

Preface

Medical informatics has matured into a true scientific discipline, with its own international conferences, journals, exhibitions, research laboratories, calls for proposals for national and international research funding, and master's courses for the training of students.

Both basic and applied aspects are taught, not only in all areas of health (medicine, dentistry, pharmacy, health and social sciences, nursing, public health) but also in many other domains, including life sciences, engineering and economics.

Medical informatics is a complex and rapidly changing discipline. Few books are published in this domain, and they rapidly become obsolete. This book is the fruit of collaboration between several authors, all of whom teach medical informatics in France and perform research in this field. It contains 18 chapters, all of which include learning objectives, recommendations for further reading and information retrieval, exercises and bibliographic references.

Chapter 1 presents the main areas of medical informatics and links to other scientific domains, such as computer sciences, biostatistics, biomedical engineering and public health. Key scientific societies, journals, conferences and exhibitions are listed.

Chapter 2 focuses on the broad terminological resources developed for health. These resources are an essential tool for the normalisation of concept expression and for information coding in health, both these operations being prerequisites to the use of health information.

Chapter 3 presents the various types of knowledge resources available in the domain of health, the principles underlying their indexing, the means developed for accessing these documents and quality criteria for health information.

Chapter 4 deals with the representation of patient data in health information systems. The problems posed by the computerisation of patient records are analysed, and ways of structuring and standardising data are presented.

In Chapters 5 and 6, the reader is introduced to the principles of medical image processing and analysis. These chapters provide an understanding of the ways in

which these methods and techniques can improve interventions, providing surgeons with the possibility of using robots and achieving higher-quality care.

Chapters 7, 8, 9 and 10 concern individual and collective decision support. They provide the reader with an understanding of the theoretical foundations underlying computerised decision-making methods for diagnosis and treatment. Medical economic aspects of decision-making are presented to illustrate the way in which information systems have led to sophisticated methods for pricing activities in hospitals. The various methods and tools facilitating decision-making in the field of public health are explained to the reader.

Chapter 11 deals with the respect of ethical and legal aspects during the collection, archiving and processing of health data, particularly in Europe. Methods for securing records and information exchanges are presented.

Chapters 12, 13, 14, 15 and 16 deal with the principal applications of medical informatics, such as the development of hospital information systems, shared medical records and the computerisation of medical and dental offices. The concept of e-health is presented, together with telemedicine and telehealth, including teleservices for everyday life and social welfare.

Chapter 17 explains how medical informatics can facilitate research, whether basic or clinical, in the domains of epidemiology and public health.

Finally, Chapter 18 highlights the role of human factors and ergonomics in the applications of medical informatics.

This book is designed to be a study tool. It contains many international comparisons of developments and actions in the field.

The writing of this book was supported by the French College of Biostatistics and Medical Informatics Teachers, presided by **Prof. Pascal Roy** (Lyon 1 University).

Paris 13 University, Bobigny, France
Paris 5 University, Paris, France
Burgundy University, Dijon, France

Prof. Alain Venot
Prof. Anita Burgun
Prof. Catherine Quantin

Medical Informatics, e-Health

Fundamentals and Applications

Venot, A.; Burgun, A.; Quantin, C. (Eds.)

2014, X, 494 p. 124 illus., 81 illus. in color., Hardcover

ISBN: 978-2-8178-0477-4