



# Professional Enrichment Course

University of Pittsburgh School of Medicine  
Office of Medical Education

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## Cardiac Surgery 101

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| <b>Enrollment Period:</b>    | Spring 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Course Dates:</b>         | Mondays, 5—7pm<br>1.10.22<br>1.24.22<br>1.31.22<br>2.7.22<br>2.14.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Student Max:</b>          | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Class Year:</b>           | MS1, MS2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Course Director:</b>      | Ibrahim Sultan, MD, FACS, FACC<br>Telephone: 412-623-2027<br>E-mail <a href="mailto:sultani@upmc.edu">sultani@upmc.edu</a>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Course Administrator:</b> | Angie Kinnunen, MPA<br><a href="mailto:kinnunenae@upmc.edu">kinnunenae@upmc.edu</a><br>Telephone: 412-770-4949                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Location:</b>             | (WISER) 230 McKee Place, #300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Registration:</b>         | Via Amp Up – You will receive an email with enrollment info                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Course Description:</b>   | The aim of Cardiac Surgery 101 is to provide University of Pittsburgh medical students a jump-start on their potential careers as future cardiac surgeons by providing an intensive five-week immersion into the field. The course foundation will be laid through interactive and case discussions for the first hour of each session. The second hour will allow students to apply their knowledge in surgical simulation labs. This elective will emphasize hands-on work utilizing porcine hearts, aorta, veins and tissue, as well as cardiovascular devices.       |
| <b>Objectives:</b>           | <ul style="list-style-type: none"> <li>• Introduction to basic anatomy and physiology of the heart.</li> <li>• Understand how to diagnose cardiovascular pathology using clinical and imaging tools.</li> <li>• Develop basic understanding of surgical interventions for common cardiovascular pathologies.</li> <li>• Expose students to basic technical skills that are relevant to being a cardiac surgeon.</li> <li>• Provide opportunities to engage in basic science and clinical research within the Department of Cardiothoracic Surgery.</li> <li>•</li> </ul> |

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|------------------------|------------------------------------------------------------------------|
| <b>Pre-Requisites:</b> | None                                                                   |
| <b>Requirements:</b>   | Attend all five sessions; participate in an active and engaged manner. |
| <b>Texts:</b>          | None                                                                   |

## **COURSE OUTLINE:**

**Course Director:** Ibrahim Sultan, MD, FACS, FACC

Associate Professor of Cardiothoracic Surgery  
 Director, Center for Thoracic Aortic Disease  
 Surgical Director, Center for Heart Valve Disease  
 UPMC Heart and Vascular Institute  
 University of Pittsburgh, Department of Cardiothoracic Surgery

### **Course Location:**

WISER 230 McKee Place, #300

### **SESSION I: Cardiopulmonary Bypass and ECMO**

This first hour of this session will introduce you to basic anatomy and physiology of the heart. You will learn the concepts of cardiopulmonary bypass (CPB) and how open heart surgery is conducted with the assistance of CPB. You will also be introduced to Extra Corporeal Membrane Oxygenation (ECMO) and its role in critically ill patients. The second hour will involve hands on interaction with both a CPB and an ECMO simulator, so you can see how it works in the operating room.

### **SESSION II: Aorta**

The first hour will be spent understanding how cardiac surgeons manage patients who present with elective and emergent aortic pathology using both open surgical and endovascular techniques. The second hour will allow students to practice sewing aortic grafts onto the porcine aorta and be able to deploy thoracic endografts (TEVAR).

### **SESSION III: Aortic Valve**

The first hour will be spent on discussing natural history of patients with aortic stenosis and aortic regurgitation and the impact on the left ventricle. The lab will concentrate on understanding how an open

surgical aortic valve replacement is performed in most patients and how a transcatheter aortic valve replacement (TAVR) is performed in patients who are otherwise at elevated risk for open heart surgery.

#### **SESSION IV: Heart Transplant/Ventricular Assist Devices**

Some patients simply have hearts that do not pump strongly enough to produce enough blood. The first hour will explore surgical management of heart failure with heart transplant or with left ventricular assist devices (LVAD). The lab will focus on live demonstration of various LVAD devices and their ability to replace the work of the ventricle.

#### **SESSION V: Coronary Artery Disease and CABG**

The first hour will explore the leading cause of death in the United States, coronary artery disease (CAD) and surgical and non-surgical interventions for CAD such as PCI and CABG. Didactic will be followed by a porcine heart lab, in which participants will be proctored through their first coronary artery bypass surgery (CABG).