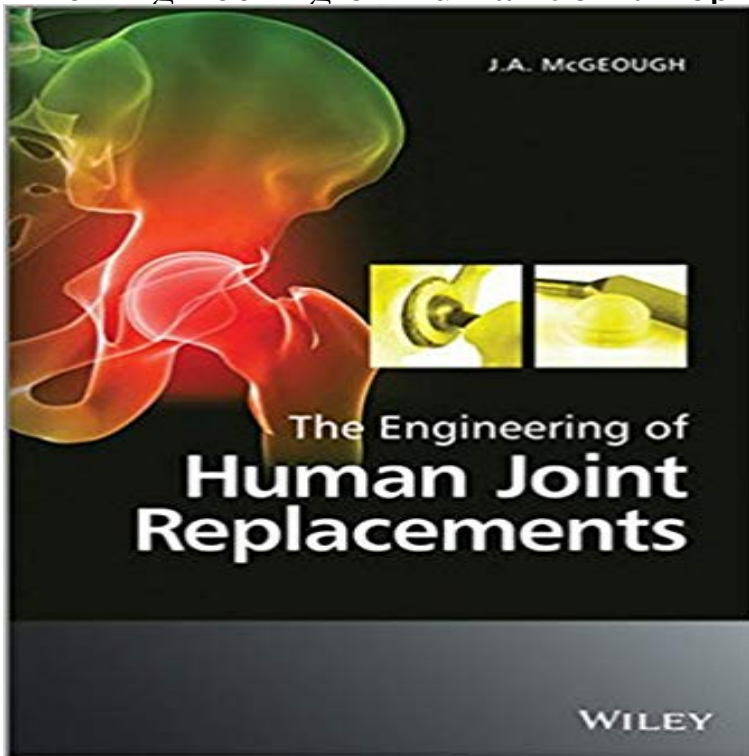


The Engineering of Human Joint Replacements



Since the major pioneering of joint replacement surgery more than fifty years ago, much research and progress has been made in the field of arthroplasty with new insights into better materials, types of cement and bone-cell compatible coatings, and a better understanding of the causes of implant failure. With an increasingly ageing population the requirement for arthroplastic surgery is manifest; over 800,000 hips worldwide are replaced each year, and replacement surgery is performed for almost every joint of the body. The Engineering of Human Joint Replacements covers the design, engineering, production and manufacture of human joint replacements, as well as associated engineering concerns such as surface coatings, orthopedic bone cement, the causes and effects of wear and tear, and rapid prototyping for clinical evaluation. Materials evaluation and selection is discussed, as well as production processes and insertion methods. The author provides an overview of skeletal anatomy and the effects of pain and deterioration in order to put the engineering principles into a medical context. Examples of joint replacements for the most common regions of the body are included, and aspects of clinical studies of these cases are discussed. Key Features: Provides an overview of the engineering materials and processes involved in the manufacture of human joint replacements Sets the scene for engineers and clinicians embarking on research into joint replacements Includes clinical and industrial examples and points the way to future developments Provides information on medical device companies with an engineering guide to the requirements for joint replacement The Engineering of Human Joint Replacements bridges the divide between engineering and orthopaedic surgery, offering an introductory text to young engineers entering the field, as well as a reference for

medical staff who will benefit from an understanding of the materials and methods used in their design, engineering and manufacture.

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