

# Introduction

Congenital heart disease (CHD) is unfortunately quite common, occurring in just under 1% of live births. With the continuing evolution of treatment modalities for patients with CHD, both in the cardiac operating rooms and cardiac catheterization suites, the survival of these patients has significantly improved, albeit with varying degrees of physiologic impairment and/or sequelae. In fact, the population of adults with CHD is growing at a rate of approximately 5% per year. Multiple studies have illustrated that children with CHD are at higher risk for perioperative cardiac arrest compared to the general population during anesthesia and surgery. Additionally, children with CHD also experience increased morbidity, mortality, and increased length of hospital stay.

The ever-growing population of patients with CHD means that these patients are presenting with increasing frequency for a wide variety of non-cardiac-related surgeries and imaging studies. It is not uncommon for pediatric anesthesia practitioners, often without specific cardiac training, to be asked to care for patients ranging from neonates to adults with unrepaired, repaired, and palliated CHD in a variety of venues, including diagnostic imaging, the general operating rooms, and interventional radiology. Indeed, as this patient population continues to grow, it will become the “new normal” for many patients with some form of CHD to receive care from non-cardiac-trained anesthesia care providers. We hope to address this growing need with this book, by offering both an organized approach to analyzing and understanding CHD as well as strategies for assessing and caring for these patients. Our aim is to provide a useful educational resource for anesthesia residents, fellows, nurse anesthetists, nurse anesthesia students, and anesthesiologists who do not routinely care for patients with CHD.

We have chosen to use a case-based approach for a number of reasons. Case presentations emphasize the practical aspects of perioperative care and allow the reader to be actively involved in analyzing information and formulating an appropriate care plan. Cases of varying complexity are offered to facilitate an understanding of the

diverse nature of CHD and provide learning for readers with varying levels of experience. Visual aids are used to assist in understanding the anatomy and physiology of the different congenital lesions. An understanding of the underlying physiologic abnormalities allows the practitioner to develop an appropriate anesthetic plan for each patient.

Each chapter contains **Key Objectives, Questions and Answers, Clinical Pearls, and Suggested Readings**. Chapters are further divided into two sections: “**Pathophysiology**” wherein the cardiac lesion is defined and analyzed, and “**Anesthetic Implications**,” which then discusses the specific concerns related to the particular cardiac lesion which will affect formation of the perioperative plan. Chapters vary greatly in complexity. In part, this is to allow the reader to appreciate the diversity that exists even within a given anomaly, meaning that the anesthetic plan might vary considerably depending on the child’s individual pathology. Second, this is to accommodate those readers with a particular interest and knowledge of CHD and to allow them to continue to enrich their knowledge base. It is our hope that the more complicated scenarios will prove useful for those training to provide care for this patient population. We have also included multiple scenarios in the cardiac catheterization laboratory, in recognition of the fact that anesthesia staffing in this particular location varies from institution to institution.

Our hope is that this case-based book will allow readers to better understand the vast array of congenital heart defects and assist them in understanding the key principles which guide safe perioperative management. There is rarely a single “right way” to provide an anesthetic for a patient with CHD; instead, the key is to understand the hemodynamic goals that should guide decision making during the perioperative course. We hope that this book will be a practical guide for anesthesia care providers in all regions of the world and will in some small way have a positive impact on the anesthetic care of patients with congenital heart disease.