

# Introduction

The ability to correctly interpret an electrocardiogram (ECG), be it a simple six second strip or a 12 lead ECG, is a vital skill in all critical care areas. Of all critical care skills, meaningful ECG interpretation may be the one skill that sets critical care practitioners apart from other clinicians.

**The Six Second ECG** is a practical guidebook designed for you to quickly and effectively interpret ECGs. Delivered in a no-nonsense candid style, each chapter builds on previous chapters. A simple and effective framework is presented that enables you to not only identify ECGs but to make sense of the ECG from a clinical perspective.

While ECG interpretation is well covered in several books, this book is unique in its persistent attention to the connections between ECG interpretation and cardiac physiology. The practice of ECG interpretation involves more than just naming cardiac rhythms or identifying changes in ECG morphologies. A skilled practitioner connects the findings of an ECG to a patient's clinical condition and uses this information to decide upon an appropriate treatment strategy.

## This Book is For You

If you want to *quickly identify* and to readily *make sense* of an ECG from a physiological and clinical perspective, the Six Second ECG is written for you. From a position of understanding, the ability to interpret ECGs is much more likely to stick as a career-long skill. Your time is too precious to waste it on imminently forgotten memory work.

*It is, after all, the pattern on the fabric that holds the interest of most of us,  
rather than the threads.*

Dr. Arnold M. Katz

## How to Use This Book

This book is designed for the busy health care professional, one who needs to fill any informational gaps quickly with the least amount of fuss. An expanded table of contents and an index facilitates the rapid location of information. Each chapter begins and ends with a chapter summary. As well, a “Quick Look” section heading navigator appears on the first page of each chapter to facilitate a quick and focused reference to specific topics of interest.

Each chapter is independent and can stand on its own. Read the book from cover to cover or jump around concentrating on what you need. Choose to complete the exercises and quizzes inside each chapter. Answers to the quizzes are provided at the base of the pages that contain the questions. Detailed answers are provided in Appendix B.

For the like-minded keener whose curiosity in the area of cardiology is almost insatiable, a list of additional resources are included at the end of each chapter. Several resources are freely available on the web. Some of the resources mentioned are included in the provided CD-ROM for off-line use.

Certain conventions have been used throughout the book to draw attention to information. One of these conventions is the use of icons and gray boxes to signify vital information, points to remember, explanations, trivia and references to additional information.



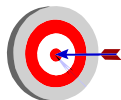
The hand signal for 'stop' denotes vital information often related to clinical practice.



A string tied around the index finger serves as a reminder. This icon serves the same purpose here.



The icon of a magnifying glass rests beside explanations on how things work. This information may be useful but is often just nice-to-know.



The well placed arrow signifies information that is nice to know. This includes tips, trivia and short explanations.



Synonymous with the internet, this icon marks any suggested resources, both online and off-line.

## Brief Synopsis

The **Six Second ECG** follows the order of a course by the same name. Seven chapters make up its contents followed by four appendices.

**Chapter 1: The Structures of the Heart** is a brief account of the heart's anatomy.

**Chapter 2: It's All About Cardiac Output** is an introductory discussion on the dynamics of the heart as an effective pump. Concepts of the cardiac cycle and the parameters that determine cardiac output are brought together in case studies.

**Chapter 3: The Electrics** outlines the electrical pathways of the heart. Understanding the electrical components of the heart is a necessary foundation to making sense of ECGs.

**Chapter 4: An ECG Primer** introduces the cardiac monitoring system: ECG paper, the basic components of an electrocardiogram and methods to determine heart rate.

**Chapter 5: Six Second ECG Interpretation** provides a step-by-step method for rapid ECG interpretation. Practice exercises reinforce rapid ECG interpretation.

**Chapter 6: Dysrhythmias** explores the defining characteristics of various dysrhythmias. Mechanisms of dysrhythmia generation are also outlined.

**Chapter 7: The 12 Lead ECG** reveals the advantages of multiple lead views for the diagnosis of various conditions such as cardiac ischemic states. A simple method of 12 lead ECG interpretation is presented that builds on steps already established in Chapter 5. Practice exercises help to build competence and confidence.

**Chapter 8: Put Together** is a compilation of 100 questions, designed to challenge and reinforce your ECG interpretation skills. Questions include single lead, 12 lead and 15 lead ECGs. Detailed answers are included in Appendix C.

**Appendix A: Dysrhythmia Reference** is a detailed account of each of the main rhythms with respect to mechanism, characteristics, and treatment.

**Appendix B: Glossary of Terms** is a quick reference defining terms mentioned throughout this book.

**Appendix C: Detailed Answers to Quiz Questions** provides in depth answers to the chapter quiz questions and to the practice questions of Chapter 8.

## **The Author**

I have been a critical care practitioner and educator for the past 14 years. My clinical experience - like many other critical care nurses - spans intensive care, coronary care, emergency, and flight nursing. I am one of those keeners mentioned earlier with an insatiable curiosity within the cardiac domain.

One of my loves is teaching. I have been privileged to travel to many regions of Canada facilitating over 300 ACLS courses as well as over 100 basic and advanced ECG interpretation courses. Much of what I have learned has been garnered from discussions with talented course participants and fellow instructors.

In my spare time - late at night when my family is asleep - I write or develop web-based learning tools for health care professionals ([www.skillstat.com](http://www.skillstat.com)). One tool is an ECG simulator-based learning program that has been downloaded by over 120,000 health professionals in the last 18 months. This tool is included in the CD-ROM.

## **The CD-ROM**

A windows compatible CD-ROM is included on the inside back cover. The CD-ROM includes:

- **The Six Second ECG** in eBook format. The chapters, cross-references and indexes are hyper linked, facilitating rapid access to information of interest. The tests are fully interactive with automatic scoring and 'lively' feedback
- An animated **ECG Simulator** that includes learning and game modes
- Randomly generated **ECG Skill Test** to practice your skills. Detailed answers are provided for each question. Choose tests of 10, 15 or 20 questions focusing on single lead and/or 12 lead ECGs.

The CD-ROM launches automatically for most computers that use windows operating systems (Windows 95 or newer). Just place it in your computer's CD player and close the disk tray. A navigational flash screen should appear after a few moments. Follow the links to reap the full benefits of this book. If the flash screen doesn't appear, follow the directions on the CD-ROM's sleeve inside the back cover.

The learning tools are fun, fast, effective and simple to use. If you are a novice to the computer, this might be a good CD-ROM to try out.

## Acknowledgements

This book would not have been possible without the invaluable suggestions of several colleagues. In particular, I am particularly grateful for the contributions of Michael N. Dare, Gaynor Burns, Cecelia L. Crawford, SkillStat Learning Inc. and Global Medical Services. Their proofing and editing has made this book a much more worthy work. Any errors in grammar, spelling or content do not occur from any lack of effort, but remain my shortcomings.

Plans and drafts for this book began about five years ago with a major push beginning two years ago. The ongoing patience, support and encouragement from Janet, my spouse and my two sons -Kieran and Shane - have greatly helped this project go the distance that my dreams originally envisioned. Thank you.

Much of the book's content was formed in the classroom, facilitating Six Second ECG workshops for nurses, medical students, paramedics, respiratory therapists and physicians. Thank you for the many lessons you have taught me over the past 12 years. I hope that you recognize your feedback in these pages.

## Let's Get Started!

This book was written to be straightforward and easy to read. Much effort has gone into eradicating errors in spelling, grammar and content. I expect that some may have snuck through, nevertheless. I greatly appreciate all feedback, corrections and questions via e-mail (my e-mail address is included on the next page). Your input will help with the next version of this book.

I sincerely hope that you grow in competence and confidence in ECG interpretation whether you are a novice or an experienced practitioner.

**Tracy Paul Barill**

North Vancouver, British Columbia, Canada  
tracyb@nursecom.com

