

# CARDIOVASCULAR SYSTEM : ANATOMY & PHYSIOLOGY

## FUNCTION OF CIRCULATION:

Delivers O<sub>2</sub>, nutrients, hormones and antibodies to organs, tissues and cells. Removes the end product of cellular metabolism.

## FUNCTION OF THE HEART

Pumps oxygenated blood into the arterial system to supply capillaries and tissue.  
Pumps oxygen poor blood from the venous system through the lungs to be reoxygenated.

## ANATOMY OF THE HEART

Cone shaped organ located in the mediastinal space.  
The pericardial sac encases the heart and protects it, lubricates and holds 5-20 ml of pericardial fluid.  
This has two layers.

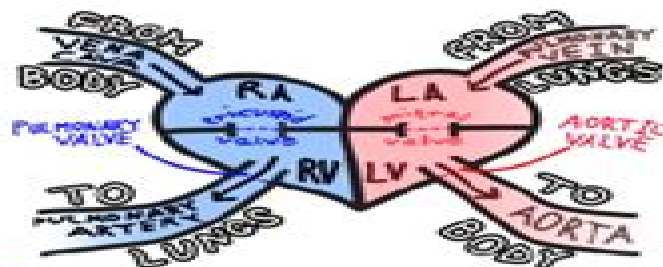
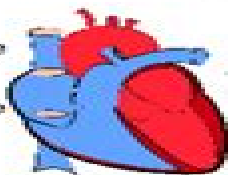
- ✦ the parietal pericardium which is the outer membrane.
- ✦ the visceral pericardium is the inner membrane attached to the heart.

## CONSISTS OF 3 LAYERS

- ✦ **Epicardium** : outermost layer of the heart.
- ✦ **Myocardium**: middle layer of the heart, the contracting muscle.
- ✦ **Endocardium**: innermost layer of the heart, lines the inner chambers and the valves.

## 4 CHAMBERS

- ✦ **Right atrium**: carries deoxygenated blood from the body via superior and inferior vena cava.
- ✦ **Right ventricle**: carries blood from the right atrium and pumps it into the lungs through the pulmonary artery.
- ✦ **Left atrium**: carries oxygenated blood from the pulmonary veins.
- ✦ **Left ventricle**: carries oxygenated blood from the left atrium and pumps it into the systemic circuit through the aorta.



## 4 VALVES

*Two atrioventricular valves that close at the beginning of ventricular contraction. They prevent blood from flowing back into the atria.*

- ✦ **Tricuspid valve** : on the right side of the heart.
- ✦ **Bicuspid valve**: on the left side of the heart.

*Two semilunar valves that prevent blood from flowing back into the ventricles during relaxation.*

- ✦ **Pulmonic semilunar valve**: between the right ventricle and pulmonary artery.
- ✦ **Aortic semilunar valve**: between the ventricle and the aorta.

## CORONARY ARTERIES

- ✦ **Right main coronary artery**: supplies the right atrium and ventricle, the inferior left ventricle, posterior septal wall, SA and AV nodes.
- ✦ **Left main coronary artery**: consists of two main branches left anterior descending which supplies blood to the left ventricle and the ventricular septum and circumflex arteries which supply blood to the left atrium and the lateral/posterior aspects of the left ventricle.

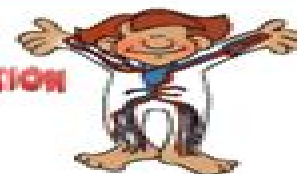
## BLOOD FLOW OF THE HEART

1. From the superior and inferior vena cava, oxygen poor blood goes to the right atria through the tricuspid valve.
2. Right ventricle to the pulmonary valve.
3. To the pulmonary trunk and arteries into the lungs. CO<sub>2</sub> is lost and O<sub>2</sub> is gained in the pulmonary capillaries.
4. O<sub>2</sub> rich blood enters the pulmonary veins to the left atrium.
5. Blood travels through the bicuspid valve and enters the left ventricle.
6. Blood moves through the aortic valve and travels through the aorta to the systemic circuit.

## ELECTRICAL CONDUCTION:

- ✦ **SA node**: pacemaker of the heart and initiates contraction at 60- 100 BPM.
- ✦ **AV** : receives impulses from the SA node initiates and sustains impulses at 40-60 BPM.
- ✦ **Bundle of His**: continuation of the AV node and branches into the the bundle branches which terminate in the purkinje fibers.
- ✦ **Purkinje fibers**: network of conducting strands beneath the ventricular endocardium. They can act as a pacemaker when the SA and AV fail as pace makers. They can sustain at 20-40 BPM.

**CIRCULATION**



# Cardiac Surgery Study Guide

**David Daiho Yuh, Luca A.  
Vricella, William Baumgartner**

## **Cardiac Surgery Study Guide:**

Ace the Csc(r)! Nicole Kupchik, 2019-02-27 Cardiac Surgery Certification Study Guide      Adult CCRN® Exam Prep Study Guide Springer Publishing Company, 2023-03-15 Adult CCRN Exam Prep Study Guide gets right to the point with targeted content based on the latest AACN exam blueprint This easy to follow guide includes all the tools you need to prepare practice and pass the exam and nothing you don't PREPARE Concise coverage of the content you'll be tested on Quick reference features with complications alerts and nursing pearls Need to know information to prepare you for exam day PRACTICE Two full length practice tests one in book and one online to assess your readiness and simulate the test taking experience Detailed rationales for correct and incorrect answers Pop quizzes that highlight key information you don't want to miss PASS The first time with Springer Publishing Exam Prep's 100% Pass Guarantee With confidence knowing you're well prepared with all the skills and knowledge you need on exam day and in practice With pride in your commitment to patient health and safety CCRN is a registered trademark of the American Association of Critical Care Nurses AACN AACN does not endorse this resource nor does it have a proprietary relationship with Springer Publishing Company      *Fast Facts for the Cardiac Surgery Nurse, Third Edition* Tanya Hodge, 2019-08-13 Delivers the big picture from pre op through extended recovery in quick access format This concise clinical guide provides nurses who care for cardiac patients with speedy access to information and guidelines they need to know and use daily Heavily updated with the newest clinical practice information the third edition emphasizes postoperative complications and the nursing interventions designed to prevent and treat them It includes updated coverage of risk factors for stroke and congenital heart disease and discusses new antithrombotics and antiplatelet medications Bulleted information brief paragraphs boxed indicators highlighting key information and Fast Facts boxes are included in each chapter The book's consistent organization facilitates quick access to information on equipment procedures and pre and post op specialty care Ideal for new graduates and nurses considering a switch to cardiac care and critical care this resource reinforces existing knowledge and provides a foundation for developing additional skills New to the Third Edition Encompasses the latest research and guidelines Emphasizes postoperative complications and care Discusses diagnostic testing preparing a patient for cardiac surgery initial post op complications extended recovery complications and stroke care Updated rehabilitation chapter includes important patient education content Educates readers about new antithrombotics and antiplatelet medications Offers new guidelines for use of ventricular assist devices Focuses on patient safety throughout Key Features Delivers a handy pocket reference for new and experienced cardiac care nurses Provides bulleted information brief paragraphs and boxed indicators highlighting critical information Organized for easy access to equipment procedures and pre and post op specialty care      Pediatric Critical Care Study Guide Steven E. Lucking, Frank A. Maffei, Robert F. Tamburro, Neal J. Thomas, 2012-04-10 This is the first comprehensive study guide covering all aspects of pediatric critical care medicine It fills a void that exists in learning resources currently available to pediatric critical care

practitioners The major textbooks are excellent references but do not allow concise reading on specific topics and are not intended to act as both text and study guide There are also several handbooks available but these are usually written for general pediatric residents and lack the advanced physiology and pathophysiology required for the higher level pediatric critical care practitioner

**Manual of Perioperative Care in Adult Cardiac Surgery** Robert M. Bojar, 2011-08-02 The fifth edition of Bojar's Manual of Perioperative Care in Adult Cardiac Surgery remains the gold standard for management of adult patients undergoing cardiac surgery The easily referenced outline format allows health practitioners of all levels to understand and apply basic concepts to patient care perfect for cardiothoracic and general surgery residents physician assistants nurse practitioners cardiologists medical students and critical care nurses involved in the care of both routine and complex cardiac surgery patients This comprehensive guide features Detailed presentation addressing all aspects of perioperative care for adult cardiac surgery patients Outline format allowing quick access to information Chronological approach to patient care starting with diagnostic tests then covering preoperative intraoperative and postoperative care issues Additional chapters discuss bleeding the respiratory cardiac and renal subsystems as well as aspects of care specific to recovery on the postoperative floor Updated references information on new drug indications and new evidence to support various treatment management options Practical and accessible this new edition of Manual of Perioperative Care in Adult Cardiac Surgery is the essential reference guide to cardiac surgical patient care

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**Transoesophageal Echocardiography** Andrew Roscoe, 2007-05-03 Transoesophageal Echocardiography TOE TEE in cardiac patients is now almost routine Its use in cardiac monitoring has also extended to include critically ill patients for non cardiac surgery and the intensive care setting Specific accreditation is required prior to practice of TOE TEE involving a written examination and a documented logbook of experience This book was specifically designed to help candidates pass the written exam and was structured around the syllabus Providing a summary of all relevant information this is an invaluable study aid Lists of further reading material are provided with every topic including guidelines and safety cardiomyopathies heart disease haemodynamic calculations and many more Each chapter ends with a series of exam style questions for self assessment An extremely useful book for trainee anaesthetists intensivists trainee cardiologists and cardiac surgeons

*Cardiac Surgery* Shahzad G. Raja, 2020-02-11 This textbook provides a succinct overview of cardiac surgery with key concepts being emphasized throughout An abundance of illustrations intra operative photographs tables as well as information boxes aids the reader to visualise grasp and retain difficult concepts The inclusion of evidence based approaches to the management of a range of cardiac surgical conditions equips the reader with an understanding of how to overcome a variety of potentially tough clinical challenges Concise Cardiac Surgery A Complete Guide comprehensively covers a range of techniques used in cardiac surgery It is therefore an ideal resource for the trainee and practising cardiac surgeon seeking a practically focused text detailing how to apply the latest techniques and evidence based approaches in their day to day practice

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*Critical Heart Disease in Infants and Children E-Book* Ross M. Ungerleider, Kristen Nelson McMillan, David S. Cooper, Jon N. Meliones, Jeffrey Jacobs, 2018-09-26 Selected for Doody's Core Titles 2024 with Essential Purchase designation in Pediatric Surgery Now in brilliant full color and reflecting recent significant changes in the field *Critical Heart Disease in Infants and Children* 3rd Edition keeps you abreast of the skills and knowledge required to safely care for children with congenital and acquired heart disease in the ICU Pediatric intensivists cardiologists cardiac surgeons and anesthesiologists from leading centers around the world provide a well rounded perspective on basic scientific principles medical and pharmacologic treatments surgical techniques and equipment Features comprehensive updates throughout the text including indications techniques potential complications in perioperative management of patients and surgical techniques for congenital heart disease Covers recent advances in the treatment of pulmonary hypertension developments in mechanical assist devices heart and lung transplantation and interventional cardiac catheterization Features an all new full color format that speeds navigation and helps clarify complex concepts Contains 27 new chapters with an emphasis on the team approach to patient care in the ICU including creating multidisciplinary teams quality and performance improvement training and challenges and solutions to developing a cohesive team environment Includes a detailed chapter on bedside ultrasound walking you through the techniques you're most likely to encounter in the ICU Employs well documented tables text boxes and algorithms to make clinical information easy to access and more than two dozen video clips provide a more complete understanding of echocardiography imaging modalities pulmonary hypertension and more Describes the basic pharmacology and clinical applications of new pharmacologic agents Examines issues affecting adults with congenital heart disease Enhanced eBook version included with purchase Your enhanced eBook allows you to access all of the text figures and references from the book on a variety of devices Offers four completely new chapters Cardiac Trauma Congenital Heart Disease in the Adult Congenitally Corrected Transposition of the Great Arteries and Outcome Evaluation Describes the basic pharmacology and clinical applications of all of the new pharmacologic agents Details important refinements and developments in surgical techniques including the Ross pulmonary autograft replacement of the aortic valve video assisted fluoroscopy and the extracardiac Fontan connection and discusses their indications and potential complications Explores the latest advances in the treatment of pulmonary hypertension new developments in mechanical assist devices heart and lung transplantation and interventional cardiac catheterization Examines issues affecting adults with congenital heart disease     **Cardiac Surgery**

Patricia C. Seifert, 1994     *Introductory Medical-Surgical Nursing* Barbara Kuhn Timby, Nancy Ellen Smith, 2006-06-16 Study guide to accompany Timby and Smith's *Introductory Medical-Surgical Nursing* Ninth Edition Plus LiveAdvise Online Student Tutoring Service 9780781780322 Compatibility BlackBerry OS 4.1 or Higher iPhone iPod Touch 2.0 or Higher Palm OS 3.5 or higher Palm Pre Classic Symbian S60 3rd edition Nokia Windows Mobile Pocket PC all versions Windows Mobile Smartphone Windows 98SE 2000 ME XP Vista Tablet PC     **CSC Exam Study Guide 2024-2025 - Secrets Review Book and Practice**

**Test Questions for the Cardiac Surgery Certification** Matthew Bowling, 2024-08-31 Mometrix Test Preparation's CSC Exam Study Guide 2024 2025 Secrets Review Book is the ideal prep solution for anyone who wants to pass their Cardiac Surgery Certification Exam. The exam is extremely challenging and thorough test preparation is essential for success. Our study guide includes Practice test questions with detailed answer explanations Step by step video tutorials to help you master difficult concepts Tips and strategies to help you get your best test performance A complete review of all CSC test sections. Mometrix Test Preparation is not affiliated with or endorsed by any official testing organization. All organizational and test names are trademarks of their respective owners. The Mometrix guide is filled with the critical information you will need in order to do well on your CSC exam: the concepts, procedures, principles, and vocabulary that the American Association of Critical Care Nurses (AACN) Certification Corporation expects you to have mastered before sitting for your exam. The Procedures section covers Cardiovascular Surgical Procedures, Thoracic Surgical Procedures. The Complications section covers Cardiovascular, Pulmonary, Hematology, Immunology, Neurological, Gastrointestinal, Renal, Multisystem, Behavioral. Important Terms. The Therapeutic Interventions section covers Cardiovascular, Pulmonary, Endocrine, Hematology, Immunology, Neurology, Hepatic, Renal, Multisystem, Post Operative Care. The Monitoring and Diagnostics section covers Hemodynamic Monitoring, Other Monitoring, Diagnostics, and much more. Our guide is full of specific and detailed information that will be key to passing your exam. Concepts and principles aren't simply named or described in passing but are explained in detail. The Mometrix CSC study guide is laid out in a logical and organized fashion so that one section naturally flows from the one preceding it. Because it's written with an eye for both technical accuracy and accessibility, you will not have to worry about getting lost in dense academic language. Any test prep guide is only as good as its practice questions and answer explanations, and that's another area where our guide stands out. The Mometrix test prep team has provided plenty of CSC practice test questions to prepare you for what to expect on the actual exam. Each answer is explained in depth in order to make the principles and reasoning behind it crystal clear. Many concepts include links to online review videos where you can watch our instructors break down the topics so the material can be quickly grasped. Examples are worked step by step so you see exactly what to do. We've helped hundreds of thousands of people pass standardized tests and achieve their education and career goals. We've done this by setting high standards for Mometrix Test Preparation guides, and our CSC Exam Study Guide 2024 2025 Secrets Review Book is no exception. It's an excellent investment in your future. Get the CSC review you need to be successful on your exam.

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