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Autore	Parker Vivian B
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Pubbl/distr/stampa	Gaithersburg, MD : , : U.S. Dept. of Commerce, National Institute of Standards and Technology, , 1976
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Altri autori (Persone)	GarvinD ParkerVivian B WagmanDonald D
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Autore	Bhatia Sujata K
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Soggetti	Biomedical materials Biomedical engineering Health services administration Public health Biomaterials Biomedical Engineering and Bioengineering Health Care Management Public Health Biomedical Engineering/Biotechnology
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Nota di contenuto	The Current Global Surgical Care Paradigm -- The Global Surgical Burden of Disease: A Global Health Paradigm -- Surgically Avertable Deaths: A Silent Premise -- Defining Essential Surgical Conditions in LMICs -- Disparity of Surgical Service Provision in LMICs -- Disparities in Provisional Access to Surgical Instruments and Supplies in LMICs -- Surgical Interventions in Global Health: Social and Economic Implications -- Surgery: A Highly Cost-Effective Health Intervention -- The Economic Returns of Surgical Interventions -- Catastrophic Healthcare Expenditures: A Perspective -- The Social Returns of Surgical Interventions -- Dimensional Printing and Rapid Prototyping: Implications for Global Health -- The Dawn of Disruptive Innovations and Frugal Engineering -- 3-Dimensional Printing: An Introduction to Rapid Device Prototyping and Fabrication -- The RepRap Rapid

Prototyping Device and Fused Deposition Modeling -- 3-Dimensional Device Fabrication: Bio-Based Materials and Thermoplastics -- Bio-Based Thermoplastic Polymers in 3D Printing -- Polylactic-Acid: Bio-Based Thermoplastic Polymer Properties and Medical Device Applications -- Acrylonitrile Butadiene Styrene Thermoplastics: Mechanical and Chemical Profile -- Chemical and Mechanical Profile Modification of Bio-Based Materials: Polymeric Blending and Natural Polymer Enhancement -- 3-Dimensional Printing of Medical Devices and Supplies -- The Current State of 3-Dimensional Printing: Fabrication of Medical Devices and Supplies -- Fabrication of High-Utility Integrative Surgical Toolkits -- 3-Dimensional Printing in the Surgical Field: Field Applications and Considerations -- 3-Dimensional Printing: Interventional Capacities in the Global Health Arena -- 3D Printed Instrument and Medical Supply Price Competencies -- Barriers to Entry and Adoption of Medical Device Innovations in LMICs -- 3D Printing: A Paradigm Shift in the Global Medical Device and Humanitarian Supply Chain -- 3D Printing: Global Open Source Blueprint and Information Dissemination -- The Future of Bio-Based Materials Development in Medical Device Fabrication.

Sommario/riassunto

This book examines the potential to deploy low-cost, three-dimensional printers known as RepRaps in developing countries to fabricate surgical instruments and medical supplies to combat the “global surgical burden of disease.” Approximately two billion people in developing countries around the world lack access to essential surgical services, resulting in the avoidable deaths of millions of individuals each year. A fundamental barrier that inhibits access to surgical care in these locations is the lack of basic surgical instruments and supplies in healthcare facilities. RepRap printers are highly versatile 3D printers assembled from basic, domestically sourced materials that can fabricate low-cost surgical instruments on-site, ultimately enhancing the interventional capacity of healthcare facilities to treat patients. Rather than focusing on one specific field of interest, this book takes an integrative approach that incorporates topics and methods from multiple disciplines ranging from global health and development economics to materials science and applied engineering. These topics include the feasibility of using bio-based plastics to fabricate surgical instruments via 3D printing sustainably, the application of "frugal innovation and engineering” in resource-poor settings, and analyses related to the social returns on investment, barriers to entry, and current and future medical device supply-chain paradigms. In taking a multi-disciplinary approach, the reader can gain a holistic understanding of the multiple facets related to implementing medical device innovations in developing countries.