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Arthritis (RA); 3.10.4 Infection and Trauma; 4 Methods of Inspection for Joint Replacements; 4.1 Introduction; 4.2 Gait Analysis; 4.3 X-ray; 4.4 Tomography and Computed Tomography (CT); 4.5 Radionuclide Scanning; 4.6 Ultrasonography; 4.7 Magnetic Resonance Imaging (MRI); 5 Materials in Human Joint Replacement; 5.1 Introduction; 5.2 Alloy Metals; 5.2.1 Stainless Steel; 5.2.2 Cobalt-Based Alloys; 5.2.3 Titanium-Based Alloys; 5.2.4 Tantalum Trabecular Metal; 5.2.5 Magnesium Alloys; 5.3 Ceramics; 5.3.1 Structure 5.3.2 Mechanical Properties 5.3.3 Applications of Ceramics in Joint Replacements; 5.4 Polymers; 5.4.1 Structure; 5.4.2 Ultra-high Molecular Weight Polyethylene (UHMWPE); 5.4.3 Polymer Cement; 5.5 Joint Replacement Materials in Service; 5.5.1 Wear and Friction; 5.5.2 Fatigue and Creep; 5.5.3 Corrosion; 5.6 Nanomaterials; 6 Methods of Manufacture of Joint Replacements; 6.1 Introduction; 6.2 Surface Finish; 6.3 Tolerance; 6.4 Wear and Friction; 6.5 Machining; 6.5.1 Milling; 6.5.2 Grinding; 6.5.3 Turning; 6.5.4 Electrochemical Machining (ECM); 6.5.5 Electrodischarge Machining (EDM); 6.6 Forging 6.7 Casting 6.7.1 Casting of Metals; 6.7.2 Casting of Ceramic Parts; 6.8 Manufacture of Polymer Parts; 6.9 Surface Treatment; 6.9.1 Coatings; 6.9.2 Plasma Spraying; 6.9.3 Chemical and Physical Vapour Deposition (CVD and PVD); 6.9.4 Diamond-like Carbon (DLC) Coating; 6.9.5 Ion Implantation; 6.9.6 Porous Metal Coatings; 6.10 Surface Finishing of Implants; 6.10.1 Deburring; 6.10.2 Electropolishing; 6.10.3 Mechanical Polishing; 6.10.4 Lapping; 6.11 Manufacture of Joint Replacements; References; 7 Computer-Aided Engineering in Joint Replacements; 7.1 Introduction; 7.2 Reverse Engineering 7.3 Solid Modelling

Sommario/riassunto

"Includes an anatomy of the human skeleton: bone, tissue ligament, muscle and cartilage, in order to provide the engineering student with the medical context required"--
