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# Text Atlas of Practical Electrocardiography



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Massimo Romanò

# Text Atlas of Practical Electrocardiography

A Basic Guide to ECG Interpretation

With contributions by Roberta Bertona

 Springer

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## Preface

More than a century has passed since Willem Einthoven immersed his arms and legs in basins containing saline solution, connected them with wires to a galvanometer, and became the first man to record the electrical activity of the heart. For years, his “invention”—electrocardiography or ECG—was (along with the chest X-ray and a sensitive ear) the cornerstone of clinical cardiology. Generations of physicians have been fascinated and challenged by those messages in code, which to the trained and experienced eye revealed vast amounts of previously inaccessible information on the inner workings of the heart, information that could clearly improve the diagnosis, treatment, and prognosis of their patients.

Subsequent technological advances have sometimes overshadowed the decisive diagnostic role played by the ECG, but it has always maintained its status as an indispensable tool in a wide variety of settings, from the emergency rooms of small, rural hospitals to the sophisticated prehospital emergency service providers of teeming urban centers—in short, wherever human lives depend on the rapid recognition and proper treatment of acute coronary syndromes or life-threatening cardiac arrhythmias.

It’s important to recall that the ECG should never be used as a replacement for clinical assessment: the tracings must first be analyzed in light of the clinical findings, described, and then used to formulate a diagnosis. How many patients have been diagnosed with ischemia solely on the bases of T wave inversion or nonspecific repolarization changes! This is what motivated me to create a concise text-atlas of electrocardiography based on no less than 30 years of experience as a hospital cardiologist, many of which were spent in frontier-hospitals, where clinicians find themselves face-to-face with a dismayingly complex array of major cardiac events in all of their various guises.

In a market that abounds with books and manuals on electrocardiography, the significance of this book lies primarily in its attempt to tie the fundamentals of electrophysiology to the variegated reality of clinical practice, abundantly illustrated with real-life ECG tracings. An essential handbook of sorts designed for rapid consultation by clinical cardiologists, emergency-department physicians and ambulance personnel, anesthesiologists involved in preoperative patient assessments, internists and intensivists caring for patients who are critically ill. With time (and years of study and experience and an undying awareness of one’s own

limits), each of these figures will come to regard the ECG as an indispensable resource for helping the patients in their care, an old but finely-honed diagnostic tool, which is almost quintessentially patient-centered and at the same time completely “at home” in the sophisticated, high-tech world of modern medicine. (One of the many examples that come to mind—and are explored in detail in the book—is the interventional cardiology lab, where the ECG tracings recorded during coronary angioplasty are indispensable for verifying the success of revascularization and rapidly detecting complications.)

Special thanks go first of all to my patients, who have taught me so much (often much more than I realized at the time); to the colleagues and co-workers who have helped me collect the numerous tracings included in the volume; to my co-author Dr. Roberta Bertona, for her valuable contributions, untiring support, meticulous attention to detail, and lively intelligence; to Drs. Madeleine Hofmann and Donatella Rizza of Springer-Verlag, who believed in and supported this project from the very start; and to Drs. Catherine Mazars and Angela Vanegas for their assistance and patience in the realization of this project.

And last but not least, to my mentor, Prof. Ugo Garbarini, *Maestro di Medicina* at the University of Milan: along with the fundamentals of my profession, he instilled in me an unwavering and broad-ranging fascination with the “language” of electrocardiography: from the esthetics of its waveforms—rhythmic, almost musical—to the remarkable eloquence, subtlety, and expressive range of the statements they make about the heart and the body in general. Without these foundations, this book would never have been possible.

Vigevano, Italy  
February 2015

Massimo Romanò

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## Acronyms and Abbreviations

AF	Atrial fibrillation
AFL	Atrial flutter
AIVR	Accelerated idioventricular rhythm
AMI	Acute myocardial infarction
AVN	Atrioventricular node
AVB	Atrioventricular blocks
AVRT	Atrioventricular reentrant tachycardia
AVNRT	Atrioventricular nodal reentrant tachycardia
bpm	Beats per minute
BBB	Bundle-branch block
CTI	Cavotricuspid isthmus
DC	Direct-current
ECG	Electrocardiogram
IC-ECG	Intracardiac electrocardiogram
LAD	Left anterior descending artery
LAFB	Left anterior fascicular block
LBBB	Left bundle-branch block
LCx	Left circumflex artery
LPFB	Left posterior fascicular block
MI	Myocardial infarction
NSTEMI	Non-ST-segment-elevation myocardial infarction
PTCA	Percutaneous transluminal coronary angioplasty
PJRT	Permanent reciprocating junctional tachycardia
PM	Pacemaker
RBBB	Right bundle-branch block
RCA	Right coronary artery
SA	Sinoatrial
STEMI	ST-segment-elevation myocardial infarction
SVEB	Supraventricular ectopic beats
SVT	Supraventricular tachycardia
TdP	Torsade de pointes
VEB	Ventricular ectopic beats
VT	Ventricular tachycardia
WPW	Wolff-Parkinson-White





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