

REVIEW

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# Benefits of antioxidant supplements for knee osteoarthritis: rationale and reality

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## Abstract

Arthritis causes disability due to pain and inflammation in joints. There are many forms of arthritis, one of which is osteoarthritis whose prevalence increases with age. It occurs in various joints including hip, knee and hand with knee osteoarthritis being more prevalent. There is no cure for it. The management strategies include exercise, glucosamine plus chondroitin sulfate and NSAIDs. In vitro and animal studies provide a rationale for the use of antioxidant supplements for its management. This review assesses the reality of the benefits of antioxidant supplements in the management of knee osteoarthritis. Several difficulties were encountered in examining this issue: poorly conducted studies, a lack of uniformity in disease definition and diagnosis, and muddling of conclusions from attempts to isolate the efficacious molecules. The antioxidant supplements with most evidence for benefit for pain relief and function in knee osteoarthritis were based on curcumin and avocado-soya bean unsaponifiables. Boswellia and some herbs used in Ayurvedic and Chinese medicine may also be useful. The benefits of cuisines with the appropriate antioxidants should be assessed because they may be more economical and easier to incorporate into the lifestyle.

**Keywords:** Arthritis, Turmeric, Curcumin, Piperine, Avocado, Boswellia, Superoxide, Peroxide, Peroxynitrite

## Current knowledge

Arthritis may have originated before man itself since it also afflicts other primates [1]. The disease causes disability due to pain and inflammation in joints. There are many different types of arthritis of which rheumatoid arthritis and osteoarthritis (OA) are the most common. Rheumatoid arthritis is an autoimmune disease that affects mainly small joints such as those in the fingers of the hand. OA affects large joints such as hips and knees and also those in the hands. OA is a leading cause of disability with an unknown cause or cure. The global age standardised prevalence of OA in the knee and hip has recently been reported to be 3.8 and 0.85 %, respectively [2]. Worldwide estimates indicate that 9.6 % of men and 18 % of women >60 years have symptomatic OA (<http://www.who.int/chp/topics/rheumatic/en/>). Other risk factors of knee OA include trauma such as torn meniscus, occupation, exercise, gender (more common in females), ethnicity, genetics, obesity, diet and bone density [2]. Since OA normally progresses with

age, its economic burden may increase with the aging human population in the coming decades. This review will focus on knee OA which is more common. The knee joints are the largest and being synovial joints, they provide a very high degree of mobility. A knee joint provides two articulations - one between tibia and femur and the other between patella and femur [3, 4]. The joints allow for flexion, extension and a limited degree of rotation. It contains a bone-cartilage interface and a synovial body. The synovial body contains the fluid whose composition and viscosity are key to the knee operation. The bone-cartilage interface is a complex functional unit and biocomposite at the centre of joint function in which the individual components interact cooperatively and synergistically. Due to this intimate contact between bone and cartilage, any changes in either tissue will influence the other component. Its role in knee OA is discussed in the next section.

## Pathophysiology of knee OA

The suggested causes for the development of OA include genetic predisposition, aging, obesity, trauma, and

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# Benefits Of Antioxidant Supplements For Knee

**Lisa P. McFaddin**



## Benefits Of Antioxidant Supplements For Knee:

**Gelenkschmerzen natürlich heilen** Michaela Döll, 2021-11-14 Rückenbeschwerden Gicht Arthrose Schleimbeutelentzündungen oder Fibromyalgie Gelenkbeschwerden treten in vielen Formen auf. Doch egal an welcher rheumatischen Erkrankung Sie leiden, Schmerzen und erhebliche Einschränkungen im Alltag gehen immer dazu. Um diese Symptome zu bekämpfen müssen Sie nicht zwingend zu Medikamenten greifen, die gerade bei langfristiger oder regelmäßiger Einnahme auch Risiken bergen. Nutzen Sie stattdessen natürliche Heilmittel und Methoden, die wesentlich verträglicher häufig ebenso wirksam und vor allem gesünder für den Körper sind. Bestsellerautorin und Heilkundeexpertin Prof. Dr. Michaela Döll stellt Ihnen die wichtigsten Heilpflanzen, therapeutischen Öle und Mikronährstoffe vor, die Schwellungen lindern, die Durchblutung fördern, Entzündungen hemmen und Knorpelabbau stoppen. Basierend auf dem neuesten Forschungsstand beschreibt sie, wie die Substanzen wirken und wie Sie gezielt einsetzen, um Ihre Beschwerden zu behandeln. Zusätzlich verrät sie, wie Sie durch eine ausgewogene Ernährung, ausreichend Bewegung und andere therapeutische Maßnahmen Ihre Gelenke und damit auch sich selbst stärken und gesund halten. So können Sie Ihre Lebensqualität nachhaltig verbessern und sich endlich wieder schmerzfrei bewegen. [Osteoarthritis, An Issue of Clinics in Geriatric Medicine, E-Book](#) David Hunter, 2022-04-14 In this issue of Clinics in Geriatric Medicine, guest editor Dr. David Hunter brings his considerable expertise to the topic of Osteoarthritis. Top experts in the field cover key topics such as obesity and nutrition influences in osteoarthritis, the genesis of pain in osteoarthritis, overview of disease management, and more. Contains 14 relevant practice-oriented topics including overview of disease management, concordance with guidelines, and strategies to increase implementation of best evidence. Obesity and nutrition influences in osteoarthritis, pathogenesis of osteoarthritis, behavior change barriers and facilitators in people with osteoarthritis, suitable candidates and realistic expectations in surgery for osteoarthritis, and more. Provides in-depth clinical reviews on osteoarthritis, offering actionable insights for clinical practice. Presents the latest information on this timely focused topic under the leadership of experienced editors in the field. Authors synthesize and distill the latest research and practice guidelines to create clinically significant, topic-based reviews. *Cooking for Health and Disease Prevention* Nicole M. Farmer, Andres V. Ardisson Korat, 2022-08-08 Poor diet and substandard nutrition are underlying causes of many diseases, including cardiovascular disease, diabetes, and cancer. Collectively, these ailments are the leading causes of premature death, most of which are preventable. *Cooking for Health and Disease Prevention: From the Kitchen to the Clinic* helps demonstrate cooking as a fundamental bridge between ideal nutrition and long-term health. Clinicians, patients, and the public often lack adequate knowledge to help select and prepare foods for optimal disease management. This book provides information to clinicians and their patients about foods and cooking principles to help prevent common health conditions. Features: Focuses on disease endpoints, reviewing the disease biology and epidemiology and presenting dietary interventions for disease prevention. Provides recommendations for translating dietary and culinary principles of health prevention into

clinical practice and includes a recipe appendix with practical examples Features information on healthy cooking techniques as well as food selection storage and preparation to help maximize nutritional value Introduces the reader to fundamental concepts in nutrition and culinary principles explaining the relationship between food processing and food preparation and nutritional quality of foods This book is accessible to patients and offers evidence based practical interventions for healthcare professionals It is authored by Nicole Farmer physician scientist at the NIH Clinical Center and nutrition researcher Andres Ardisson Korat awarded a doctorate degree in nutrition and epidemiology from the Harvard T H Chan School of Public Health

Integrative Medicine in Veterinary Practice Lisa P. McFaddin, 2024-04-02 Integrative Medicine in Veterinary Practice Enables the entire veterinary team to seamlessly incorporate integrative medicine into everyday practice Integrative Medicine in Veterinary Practice is a unique resource designed to introduce the basic concepts of ten different integrative modalities to all members of the hospital team to establish a baseline of knowledge explaining how patients will benefit from their use discussing return on investment informing veterinarians of available courses and suggested reading materials walking managers through staff training and providing client education materials Supplemental web based documents and presentations increase the ease with which staff are trained and clients are educated Integrative medicine is not an all or nothing concept This umbrella term encompasses a wide spectrum of treatment modalities Therapies can be used individually or in combination as part of a multimodal approach and applied easily to every patient or used in select cases Sample topics covered in Integrative Medicine in Veterinary Practice include Photobiomodulation covering light laser specifics mechanisms of action supplies and equipment and techniques Veterinary Spinal Manipulation Therapy VSMT covering pain in veterinary patients mechanisms of action adjustment vs manipulation vs mobilization techniques and post adjustment recommendations Acupuncture covering acupuncture point selection using traditional Chinese veterinary medicine TCVM and Western medicine techniques mechanisms of action safety and practical applications Chinese Herbal Medicine CHM covering TCVM fundamentals as it applies to herbal classification and selection herb production safety and formulation and CHM applications Integrative Medicine in Veterinary Practice is a valuable resource for all veterinary hospital team members from customer service representatives to veterinary assistants technicians practice managers and veterinarians The text is also helpful to veterinary students interested in integrative medicine or those taking introductory integrative medicine courses

Nutraceuticals Ramesh C. Gupta, Rajiv Lall, Ajay Srivastava, 2021-01-27 Nutraceuticals Efficacy Safety and Toxicity Second Edition brings together everything that is currently known about nutraceuticals and their potential toxic effects The book introduces readers to nutraceuticals herbal medicines Ayurvedic medicines prebiotics probiotics adaptogens and their uses and specific applications This essential reference discusses the mechanism of action for the judicious use of these nutraceuticals and the best tools for their evaluation before detailing the safety and toxicity of nutraceuticals and interactions with other therapeutic drugs Finally and crucially regulatory aspects from around the world

are covered Completely revised and updated this updated edition provides toxicologists pharmacologists pharmaceutical scientists and those interested in medicinal plants and natural products with a comprehensive overview of the most effective tools upon which to evaluate the safety and toxicity of nutraceuticals prebiotics probiotics and alternative medicines Presents a completely revised and updated resource on the impact of nutraceuticals and various disease states such as diabetes and ophthalmic and dermal diseases Grants an overview of the current state of the science of nutraceuticals their use and applications and known adverse effects Provides effective tools to evaluate the potential toxicity of any nutraceutical Includes details of regulatory issues as written by international experts *A Concise Treatise on Natural Remedies* Antoine

Al-Achi,2020-05-28 This volume examines the use of natural remedies in health and disease blending scientific findings known to operate in the alternative and complementary medicine modalities with those utilized in folklore medicine It points toward a unified theory that links the development of chronic degenerative diseases with inflammation and considers how natural health modalities can alter or halt the progression of chronic diseases through their beneficial actions on inflammation The book will serve as a venue for educating those who desire concise yet thorough insights into this area of alternative health practices Students in the healthcare field as well as medical practitioners will find the information provided here particularly helpful and educational *Bone and Cartilage Diseases - The Role and Potential of Natural*

*Products* Longhuo Wu,Qian Chen,Daohua Xu,Walter Luyten,2022-09-23 *Biodiversity and Business* Laladhas Krishna Panicker,Prakash Nelliyaat,Oommen V. Oommen,2024-12-04 This book addresses the climate risk influencing biodiversity globally and discusses the sustainable use of biological diversity and its legal implications The sustainable bio prospecting will help conservation regarding the resources and livelihood support of those who conserve it from the UN CBD perspective In mega bio diverse countries biodiversity provides a number of ecosystem services as well as sources of income livelihood for millions of poor and they are also the home of a vast repository of traditional knowledge TK associated with biological resources which can be translated therapeutically As for Climate risks the risks related to unscientific management and use of biodiversity are far more compared to the benefits for society and business and therefore reducing pressure on biodiversity and developing a sustainable commodity supply chain is essential for both the industry and the governments Exploring and further mining of the vastness of biodiversity potential in the marketplace has been a subject of great consideration among biotechnologists food processors health care specialists and the like as they are real money spinners The book will be of interest to researchers College University students interested in ecology and biodiversity conservation worldwide **User's Guide to Nutritional Supplements** Jack Challem,2003 The User's Guide to Nutritional Supplements focuses on the most popular nutritional supplements those that consistently attract the most attention and are the ones most likely to benefit the majority of people In describing the most popular nutritional supplements this book explains Vitamin E can reduce the risk of heart disease and the best types to take Selenium can slash the chances of developing some types of

cancer Ginkgo can improve memory and recall Chromium can help promote weight loss and lower the risk of diabetes Glucosamine and chondroitin can prevent osteoarthritis Calcium and magnesium work together to build strong bones Coenzyme Q10 can boost your energy levels and strengthen your heart Ginseng and other supplements boost your exercise stamina *The Essential Guide to Vitamins, Minerals and Herbal Supplements* Sarah Brewer, 2013-07-25 A bewildering range of vitamin mineral and herbal supplements is now widely available to us all but information about their health benefits cannot be given on the packaging as it would constitute a health claim In this jargon free guide leading expert on sensible supplementation Dr Sarah Brewer sets out all you need to know about the main supplements and suggests which to take for specific health problems It includes A Z guide to 150 supplements for a brighter and healthier life Clearly explains the benefits possible side effects and contraindications Thoroughly sets out the research evidence to back their efficacy Recommends supplements for common problems such as IBS chronic fatigue recurrent candida and arthritis Packed with clear and concise answers this essential guide explains the use of supplements to maintain or improve your daily health

Essentials of Exercise & Sport Nutrition: Science to Practice Richard B. Kreider PhD FACSM FISSN FNAK, 2019-06-21 We all want to look and feel good We also want to perform well whether it is in the weight room in sports or at work Research has shown exercise proper nutrition and adequate recovery affect health and human performance However there is a lot of conflicting and confusing information regarding exercise and nutrition In *Essentials of Exercise and Sport Nutrition* author Dr Richard B Kreider offers an up to date assessment of the science and practice of exercise and sport nutrition Kreider who has conducted extensive research on the subject and has consulted with numerous teams coaches and athletes for more than thirty years brings a scientific and applied perspective to discussing the latest research and how it can be used to optimize performance He also provides summary recommendations training programs and meal plans for beginners through athletes as well as for individuals who want to lose and or manage their weight *Biomaterials with the regulation of reactive oxygen/nitrogen species for biomedical applications* Qihui Zhou, Brandon W. Peterson, Yong Liu, Huihua Yuan, 2023-05-11

Diet, Inflammation, and Health James R. Hebert, Lorne J Hofseth, 2022-04-28 *Diet Inflammation and Health* introduces concepts of inflammation the role of acute inflammatory responses in good health and the association of chronic systemic inflammation with mental distress cognitive decline and chronic diseases ranging from diabetes to cardiovascular diseases stroke and cancer The book also describes the pathophysiology of inflammation and its effects on insulin insensitivity and blunted immune response to carcinogenesis Researchers and allied health care professionals working in dietetics and medicine as well as students studying related fields will benefit from this reference and its recommendations on areas where future research is needed Addresses the role of acute inflammatory responses in achieving and maintaining good health Covers the association of chronic system inflammation with various conditions and diseases Describes the effect of inflammation on mechanisms ranging from insulin insensitivity and immune response to carcinogenesis *Rheumatology*

*E-Book* Krysia Dziedzic, Alison Hammond, 2010-02-22 Rheumatology is an indispensable resource for physiotherapists occupational therapists and other health professionals offering practical approaches to the treatment and management of rheumatic musculoskeletal conditions The text focuses on applying evidence based understanding of these conditions to clinical context The specific disease chapters cover incidence and prevalence of the condition clinical presentation and diagnosis red flags clinical assessment important first treatments early intermediate and long term management prognosis and long term outcomes Supporting case histories of increasing complexity and study activities illustrate the clinical relevance of the treatment and management approaches Multidisciplinary team approach Practical solutions to management of conditions supported by the latest research Case histories of increasing complexity consolidate understanding and develop clinical reasoning Highlighted boxes throughout contain study tasks and key messages

**Nutritional Supplements in Sport, Exercise and Health** Linda M. Castell, Samantha J. Stear, Louise M. Burke, 2015-04-17 Nutritional Supplements in Sport Exercise and Health is the most up to date and authoritative guide to dietary supplements ergogenic aids and sports nutrition foods currently available Consisting of over 140 evidence based review articles written by world leading research scientists and practitioners the book aims to dispel the misinformation that surrounds supplements and supplementation offering a useful balanced and unbiased resource The reviews are set out in an A Z format and include definitions alongside related products applicable food sources where appropriate practical recommendations such as dosage and timing possible nutrient interactions requiring the avoidance of other nutrients and any known potential side effects and full research citations The volume as a whole addresses the key issues of efficacy safety legality and ethics and includes additional reviews on the WADA code inadvertent doping and stacking Combining the most up to date scientific evidence with consideration of practical issues this book is an essential reference for any healthcare professional working in sport and exercise any student or researcher working in sport and exercise science sports medicine health science or nutrition and for all coaches and support teams working with athletes

**Anti-Inflammatory Diet** Susan Lombardi, 2021-05-28 If You have an inflammatory disorder then You need to change your eating habits Although medication and other therapies are necessary many experts say it may be beneficial to follow an anti inflammatory diet too If You have say rheumatoid arthritis it s not going to be a miracle fix to alter what s on your plate but it may reduce the number of flare ups You ve got or it may help push the pain down a few notches An anti inflammatory diet is widely considered safe so it can help lower your chances of having other issues even if it doesn t help with your disease Anti inflammatory foods are those that would be recommended to eat by any conventional nutrition expert This book has discussed Inflammation What is an anti inflammatory diet How inflammation is interrelated with obesity and arthritis What is an anti inflammatory lifestyle Foods that prevent inflammation and much more If You want to improve your health by eating correctly then this is the right book for You Don t wait any longer Grab you copy now

**Studies on Arthritis and Joint Disorders** Maria Jose Alcaraz, Oreste Gualillo, Olga Sánchez-Pernaute, 2013-02-20

This next volume in our established series proposes to systematically review the basic science and clinical knowledge of the role of free radicals and antioxidants collectively known as oxidative stress in the pathology of arthritis and other joint diseases. It will describe the most current diagnostic tools, laboratory methods and technology to suggest ways of prevention and treatment and to emphasize the concept of the bench to bedside approach. The book will also provide specific coverage on emerging technology and medical applications including discussions of biomarkers and antioxidants as therapeutic agents and several more relevant aspects. In addition, the book will promote the concept of using biomarkers representative of oxidative stress reactions and free radical damage as well as describe the effect of antioxidants in treating disease in clinical trials. The content will be valuable to researchers studying the development of arthritis, joint disease and clinicians treating patients with these diagnoses.

**Nutrition and Rheumatic Disease** Laura A. Coleman, 2008-03-11. In this book, experts provide a comprehensive review of current knowledge regarding nutrition and dietary management for the complex set of rheumatic conditions. Within the disease-specific chapters, the authors present a historical perspective, a discussion of the major clinical features, current management and treatment, a review of the literature related to nutritional status and diet, and dietary recommendations based on current scientific evidence. The field of rheumatic diseases includes a wide variety of pathologic processes. This book will greatly benefit physicians specializing in internal medicine, family practice and rheumatology.

***Antioxidants in Food, Vitamins and Supplements*** Amitava Dasgupta, Kimberly Klein, 2014-02-11. *Antioxidants in Food, Vitamins and Supplements* bridges the gap between books aimed at consumers and technical volumes written for investigators in antioxidant research. It explores the role of oxidative stress in the pathophysiology of various diseases as well as antioxidant foods, vitamins and all antioxidant supplements including herbal supplements. It offers healthcare professionals a rich resource of key clinical information and basic scientific explanations relevant to the development and prevention of specific diseases. The book is written at an intermediate level and can be easily understood by readers with a college-level chemistry and biology background. Covers both oxidative stress-induced diseases as well as antioxidant-rich foods, not the chemistry of antioxidants. Contains easy-to-read tables and figures for quick reference information on antioxidant foods and vitamins. Includes a glycemic index and a table of ORAC values of various fruits and vegetables for clinicians to easily make recommendations to patients.

***The Vitamin Cure for Arthritis*** Robert G. Smith, Ph.D., Todd Penberthy, 2015-01-01. The general explanation for the cause of arthritis is that over time, our joints simply wear out; that is, the cartilage that lubricates the ends of the bones simply gets worn thinner and thinner until one bone wears directly on another, causing pain and lowering our quality of life. It stands to reason that wear and tear is responsible for some of the damage. It is considered a progressive disease, meaning that once the symptoms are diagnosed, they tend to get worse. Yet arthritis can be reversed. The process of degradation and regrowth in a joint is a dynamic process that continues throughout life. Arthritis results when the joint does not recover from damage. Most people may not realize it, but they have a



direct influence on the current and future health of their joints through their nutritional behaviour With the proper knowledge we can prevent degeneration from taking hold by improving our body's regeneration processes This book offers natural weapons we can use to defend and protect our joints from the destructive effects of poor nutrition and time This clear readable book describes the composition of joints and how they work within the body how normal healthy joints are supported and what can go wrong It describes the degenerative diseases that affect joints and explains the basis of orthomolecular natural megavitamin medicine from a scientific perspective There are several types of arthritis but they all involve degeneration of the joints and tissues surrounding them This book covers the different types Including Osteoarthritis OA Rheumatoid arthritis RA Gout Arthritis caused by infections or inflammation such as Borrelia Lyme Disease fibromyalgia and psoriasis And more THE VITAMIN CURE FOR ARTHRITIS explains each form of arthritis and current and new medical treatments for them More importantly it describes the nutritional approach to help sufferers prevent further progress of the disease and even reverse it

The Top Books of the Year Benefits Of Antioxidant Supplements For Knee The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous compelling novels enthralling the hearts of readers worldwide. Lets delve into the realm of top-selling books, exploring the engaging narratives that have enthralled audiences this year. The Must-Read : Colleen Hoover's "It Ends with Us" This poignant tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover expertly weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can prevail. Benefits Of Antioxidant Supplements For Knee : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This intriguing historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids absorbing storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Discover the Magic : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, captivating readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a exceptional and suspenseful novel that will keep you guessing until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

<https://cmsemergencymanual.iom.int/results/scholarship/default.aspx/the%20rule%20of%20law%20tom%20bingham.pdf>

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