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| Nota di contenuto | Front Cover; UHMWPE Biomaterials Handbook: Ultra-High Molecular Weight Polyethylene in Total Joint Replacement and Medical Devices; Copyright Page; Contents; Dedication; Foreword; Contributors; Chapter 1. A Primer on UHMWPE; 1.1 Introduction; 1.2 What is a Polymer?; 1.3 What is Polyethylene?; 1.4 Crystallinity; 1.5 Thermal Transitions; 1.6 Overview of the Handbook; References; Chapter 2. From Ethylene Gas to UHMWPE Component: The Process of Producing Orthopedic Implants; 2.1 Introduction; 2.2 Polymerization: from Ethylene Gas to UHMWPE Powder; 2.2.1. GUR Resins; 2.2.2. 1900 Resins<br>2.2.3. Molecular Weight2.2.4. GUR versus 1900 Resin; 2.2.5. Calcium Stearate; 2.2.6. DSM Resin; 2.3 Conversion: from UHMWPE Powder to Consolidated Form; 2.3.1 Compression Molding of UHMWPE; 2.3.2 Ram Extrusion of UHMWPE; 2.3.3 Hot Isostatic Pressing of ArCom UHMWPE; 2.3.4 Direct Compression Molding of UHMWPE; 2.3.5 ArCom; 2.3.6 Properties of Extruded versus Molded UHMWPE; 2.4 Machining: from Consolidated Form to Implant; 2.5 Conclusion; References; Chapter 3. Packaging and Sterilization of UHMWPE; 3.1 Introduction; 3.2 Gamma |

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3.4 Ethylene Oxide Gas Sterilization3.5 Gas Plasma Sterilization; 3.6 The Torino Survey of Contemporary Orthopedic Packaging; 3.7 Shelf Life of UHMWPE Components for TJR; 3.8 Overview of Current Trends; 3.9 Acknowledgments; References; Chapter 4. The Origins of UHMWPE in Total Hip Arthroplasty; 4.1 Introduction and Timeline; 4.2 The Origins of a Gold Standard (1958 to 1982); 4.3 Charnley's First Hip Arthroplasty Design with PTFE (1958); 4.4 Implant Fixation with Pink Dental Acrylic Cement (1958 to 1966); 4.5 Interim Hip Arthroplasty Designs with PTFE (1958 to 1960)
4.6 Final Hip Arthroplasty Design with PTFE (1960 to 1962)4.7 Implant Fabrication at Wrightington; 4.8 The First Wear Tester; 4.9 Searching to Replace PTFE; 4.10 UHMWPE Arrives at Wrightington; 4.11 Implant Sterilization Procedures at Wrightington; 4.12 Summary; 4.13 Acknowledgments; References; Chapter 5. The Clinical Performance of UHMWPE in Hip Replacements; 5.1 Introduction; 5.2 Joint Replacements do not Last Forever; 5.3 Range of Clinical Wear Performance in Cemented Acetabular Components; 5.4 Wear versus Wear Rate of Hip Replacements
5.5 Comparing Wear Rates Between Different Clinical Studies5.6 Comparison of Wear Rates in Clinical and Retrieval Studies; 5.7 Current Methods for Measuring Clinical Wear in THA; 5.8 Range of Clinical Wear Performance in Modular Acetabular Components; 5.9 Conclusion; 5.10 Acknowledgments; References; Chapter 6. Contemporary Total Hip Arthroplasty: Hard-on-Hard Bearings and Highly Crosslinked UHMWPE; 6.1 Introduction; 6.2 Metal-on-Metal Alternative Hip Bearings; 6.2.1 Historical Overview of Metal-on-Metal; 6.2.2 Contemporary (Second Generation) Metal-on-Metal Hip Designs
6.2.3 Metal-on-Metal Hip Resurfacing

Sommario/riassunto

This book describes the science, development, properties and application of of ultra-high molecular weight polyethylene (UHMWPE) used in artificial joints. This material is currently used in 1.4 million patients around the world every year for use in the hip, knee, upper extremities, and spine. Since the publication of the 1st edition there have been major advances in the development and clinical adoption of highly crosslinked UHMWPE for hip and knee replacement. There has also been a major international effort to introduce Vitamin E stabilized UHMWPE for patients. The accumulated know