Advanced Interventional Cardiology

TIPS AND TRICKS

Fourth Edition

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Practical Handbook of Advanced Interventional Cardiology

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Preface

ADVANCED INTERVENTIONAL CARDIOLOGY ART AND SCIENCE

In 2013, more than 30 years after its humble beginnings, interventional cardiology has become a mature and major player in the management of complex cardiovascular problems. Thanks to the miniaturization of equipment, as a result of modern microtechnology and nano-engineering, interventional cardiology techniques have made a giant leap forward to become ever-more effective and user-friendly. These techniques can be formulated as a sequence of rigorously controlled maneuvers which can be taught to fellows or staff (or even programmed into robots).

To understand and explain the physical, chemical, biologic, and engineering mechanisms of any of these techniques or maneuvers is a science. To perform a procedure both cost- and time-effectively in a humane manner is an art. In any interventional laboratory, a lesion could be dilated with one guide, wire, balloon or stent by a senior operator or by x (>1) numbers of devices by a beginner. This is where science and art mix.

Which is the Best Option to Apply to this Real-Life Situation? During a procedure, each operator has the luxury (and the responsibility) to select, change, or modify the direction or position of a device, the drug of use, and the strategy of choice; or to be forced to use one when the others are not available. These options are frequently listed and discussed ad nauseam elsewhere in print and electronic media. However, the main question always remains: which is the best option, with the equipment available, in any given real-life situation?

In the fourth edition of this handbook, the authors have tried to answer this very question and to give practical advice derived from their own considerable experience within the cardiac interventional setting.

In the "Strategic Mapping" boxes, the operator visualizes a global schema of procedural sequences he or she would execute in order to achieve success. This strategic map also includes preventive or corrective measures to deal with crisis situations such as unexpected complications or suboptimal performance of any tactic or strategy.

In the "Tactical Move" boxes, the authors break up the whole strategy into detailed procedural sequences with limited local goals. At the beginning, it is how to select an appropriate device, e.g. guides, to achieve success at the first attempt. Then, if a device does not function as expected, there are many simple maneuvers to correct or reverse the situation. In any case, the

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operators will try to exhaust the full potential of any device first without prematurely and wastefully discarding it.

However, at the same time, while there are many parallel competing tactics or strategies, how does one objectively select the one that is best in any given situation? This is the role of critical thinking: a subjective change of tactics that could save the whole procedure and lead to success or alternatively - to our worst nightmare - failure. In this section, each maneuver is graded according to time spent, the cost of any extra equipment required and the risk of complication. For every extra 10 minutes, one more hour can be added to the clock. One dollar sign means that an extra \$100.00 US are spent. One drop of blood is the symbol for moderate complication; two drops indicate high risk.

In the "Caveat" boxes, we warn the readers of any deceiving signs or treacherous wrong moves that harbinger impending disaster. This information is combined with operator experience from past personal failures, near death experiences of the patient and successful (often almost miraculous) resolution of the critical events. Altogether they constitute a collective memory of how to avoid failure and how to achieve success i.e. what we call experience! If these hard earned lessons of collective memory were applied in real life, the rate of procedural success would be higher and the incidence of complications much lower.

The rate of complication depends on the operator's skill, the technology available, and patient selection. Rigorous preventive measures learned from that collective memory (i.e., experience) pre-empt the appearance of complications (although one of the best ways to avoid EVERY complication is to perform NO procedures!). With the use of current low-profile balloons and high torqueable wires, most patients with "simple" stenoses will have good results, even in the hands of relatively inexperienced operators. However, in patients with complex anatomy or when simple cases become complicated, experienced operators are likely to have superior outcomes. This is why we value experience so much [1].

The authors and editors, who are all your friends and colleagues, labor every day in the cardiac interventional laboratory, as you do yourself. We write from our limited subjective experience and from our hearts. This handbook contains practical advice aimed at you, the reader, and at us, the authors and editors ourselves. We practice what we preach. They are not pronouncements from some ivory tower: they are practiced by those with experience and also by beginners, by the young and old, by men and women, by serious operators and by part timers; so there are no distinctions here between class, age, sex or race.

In this book, we try to highlight these practical suggestions with all of the dramatic ups and downs - reminiscent of an Italian opera - which happen daily in the interventional cardiology laboratory. However, we hope the outcome of these procedures is both happy and beautiful, as the end of any Chinese martial arts movie. The bottom line is that we practice interventional cardiology in a responsible manner: both cost- and time-effective without causing more harm (prima non nocere). All of us are equal in this quest of striving for the best procedural and clinical success. This is the only goal of this handbook.

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Foreword to the First Edition

Interventional cardiovascular medicine has evolved from an extremely crude method of opening femoral arteries initiated by Dotter, to a field that has now been recognized as having a sufficient fund of knowledge to require boards sanctioned by the American Board of Internal Medicine. From Andreas Gruentzig's development of the noncompliant balloon method, we have seen an explosion of bio- engineering technology. The discipline of interventional cardiovascular medicine has perhaps initiated more registries and clinical trials than any other discipline in medicine. Indeed, the whole emphasis on evidence-based medicine has evolved during the era of interventional cardiology. Many basic science breakthroughs have been stimulated by the advances produced in interventional cardiology, as well as the problems and complications created by the new technologies.

However, no matter how advanced the science becomes, the success of solving a patient's problem with interventional techniques usually depends on the operator's technical ability. This ability springs from the wealth of experience the operator has acquired to deal with routine situations as well as complex and almost unique problems that may present themselves. Because of the large number of interventional cardiologists and the rapidly expanding number of procedures that can be performed, it is difficult for many cardiologists to experience all of the situations that can be helpful in building this database.

Dr Thach N. Nguyen has prepared a remarkable book, rich with tips and tricks for performing interventional cardiovascular medicine procedures. He has enlisted numerous experts on various aspects of interventional cardiovascular medicine to describe their areas of expertise. Rather than let them recite the evidence from registries and trials that are available elsewhere, he forces the contributors to provide the practical tips that they have learned. It is almost as though Dr Nguyen is trying to simulate the type of scenarios that exist in the catheterization laboratories with new cardiology fellows or less experienced operators. It is the type of advice that he has often given to cardiologists in developing countries who are bringing interventional techniques to help cope with the rapidly expanding new threat in these countries, vascular disease. Since new techniques are constantly appearing, all operators, experienced or not, can benefit from these tips. Whereas every operator will not agree with every approach to a problem or a complication, it is always instructive to understand many potential approaches. In this regard, the book does a masterful job of collecting not only the authors' experiences, but those of many others collected from the published literature, from numerous postgraduate courses, and from one-on-one demonstrations throughout the world.

This book should be a valuable resource to trainees in formal programs that have now evolved in the United States and other countries, as well as the many preceptorships that are the major

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