

1. Record Nr.	UNINA9910300421003321
Autore	Thiriet Marc
Titolo	Diseases of the Cardiac Pump // by Marc Thiriet
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-12664-4
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (635 p.)
Collana	Biomathematical and Biomechanical Modeling of the Circulatory and Ventilatory Systems, , 2193-1682 ; ; 7
Disciplina	571.4
Soggetti	Biophysics Biological physics Biomedical engineering Biomathematics Systems biology Fluid mechanics Cardiology Biological and Medical Physics, Biophysics Biomedical Engineering and Bioengineering Mathematical and Computational Biology Systems Biology Engineering Fluid Dynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	From the Contents: Heart Pathologies -- Vascular Diseases -- Respiratory Diseases -- Treatments of Cardiovascular Diseases -- Conclusion -- References -- List of Currently Used Prefixes and Suffixes -- List of Aliases and Primary Symbols -- Complementary Lists of Notations -- Index.
Sommario/riassunto	Together, the volumes in this series present all of the data needed at various length scales for a multidisciplinary approach to modeling and simulation of flows in the cardiovascular and ventilatory systems, especially multiscale modeling and coupled simulations. The cardiovascular and respiratory systems are tightly coupled, as their

primary function is to supply oxygen to and remove carbon dioxide from the body's cells. Because physiological conduits have deformable and reactive walls, macroscopic flow behavior and prediction must be coupled to nano- and microscopic events in a corrector scheme of regulated mechanism. Therefore, investigation of flows of blood and air in anatomical conduits requires an understanding of the biology, chemistry, and physics of these systems together with the mathematical tools to describe their functioning in quantitative terms. The present volume focuses on macroscopic aspects of the cardiovascular and respiratory systems in pathological conditions, i.e., diseases of the cardiac pump, blood vessels, and airways, as well as their treatments. Only diseases that have a mechanical origin or are associated with mechanical disorders are covered. Local flow disturbances can trigger pathophysiological processes or, conversely, result from diseases of conduit walls or their environment. The ability to model these phenomena is essential to the development and manufacturing of medical devices, which incorporate a stage of numerical tests in addition to experimental procedures.
