

precision orthopedics and sports medicine

precision orthopedics and sports medicine represent an advanced and specialized field focused on the diagnosis, treatment, and prevention of musculoskeletal injuries and disorders, particularly those related to sports and physical activity. This field combines cutting-edge technology, personalized treatment plans, and a deep understanding of anatomy and biomechanics to improve patient outcomes. Precision orthopedics uses data-driven approaches and innovative techniques such as 3D imaging, robotic-assisted surgery, and regenerative medicine to tailor interventions to each patient's unique condition. Sports medicine complements these efforts by addressing athletic injuries, enhancing performance, and promoting safe return to activity. Together, precision orthopedics and sports medicine provide comprehensive care for athletes, active individuals, and those suffering from orthopedic conditions. This article explores the key aspects of this dynamic field, including the latest advancements, common injuries treated, diagnostic methods, and rehabilitation strategies.

- Overview of Precision Orthopedics
- Role of Sports Medicine in Injury Management
- Common Injuries Treated with Precision Orthopedics and Sports Medicine
- Diagnostic Techniques and Technology
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- Rehabilitation and Recovery Strategies

Overview of Precision Orthopedics

Precision orthopedics is an evolving branch of orthopedic medicine that emphasizes customized treatment tailored to the individual patient's anatomy, lifestyle, and specific injury. This approach integrates advanced imaging techniques, biomechanical assessments, and personalized surgical planning to optimize outcomes. Unlike traditional orthopedic methods that often apply a standardized treatment, precision orthopedics leverages patient-specific data to guide decision-making processes. This ensures higher accuracy in procedures such as joint replacement, fracture repair, and ligament reconstruction. The integration of digital tools and robotics enhances surgical precision, reduces recovery time, and minimizes complications. Precision orthopedics is particularly beneficial for complex cases requiring meticulous alignment and functional restoration.

Technological Innovations in Precision Orthopedics

Recent advancements in technology have revolutionized precision orthopedics. Innovations such as 3D printing allow for the creation of patient-specific implants and surgical guides. Robotic-assisted surgery provides surgeons with enhanced control and accuracy during procedures. Additionally, computer navigation systems facilitate precise alignment and placement of orthopedic hardware. These technologies contribute to improved surgical outcomes, less postoperative pain, and faster rehabilitation. The use of artificial intelligence and machine learning is also emerging, assisting in predictive analytics and personalized treatment planning.

Benefits of Personalized Treatment

Personalized treatment in precision orthopedics offers numerous advantages. Tailoring interventions to the patient's unique condition helps minimize risks and enhances recovery. Customized implants and surgical techniques reduce the likelihood of implant failure and the need for revision surgeries. This approach also improves functional outcomes, allowing patients to regain mobility and strength more effectively. Furthermore, personalized care facilitates better pain management and patient satisfaction by addressing specific needs and preferences throughout the treatment journey.

Role of Sports Medicine in Injury Management

Sports medicine focuses on preventing, diagnosing, and treating injuries related to physical activity and athletic performance. It encompasses a wide range of conditions, including acute injuries, chronic overuse syndromes, and performance optimization. Sports medicine specialists work closely with athletes and active individuals to develop injury prevention strategies, manage rehabilitation, and promote safe return to sports. The field integrates knowledge from orthopedics, physical therapy, nutrition, and exercise science to provide comprehensive care. Collaboration between sports medicine practitioners and precision orthopedic surgeons enhances treatment efficacy, particularly for complex sports-related injuries.

Injury Prevention Strategies

Effective injury prevention is a cornerstone of sports medicine. Practitioners employ various strategies to reduce the risk of musculoskeletal injuries, including:

- Biomechanical assessments to identify movement abnormalities
- Customized training programs to improve strength and flexibility
- Education on proper techniques and equipment use

- Implementation of conditioning and warm-up routines
- Monitoring workload to prevent overtraining

These preventive measures are critical for athletes at all levels, helping to minimize downtime and enhance long-term health.

Multidisciplinary Approach

Sports medicine employs a multidisciplinary approach involving orthopedic surgeons, physical therapists, athletic trainers, and nutritionists. This collaboration ensures holistic care that addresses all aspects of injury management and athletic performance. For example, nutritionists may develop diet plans to support tissue healing, while physical therapists design rehabilitation exercises to restore function. This integrated care model maximizes recovery potential and supports sustained athletic achievement.

Common Injuries Treated with Precision Orthopedics and Sports Medicine

Precision orthopedics and sports medicine address a broad spectrum of musculoskeletal injuries commonly encountered in athletes and active individuals. Accurate diagnosis and individualized treatment are vital to effective management and recovery. The most frequent injuries treated include ligament tears, fractures, tendonitis, cartilage damage, and joint instability. These conditions often result from acute trauma or repetitive stress during physical activity.

Ligament Injuries

Ligament injuries, such as anterior cruciate ligament (ACL) tears, are prevalent in sports involving sudden direction changes and high-impact forces. Precision orthopedics utilizes advanced imaging and surgical techniques to repair or reconstruct damaged ligaments, restoring joint stability and function. Sports medicine supports rehabilitation and gradual return to activity to prevent reinjury.

Fractures and Bone Injuries

Fractures are common in contact sports and high-risk activities. Precision orthopedics offers minimally invasive fixation methods tailored to the fracture type and patient anatomy. Proper alignment and stabilization promote optimal healing. Sports medicine emphasizes early mobilization and strengthening to expedite recovery.

Overuse Injuries

Overuse injuries, such as tendonitis and stress fractures, develop from repetitive strain without adequate rest. Sports medicine plays a pivotal role in diagnosing these conditions early and implementing rest, physical therapy, and biomechanical corrections. Precision orthopedics may intervene when conservative management fails, applying targeted surgical procedures when necessary.

Diagnostic Techniques and Technology

Accurate diagnosis is foundational to effective treatment in precision orthopedics and sports medicine. The integration of sophisticated diagnostic tools enables detailed assessment of musculoskeletal structures and injury severity. These technologies facilitate personalized treatment planning and monitoring of healing progress.

Imaging Modalities

Common imaging techniques include X-rays, magnetic resonance imaging (MRI), computed tomography (CT) scans, and ultrasound. MRI is particularly valuable for visualizing soft tissues such as ligaments, tendons, and cartilage. CT scans provide detailed bone imaging, while ultrasound offers real-time evaluation of dynamic structures. Advanced imaging supports the development of patient-specific surgical plans and minimally invasive interventions.

Biomechanical Analysis

Biomechanical analysis involves assessing movement patterns, joint angles, and muscle function to identify abnormalities contributing to injury risk. Tools such as motion capture systems and force plates provide quantitative data that inform treatment and rehabilitation strategies. This analysis is essential for optimizing athletic performance and preventing recurrence of injuries.

Treatment Approaches and Innovations

Treatment in precision orthopedics and sports medicine ranges from conservative management to advanced surgical procedures. The goal is to restore function, alleviate pain, and enable return to activity while minimizing complications. Emerging innovations continue to enhance treatment efficacy and patient outcomes.

Conservative Management

Initial treatment often includes rest, physical therapy, anti-inflammatory medications, and activity modification. Sports medicine specialists design rehabilitation programs focused on strength, flexibility, and proprioception. These non-surgical approaches are effective for many injuries, reducing the need for invasive interventions.

Minimally Invasive and Robotic-Assisted Surgery

When surgery is indicated, minimally invasive techniques such as arthroscopy offer reduced tissue damage, shorter hospital stays, and faster recovery. Robotic-assisted surgery enhances precision and accuracy, particularly in complex joint reconstructions and implant placements. These advancements represent significant progress in personalized orthopedic care.

Regenerative Medicine

Regenerative therapies, including platelet-rich plasma (PRP) and stem cell treatments, are gaining traction in precision orthopedics and sports medicine. These biologic interventions aim to promote tissue healing and reduce inflammation, potentially accelerating recovery times. While research continues, these treatments offer promising adjuncts to traditional care.

Rehabilitation and Recovery Strategies

Rehabilitation is a critical phase in the management of orthopedic and sports-related injuries. Precision orthopedics and sports medicine emphasize customized recovery programs tailored to the patient's injury, surgical procedure, and functional goals. Effective rehabilitation restores mobility, strength, and endurance, facilitating a safe return to daily activities and sports.

Phases of Rehabilitation

1. **Acute Phase:** Focuses on pain control, swelling reduction, and protection of the injured area.
2. **Recovery Phase:** Emphasizes gradual restoration of range of motion and muscle strengthening.
3. **Functional Phase:** Targets sport-specific training, balance, and coordination to prepare for return to activity.

Throughout these phases, continuous assessment and adjustment of the rehabilitation plan ensure optimal

progress and prevent setbacks.

Role of Physical Therapy

Physical therapy is integral to rehabilitation, offering targeted exercises and manual techniques to enhance healing and function. Therapists utilize modalities such as electrical stimulation, ultrasound therapy, and therapeutic massage to support recovery. Education on injury prevention and body mechanics is also provided to reduce future injury risk.

Frequently Asked Questions

What is precision orthopedics and how does it differ from traditional orthopedics?

Precision orthopedics is an approach that customizes diagnosis, treatment, and rehabilitation based on an individual's unique genetic, anatomical, and lifestyle factors. Unlike traditional orthopedics, which often applies standardized treatments, precision orthopedics uses advanced imaging, biomarker analysis, and personalized data to optimize outcomes.

How is sports medicine benefiting from advances in precision medicine?

Sports medicine benefits from precision medicine by providing tailored injury prevention strategies, personalized rehabilitation protocols, and targeted therapies based on an athlete's genetic profile and biomechanics. This approach helps enhance performance, reduce recovery time, and minimize the risk of re-injury.

What role do wearable technologies play in precision orthopedics and sports medicine?

Wearable technologies collect real-time data on movement patterns, joint load, muscle activity, and other physiological metrics. This data enables clinicians to monitor an athlete's biomechanics closely, identify potential injury risks early, and customize treatment and training plans accordingly.

Can regenerative medicine techniques be integrated into precision orthopedics?

Yes, regenerative medicine techniques such as stem cell therapy, platelet-rich plasma (PRP), and tissue engineering are increasingly integrated into precision orthopedics. These therapies are tailored to the patient's specific condition and biological environment to promote faster and more effective healing.

How does genetic testing influence treatment plans in sports medicine?

Genetic testing can identify predispositions to certain injuries, inflammation responses, and recovery rates. This information helps sports medicine specialists design personalized training regimens, select appropriate interventions, and optimize recovery strategies to improve athlete outcomes.

What are the latest imaging technologies used in precision orthopedics?

Latest imaging technologies include 3D MRI, high-resolution ultrasound, and dynamic fluoroscopy. These provide detailed visualization of musculoskeletal structures and movement in real-time, enabling precise diagnosis, surgical planning, and monitoring of treatment effectiveness.

Additional Resources

1. *Precision Orthopedics: Advances in Personalized Treatment*

This book explores the latest innovations in precision orthopedics, focusing on personalized treatment plans tailored to individual patient anatomy and genetics. It covers cutting-edge diagnostic tools and surgical techniques that enhance outcomes. Ideal for orthopedic surgeons and researchers aiming to integrate precision medicine into clinical practice.

2. *Sports Medicine and Orthopedic Surgery: A Precision Approach*

Combining principles of sports medicine with orthopedic surgery, this text emphasizes precision in injury diagnosis and management. It includes detailed case studies on athletes, highlighting minimally invasive procedures and rehabilitation protocols. The book serves as a comprehensive guide for sports physicians and orthopedic surgeons.

3. *Biomechanics and Precision in Sports Injury Prevention*

This book delves into the biomechanical factors influencing sports injuries and presents strategies for precise prevention and intervention. It integrates motion analysis technologies and wearable sensors to tailor injury prevention programs. Sports scientists, coaches, and clinicians will find valuable insights here.

4. *Personalized Rehabilitation in Sports Orthopedics*

Focusing on rehabilitation, this book discusses personalized protocols that optimize recovery based on patient-specific factors. It covers advancements in physical therapy, neuromuscular training, and technology-assisted rehab methods. A resource for physical therapists and sports medicine professionals.

5. *Imaging Techniques in Precision Orthopedics and Sports Medicine*

This volume offers an in-depth look at advanced imaging modalities such as MRI, CT, and ultrasound for precise diagnosis in orthopedics and sports injuries. It highlights the role of imaging in guiding minimally invasive procedures and monitoring healing. Radiologists and orthopedic specialists will benefit from its practical approaches.

6. *Genomics and Precision Medicine in Orthopedics*

Exploring the intersection of genomics and orthopedics, this book discusses how genetic profiling can influence treatment decisions in sports-related injuries. It examines the potential for personalized therapies based on genetic predispositions and healing capacities. Researchers and clinicians interested in the future of precision medicine will find this essential.

7. *Minimally Invasive Techniques in Precision Sports Orthopedics*

This text covers the latest minimally invasive surgical techniques that enhance precision and reduce recovery time for athletes. It includes step-by-step procedural guides and the integration of robotic assistance. Orthopedic surgeons specializing in sports injuries will gain practical knowledge from this book.

8. *Data-Driven Approaches to Precision Sports Medicine*

Highlighting the use of big data and machine learning, this book demonstrates how data analytics improve injury prediction, treatment customization, and performance optimization. It offers insights into wearable technology and electronic health records integration. Sports medicine practitioners and data scientists will find this a valuable resource.

9. *Innovations in Cartilage Repair and Regeneration: Precision Orthopedic Perspectives*

This book reviews state-of-the-art techniques in cartilage repair and regeneration with an emphasis on precision approaches. It covers tissue engineering, biomaterials, and growth factor therapies tailored to individual patient needs. Essential reading for orthopedic researchers and clinicians focused on joint preservation and sports injuries.

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precision orthopedics and sports medicine: Rotator Cuff Injuries Patrick J. McMahon, 2017-09-30 Comprised exclusively of clinical cases presenting injuries to and management of the rotator cuff, this concise, practical casebook will provide orthopedic surgeons with the best real-world strategies to properly manage the various kinds of cuff injury they may encounter. Each chapter is a case that opens with a unique clinical presentation, followed by a description of the diagnosis, assessment and management techniques used to treat it, as well as the case outcome, literature review and clinical pearls and pitfalls. Cases included illustrate different management strategies for rotator cuff surgery, including arthroscopic repair for tendonitis and tears, open and mini-open repair for severe tears, latissimus dorsi and pectoralis tendon transfer, arthroscopic debridement, hemiarthroplasty and total reverse arthroplasty, biological augmentation, and revision repair after retear and infection. Pragmatic and reader-friendly, *Rotator Cuff Injuries: A Clinical Casebook* is an excellent resource for orthopedic surgeons and sports medicine specialists confronted with both common and complex injuries to the rotator cuff.

precision orthopedics and sports medicine: *Precision ACL Reconstruction, An Issue of Clinics in Sports Medicine, E-Book* Volker Musahl, Alan Getgood, 2024-06-01 In this issue of Clinics in Sports Medicine, guest editors Drs. Volker Musahl and Al Getgood bring their considerable expertise to the topic of Precision ACL Reconstruction. Top experts in the field cover key topics such as the timing of ACL surgery; non-operative ACL injury treatment; avoiding graft failure: lessons learned from the STABILITY trial; the role of osteotomy in ACL reconstruction; revision ACL reconstruction and associated procedures; and more. - Contains 15 relevant, practice-oriented topics including comprehensive clinical examination of ACL injury; value-based sustainable ACL surgery; complications in ACL surgery and how to avoid them; evaluation of outcomes after ACL reconstruction; rehabilitation and return to sport after ACL reconstruction; and more. - Provides in-depth clinical reviews on precision ACL reconstruction, 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.

precision orthopedics and sports medicine: *Arthroscopic Shoulder Surgery* Terry Thompson, 2024-06-01 A comprehensive reference for the current surgical landscape of arthroscopic shoulder surgery, *Arthroscopic Shoulder Surgery: Complications and Management* provides expert opinions on the management of commonly encountered and unusual complications. As there is currently no other up-to-date resource dedicated wholly to complications in shoulder arthroscopy, this will become a go-to resource. Edited by Dr. Terry L. Thompson, alongside expert contributor perspectives on management and preferred treatment, *Arthroscopic Shoulder Surgery* is a great asset for any practicing orthopedic surgeon performing arthroscopic shoulder surgery, including fellowship-trained shoulder surgeons, sports medicine surgeons, orthopedic surgery residents, and sports medicine and shoulder fellows. By showcasing a broad range of complications and adverse outcomes, this text will assist with cases from adolescents through older adults. Each chapter in *Arthroscopic Shoulder Surgery* includes: Epidemiology Review of the literature Etiology Author's preferred treatment with pearls Case presentations including radiographic and surgical images *Arthroscopic Shoulder Surgery: Complications and Management* is a necessary text discussing one of the most rapidly growing procedures in orthopedic surgery and meeting a need within the orthopedic community to discuss complications. Bringing together literature with tips and tricks from established leaders in shoulder surgery makes this an invaluable resource on handling complications of arthroscopic surgery of the shoulder.

precision orthopedics and sports medicine: Shoulder and Elbow Injuries in Athletes Robert A. Arciero, Frank A. Cordasco, Matthew T. Provencher, 2017-10-17 Thorough and concise, this practical reference provides a unique, on-field management approach to all athletic injuries to the shoulder and elbow, as well as nonoperative and operative treatment options, including arthroscopy and open surgery. Focusing on high-performance athletes, leading authorities in the field demonstrate how to provide pain relief, restore function, and return the athlete to sport and to prior level of performance in a safe and timely fashion. - Showcases the knowledge and expertise of an international group of editors and authors who have served as president of the American Orthopaedic Society for Sports Medicine, the American Shoulder and Elbow Surgeons and the Arthroscopy Association of North America, are physicians or consultants for professional and collegiate sports teams, have won awards for research in the field of shoulder surgery, are editors and reviewers for peer-reviewed journals, and much more. - Contains rehabilitation guidelines and critical return-to-sport protocols – essential information for nonsurgical healthcare providers -- primarily on athletes under the age of 40, with some consideration of the older athlete (professional golf, for example). - Contains a section in each chapter covering On-the-Field Management and Early Post-Injury Assessment and Treatment – a must-read for immediate care of the injured athlete and ensuring the safe return to play. - Covers the most recent advances in the management of tendon tears in elite and overhead athletes, including prevention in youth sports, early sports specialization, and changing standards of care regarding shoulder and elbow instability. - Provides a thorough

review of current ulnar collateral ligament injury diagnosis, imaging, non-operative management, and surgery, as well as acromioclavicular and sternoclavicular joint injuries, clavicle and olecranon fractures, and OCD of the capitellum.

precision orthopedics and sports medicine: *Digital Orthopedics* Guoxian Pei, 2019-03-14 This book addresses all aspects of digital techniques in orthopedics, from development of the core principles to imaging techniques, computer-aided design, reverse engineering and their applications. It illustrates the successful applications in accurate operation using 3-D reconstruction and applied digital techniques. All illustrations and tables were meticulously selected and are easy to understand. The book was written for all doctors and researchers who work in the fields of orthopedics, CAD/CAM and anatomy. Above all, surgeons, physiatrists, radiologists, and engineers in image processing and orthopedics will find it a valuable resource.

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precision orthopedics and sports medicine: *EORS, European Orthopaedic Research Society* LEYVRAZ, 2002-01-01

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precision orthopedics and sports medicine: *Biomechanics in Orthopaedic Diseases and Surgery* Jingwei Zhang, Cheng-Kung Cheng, Chia-Ying Lin, 2025-01-30 The mechanical environment of the musculoskeletal system plays a fundamental role in orthopaedic diseases. Understanding the magnitude, pattern, and duration of biomechanical factors and how they impact surgical treatment is an ongoing topic of interest in biomechanics. However, the way forces and stresses acting on the skeletal system affect disease progression and treatment outcomes is not yet fully elucidated. As a result, investigating the biomechanical responses in the incidence and surgical treatment of orthopaedic diseases, such as osteoarthritis, can significantly enhance existing surgical treatment strategies and foster the development of new pharmaceutical interventions. Our goal is to consolidate groundbreaking studies in this field to advance the understanding of the biomechanical principles underlying disease progression and create a foundation for novel therapeutic strategies.

precision orthopedics and sports medicine: *Orthopaedic Biomechanics in Sports Medicine* Jason Koh, Stefano Zaffagnini, Ryosuke Kuroda, Umile Giuseppe Longo, Farid Amirouche, 2021-10-19 This book presents a fundamental basic overview of orthopedic biomechanics in sports medicine, with a special focus on the current methodologies used in modeling human joints, ligaments, and muscle forces. The first part discusses the principles and materials, including the use of finite element analysis (FEA) to analyze the stress-strain response in the implant-bone interface and design. The second part focuses on joint-specific biomechanics, highlighting the biomechanics of the knee and shoulder joints, their modeling, surgical techniques, and the clinical assessment of joint performance under various kinematic conditions resulting from different repair techniques. Written by international experts working at the cutting edge of their fields, this book is an easy-to-read guide to the fundamentals of biomechanics. It also offers a source of reference for readers wanting to explore new research topics, and is a valuable tool for orthopedic surgeons, residents, and medical students with an interest in orthopedic biomechanics.

precision orthopedics and sports medicine: *AAOS Comprehensive Orthopaedic Review 2* Martin I. Boyer, MD, FRCS(C), 2018-08-31 AAOS Comprehensive Orthopaedic Review, 2nd edition offers sweeping coverage of the core of orthopaedic knowledge that spans the spectrum of the orthopaedic specialties. Gathered in one convenient and comprehensive text, you'll find the specific information you need to prepare for your examination.

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needs of both novice and senior researchers in Orthopaedics by providing the essential, clinically relevant knowledge on research methodology that is sometimes overlooked during training. Readers will find a wealth of easy-to-understand information on all relevant aspects, from protocol design, the fundamentals of statistics, and the use of computer-based tools through to the performance of clinical studies with different levels of evidence, multicenter studies, systematic reviews, meta-analyses, and economic health care studies. A key feature is a series of typical case examples that will facilitate use of the volume as a handbook for most common research approaches and study types. Younger researchers will also appreciate the guidance on preparation of abstracts, poster and paper presentations, grant applications, and publications. The authors are internationally renowned orthopaedic surgeons with extensive research experience and the book is published in collaboration with ISAKOS.

precision orthopedics and sports medicine: *The Future Circle of Healthcare* Sepehr Ehsani, Patrick Glauner, Philipp Plugmann, Florian M. Thieringer, 2022-10-08 The past decade has brought to the fore the critical need to constantly envision and consider various scenarios where ongoing trends and sudden changes could together alter the provision of healthcare and the direction of medical research. This book brings together scholars whose areas of expertise represent different themes that are essential to understanding how healthcare might change and evolve over the next decade. What lessons can one take away from current and past developments? The themes explored by the book rest on four pillars. The first is the rapid pace and ubiquity of technological advances in areas such as artificial intelligence, machine learning, additive manufacturing and wearable electronics. The second pillar concerns healthy aging, longevity and the management of chronic diseases. The third is the imperative to remain cognizant of the ethical dimensions of medical decisions, adapting bioethics to ongoing changes in healthcare provision. Finally, the fourth pillar relates to how uncertainty in different domains of medical knowledge can be mitigated and translated into clinical practice. For example, how should uncertainty with the results of clinical trials for a new treatment be dealt with? What cost-benefit analyses would be most appropriate for the situation? Chapter authors identify respective challenges and promising opportunities, discussing how these could contribute to envisioning the future scope of healthcare when it comes to providing medical, economic and ethical values to human societies. Chapters 1, 4, 12, and 20 are available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

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precision orthopedics and sports medicine: DeLee & Drez's Orthopaedic Sports Medicine

E-Book Mark D. Miller, Stephen R. Thompson, 2018-12-20 Indispensable for both surgeons and sports medicine physicians, DeLee, Drez, & Miller's Orthopaedic Sports Medicine: Principles and Practice, 5th Edition, remains your go-to reference for all surgical, medical, rehabilitation and injury prevention aspects related to athletic injuries and chronic conditions. Authored by Mark D. Miller, MD and Stephen R. Thompson, MD, this 2-volume core resource provides detailed, up-to-date coverage of medical disorders that routinely interfere with athletic performance and return to play, providing the clinically focused information you need when managing athletes at any level. - Provides a unique balance of every relevant surgical technique along with extensive guidance on nonsurgical issues—making it an ideal reference for surgeons, sports medicine physicians, physical therapists, athletic trainers, and others who provide care to athletes. - Offers expanded coverage of revision surgery, including revision ACL and revision rotator cuff surgery. - Features additional coverage of cartilage restoration procedures and meniscal transplantation. - Provides significant content on rehabilitation after injury, along with injury prevention protocols. - Includes access to a comprehensive video collection, with more than 100 videos new to this edition. - Retains key features such as coverage of both pediatric and aging athletes; a streamlined organization for quick reference; in-depth coverage of arthroscopic techniques; extensive references; levels of evidence at the end of each chapter; and Author's Preferred Technique sections. - Enhanced eBook version included with purchase. Your enhanced eBook allows you to access all of the text, figures, and references from the book on a variety of devices.

precision orthopedics and sports medicine: Drug Discovery Derived from Herbal Medicine/Polypeptide for Neurological Diseases Qi Liang, Junfeng Wang, Peng Sang, 2025-06-18 The pursuit of drug candidates for neurological diseases including Parkinson's Disease (PD), Alzheimer's disease (AD), Spinal Cord Injury (SCI), and Neural Tube Defects (NTD), etc, is deemed as challenging due to the undesirable side effects of many drugs available on the market. Despite the imminent approval of new drug candidates like galanthamine, zuranolone, and emraclidine, there is still a lack of attention to drug discovery derived from herbal medicine, polypeptides, and oligopeptides. This Research Topic seeks to consolidate research findings concerning the discovery of drug candidates from herbal medicine, polypeptides, and oligopeptides for the treatment of neurological diseases. The primary objective is to report on pharmaceutical analysis, analytical techniques and methods, new drug delivery methods, pharmacology, metabolism, and organic synthesis of drug candidates. By addressing gaps in knowledge and identifying recent breakthroughs, our Research Topic aims to elucidate the potential of herbal medicine and polypeptides in neurological disease treatment. Scope and Information for Authors: This Research Topic encourages to contribute manuscripts focusing on various themes, including but not limited to:

- Identifying drug candidates within herbal medicine, polypeptides, or oligopeptides for the treatment of neurological diseases.
- Elucidating the biological mechanisms underlying the neurological diseases treatment of herbal medicine, polypeptides, or polypeptides.
- Presenting novel methods for the separation of drug candidates, enhancing our ability to investigate their effects.
- Constructing/improving the drug delivery methods for passing the blood-brain barrier.

This Research Topic serves as a platform to disseminate cutting-edge research and expand our understanding of these promising therapeutic strategies. We invite the authors to contribute Original Research, Perspective, Review, Clinical Trial, Opinion, Commentary, and Case Report to this Research Topic. Please Note: All the manuscripts submitted to this project will be peer-reviewed and need to fully comply with the Four Pillars of Best Practice in Ethnopharmacology (you can freely download the full version here) and the ConPhyMP statement: Front. Pharmacol. 13:953205. <https://doi.org/10.3389/fphar.2022.953205>). You need to check your MS using the ConPhyMP tool, see <https://ga-online.org/best-practice/> It is essential that the studies focus on specific, pharmacognostically well-defined preparations and these preparations must be characterised chemically if experimental studies are included. Purely in silico analyses of specific preparations using network analysis or docking studies are only considered if a detailed body of novel experimental pharmacological data are included.

precision orthopedics and sports medicine: Athletic Footwear and Orthoses in Sports Medicine Matthew B. Werd, E. Leslie Knight, Paul R. Langer, 2017-05-27 Now in a revised and expanded second edition, including an expanded section on running footwear and additional sports-specific recommendations, this updated, practical resource provides a concise and logical approach to prescribing footwear that will maximize performance and minimize injury in athletes. From fundamentals — including athletic foot types, basic biomechanics and gait evaluation — to step-by-step guidance through assessment and prescription of shoes, socks, lacing, inserts, and orthoses, this book is both comprehensive and easily accessible. A new section has been added to cover the array of different considerations for running footwear (barefoot, minimalist, maximalist), as well as new sport-specific recommendations. As in the previous edition, referral, coding and billing are also addressed. Photographs and drawings clearly illustrate key concepts, and wherever relevant, the authors have incorporated evidence-based medicine. By presenting new and updated essential information in a user-friendly format, *Athletic Footwear and Orthoses in Sports Medicine, Second Edition* will prove to be invaluable for sports medicine physicians, podiatrists, orthopedists, physical therapists, and athletic trainers.

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