altogether, the joint feels stiff and sore.



Cartilage: The Key to Healthy Joints

Cartilage is 65 to 80 percent water. The remaining three components—collagen, proteoglycans, and chondrocytes—are described below.

- **Collagen (KAHL-uh-jen):** A family of fibrous proteins, collagens are the building blocks of skin, tendon, bone, and other connective tissues.
- **Proteoglycans (PRO-tee-uh-GLY-kanz):** Made up of proteins and sugars, strands of proteoglycans interweave with collagens and form a mesh-like tissue. This allows cartilage to flex and absorb physical shock.
- **Chondrocytes (KAHN-druh-sytz):** Found throughout the cartilage, chondrocytes are cells that produce cartilage and help it stay healthy as it grows. Sometimes, however, they release substances called enzymes that destroy collagen and other proteins. Researchers are trying to learn more about chondrocytes.

How Do You Know if You Have Osteoarthritis?

Usually, osteoarthritis comes on slowly. Early in the disease, your joints may ache after physical work or exercise. Later on, joint pain may become more persistent. You may also experience joint stiffness, particularly when you first wake up in the morning or have been in one position for a long time.

Although osteoarthritis can occur in any joint, most often it affects the hands, knees, hips, and spine (either at the neck or lower back). Different characteristics of the disease can depend on the specific joint(s) affected. For general warning signs of osteoarthritis, see the information box "The Warning Signs of Osteoarthritis." For information on the joints most often affected by osteoarthritis, see the following descriptions:

Hands: Osteoarthritis of the hands seems to have some hereditary characteristics; that is, it runs in families. If your mother or grandmother has or had osteoarthritis in their hands, you're at greater-than-average risk of having it too. Women are more likely than men to have osteoarthritis in the hands. For most women, it develops after menopause.

When osteoarthritis involves the hands, small, bony knobs may appear on the end joints (those closest to the nails) of the fingers. They are called Heberden's (HEBerr-denz) nodes. Similar knobs, called Bouchard's (boo-SHARDZ) nodes, can appear on the middle joints of the fingers. Fingers can become enlarged and gnarled, and they may ache or be stiff and numb. The base of the thumb joint also is commonly affected by osteoarthritis.

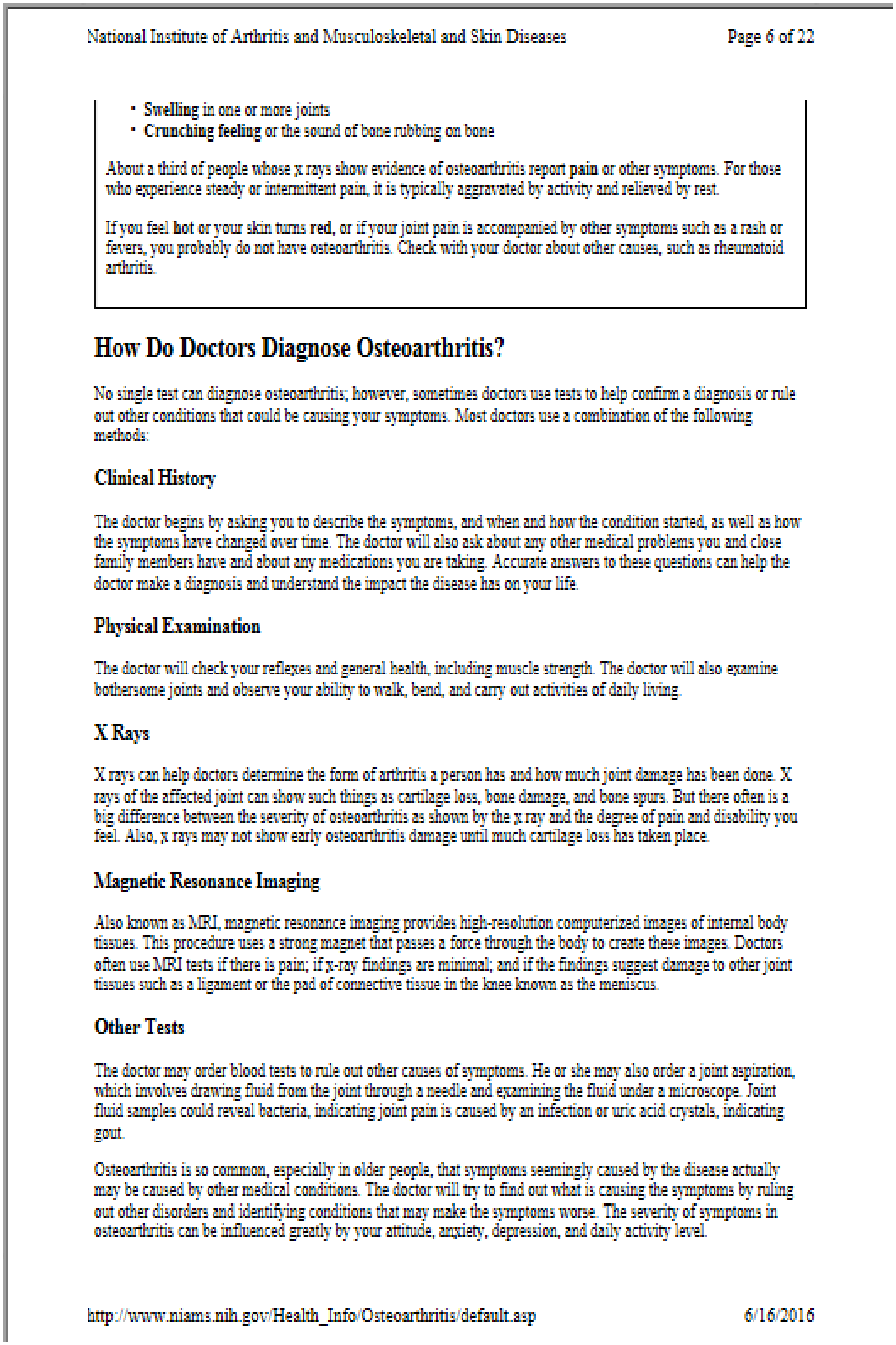
Knees: The knees are among the joints most commonly affected by osteoarthritis. Symptoms of knee osteoarthritis include stiffness, swelling, and pain, which make it hard to walk, climb, and get in and out of chairs and bathtubs. Osteoarthritis in the knees can lead to disability.

Hips: The hips are also common sites of osteoarthritis. As with knee osteoarthritis, symptoms of hip osteoarthritis include pain and stiffness of the joint itself. But sometimes pain is felt in the groin, inner thigh, buttocks, or even the knees. Osteoarthritis of the hip may limit moving and bending, making daily activities such as dressing and putting on shoes a challenge.

Spine: Osteoarthritis of the spine may show up as stiffness and pain in the neck or lower back. In some cases, arthritis-related changes in the spine can cause pressure on the nerves where they exit the spinal column, resulting in weakness, tingling, or numbness of the arms and legs. In severe cases, this can even affect bladder and bowel function.

The Warning Signs of Osteoarthritis

- Stiffness in a joint after getting out of bed or sitting for a long time



- **Swelling** in one or more joints
- **Crunching feeling** or the sound of bone rubbing on bone

About a third of people whose x rays show evidence of osteoarthritis report **pain** or other symptoms. For those who experience steady or intermittent pain, it is typically aggravated by activity and relieved by rest.

If you feel **hot** or your skin turns **red**, or if your joint pain is accompanied by other symptoms such as a rash or fevers, you probably do not have osteoarthritis. Check with your doctor about other causes, such as rheumatoid arthritis.

How Do Doctors Diagnose Osteoarthritis?

No single test can diagnose osteoarthritis; however, sometimes doctors use tests to help confirm a diagnosis or rule out other conditions that could be causing your symptoms. Most doctors use a combination of the following methods:

Clinical History

The doctor begins by asking you to describe the symptoms, and when and how the condition started, as well as how the symptoms have changed over time. The doctor will also ask about any other medical problems you and close family members have and about any medications you are taking. Accurate answers to these questions can help the doctor make a diagnosis and understand the impact the disease has on your life.

Physical Examination

The doctor will check your reflexes and general health, including muscle strength. The doctor will also examine bothersome joints and observe your ability to walk, bend, and carry out activities of daily living.

X Rays

X rays can help doctors determine the form of arthritis a person has and how much joint damage has been done. X rays of the affected joint can show such things as cartilage loss, bone damage, and bone spurs. But there often is a big difference between the severity of osteoarthritis as shown by the x ray and the degree of pain and disability you feel. Also, x rays may not show early osteoarthritis damage until much cartilage loss has taken place.

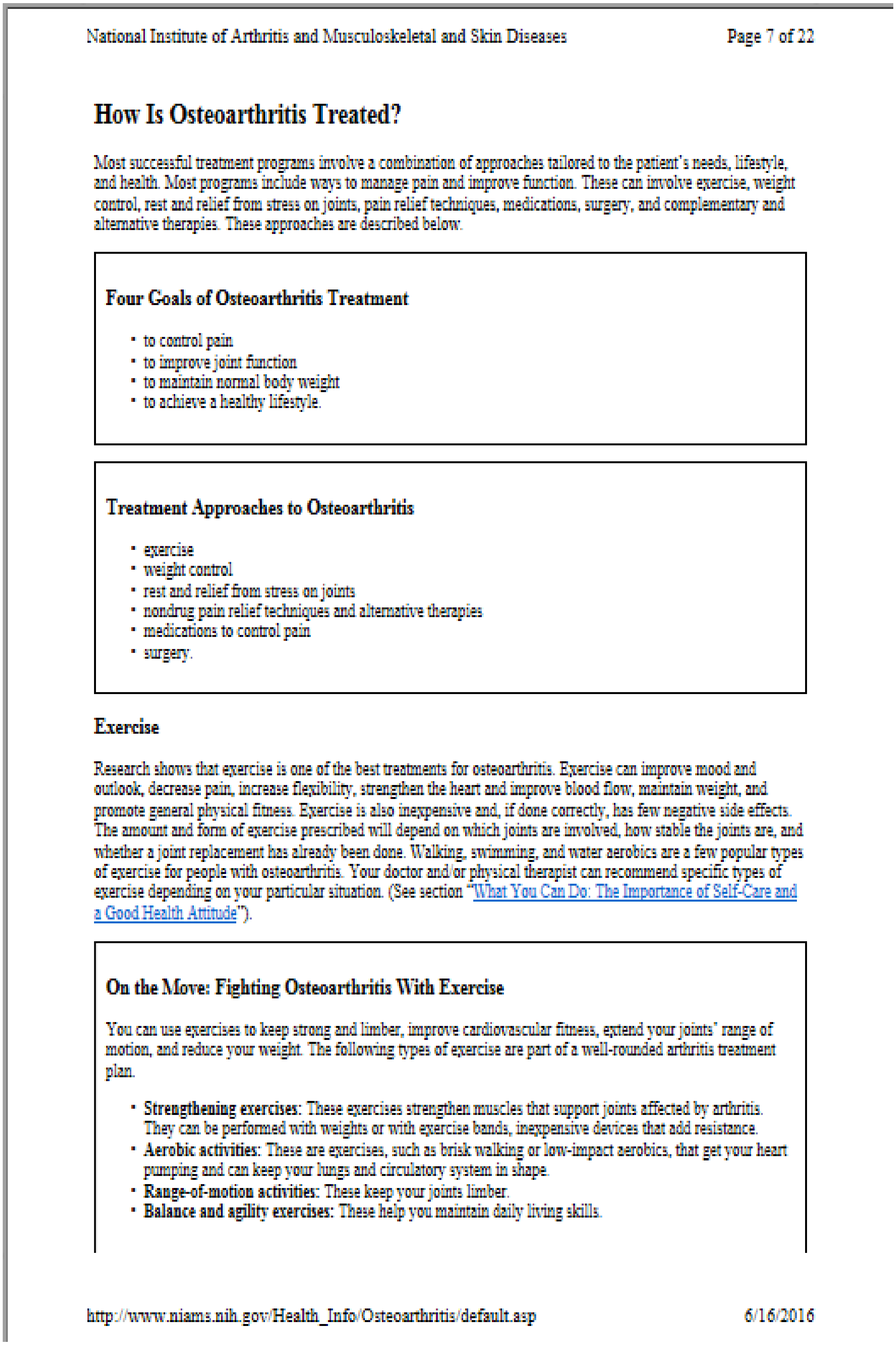
Magnetic Resonance Imaging

Also known as MRI, magnetic resonance imaging provides high-resolution computerized images of internal body tissues. This procedure uses a strong magnet that passes a force through the body to create these images. Doctors often use MRI tests if there is pain; if x-ray findings are minimal; and if the findings suggest damage to other joint tissues such as a ligament or the pad of connective tissue in the knee known as the meniscus.

Other Tests

The doctor may order blood tests to rule out other causes of symptoms. He or she may also order a joint aspiration, which involves drawing fluid from the joint through a needle and examining the fluid under a microscope. Joint fluid samples could reveal bacteria, indicating joint pain is caused by an infection or uric acid crystals, indicating gout.

Osteoarthritis is so common, especially in older people, that symptoms seemingly caused by the disease actually may be caused by other medical conditions. The doctor will try to find out what is causing the symptoms by ruling out other disorders and identifying conditions that may make the symptoms worse. The severity of symptoms in osteoarthritis can be influenced greatly by your attitude, anxiety, depression, and daily activity level.



How Is Osteoarthritis Treated?

Most successful treatment programs involve a combination of approaches tailored to the patient's needs, lifestyle, and health. Most programs include ways to manage pain and improve function. These can involve exercise, weight control, rest and relief from stress on joints, pain relief techniques, medications, surgery, and complementary and alternative therapies. These approaches are described below.

Four Goals of Osteoarthritis Treatment

- to control pain
- to improve joint function
- to maintain normal body weight
- to achieve a healthy lifestyle.

Treatment Approaches to Osteoarthritis

- exercise
- weight control
- rest and relief from stress on joints
- nondrug pain relief techniques and alternative therapies
- medications to control pain
- surgery.

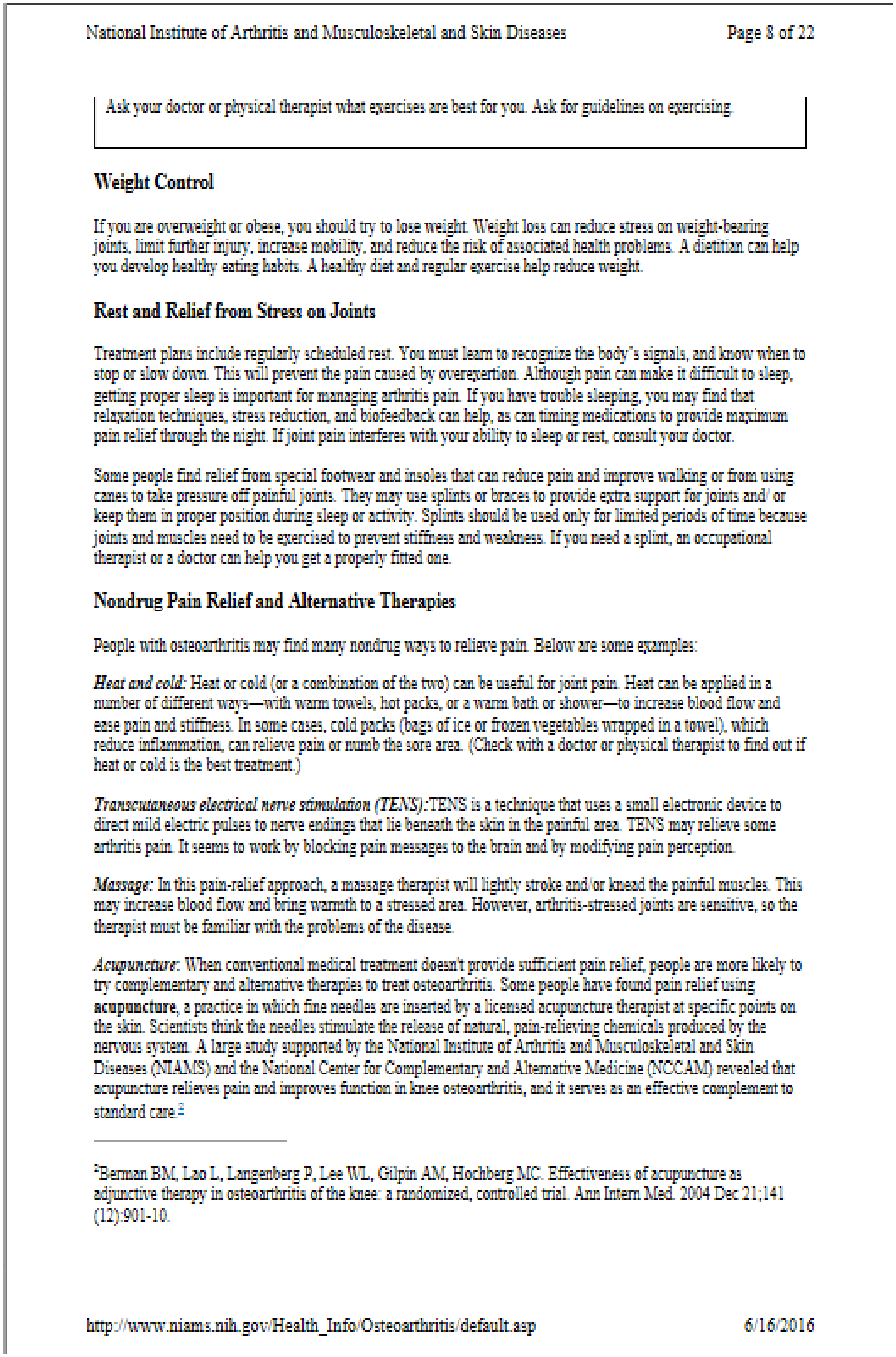
Exercise

Research shows that exercise is one of the best treatments for osteoarthritis. Exercise can improve mood and outlook, decrease pain, increase flexibility, strengthen the heart and improve blood flow, maintain weight, and promote general physical fitness. Exercise is also inexpensive and, if done correctly, has few negative side effects. The amount and form of exercise prescribed will depend on which joints are involved, how stable the joints are, and whether a joint replacement has already been done. Walking, swimming, and water aerobics are a few popular types of exercise for people with osteoarthritis. Your doctor and/or physical therapist can recommend specific types of exercise depending on your particular situation. (See section "What You Can Do: The Importance of Self-Care and a Good Health Attitude").

On the Move: Fighting Osteoarthritis With Exercise

You can use exercises to keep strong and limber, improve cardiovascular fitness, extend your joints' range of motion, and reduce your weight. The following types of exercise are part of a well-rounded arthritis treatment plan.

- **Strengthening exercises:** These exercises strengthen muscles that support joints affected by arthritis. They can be performed with weights or with exercise bands, inexpensive devices that add resistance.
- **Aerobic activities:** These are exercises, such as brisk walking or low-impact aerobics, that get your heart pumping and can keep your lungs and circulatory system in shape.
- **Range-of-motion activities:** These keep your joints limber.
- **Balance and agility exercises:** These help you maintain daily living skills.



Ask your doctor or physical therapist what exercises are best for you. Ask for guidelines on exercising.

Weight Control

If you are overweight or obese, you should try to lose weight. Weight loss can reduce stress on weight-bearing joints, limit further injury, increase mobility, and reduce the risk of associated health problems. A dietitian can help you develop healthy eating habits. A healthy diet and regular exercise help reduce weight.

Rest and Relief from Stress on Joints

Treatment plans include regularly scheduled rest. You must learn to recognize the body's signals, and know when to stop or slow down. This will prevent the pain caused by overexertion. Although pain can make it difficult to sleep, getting proper sleep is important for managing arthritis pain. If you have trouble sleeping, you may find that relaxation techniques, stress reduction, and biofeedback can help, as can timing medications to provide maximum pain relief through the night. If joint pain interferes with your ability to sleep or rest, consult your doctor.

Some people find relief from special footwear and insoles that can reduce pain and improve walking or from using canes to take pressure off painful joints. They may use splints or braces to provide extra support for joints and/ or keep them in proper position during sleep or activity. Splints should be used only for limited periods of time because joints and muscles need to be exercised to prevent stiffness and weakness. If you need a splint, an occupational therapist or a doctor can help you get a properly fitted one.

Nondrug Pain Relief and Alternative Therapies

People with osteoarthritis may find many nondrug ways to relieve pain. Below are some examples:

Heat and cold: Heat or cold (or a combination of the two) can be useful for joint pain. Heat can be applied in a number of different ways—with warm towels, hot packs, or a warm bath or shower—to increase blood flow and ease pain and stiffness. In some cases, cold packs (bags of ice or frozen vegetables wrapped in a towel), which reduce inflammation, can relieve pain or numb the sore area. (Check with a doctor or physical therapist to find out if heat or cold is the best treatment.)

Transcutaneous electrical nerve stimulation (TENS): TENS is a technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in the painful area. TENS may relieve some arthritis pain. It seems to work by blocking pain messages to the brain and by modifying pain perception.

Massage: In this pain-relief approach, a massage therapist will lightly stroke and/or knead the painful muscles. This may increase blood flow and bring warmth to a stressed area. However, arthritis-stressed joints are sensitive, so the therapist must be familiar with the problems of the disease.

Acupuncture: When conventional medical treatment doesn't provide sufficient pain relief, people are more likely to try complementary and alternative therapies to treat osteoarthritis. Some people have found pain relief using **acupuncture**, a practice in which fine needles are inserted by a licensed acupuncture therapist at specific points on the skin. Scientists think the needles stimulate the release of natural, pain-relieving chemicals produced by the nervous system. A large study supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and the National Center for Complementary and Alternative Medicine (NCCAM) revealed that acupuncture relieves pain and improves function in knee osteoarthritis, and it serves as an effective complement to standard care.[2]

---

[2] Berman BM, Lao L, Langenberg P, Lee WL, Gilpin AM, Hochberg MC. Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: a randomized, controlled trial. Ann Intern Med. 2004 Dec 21;141 (12):901-10.

Nutritional supplements, such as glucosamine and chondroitin sulfate have been reported to improve symptoms in some people with osteoarthritis, as have certain vitamins. Additional studies have been carried out to further evaluate these claims (see "Research Highlights"). It is unknown whether they might change the course of disease.

Medications to Control Pain

Doctors prescribe medicines to eliminate or reduce pain and to improve functioning. Doctors consider a number of factors when choosing medicines for their patients with osteoarthritis. These include the intensity of pain, potential side effects of the medication, your medical history (other health problems you have or are at risk for), and other medications you are taking.

Because some medications can interact with one another and certain health conditions put you at increased risk of drug side effects, it's important to discuss your medication and health history with your doctor before you start taking any new medication, and to see your doctor regularly while you are taking medication. By working together, you and your doctor can find the medication that best relieves your pain with the least risk of side effects.

The following types of medicines are commonly used in treating osteoarthritis:[3]

---

[3] All medicines can have side effects. Some side effects may be more severe than others. You should review the package insert that comes with your medicine and ask your health care provider or pharmacist if you have any questions about the possible side effects.

Over-the-counter pain relievers: Oral pain medications, such as acetaminophen, are often a first-line approach to relieve pain in people with osteoarthritis.

NSAIDs (nonsteroidal anti-inflammatory drugs): A large class of medications useful against both pain and inflammation, (NSAIDs)[4] are staples in arthritis treatment. Aspirin, ibuprofen, naproxen, and naproxen sodium are examples of NSAIDs. They are often the first type of medication used. All NSAIDs work similarly: by blocking substances called prostaglandins that contribute to inflammation and pain. However, each NSAID is a different chemical, and each has a slightly different effect on the body.

---

[4] Warning: Side effects of NSAIDs include stomach problems; skin rashes; high blood pressure; fluid retention; and liver, kidney, and heart problems. The longer a person uses NSAIDs, the more likely he or she is to have side effects, ranging from mild to serious. Many other drugs cannot be taken when a patient is being treated with NSAIDs, because NSAIDs alter the way the body uses or eliminates these other drugs. Check with your health care provider or pharmacist before you take NSAIDs. NSAIDs should only be used at the lowest dose possible for the shortest time needed.

Some NSAIDs are available over the counter, while more than a dozen others, including a subclass called COX-2 inhibitors, are available only with a prescription.

All NSAIDs can have significant side effects, and for unknown reasons, some people seem to respond better to one NSAID than another. Any person taking NSAIDs regularly should be monitored by a doctor.

Reducing the Risks of NSAID Use

Certain health problems and lifestyle habits can increase the risk of side effects from NSAIDs. These include a history of peptic ulcers or digestive tract bleeding, use of oral corticosteroids or anticoagulants (blood thinners), smoking, and alcohol use.

There are measures you can take to help reduce the risk of side effects associated with NSAIDs. These include taking medications with food and avoiding stomach irritants such as alcohol, tobacco, and caffeine. In some cases, it may help to take another medication along with an NSAID to coat the stomach or block stomach acids. Although these measures may help, they are not always completely effective.

Narcotic or central acting agents: Tramadol is a prescription pain reliever and synthetic opioid that is sometimes prescribed when over-the-counter medications don't provide sufficient relief. It works through the central nervous system to achieve its effects. Tramadol carries risks that don't exist with acetaminophen and NSAIDs, including the potential for addiction.

Mild narcotic painkillers containing analgesics such as codeine or hydrocodone are often effective against osteoarthritis pain. But because of concerns about the potential for physical and psychological dependence on these drugs, doctors generally reserve them for short-term use.

Corticosteroids: Corticosteroids are powerful anti- inflammatory hormones made naturally in the body or man-made for use as medicine. They may be injected into the affected joints to temporarily relieve pain. This is a short-term measure, generally not recommended for more than two to four treatments per year. Oral corticosteroids are not routinely used to treat osteoarthritis. They are occasionally used for inflammatory flares.

Hyaluronic acid substitutes: Sometimes called viscosupplements, hyaluronic acid substitutes are designed to replace a normal component of the joint involved in joint lubrication and nutrition. Depending on the particular product your doctor prescribes, it will be given in a series of three to five injections. These products are approved only for osteoarthritis of the knee.

Other medications: Doctors may prescribe several other medicines for osteoarthritis. They include topical pain-relieving creams, rubs, and sprays, which are applied directly to the skin over painful joints. They contain ingredients that work in one of three different ways: (1) by stimulating the nerve endings to distract the brain's attention from the joint pain, (2) by depleting the amount of a neurotransmitter called substance P that sends pain messages to the brain, or (3) by blocking chemicals called prostaglandins that cause pain and inflammation.

Because most medicines used to treat osteoarthritis have side effects, it's important to learn as much as possible about the medications you take, even the ones available without a prescription. Certain health problems and lifestyle habits can increase the risk of side effects from NSAIDs. These include a history of peptic ulcers or digestive tract bleeding, use of oral corticosteroids or anticoagulants (blood thinners), smoking, and alcohol use.

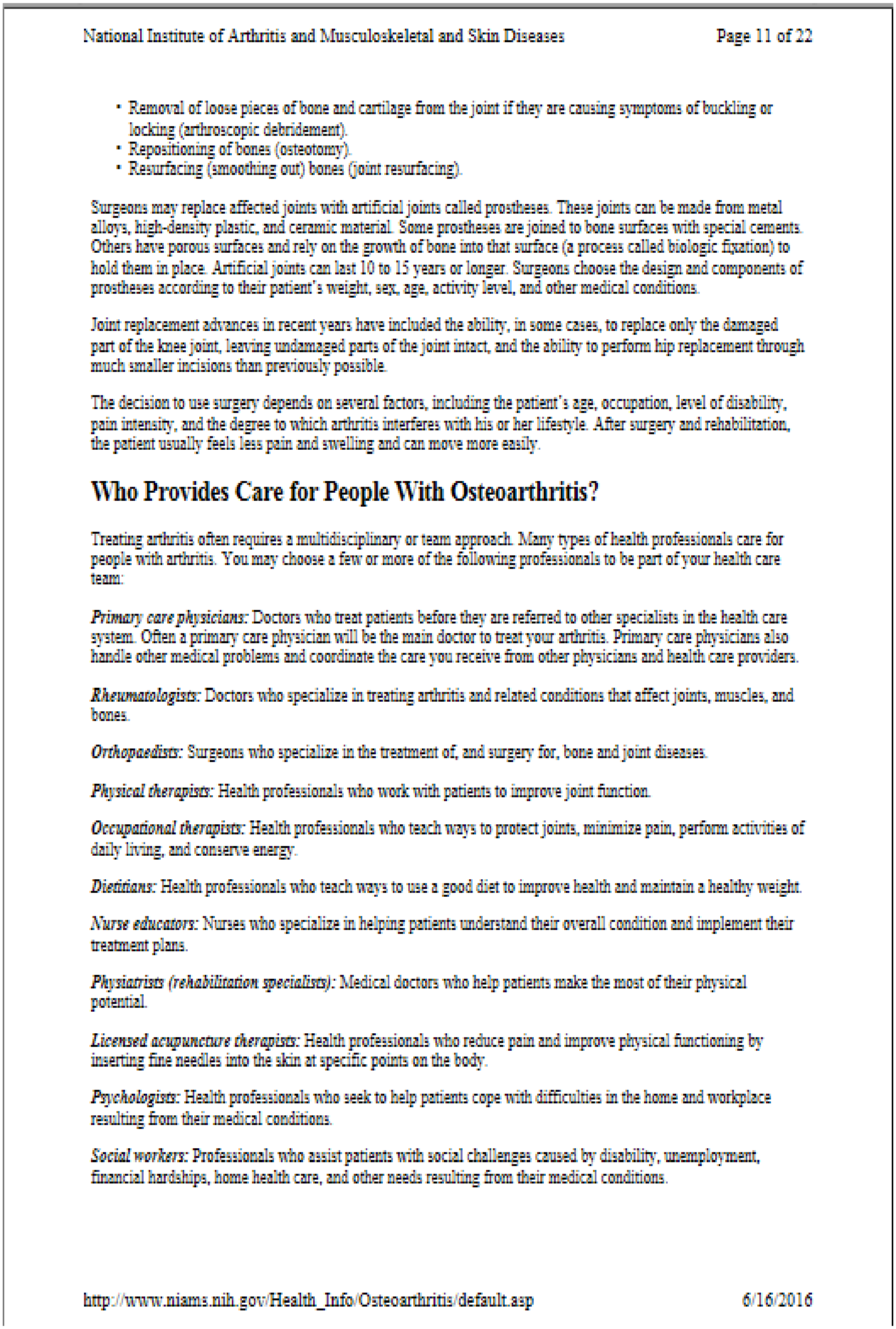
There are measures you can take to help reduce the risk of side effects associated with NSAIDs. These include taking medications with food and avoiding stomach irritants such as alcohol, tobacco, and caffeine. In some cases, it may help to take another medication along with an NSAID to coat the stomach or block stomach acids. Although these measures may help, they are not always completely effective.

Questions to Ask Your Doctor or Pharmacist About Medicines

- How often should I take this medicine?
- Should I take this medicine with food or between meals?
- What side effects might occur?
- Should I take this medicine with the other prescription medicines I take?
- Is this medication safe considering other medical conditions I have?

Surgery

For many people, surgery helps relieve the pain and disability of osteoarthritis. Surgery may be performed to achieve one or more of the following:



- Removal of loose pieces of bone and cartilage from the joint if they are causing symptoms of buckling or locking (arthroscopic debridement).
- Repositioning of bones (osteotomy).
- Resurfacing (smoothing out) bones (joint resurfacing).

Surgeons may replace affected joints with artificial joints called prostheses. These joints can be made from metal alloys, high-density plastic, and ceramic material. Some prostheses are joined to bone surfaces with special cements. Others have porous surfaces and rely on the growth of bone into that surface (a process called biologic fixation) to hold them in place. Artificial joints can last 10 to 15 years or longer. Surgeons choose the design and components of prostheses according to their patient's weight, sex, age, activity level, and other medical conditions.

Joint replacement advances in recent years have included the ability, in some cases, to replace only the damaged part of the knee joint, leaving undamaged parts of the joint intact, and the ability to perform hip replacement through much smaller incisions than previously possible.

The decision to use surgery depends on several factors, including the patient's age, occupation, level of disability, pain intensity, and the degree to which arthritis interferes with his or her lifestyle. After surgery and rehabilitation, the patient usually feels less pain and swelling and can move more easily.

Who Provides Care for People With Osteoarthritis?

Treating arthritis often requires a multidisciplinary or team approach. Many types of health professionals care for people with arthritis. You may choose a few or more of the following professionals to be part of your health care team:

Primary care physicians: Doctors who treat patients before they are referred to other specialists in the health care system. Often a primary care physician will be the main doctor to treat your arthritis. Primary care physicians also handle other medical problems and coordinate the care you receive from other physicians and health care providers.

Rheumatologists: Doctors who specialize in treating arthritis and related conditions that affect joints, muscles, and bones.

Orthopaedists: Surgeons who specialize in the treatment of, and surgery for, bone and joint diseases.

Physical therapists: Health professionals who work with patients to improve joint function.

Occupational therapists: Health professionals who teach ways to protect joints, minimize pain, perform activities of daily living, and conserve energy.

Dietitians: Health professionals who teach ways to use a good diet to improve health and maintain a healthy weight.

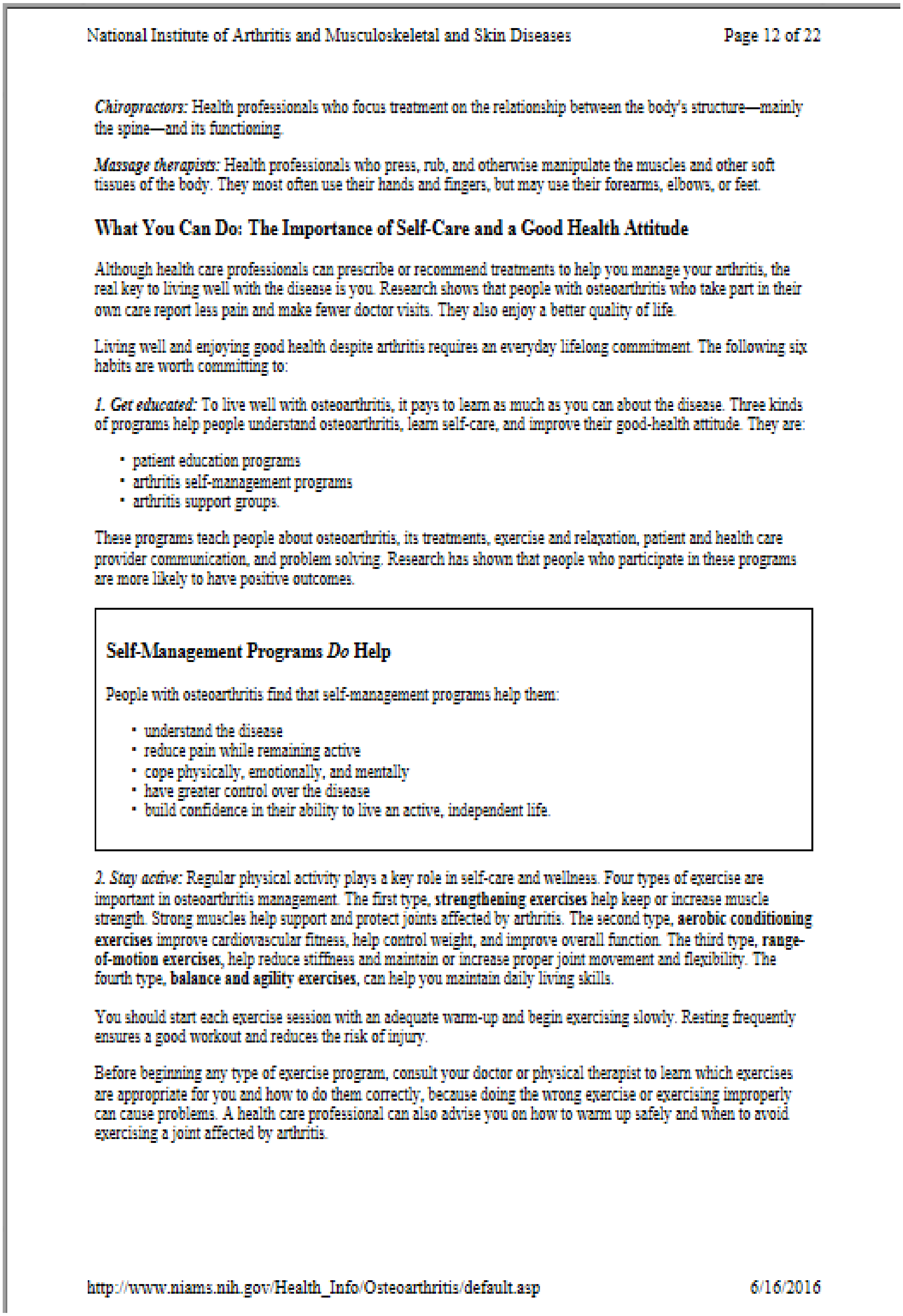
Nurse educators: Nurses who specialize in helping patients understand their overall condition and implement their treatment plans.

Physiatrists (rehabilitation specialists): Medical doctors who help patients make the most of their physical potential.

Licensed acupuncture therapists: Health professionals who reduce pain and improve physical functioning by inserting fine needles into the skin at specific points on the body.

Psychologists: Health professionals who seek to help patients cope with difficulties in the home and workplace resulting from their medical conditions.

Social workers: Professionals who assist patients with social challenges caused by disability, unemployment, financial hardships, home health care, and other needs resulting from their medical conditions.



Chiropractors: Health professionals who focus treatment on the relationship between the body's structure—mainly the spine—and its functioning.

Massage therapists: Health professionals who press, rub, and otherwise manipulate the muscles and other soft tissues of the body. They most often use their hands and fingers, but may use their forearms, elbows, or feet.

What You Can Do: The Importance of Self-Care and a Good Health Attitude

Although health care professionals can prescribe or recommend treatments to help you manage your arthritis, the real key to living well with the disease is you. Research shows that people with osteoarthritis who take part in their own care report less pain and make fewer doctor visits. They also enjoy a better quality of life.

Living well and enjoying good health despite arthritis requires an everyday lifelong commitment. The following six habits are worth committing to:

1. Get educated: To live well with osteoarthritis, it pays to learn as much as you can about the disease. Three kinds of programs help people understand osteoarthritis, learn self-care, and improve their good-health attitude. They are:

- patient education programs
- arthritis self-management programs
- arthritis support groups.

These programs teach people about osteoarthritis, its treatments, exercise and relaxation, patient and health care provider communication, and problem solving. Research has shown that people who participate in these programs are more likely to have positive outcomes.

Self-Management Programs *Do* Help

People with osteoarthritis find that self-management programs help them:

- understand the disease
- reduce pain while remaining active
- cope physically, emotionally, and mentally
- have greater control over the disease
- build confidence in their ability to live an active, independent life.

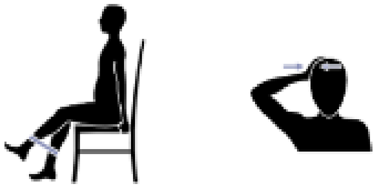
2. Stay active: Regular physical activity plays a key role in self-care and wellness. Four types of exercise are important in osteoarthritis management. The first type, **strengthening exercises** help keep or increase muscle strength. Strong muscles help support and protect joints affected by arthritis. The second type, **aerobic conditioning exercises** improve cardiovascular fitness, help control weight, and improve overall function. The third type, **range-of-motion exercises**, help reduce stiffness and maintain or increase proper joint movement and flexibility. The fourth type, **balance and agility exercises**, can help you maintain daily living skills.

You should start each exercise session with an adequate warm-up and begin exercising slowly. Resting frequently ensures a good workout and reduces the risk of injury.

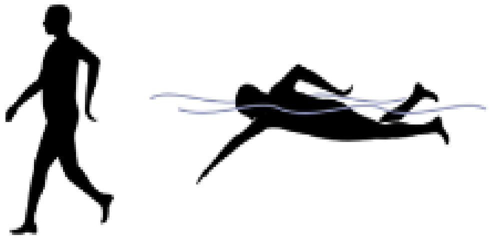
Before beginning any type of exercise program, consult your doctor or physical therapist to learn which exercises are appropriate for you and how to do them correctly, because doing the wrong exercise or exercising improperly can cause problems. A health care professional can also advise you on how to warm up safely and when to avoid exercising a joint affected by arthritis.

Exercises for Osteoarthritis

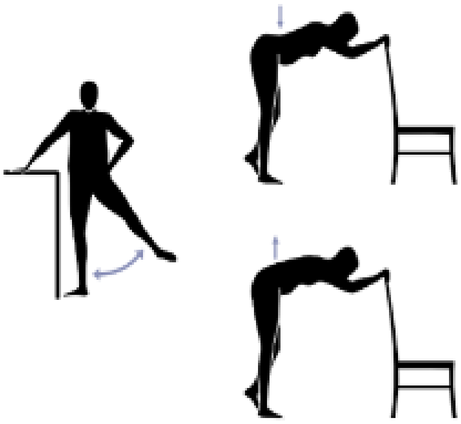
People with osteoarthritis should do different kinds of exercise for different benefits to the body. Consult your health professional before starting. The National Institute on Aging Web site (www.nia.nih.gov) has booklets on exercise and physical activity that may also be helpful.



Strengthening



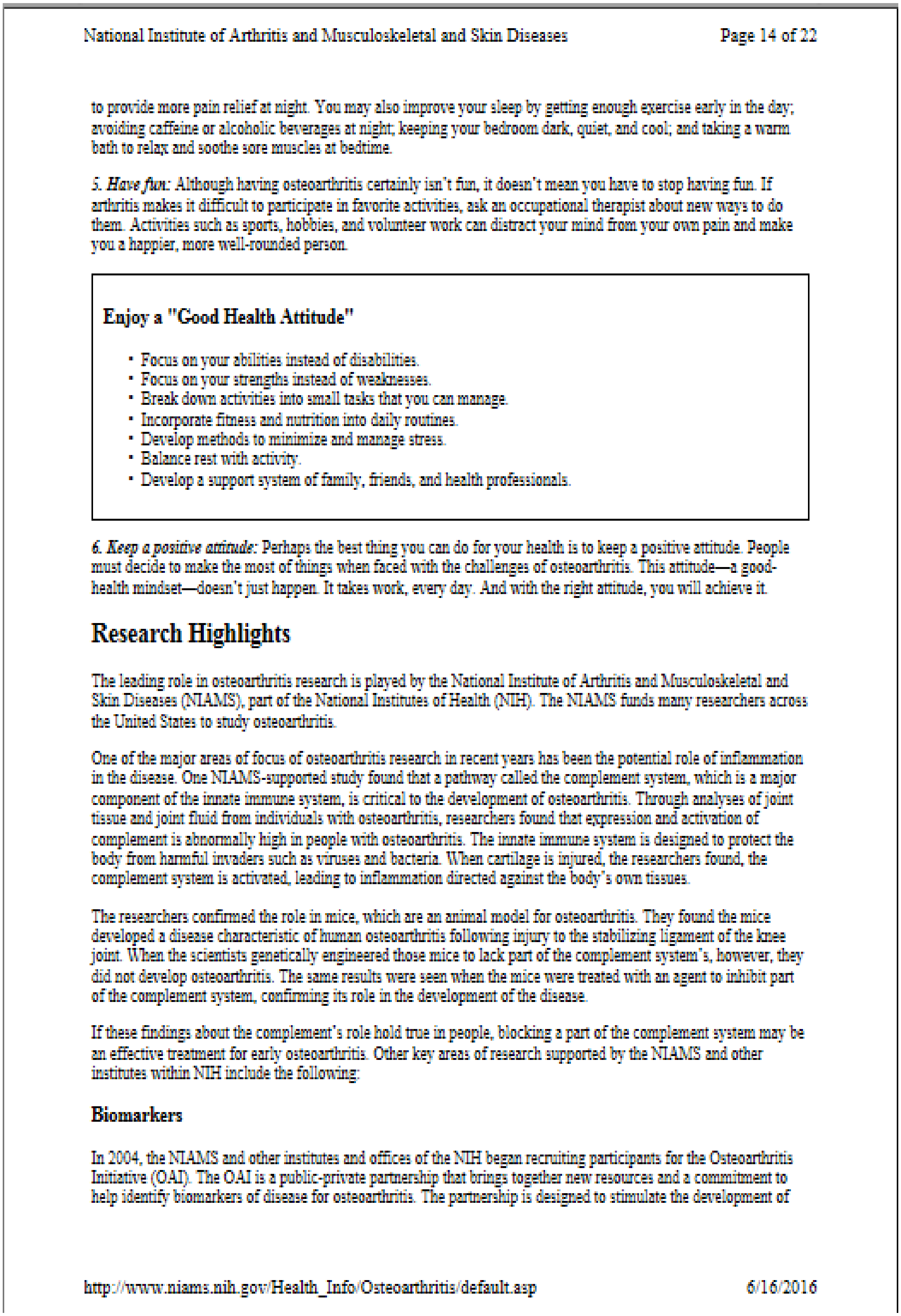
Aerobic conditioning



Range of motion

3. Eat well: Though no specific diet will necessarily make your arthritis better, eating right and controlling your weight can help by minimizing stress on the weight-bearing joints such as the knees and the joints of the feet. It can also minimize your risk of developing other health problems.

4. Get plenty of sleep: Getting a good night's sleep on a regular basis can minimize pain and help you cope better with the effects of your disease. If arthritis pain makes it difficult to sleep at night, speak with your doctor and/or physical therapist about the best mattress or comfortable sleeping positions or the possibility of timing medications



to provide more pain relief at night. You may also improve your sleep by getting enough exercise early in the day; avoiding caffeine or alcoholic beverages at night; keeping your bedroom dark, quiet, and cool; and taking a warm bath to relax and soothe sore muscles at bedtime.

5. Have fun: Although having osteoarthritis certainly isn't fun, it doesn't mean you have to stop having fun. If arthritis makes it difficult to participate in favorite activities, ask an occupational therapist about new ways to do them. Activities such as sports, hobbies, and volunteer work can distract your mind from your own pain and make you a happier, more well-rounded person.

Enjoy a "Good Health Attitude"

- Focus on your abilities instead of disabilities.
- Focus on your strengths instead of weaknesses.
- Break down activities into small tasks that you can manage.
- Incorporate fitness and nutrition into daily routines.
- Develop methods to minimize and manage stress.
- Balance rest with activity.
- Develop a support system of family, friends, and health professionals.

6. Keep a positive attitude: Perhaps the best thing you can do for your health is to keep a positive attitude. People must decide to make the most of things when faced with the challenges of osteoarthritis. This attitude—a good-health mindset—doesn't just happen. It takes work, every day. And with the right attitude, you will achieve it.

Research Highlights

The leading role in osteoarthritis research is played by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), part of the National Institutes of Health (NIH). The NIAMS funds many researchers across the United States to study osteoarthritis.

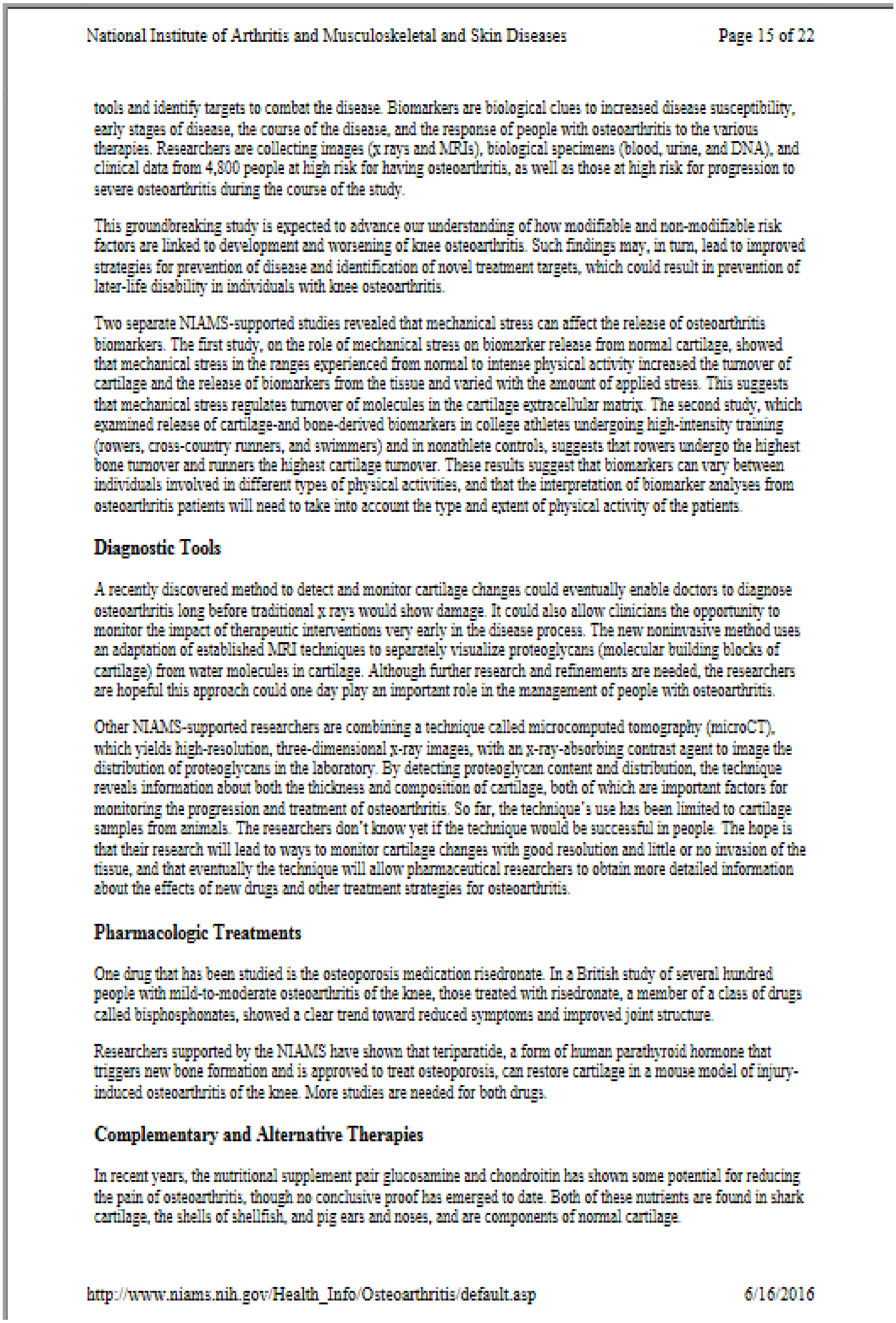
One of the major areas of focus of osteoarthritis research in recent years has been the potential role of inflammation in the disease. One NIAMS-supported study found that a pathway called the complement system, which is a major component of the innate immune system, is critical to the development of osteoarthritis. Through analyses of joint tissue and joint fluid from individuals with osteoarthritis, researchers found that expression and activation of complement is abnormally high in people with osteoarthritis. The innate immune system is designed to protect the body from harmful invaders such as viruses and bacteria. When cartilage is injured, the researchers found, the complement system is activated, leading to inflammation directed against the body's own tissues.

The researchers confirmed the role in mice, which are an animal model for osteoarthritis. They found the mice developed a disease characteristic of human osteoarthritis following injury to the stabilizing ligament of the knee joint. When the scientists genetically engineered those mice to lack part of the complement system's, however, they did not develop osteoarthritis. The same results were seen when the mice were treated with an agent to inhibit part of the complement system, confirming its role in the development of the disease.

If these findings about the complement's role hold true in people, blocking a part of the complement system may be an effective treatment for early osteoarthritis. Other key areas of research supported by the NIAMS and other institutes within NIH include the following:

Biomarkers

In 2004, the NIAMS and other institutes and offices of the NIH began recruiting participants for the Osteoarthritis Initiative (OAI). The OAI is a public-private partnership that brings together new resources and a commitment to help identify biomarkers of disease for osteoarthritis. The partnership is designed to stimulate the development of



tools and identify targets to combat the disease. Biomarkers are biological clues to increased disease susceptibility, early stages of disease, the course of the disease, and the response of people with osteoarthritis to the various therapies. Researchers are collecting images (x rays and MRIs), biological specimens (blood, urine, and DNA), and clinical data from 4,800 people at high risk for having osteoarthritis, as well as those at high risk for progression to severe osteoarthritis during the course of the study.

This groundbreaking study is expected to advance our understanding of how modifiable and non-modifiable risk factors are linked to development and worsening of knee osteoarthritis. Such findings may, in turn, lead to improved strategies for prevention of disease and identification of novel treatment targets, which could result in prevention of later-life disability in individuals with knee osteoarthritis.

Two separate NIAMS-supported studies revealed that mechanical stress can affect the release of osteoarthritis biomarkers. The first study, on the role of mechanical stress on biomarker release from normal cartilage, showed that mechanical stress in the ranges experienced from normal to intense physical activity increased the turnover of cartilage and the release of biomarkers from the tissue and varied with the amount of applied stress. This suggests that mechanical stress regulates turnover of molecules in the cartilage extracellular matrix. The second study, which examined release of cartilage-and bone-derived biomarkers in college athletes undergoing high-intensity training (rowers, cross-country runners, and swimmers) and in nonathlete controls, suggests that rowers undergo the highest bone turnover and runners the highest cartilage turnover. These results suggest that biomarkers can vary between individuals involved in different types of physical activities, and that the interpretation of biomarker analyses from osteoarthritis patients will need to take into account the type and extent of physical activity of the patients.

Diagnostic Tools

A recently discovered method to detect and monitor cartilage changes could eventually enable doctors to diagnose osteoarthritis long before traditional x rays would show damage. It could also allow clinicians the opportunity to monitor the impact of therapeutic interventions very early in the disease process. The new noninvasive method uses an adaptation of established MRI techniques to separately visualize proteoglycans (molecular building blocks of cartilage) from water molecules in cartilage. Although further research and refinements are needed, the researchers are hopeful this approach could one day play an important role in the management of people with osteoarthritis.

Other NIAMS-supported researchers are combining a technique called microcomputed tomography (microCT), which yields high-resolution, three-dimensional x-ray images, with an x-ray-absorbing contrast agent to image the distribution of proteoglycans in the laboratory. By detecting proteoglycan content and distribution, the technique reveals information about both the thickness and composition of cartilage, both of which are important factors for monitoring the progression and treatment of osteoarthritis. So far, the technique's use has been limited to cartilage samples from animals. The researchers don't know yet if the technique would be successful in people. The hope is that their research will lead to ways to monitor cartilage changes with good resolution and little or no invasion of the tissue, and that eventually the technique will allow pharmaceutical researchers to obtain more detailed information about the effects of new drugs and other treatment strategies for osteoarthritis.

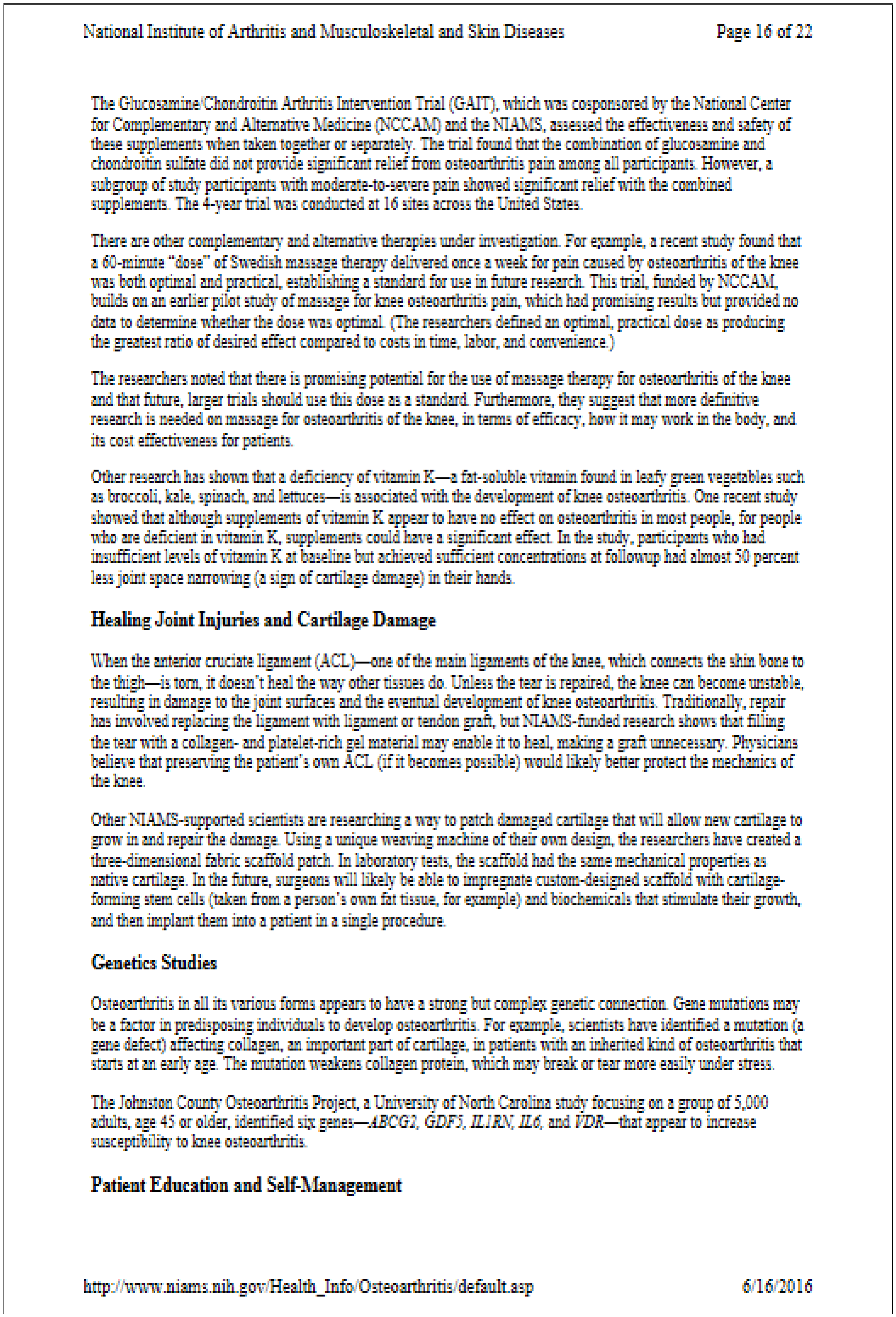
Pharmacologic Treatments

One drug that has been studied is the osteoporosis medication risedronate. In a British study of several hundred people with mild-to-moderate osteoarthritis of the knee, those treated with risedronate, a member of a class of drugs called bisphosphonates, showed a clear trend toward reduced symptoms and improved joint structure.

Researchers supported by the NIAMS have shown that teriparatide, a form of human parathyroid hormone that triggers new bone formation and is approved to treat osteoporosis, can restore cartilage in a mouse model of injury-induced osteoarthritis of the knee. More studies are needed for both drugs.

Complementary and Alternative Therapies

In recent years, the nutritional supplement pair glucosamine and chondroitin has shown some potential for reducing the pain of osteoarthritis, though no conclusive proof has emerged to date. Both of these nutrients are found in shark cartilage, the shells of shellfish, and pig ears and noses, and are components of normal cartilage.



The Glucosamine/Chondroitin Arthritis Intervention Trial (GAIT), which was cosponsored by the National Center for Complementary and Alternative Medicine (NCCAM) and the NIAMS, assessed the effectiveness and safety of these supplements when taken together or separately. The trial found that the combination of glucosamine and chondroitin sulfate did not provide significant relief from osteoarthritis pain among all participants. However, a subgroup of study participants with moderate-to-severe pain showed significant relief with the combined supplements. The 4-year trial was conducted at 16 sites across the United States.

There are other complementary and alternative therapies under investigation. For example, a recent study found that a 60-minute "dose" of Swedish massage therapy delivered once a week for pain caused by osteoarthritis of the knee was both optimal and practical, establishing a standard for use in future research. This trial, funded by NCCAM, builds on an earlier pilot study of massage for knee osteoarthritis pain, which had promising results but provided no data to determine whether the dose was optimal. (The researchers defined an optimal, practical dose as producing the greatest ratio of desired effect compared to costs in time, labor, and convenience.)

The researchers noted that there is promising potential for the use of massage therapy for osteoarthritis of the knee and that future, larger trials should use this dose as a standard. Furthermore, they suggest that more definitive research is needed on massage for osteoarthritis of the knee, in terms of efficacy, how it may work in the body, and its cost effectiveness for patients.

Other research has shown that a deficiency of vitamin K—a fat-soluble vitamin found in leafy green vegetables such as broccoli, kale, spinach, and lettuces—is associated with the development of knee osteoarthritis. One recent study showed that although supplements of vitamin K appear to have no effect on osteoarthritis in most people, for people who are deficient in vitamin K, supplements could have a significant effect. In the study, participants who had insufficient levels of vitamin K at baseline but achieved sufficient concentrations at followup had almost 50 percent less joint space narrowing (a sign of cartilage damage) in their hands.

Healing Joint Injuries and Cartilage Damage

When the anterior cruciate ligament (ACL)—one of the main ligaments of the knee, which connects the shin bone to the thigh—is torn, it doesn't heal the way other tissues do. Unless the tear is repaired, the knee can become unstable, resulting in damage to the joint surfaces and the eventual development of knee osteoarthritis. Traditionally, repair has involved replacing the ligament with ligament or tendon graft, but NIAMS-funded research shows that filling the tear with a collagen- and platelet-rich gel material may enable it to heal, making a graft unnecessary. Physicians believe that preserving the patient's own ACL (if it becomes possible) would likely better protect the mechanics of the knee.

Other NIAMS-supported scientists are researching a way to patch damaged cartilage that will allow new cartilage to grow in and repair the damage. Using a unique weaving machine of their own design, the researchers have created a three-dimensional fabric scaffold patch. In laboratory tests, the scaffold had the same mechanical properties as native cartilage. In the future, surgeons will likely be able to impregnate custom-designed scaffold with cartilage-forming stem cells (taken from a person's own fat tissue, for example) and biochemicals that stimulate their growth, and then implant them into a patient in a single procedure.

Genetics Studies

Osteoarthritis in all its various forms appears to have a strong but complex genetic connection. Gene mutations may be a factor in predisposing individuals to develop osteoarthritis. For example, scientists have identified a mutation (a gene defect) affecting collagen, an important part of cartilage, in patients with an inherited kind of osteoarthritis that starts at an early age. The mutation weakens collagen protein, which may break or tear more easily under stress.

The Johnston County Osteoarthritis Project, a University of North Carolina study focusing on a group of 5,000 adults, age 45 or older, identified six genes—*ABCG2, GDF5, IL1RN, IL6,* and *VDR*—that appear to increase susceptibility to knee osteoarthritis.

Patient Education and Self-Management

When patients understand and feel that they have some control over their chronic disease, the course of their disease is often improved. One NIAMS-supported study found that improvement can be made in the self-management of osteoarthritis when spouses provide help. The intervention that was tested used spouse-assisted coping skills training and exercise training to improve physical fitness, pain coping, and self-efficacy in patients with osteoarthritis of the knee. The results from the study suggest that a combination of both spouse-assisted pain coping skills training and exercise training leads to more improvements than could be achieved with either intervention alone.

Other research shows that patient education and social support is a low-cost, effective way to decrease pain and reduce the amount of medicine patients use. One NIAMS-funded project involves developing and testing an interactive website by which health professionals and patients could communicate concerning appointments and treatment instructions, thus giving patients a greater role in and control of their care.

Exercise and Weight Reduction

Exercise plays a key part in a comprehensive treatment plan. Researchers are studying exercise in greater detail and finding out just how to use it in treating or preventing osteoarthritis. For example, several scientists have studied knee osteoarthritis and exercise. Their results included the following:

- Walking can result in better functioning, and the more you walk, the farther you will be able to walk.
- People with knee osteoarthritis who are active in an exercise program feel less pain. They also function better.

Research has shown that losing extra weight can help people who already have osteoarthritis. Moreover, overweight or obese people who do not have osteoarthritis may reduce their risk of developing the disease by losing weight.

More information on research is available from the following websites:

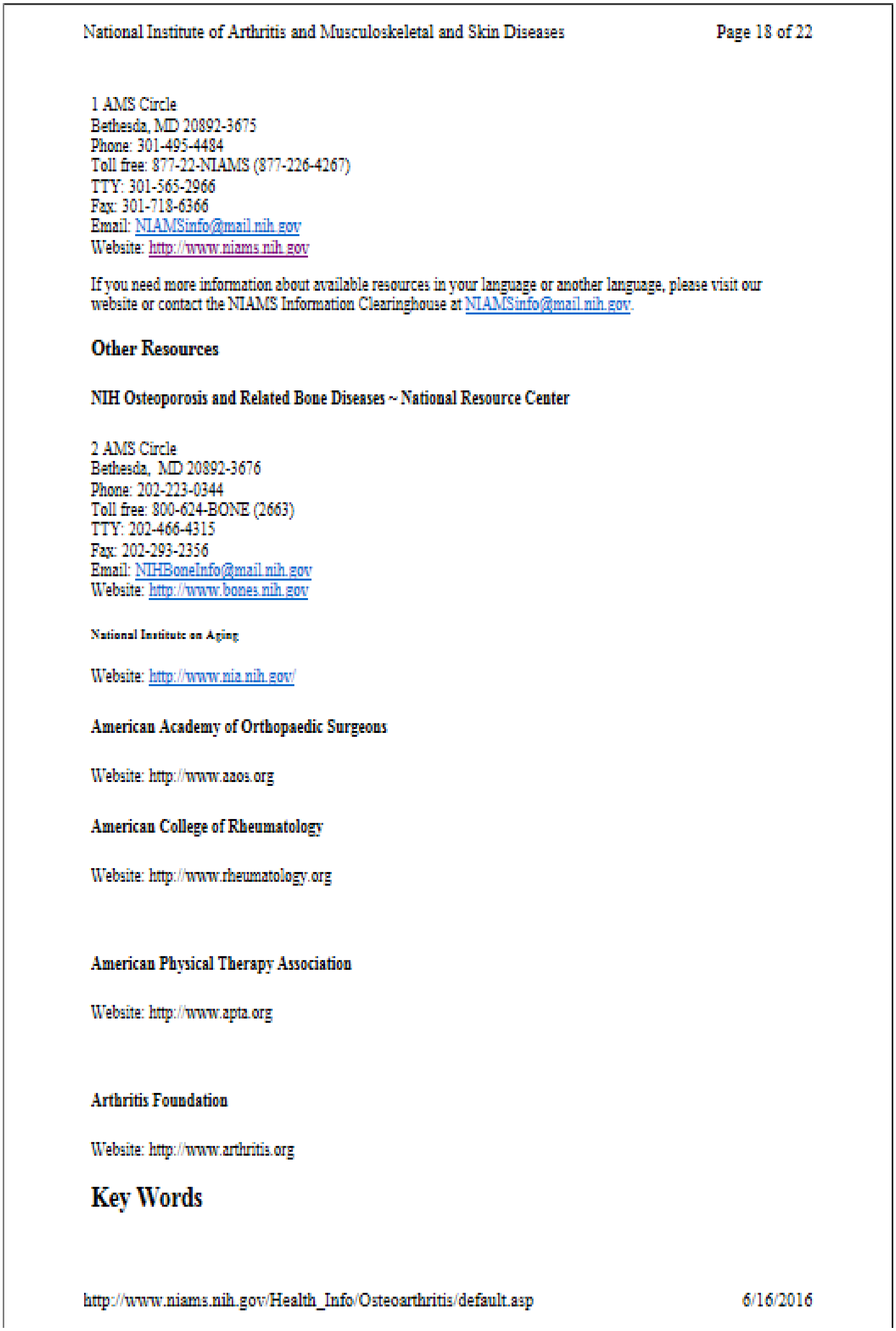
- NIH Clinical Research Trials and You was designed to help people learn more about clinical trials, why they matter, and how to participate. Visitors to the website will find information about the basics of participating in a clinical trial, first-hand stories from actual clinical trial volunteers, explanations from researchers, and links to how to search for a trial or enroll in a research-matching program.
- ClinicalTrials.gov offers up-to-date information for locating federally and privately supported clinical trials for a wide range of diseases and conditions.
- NIH RePORTER is an electronic tool that allows users to search a repository of both intramural and extramural NIH-funded research projects from the past 25 years and access publications (since 1985) and patents resulting from NIH funding.
- PubMed is a free service of the U.S. National Library of Medicine that lets you search millions of journal citations and abstracts in the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and preclinical sciences.

Hope for the Future

Research is opening up new avenues of treatment for people with osteoarthritis. A balanced, comprehensive approach is still the key to staying active and healthy with the disease. People with osteoarthritis should combine exercise, relaxation, education, social support, and medications in their treatment strategies. Meanwhile, as scientists unravel the complexities of the disease, new treatments and prevention methods should become apparent. Such developments are expected to improve the quality of life for people with osteoarthritis and their families.

For More Information

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
Information Clearinghouse
National Institutes of Health



National Institute of Arthritis and Musculoskeletal and Skin Diseases Page 18 of 22

1 AMS Circle
Bethesda, MD 20892-3675
Phone: 301-495-4484
Toll free: 877-22-NIAMS (877-226-4267)
TTY: 301-565-2966
Fax: 301-718-6366
Email: NIAMSinfo@mail.nih.gov
Website: http://www.niams.nih.gov

If you need more information about available resources in your language or another language, please visit our website or contact the NIAMS Information Clearinghouse at NIAMSinfo@mail.nih.gov.

Other Resources

NIH Osteoporosis and Related Bone Diseases ~ National Resource Center

2 AMS Circle
Bethesda, MD 20892-3676
Phone: 202-223-0344
Toll free: 800-624-BONE (2663)
TTY: 202-466-4315
Fax: 202-293-2356
Email: NIHBoneInfo@mail.nih.gov
Website: http://www.bones.nih.gov

National Institute on Aging

Website: http://www.nia.nih.gov/

American Academy of Orthopaedic Surgeons

Website: http://www.aaos.org

American College of Rheumatology

Website: http://www.rheumatology.org

American Physical Therapy Association

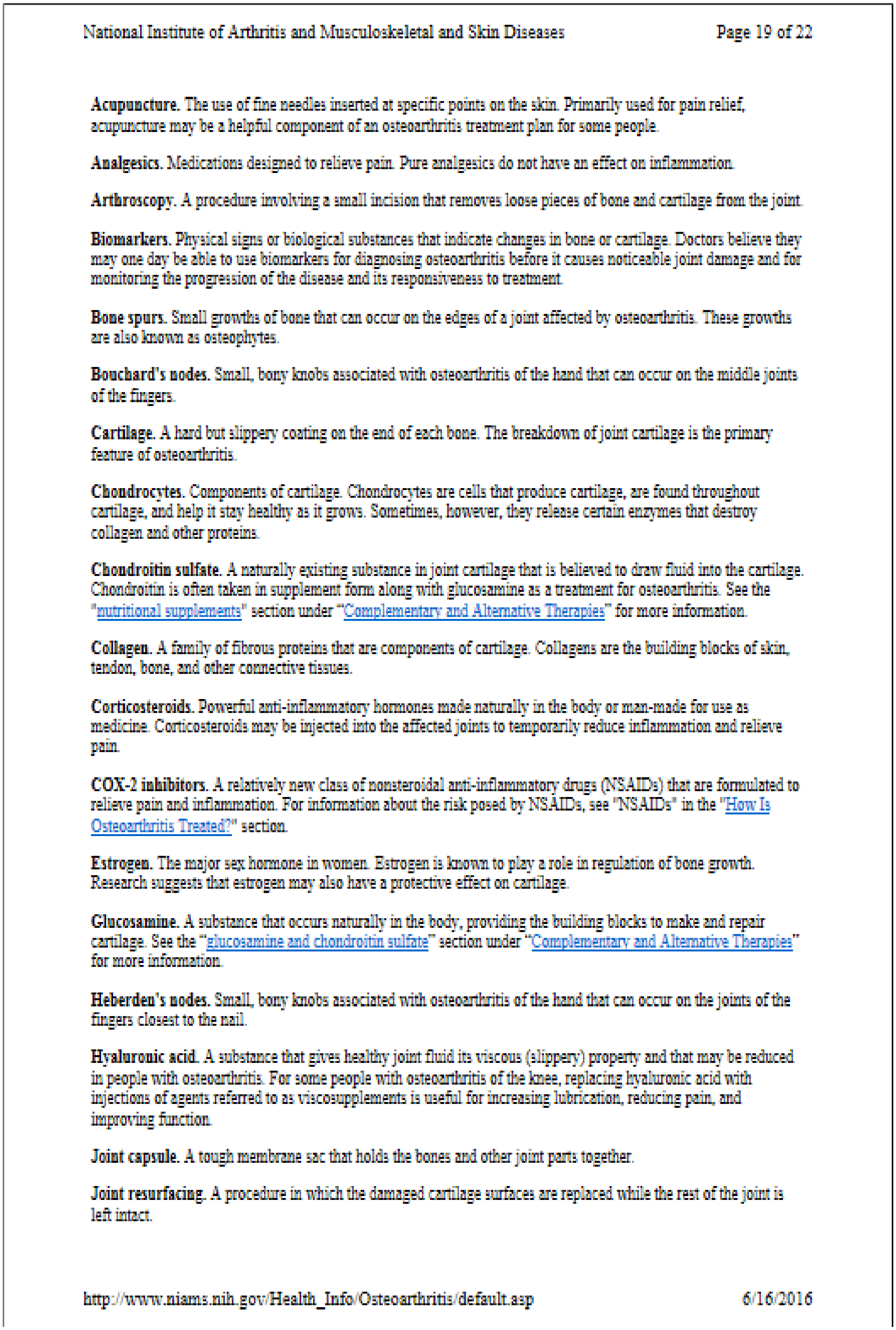
Website: http://www.apta.org

Arthritis Foundation

Website: http://www.arthritis.org

Key Words

http://www.niams.nih.gov/Health_Info/Osteoarthritis/default.asp 6/16/2016



Acupuncture. The use of fine needles inserted at specific points on the skin. Primarily used for pain relief, acupuncture may be a helpful component of an osteoarthritis treatment plan for some people.

Analgesics. Medications designed to relieve pain. Pure analgesics do not have an effect on inflammation.

Arthroscopy. A procedure involving a small incision that removes loose pieces of bone and cartilage from the joint.

Biomarkers. Physical signs or biological substances that indicate changes in bone or cartilage. Doctors believe they may one day be able to use biomarkers for diagnosing osteoarthritis before it causes noticeable joint damage and for monitoring the progression of the disease and its responsiveness to treatment.

Bone spurs. Small growths of bone that can occur on the edges of a joint affected by osteoarthritis. These growths are also known as osteophytes.

Bouchard's nodes. Small, bony knobs associated with osteoarthritis of the hand that can occur on the middle joints of the fingers.

Cartilage. A hard but slippery coating on the end of each bone. The breakdown of joint cartilage is the primary feature of osteoarthritis.

Chondrocytes. Components of cartilage. Chondrocytes are cells that produce cartilage, are found throughout cartilage, and help it stay healthy as it grows. Sometimes, however, they release certain enzymes that destroy collagen and other proteins.

Chondroitin sulfate. A naturally existing substance in joint cartilage that is believed to draw fluid into the cartilage. Chondroitin is often taken in supplement form along with glucosamine as a treatment for osteoarthritis. See the "nutritional supplements" section under "Complementary and Alternative Therapies" for more information.

Collagen. A family of fibrous proteins that are components of cartilage. Collagens are the building blocks of skin, tendon, bone, and other connective tissues.

Corticosteroids. Powerful anti-inflammatory hormones made naturally in the body or man-made for use as medicine. Corticosteroids may be injected into the affected joints to temporarily reduce inflammation and relieve pain.

COX-2 inhibitors. A relatively new class of nonsteroidal anti-inflammatory drugs (NSAIDs) that are formulated to relieve pain and inflammation. For information about the risk posed by NSAIDs, see "NSAIDs" in the "How Is Osteoarthritis Treated?" section.

Estrogen. The major sex hormone in women. Estrogen is known to play a role in regulation of bone growth. Research suggests that estrogen may also have a protective effect on cartilage.

Glucosamine. A substance that occurs naturally in the body, providing the building blocks to make and repair cartilage. See the "glucosamine and chondroitin sulfate" section under "Complementary and Alternative Therapies" for more information.

Heberden's nodes. Small, bony knobs associated with osteoarthritis of the hand that can occur on the joints of the fingers closest to the nail.

Hyaluronic acid. A substance that gives healthy joint fluid its viscous (slippery) property and that may be reduced in people with osteoarthritis. For some people with osteoarthritis of the knee, replacing hyaluronic acid with injections of agents referred to as viscosupplements is useful for increasing lubrication, reducing pain, and improving function.

Joint capsule. A tough membrane sac that holds the bones and other joint parts together.

Joint resurfacing. A procedure in which the damaged cartilage surfaces are replaced while the rest of the joint is left intact.

Ligaments. Tough bands of connective tissue that attach bones to each other, providing stability.

Magnetic resonance imaging (MRI). Provides high-resolution computerized images of internal body tissues. This procedure uses a strong magnet that passes a force through the body to create these images.

Muscles. Bundles of specialized cells that contract and relax to produce movement when stimulated by nerves.

Nonsteroidal anti-inflammatory drugs (NSAIDs). A class of medications available over the counter or with a prescription that ease pain and inflammation. Commonly used NSAIDs include ibuprofen, naproxen sodium, and ketoprofen. For information about the risks posed by NSAIDs, see "NSAIDs" in the "How Is Osteoarthritis Treated?" section.

Osteoarthritis. The most common form of arthritis. It is characterized by the breakdown of joint cartilage, leading to pain, stiffness, and disability.

Osteophytes. Small growths of bone that can appear on the edges of a joint affected by osteoarthritis. These growths are also known as bone spurs.

Osteotomy. A procedure that involves cutting and realigning bone, to shift the weight from a damaged and painful bone surface to a healthier one.

Proteoglycans. Components of cartilage. Made up of proteins and sugars, strands of proteoglycans interweave with collagens and form a mesh-like tissue. This allows cartilage to flex and absorb physical shock.

Rheumatoid arthritis. A form of arthritis in which the immune system attacks the tissues of the joints, leading to pain, inflammation, and eventually joint damage and malformation. It typically begins at a younger age than osteoarthritis does, causes swelling and redness in joints, and may make people feel sick, tired, and feverish. Rheumatoid arthritis may also affect skin tissue, the lungs, the eyes, or the blood vessels.

Stem cells. Primitive cells, usually taken from bone marrow, that can transform into other kinds of cells, such as muscle or bone cells. In the future, researchers hope to be able to insert stem cells into cartilage and stimulate them to replace cartilage damaged by arthritis or injury.

Synovium. A thin membrane inside the joint capsule that secretes synovial fluid.

Synovial fluid. A fluid secreted by the synovium that lubricates the joint and keeps the cartilage smooth and healthy.

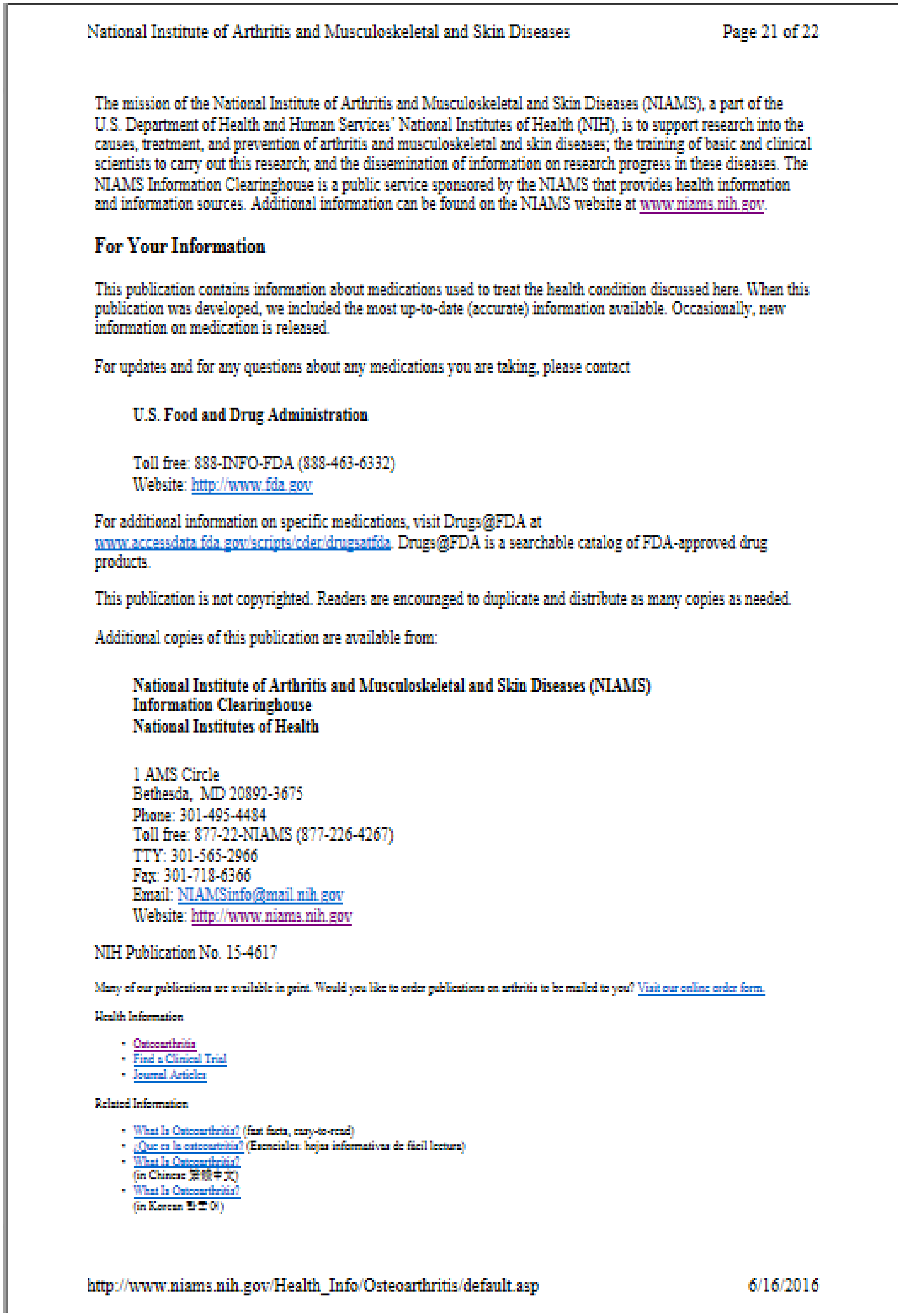
Tendons. Tough, fibrous cords that connect muscles to bones.

Transcutaneous electrical nerve stimulation (TENS). A technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in a painful area. TENS may relieve some arthritis pain. It seems to work by blocking pain messages to the brain and by modifying pain perception.

X ray. A procedure in which low-level radiation is passed through the body to produce a picture called a radiograph. X rays of joints affected by osteoarthritis can show such things as cartilage loss, bone damage, and bone spurs.

Acknowledgments

The NIAMS gratefully acknowledges the assistance of the following individuals in the preparation and review of previous versions of this publication: Gayle Lester, Ph.D., Joan McGowan, Ph.D., James Panagis, M.D., Susana Serrate-Sztein, M.D., and Bernadette Tyree, Ph.D., NIAMS/NIH; Kenneth D. Brandt, M.D., Indiana University School of Medicine, Indianapolis, IN; Victor M. Goldberg, M.D., University Hospitals of Cleveland, OH; Marc C. Hochberg, M.D., M.P.H., University of Maryland, Baltimore, MD; John Klippel, M.D., Arthritis Foundation, Atlanta, GA; and Roland Moskowitz, M.D., Case Western Reserve University, Cleveland, OH. Special thanks also go to the patients who reviewed this publication and provided valuable input.



The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the U.S. Department of Health and Human Services' National Institutes of Health (NIH), is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; the training of basic and clinical scientists to carry out this research; and the dissemination of information on research progress in these diseases. The NIAMS Information Clearinghouse is a public service sponsored by the NIAMS that provides health information and information sources. Additional information can be found on the NIAMS website at www.niams.nih.gov.

For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this publication was developed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact

U.S. Food and Drug Administration

Toll free: 888-INFO-FDA (888-463-6332)
Website: http://www.fda.gov

For additional information on specific medications, visit Drugs@FDA at www.accessdata.fda.gov/scripts/cder/drugsatfda. Drugs@FDA is a searchable catalog of FDA-approved drug products.

This publication is not copyrighted. Readers are encouraged to duplicate and distribute as many copies as needed.

Additional copies of this publication are available from:

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
Information Clearinghouse
National Institutes of Health

1 AMS Circle
Bethesda, MD 20892-3675
Phone: 301-495-4484
Toll free: 877-22-NIAMS (877-226-4267)
TTY: 301-565-2966
Fax: 301-718-6366
Email: NIAMSinfo@mail.nih.gov
Website: http://www.niams.nih.gov

NIH Publication No. 15-4617

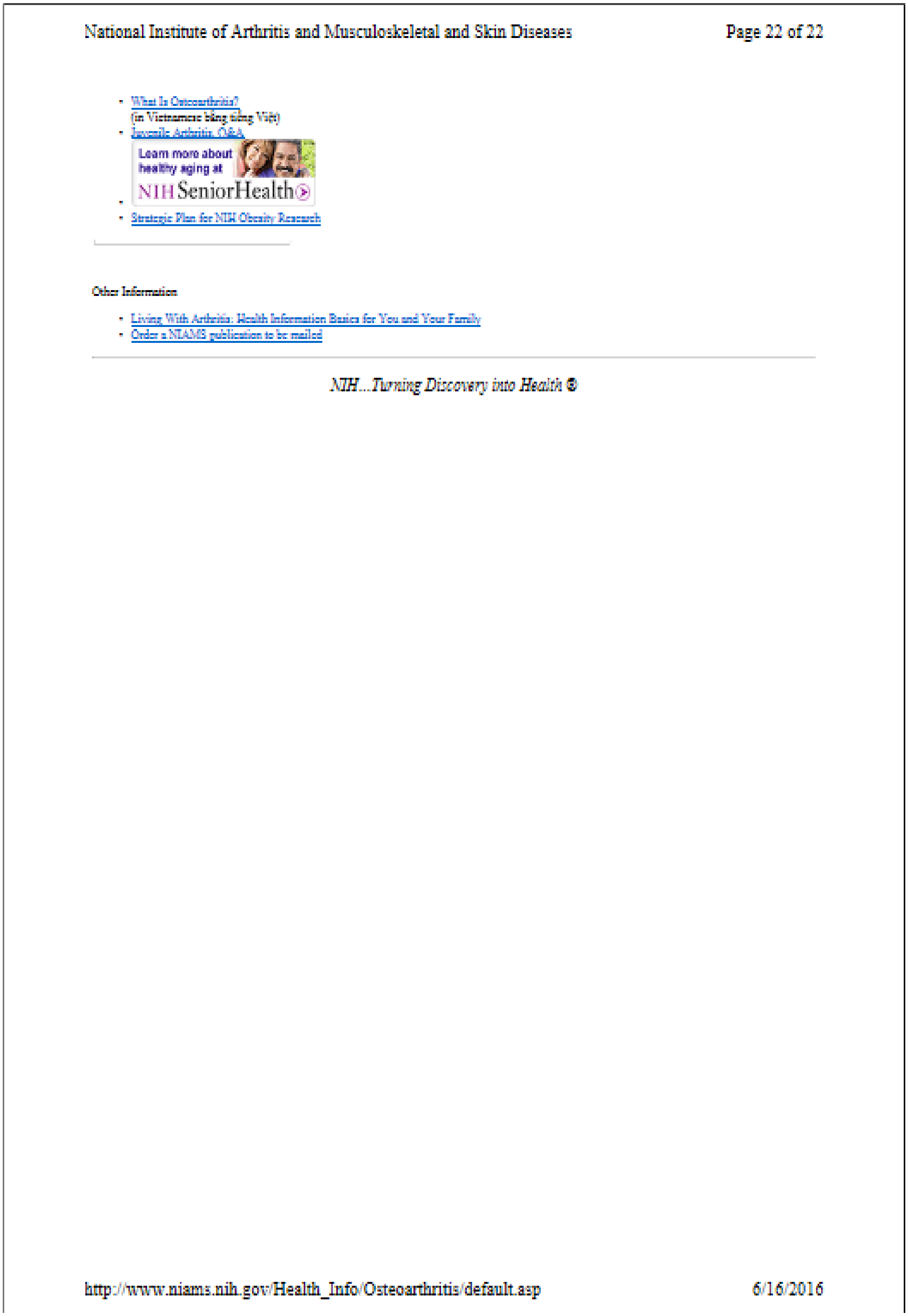
Many of our publications are available in print. Would you like to order publications on arthritis to be mailed to you? Visit our online order form.

Health Information

- Osteoarthritis
- Find a Clinical Trial
- Journal Articles

Related Information

- What Is Osteoarthritis? (fast facts, easy-to-read)
- ¿Qué es la osteoartritis? (Esenciales: hojas informativas de fácil lectura)
- What Is Osteoarthritis?
  (in Chinese 繁體中文)
- What Is Osteoarthritis?
  (in Korean 한국어)



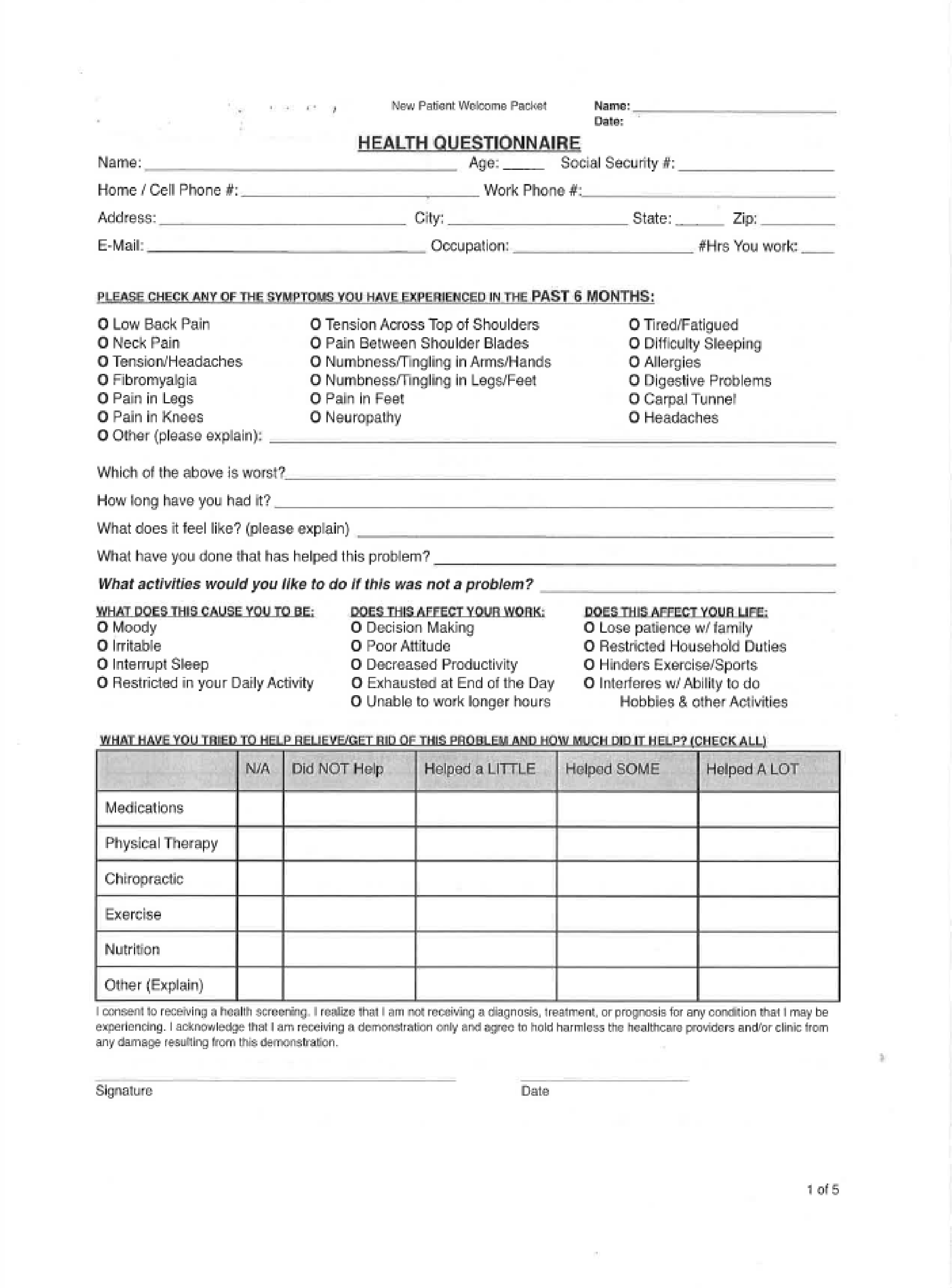
- What Is Osteoarthritis?
  (in Vietnamese bằng tiếng Việt)
- Juvenile Arthritis Q&A
- Learn more about healthy aging at NIH SeniorHealth
- Strategic Plan for NIH Obesity Research

Other Information

- Living With Arthritis: Health Information Basics for You and Your Family
- Order a NIAMS publication to be mailed

NIH...Turning Discovery into Health ®

Appendix B: New Patient Welcome Packet



New Patient Welcome Packet

Name: ____________________
Date:

HEALTH QUESTIONNAIRE

Name: ____________________ Age: _____ Social Security #: ____________

Home / Cell Phone #: ____________________ Work Phone #: ____________________

Address: ____________________ City: ______________ State: _____ Zip: ________

E-Mail: ____________________ Occupation: ______________ #Hrs You work: ____

PLEASE CHECK ANY OF THE SYMPTOMS YOU HAVE EXPERIENCED IN THE PAST 6 MONTHS:

○ Low Back Pain
○ Neck Pain
○ Tension/Headaches
○ Fibromyalgia
○ Pain in Legs
○ Pain in Knees
○ Tension Across Top of Shoulders
○ Pain Between Shoulder Blades
○ Numbness/Tingling in Arms/Hands
○ Numbness/Tingling in Legs/Feet
○ Pain in Feet
○ Neuropathy
○ Tired/Fatigued
○ Difficulty Sleeping
○ Allergies
○ Digestive Problems
○ Carpal Tunnel
○ Headaches
○ Other (please explain): ________________________________

Which of the above is worst? ________________________________

How long have you had it? ________________________________

What does it feel like? (please explain) ________________________________

What have you done that has helped this problem? ________________________________

What activities would you like to do if this was not a problem? ____________________

WHAT DOES THIS CAUSE YOU TO BE:
○ Moody
○ Irritable
○ Interrupt Sleep
○ Restricted in your Daily Activity

DOES THIS AFFECT YOUR WORK:
○ Decision Making
○ Poor Attitude
○ Decreased Productivity
○ Exhausted at End of the Day
○ Unable to work longer hours

DOES THIS AFFECT YOUR LIFE:
○ Lose patience w/ family
○ Restricted Household Duties
○ Hinders Exercise/Sports
○ Interferes w/ Ability to do Hobbies & other Activities

WHAT HAVE YOU TRIED TO HELP RELIEVE/GET RID OF THIS PROBLEM AND HOW MUCH DID IT HELP? (CHECK ALL)

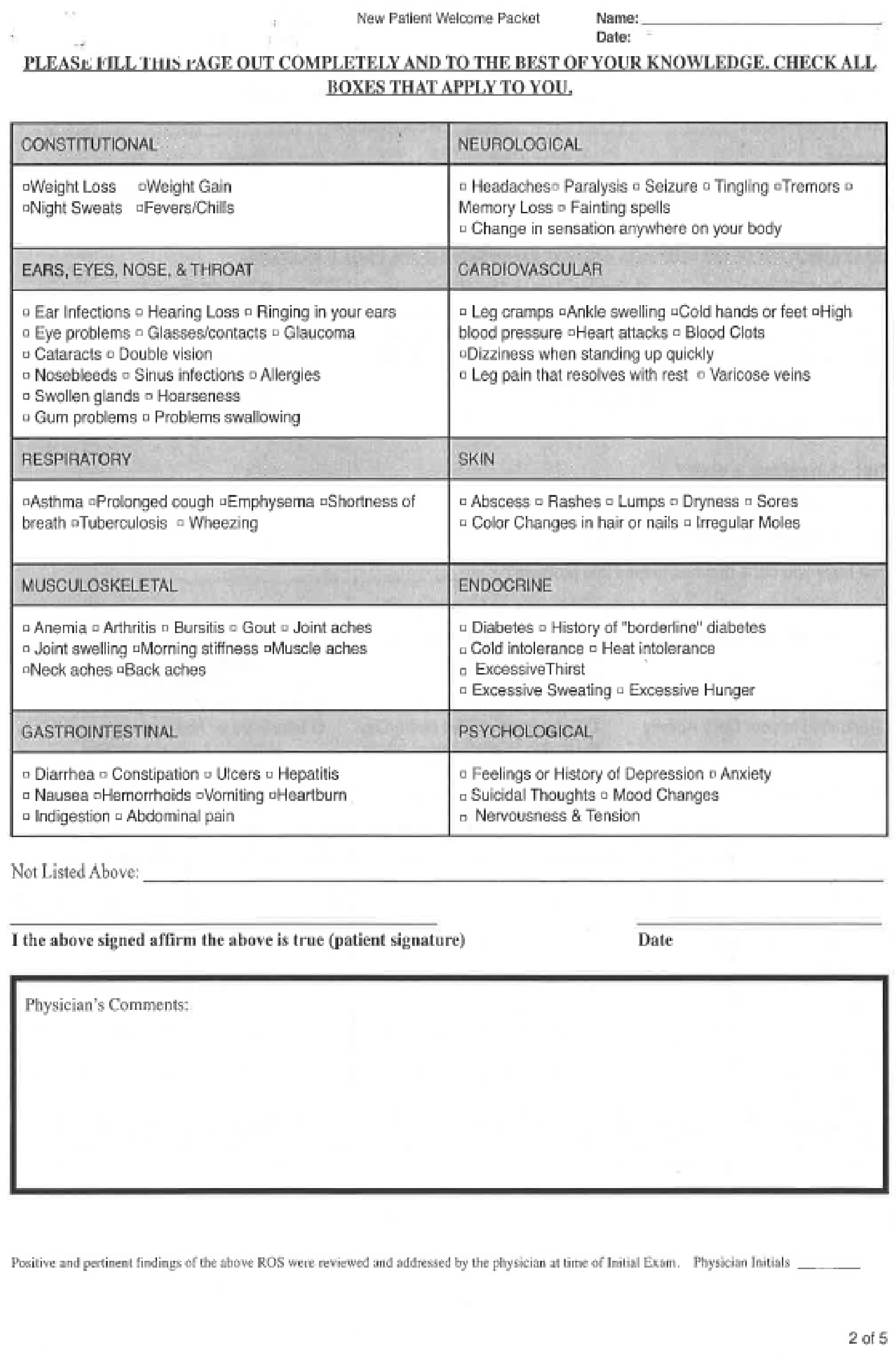
	N/A	Did NOT Help	Helped a LITTLE	Helped SOME	Helped A LOT
Medications					
Physical Therapy					
Chiropractic					
Exercise					
Nutrition					
Other (Explain)					

I consent to receiving a health screening. I realize that I am not receiving a diagnosis, treatment, or prognosis for any condition that I may be experiencing. I acknowledge that I am receiving a demonstration only and agree to hold harmless the healthcare providers and/or clinic from any damage resulting from this demonstration.

______________________________ Signature

______________ Date

1 of 5



New Patient Welcome Packet **Name:** ______________________________
Date:

PLEASE FILL THIS PAGE OUT COMPLETELY AND TO THE BEST OF YOUR KNOWLEDGE. CHECK ALL BOXES THAT APPLY TO YOU.

CONSTITUTIONAL	NEUROLOGICAL
☐Weight Loss ☐Weight Gain ☐Night Sweats ☐Fevers/Chills	☐ Headaches☐ Paralysis ☐ Seizure ☐ Tingling ☐Tremors ☐ Memory Loss ☐ Fainting spells ☐ Change in sensation anywhere on your body
EARS, EYES, NOSE, & THROAT	CARDIOVASCULAR
☐ Ear Infections ☐ Hearing Loss ☐ Ringing in your ears ☐ Eye problems ☐ Glasses/contacts ☐ Glaucoma ☐ Cataracts ☐ Double vision ☐ Nosebleeds ☐ Sinus infections ☐ Allergies ☐ Swollen glands ☐ Hoarseness ☐ Gum problems ☐ Problems swallowing	☐ Leg cramps ☐Ankle swelling ☐Cold hands or feet ☐High blood pressure ☐Heart attacks ☐ Blood Clots ☐Dizziness when standing up quickly ☐ Leg pain that resolves with rest ☐ Varicose veins
RESPIRATORY	SKIN
☐Asthma ☐Prolonged cough ☐Emphysema ☐Shortness of breath ☐Tuberculosis ☐ Wheezing	☐ Abscess ☐ Rashes ☐ Lumps ☐ Dryness ☐ Sores ☐ Color Changes in hair or nails ☐ Irregular Moles
MUSCULOSKELETAL	ENDOCRINE
☐ Anemia ☐ Arthritis ☐ Bursitis ☐ Gout ☐ Joint aches ☐ Joint swelling ☐Morning stiffness ☐Muscle aches ☐Neck aches ☐Back aches	☐ Diabetes ☐ History of "borderline" diabetes ☐ Cold intolerance ☐ Heat intolerance ☐ ExcessiveThirst ☐ Excessive Sweating ☐ Excessive Hunger
GASTROINTESTINAL	PSYCHOLOGICAL
☐ Diarrhea ☐ Constipation ☐ Ulcers ☐ Hepatitis ☐ Nausea ☐Hemorrhoids ☐Vomiting ☐Heartburn ☐ Indigestion ☐ Abdominal pain	☐ Feelings or History of Depression ☐ Anxiety ☐ Suicidal Thoughts ☐ Mood Changes ☐ Nervousness & Tension

Not Listed Above: ____

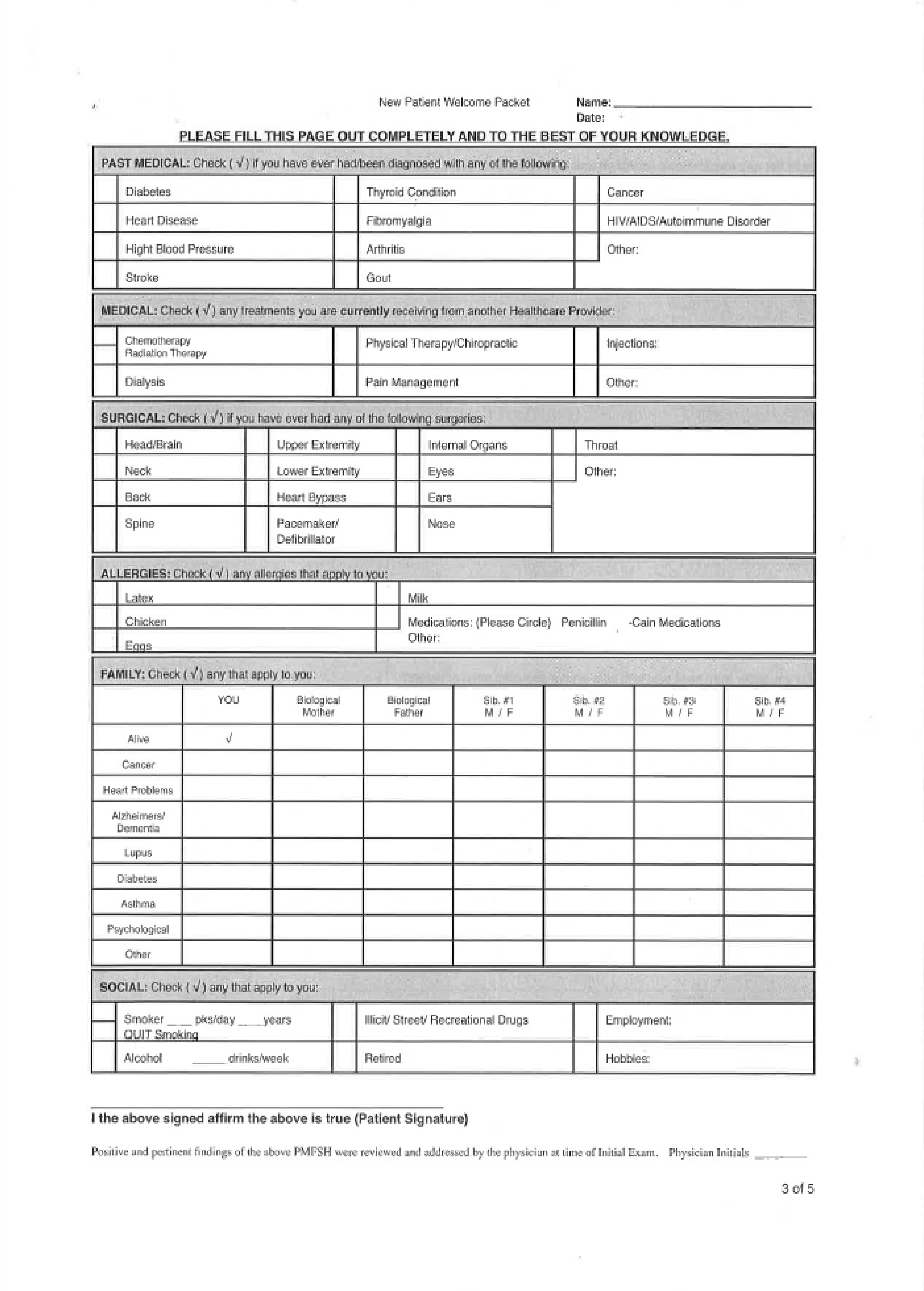
______________________________ ____________________

I the above signed affirm the above is true (patient signature) **Date**

Physician's Comments:

Positive and pertinent findings of the above ROS were reviewed and addressed by the physician at time of Initial Exam. Physician Initials ________

2 of 5



New Patient Welcome Packet

Name: ________________________
Date:

PLEASE FILL THIS PAGE OUT COMPLETELY AND TO THE BEST OF YOUR KNOWLEDGE.

PAST MEDICAL: Check (√) if you have ever had/been diagnosed with any of the following:

☐	Diabetes	☐	Thyroid Condition	☐	Cancer
☐	Heart Disease	☐	Fibromyalgia	☐	HIV/AIDS/Autoimmune Disorder
☐	Hight Blood Pressure	☐	Arthritis	☐	Other:
☐	Stroke	☐	Gout		

MEDICAL: Check (√) any treatments you are **currently** receiving from another Healthcare Provider:

☐	Chemotherapy Radiation Therapy	☐	Physical Therapy/Chiropractic	☐	Injections:
☐	Dialysis	☐	Pain Management	☐	Other:

SURGICAL: Check (√) if you have ever had any of the following surgeries:

☐	Head/Brain	☐	Upper Extremity	☐	Internal Organs	☐	Throat
☐	Neck	☐	Lower Extremity	☐	Eyes	☐	Other:
☐	Back	☐	Heart Bypass	☐	Ears		
☐	Spine	☐	Pacemaker/ Defibrillator	☐	Nose		

ALLERGIES: Check (√) any allergies that apply to you:

☐	Latex	☐	Milk
☐	Chicken	☐	Medications: (Please Circle) Penicillin -Cain Medications Other:
☐	Eggs		

FAMILY: Check (√) any that apply to you:

	YOU	Biological Mother	Biological Father	Sib. #1 M / F	Sib. #2 M / F	Sib. #3 M / F	Sib. #4 M / F
Alive	√						
Cancer							
Heart Problems							
Alzheimers/ Dementia							
Lupus							
Diabetes							
Asthma							
Psychological							
Other							

SOCIAL: Check (√) any that apply to you:

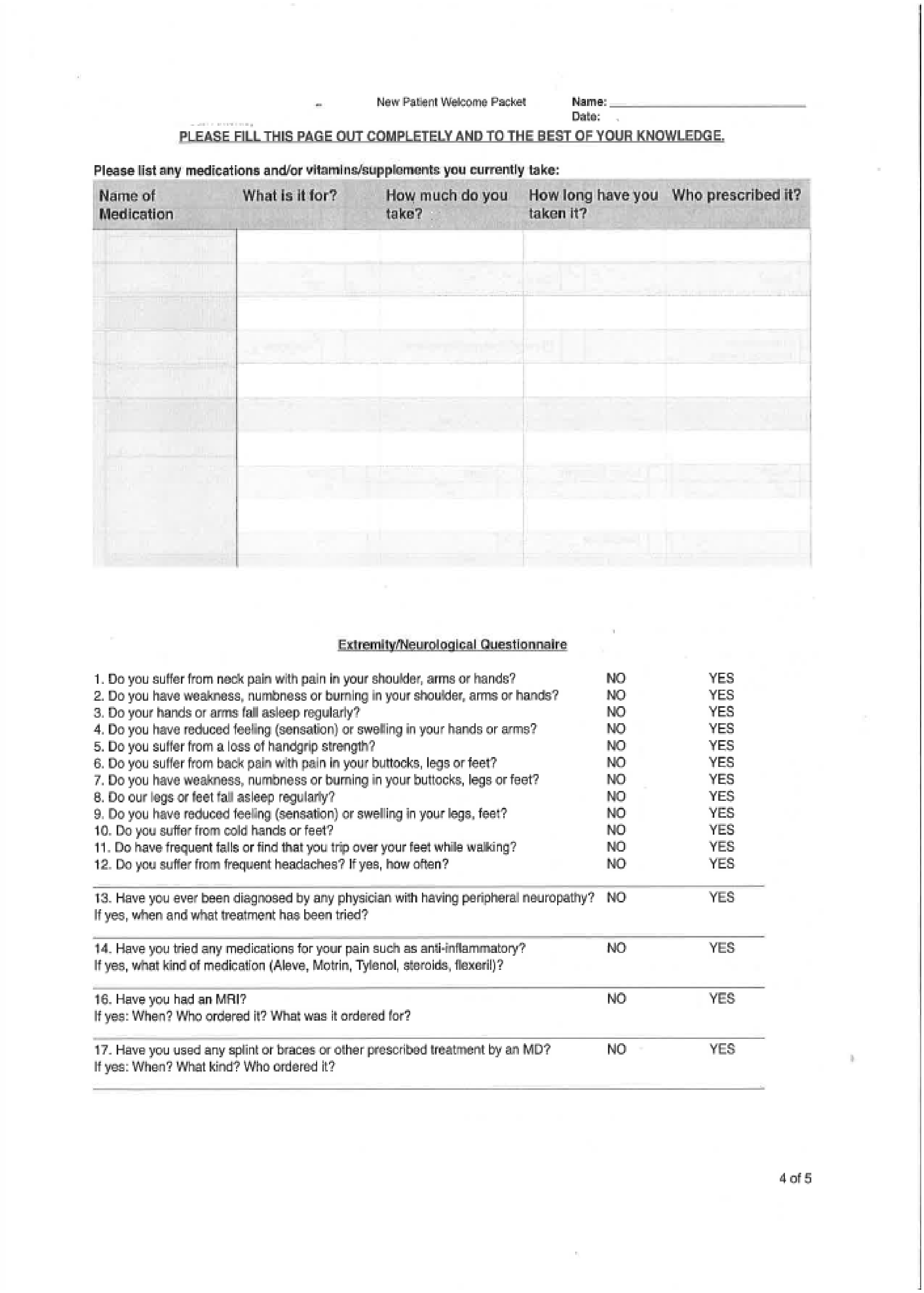
☐	Smoker ____ pks/day ____years QUIT Smoking	☐	Illicit/ Street/ Recreational Drugs	☐	Employment:
☐	Alcohol _____ drinks/week	☐	Retired	☐	Hobbies:

____

I the above signed affirm the above is true (Patient Signature)

Positive and pertinent findings of the above PMFSH were reviewed and addressed by the physician at time of Initial Exam. Physician Initials ________

3 of 5



New Patient Welcome Packet

Name: ______________________

Date:

PLEASE FILL THIS PAGE OUT COMPLETELY AND TO THE BEST OF YOUR KNOWLEDGE.

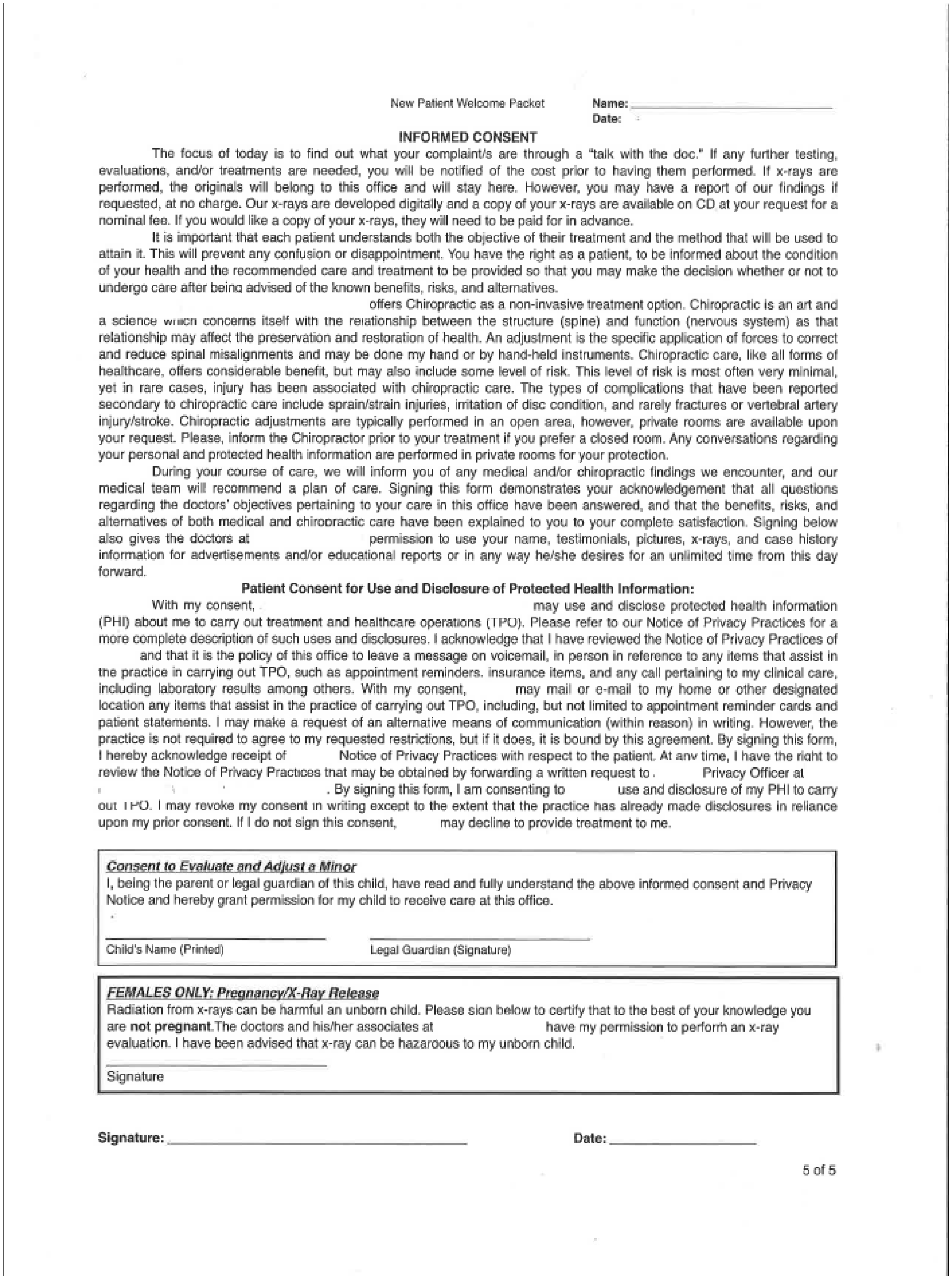
Please list any medications and/or vitamins/supplements you currently take:

Name of Medication	What is it for?	How much do you take?	How long have you taken it?	Who prescribed it?

Extremity/Neurological Questionnaire

1. Do you suffer from neck pain with pain in your shoulder, arms or hands?	NO	YES
2. Do you have weakness, numbness or burning in your shoulder, arms or hands?	NO	YES
3. Do your hands or arms fall asleep regularly?	NO	YES
4. Do you have reduced feeling (sensation) or swelling in your hands or arms?	NO	YES
5. Do you suffer from a loss of handgrip strength?	NO	YES
6. Do you suffer from back pain with pain in your buttocks, legs or feet?	NO	YES
7. Do you have weakness, numbness or burning in your buttocks, legs or feet?	NO	YES
8. Do our legs or feet fall asleep regularly?	NO	YES
9. Do you have reduced feeling (sensation) or swelling in your legs, feet?	NO	YES
10. Do you suffer from cold hands or feet?	NO	YES
11. Do have frequent falls or find that you trip over your feet while walking?	NO	YES
12. Do you suffer from frequent headaches? If yes, how often?	NO	YES
13. Have you ever been diagnosed by any physician with having peripheral neuropathy? If yes, when and what treatment has been tried?	NO	YES
14. Have you tried any medications for your pain such as anti-inflammatory? If yes, what kind of medication (Aleve, Motrin, Tylenol, steroids, flexeril)?	NO	YES
16. Have you had an MRI? If yes: When? Who ordered it? What was it ordered for?	NO	YES
17. Have you used any splint or braces or other prescribed treatment by an MD? If yes: When? What kind? Who ordered it?	NO	YES

4 of 5



New Patient Welcome Packet

Name: ______________________________

Date:

INFORMED CONSENT

The focus of today is to find out what your complaint/s are through a "talk with the doc." If any further testing, evaluations, and/or treatments are needed, you will be notified of the cost prior to having them performed. If x-rays are performed, the originals will belong to this office and will stay here. However, you may have a report of our findings if requested, at no charge. Our x-rays are developed digitally and a copy of your x-rays are available on CD at your request for a nominal fee. If you would like a copy of your x-rays, they will need to be paid for in advance.

It is important that each patient understands both the objective of their treatment and the method that will be used to attain it. This will prevent any confusion or disappointment. You have the right as a patient, to be informed about the condition of your health and the recommended care and treatment to be provided so that you may make the decision whether or not to undergo care after being advised of the known benefits, risks, and alternatives.

offers Chiropractic as a non-invasive treatment option. Chiropractic is an art and a science which concerns itself with the relationship between the structure (spine) and function (nervous system) as that relationship may affect the preservation and restoration of health. An adjustment is the specific application of forces to correct and reduce spinal misalignments and may be done my hand or by hand-held instruments. Chiropractic care, like all forms of healthcare, offers considerable benefit, but may also include some level of risk. This level of risk is most often very minimal, yet in rare cases, injury has been associated with chiropractic care. The types of complications that have been reported secondary to chiropractic care include sprain/strain injuries, irritation of disc condition, and rarely fractures or vertebral artery injury/stroke. Chiropractic adjustments are typically performed in an open area, however, private rooms are available upon your request. Please, inform the Chiropractor prior to your treatment if you prefer a closed room. Any conversations regarding your personal and protected health information are performed in private rooms for your protection.

During your course of care, we will inform you of any medical and/or chiropractic findings we encounter, and our medical team will recommend a plan of care. Signing this form demonstrates your acknowledgement that all questions regarding the doctors' objectives pertaining to your care in this office have been answered, and that the benefits, risks, and alternatives of both medical and chiropractic care have been explained to you to your complete satisfaction. Signing below also gives the doctors at permission to use your name, testimonials, pictures, x-rays, and case history information for advertisements and/or educational reports or in any way he/she desires for an unlimited time from this day forward.

Patient Consent for Use and Disclosure of Protected Health Information:

With my consent, may use and disclose protected health information (PHI) about me to carry out treatment and healthcare operations (TPO). Please refer to our Notice of Privacy Practices for a more complete description of such uses and disclosures. I acknowledge that I have reviewed the Notice of Privacy Practices of and that it is the policy of this office to leave a message on voicemail, in person in reference to any items that assist in the practice in carrying out TPO, such as appointment reminders. insurance items, and any call pertaining to my clinical care, including laboratory results among others. With my consent, may mail or e-mail to my home or other designated location any items that assist in the practice of carrying out TPO, including, but not limited to appointment reminder cards and patient statements. I may make a request of an alternative means of communication (within reason) in writing. However, the practice is not required to agree to my requested restrictions, but if it does, it is bound by this agreement. By signing this form, I hereby acknowledge receipt of Notice of Privacy Practices with respect to the patient. At any time, I have the right to review the Notice of Privacy Practices that may be obtained by forwarding a written request to Privacy Officer at . By signing this form, I am consenting to use and disclosure of my PHI to carry out TPO. I may revoke my consent in writing except to the extent that the practice has already made disclosures in reliance upon my prior consent. If I do not sign this consent, may decline to provide treatment to me.

Consent to Evaluate and Adjust a Minor

I, being the parent or legal guardian of this child, have read and fully understand the above informed consent and Privacy Notice and hereby grant permission for my child to receive care at this office.

______________________________ ______________________________

Child's Name (Printed) Legal Guardian (Signature)

FEMALES ONLY: Pregnancy/X-Ray Release

Radiation from x-rays can be harmful an unborn child. Please sign below to certify that to the best of your knowledge you are **not pregnant**.The doctors and his/her associates at have my permission to perform an x-ray evaluation. I have been advised that x-ray can be hazardous to my unborn child.

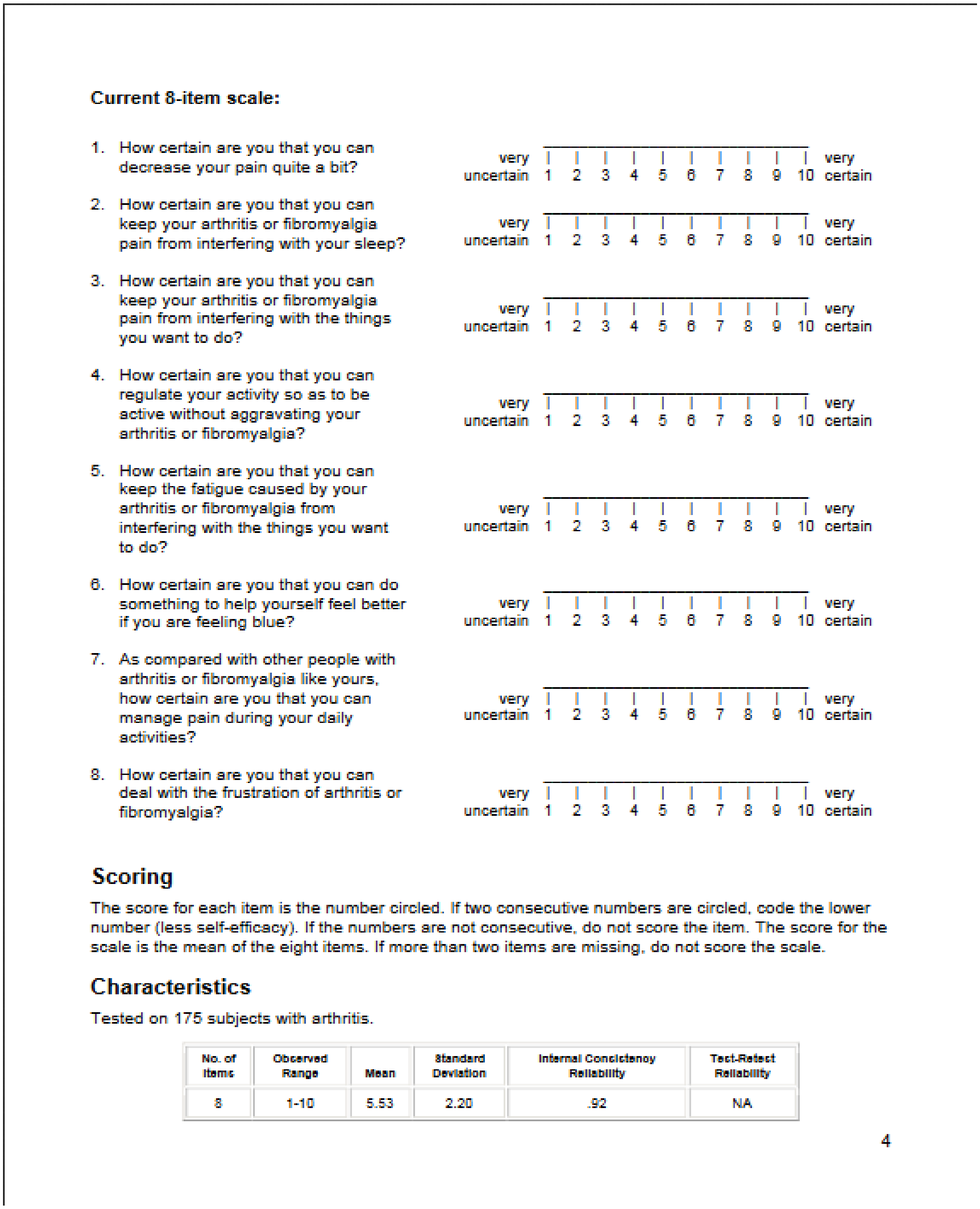
____

Signature

Signature: ____ **Date:** ____________________

5 of 5

Appendix C: The 8-Item ASES Scale



Current 8-item scale:

1. How certain are you that you can decrease your pain quite a bit?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
2. How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with your sleep?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
3. How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with the things you want to do?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
4. How certain are you that you can regulate your activity so as to be active without aggravating your arthritis or fibromyalgia?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
5. How certain are you that you can keep the fatigue caused by your arthritis or fibromyalgia from interfering with the things you want to do?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
6. How certain are you that you can do something to help yourself feel better if you are feeling blue?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
7. As compared with other people with arthritis or fibromyalgia like yours, how certain are you that you can manage pain during your daily activities?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain
8. How certain are you that you can deal with the frustration of arthritis or fibromyalgia?
   very uncertain 1 2 3 4 5 6 7 8 9 10 very certain

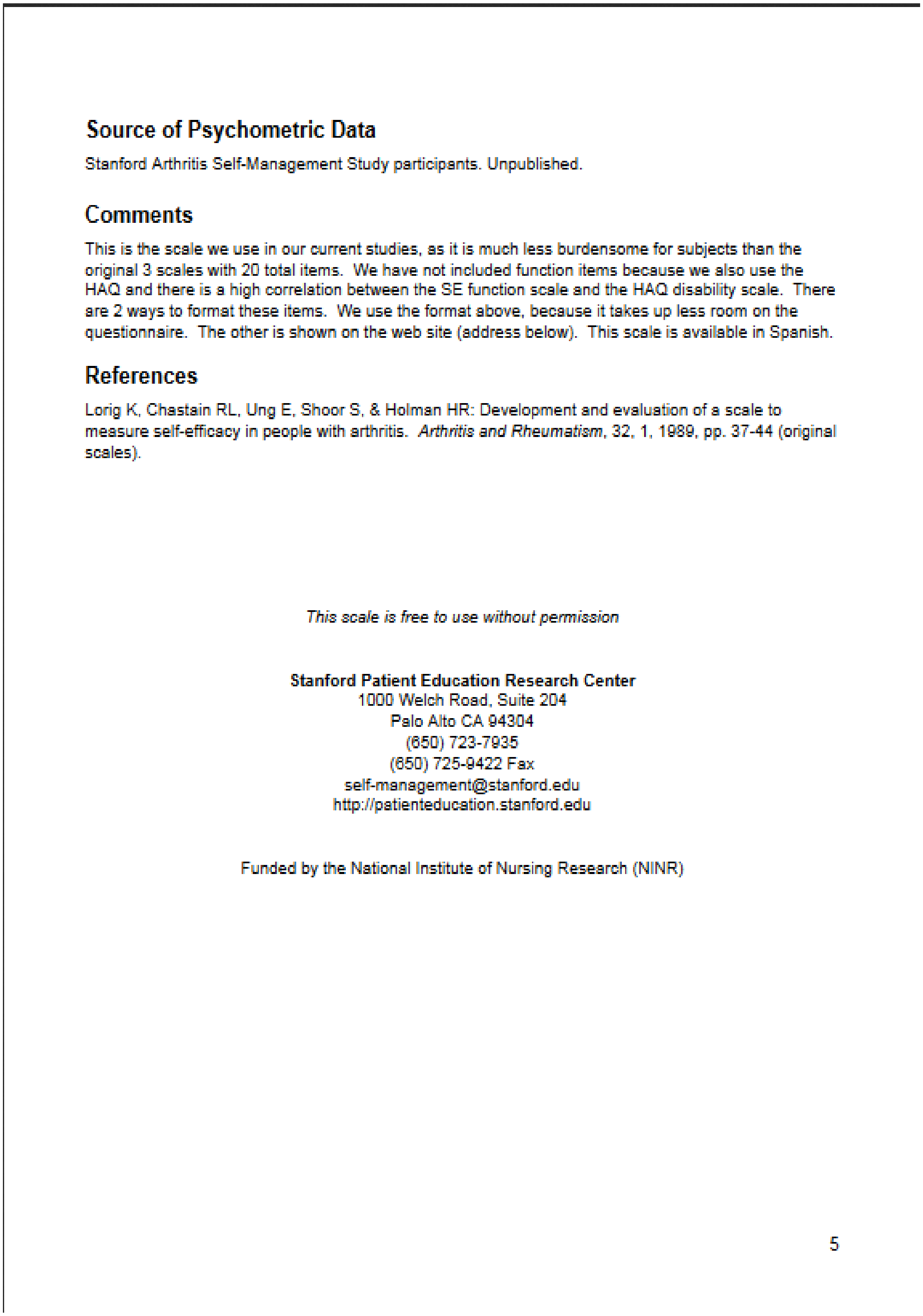
Scoring

The score for each item is the number circled. If two consecutive numbers are circled, code the lower number (less self-efficacy). If the numbers are not consecutive, do not score the item. The score for the scale is the mean of the eight items. If more than two items are missing, do not score the scale.

Characteristics

Tested on 175 subjects with arthritis.

No. of Items	Observed Range	Mean	Standard Deviation	Internal Consistency Reliability	Test-Retest Reliability
8	1-10	5.53	2.20	.92	NA



Source of Psychometric Data

Stanford Arthritis Self-Management Study participants. Unpublished.

Comments

This is the scale we use in our current studies, as it is much less burdensome for subjects than the original 3 scales with 20 total items. We have not included function items because we also use the HAQ and there is a high correlation between the SE function scale and the HAQ disability scale. There are 2 ways to format these items. We use the format above, because it takes up less room on the questionnaire. The other is shown on the web site (address below). This scale is available in Spanish.

References

Lorig K, Chastain RL, Ung E, Shoor S, & Holman HR: Development and evaluation of a scale to measure self-efficacy in people with arthritis. *Arthritis and Rheumatism*, 32, 1, 1989, pp. 37-44 (original scales).

This scale is free to use without permission

Stanford Patient Education Research Center
1000 Welch Road, Suite 204
Palo Alto CA 94304
(650) 723-7935
(650) 725-9422 Fax
self-management@stanford.edu
http://patienteducation.stanford.edu

Funded by the National Institute of Nursing Research (NINR)