



tendon transfers; management of the failed long-stemmed custom agility total ankle arthroplasty; and many more articles surrounding foot and ankle arthroplasty.

[Current Updates in Total Ankle Arthroplasty, An Issue of Foot and Ankle Clinics of North America, E-Book](#) Springer Science & Business Media

This handbook is a collection of authoritative information in the new and expanding field of polymer tribology. It brings together various research topics in the field of polymer tribology in a single volume, and provides relevant data in polymer tribology for research and industrial applications. The book's chapters are written by active, world-renowned researchers in the field. Subjects covered in this book range from the fundamentals of polymer tribology to highly applied topics such as machine element design (bearing and gears), hip prosthetic and microsystems applications. Readers in the field of tribology, in general, and polymer tribology, in particular, will find it very useful as it covers nearly all aspects of polymer tribology. Academics creating new courses based on polymer tribology will also find this book's comprehensive coverage valuable. Researchers will find this book a ready source of the state-of-the-art in the field of polymer tribology.

[In Medicine and Dentistry](#) Springer Science & Business Media

Total joint replacement (TJR), or joint arthroplasty, is a widely used surgical procedure in which the entire joint is removed and replaced with a prosthetic joint. The most common types of TJR are total hip replacement (THR) and total knee replacement (TKR). The improvement and development of safer, longer lasting and better functioning implants are essential. Recent reports of potential problems caused by ion release in metal-on-metal (MoM) TJRs resulting in the formation of pseudo-tumours therefore need to be properly investigated. This chapter provides an overview of the evolution of TJR, followed by a review of the issues and the science around ion release. The potential corrosion issues and bio-tribocorrosion processes which prevail in TJRs, including orthopaedic implant materials, load-bearing joint replacement materials tribocorrosion, and protein adsorption, are also discussed.

[Tribology of Natural and Artificial Joints](#) Springer Nature

This book features papers focusing on the implementation of new and future technologies, which were presented at the International Conference on New Technologies, Development, and Application, held at the Academy of Science and Arts of Bosnia and Herzegovina in Sarajevo on June 24-26, 2021. It covers a wide range of future technologies and technical disciplines, including complex systems such as Industry 4.0; patents in industry 4.0; robotics; mechatronics systems; automation; manufacturing; cyber-physical and autonomous systems; sensors; networks; control, energy, renewable energy sources; automotive and biological systems; vehicular networking and connected vehicles; effectiveness and logistics systems; smart grids; nonlinear systems; power, social and economic systems; education; and IoT. The book *New Technologies, Development and Application III* is oriented toward Fourth Industrial Revolution "Industry 4.0," implementation which improves many aspects of human life in all segments and leads to changes in business paradigms and production models. Further, new business methods are emerging and transforming production systems, transport, delivery, and consumption, which need to be monitored and implemented by every company involved in the global market.

[Applications of Nanocomposite Materials in Orthopedics](#) CRC Press

*Applications of Nanocomposite Materials in Orthopedics* provides a solid understanding of recent developments in the field of nano-composites used in orthopedics. The book covers joint replacement, the load bearing capability of fractured bones, bone soft tissue regeneration, hard tissue replacement, artificial bone grafting, bone repair, bone tissue transplantations, and related topics, thus helping readers understand how to resolve problems associated with bone fracture and orthopedic surgery. A variety of nanocomposite materials are discussed, with their properties and preparation methods given. Outlines the use of nanotechnology for bone tissue transplantation. Describes nanocomposites for bone grafting and artificial bones, also including their properties. Includes discussions on tissue engineering of bone and tissue regeneration and transplantation. Describes many composite materials and their preparation methods.

[The Challenge of New Composites and Alloys Used as Medical Devices](#) Springer

During the 2011 EFORT Congress in Copenhagen, many interesting topics relating to tribology in total hip arthroplasty were discussed during a special day devoted entirely to the subject. EFORT decided that, given the wide interest in these discussions, publication of the presentations would be warmly welcomed by all fellow professionals who were unable to attend. This book is the result. It provides detailed information on currently used articulating materials and their wear performance. Clinical outcomes are discussed, and important new frontiers are carefully considered. The book will be of interest both to novices who want to learn more about the field and to experienced orthopaedic surgeons wishing to keep abreast of the latest developments.

[Metals for Biomedical Devices](#) World Scientific

More than 20 years have passed since the International Symposium on Total Knee Replacement was held in London in 1974. Prosthetic design and operative technique have been greatly improved since then, and there is now an accepted standard concept of total knee arthroplasty. Thirteen years after the London symposium, another international symposium on total knee replacement was held, this time in Nagoya, Japan, in 1987. Its ambitious objective was to push forward the frontiers of continuous investigation and improvement of total knee replacement. The fruits of the individual efforts presented at the Nagoya symposium were published in a volume of proceedings entitled *Total Knee Replacement*. In the years since 1987, further investigations have been conducted in various parts of the world regarding prosthetic design, fixation, long-term radiological follow-up, biomechanical evaluation, and biomaterials research. In knee ligament reconstruction, rapid progress has been made in the past five years in clinical practice and fundamental research by means of arthroscopic surgery and tissue transplantation, and we have come close to establishing a standard treatment. Under these circumstances, an international symposium on knee joint reconstruction was planned for 1994, again to be held in Nagoya, to provide ample opportunity for exchanging information and sharing clinical experience from around the world.

[Bio-tribocorrosion in biomaterials and medical implants](#) Total Hip Arthroplasty Wear Behaviour of Different Articulations

Total hip arthroplasty, the most commonly performed orthopedic procedure, is used to replace or reconstruct the hip with an artificial joint. *Perspectives in Total Hip Arthroplasty* outlines developments in technologies and biomaterials used for this procedure, with a focus on the tribological interactions of the materials used. Part one outlines the history of total hip arthroplasty

and goes on to explore advances in techniques and biomaterials. Part two focuses on the tribology of materials used to perform this procedure, explaining the impact of wear on the load-bearing surface, a major cause of failure in hip prostheses. Chapters review a range of materials, including modern biomaterials, hybrid materials, metal, ceramic, and polyethylene. The book also discusses the tribological interactions of these materials when used in total hip arthroplasty. *Perspectives in Total Hip Arthroplasty* is a key resource for clinicians, researchers, and academics interested in the tribology of total hip arthroplasty, as well as materials researchers, engineers, and academics concerned with the tribology of biomaterials. Covers techniques from innovative surgeons and designs from multinational manufacturers, as well as information on improvements in technologies and biomaterials. Discusses the tribology of all the major materials used in total hip arthroplasty.

[10th BIOLOX Symposium, Washington D.C., June 10-11, 2005. Proceedings](#) World Scientific

Joint replacement is a very successful medical treatment. However, the survivorship of the implants could be adversely affected due to the loss of materials in the form of particles or ions as the bearing surfaces articulate against each other. The consequent tissue and immune response to the wear products, remain one of the key factors of their failure. Tribology has been defined as the science and technology of interacting surfaces in relative motion and all related wear products (e.g., particles, ions, etc.). Over the last few decades, in an attempt to understand and improve joint replacement technology, the tribological performance of several material combinations have been studied experimentally and assessed clinically. In addition, research has focused on the biological effects and long term consequences of wear products. Improvements have been made in manufacturing processes, precision engineering capabilities, device designs and materials properties in order to minimize wear and friction and maximize component longevity in vivo. This book investigates the in vivo and in vitro performance of the orthopaedic implants and their advanced bearings. Contributions are solicited from the researchers working in the field of biotribology and bioengineering.

[Crosslinkable Polyethylene](#) Springer Nature

The management of orthopedic infection is an area of growing importance in orthopedic surgery. This text provides a complete overview from basic research to clinical application and future perspectives in the treatment of orthopedic infection emphasizing the role of local therapy. Coverage details the various approaches to the treatment of orthopedic infections, making the book an important tool for the daily practice of its readers.

[Advanced Biomaterials for Orthopaedic Application](#) Georg Thieme Verlag

*Polyolefin Fibres: Structure, Properties and Industrial Applications, Second Edition*, explores one of the most widely used commercial polymers, with a focus on the most important polyolefins, namely polyethylene, polypropylene, and polyolefin bicomponent fibres. These versatile fibres are durable, chemically resistant, lightweight, economical, and functional. This new edition has been updated and expanded to include cutting-edge research on a broad range of advanced applications. Part I covers the structure and properties of polyolefin fibres, incorporating a new chapter on the environmental aspects of polyolefin use. Part II examines the methods for improving the functionality of polyolefins, providing essential information for those engaged in developing high-performance materials. A final group of chapters addresses how polyolefin fibres can be incorporated into specific textile applications, such as automotive, geotextile, biomedical, and hygiene products, and explores potential future development. This book is an essential reference for textile technologists and manufacturers, polymer and fibre scientists, yarn and fabric manufacturers, biomedical and device engineers, and industrialists and researchers. Introduces the types, properties and structure of polyolefin fibers for readers new to the polyolefins field. Examines methods to improve the functionality of polyolefin fibers, providing essential information for textile technologists and research and development managers engaged in developing high-performance materials. Presents existing and potential applications of polyolefin fibers, exploring how they can expand the range of commercial polyolefin-based products.

[Effect of Surface Degradation on Wear Behaviour of 3Y-TZP Ceramics](#) Walter de Gruyter GmbH & Co KG

During the 2010 EFORT Congress in Madrid, many interesting topics relating to tribology in total hip arthroplasty were discussed during a special day devoted entirely to the subject. So successful was the day, and such was the broad interest in the discussions, that EFORT decided that publication of all the presentations would be warmly welcomed by fellow professionals who were unable to attend. This book is the result. It includes detailed information on the different articulating materials and the wear to which they are subject. The various factors that contribute to bearing performance and control wear are thoroughly evaluated, and careful consideration is given to the technology and design solutions proposed with a view to producing low-wearing hip joints. This book will be of interest both to novices who want to learn more about the field and to experienced orthopaedic surgeons wishing to keep abreast of the latest developments.

[Controversies in Hip Surgery](#) Elsevier

During their service life, most biomaterials and medical implants are vulnerable to tribological damage. In addition, the environments in which they are placed are often corrosive. The combination of tribology, corrosion and the biological environment has been named 'bio-tribocorrosion'. Understanding this complex phenomenon is critical to improving the design and service life of medical implants. This important book reviews recent key research in this area. After an introduction to the topography of bio-tribocorrosion, Part one discusses different types of tribocorrosion including fatigue-corrosion, fretting-corrosion, wear-corrosion and abrasion-corrosion. The book also discusses the prediction of wear in medical devices. Part two looks at biological effects on tribocorrosion processes, including how proteins interact with material surfaces and the evolution of surface changes due to bio-tribocorrosion resulting from biofilms and passive films. Part three reviews the issue of bio-tribocorrosion in clinical practice, including dental applications and joint replacement as well the use of coatings and test methods for bio-tribocorrosion. With its international team of contributors, *Bio-tribocorrosion in biomaterials and medical implants* is a standard reference for those researching and developing medical devices as well as clinicians in such areas as dentistry and orthopaedic surgery. Reviews recent research in bio-tribocorrosion and its role in improving the design and service life of medical implants. Discusses types of bio-tribocorrosion including fatigue and wear corrosion. Examines biological effects on bio-tribocorrosion processes including interaction of proteins with metal surfaces.

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