

## PC1: Ischemic Heart Disease Examples of Routine, Complex, and Advanced

Procedures		
Routine	Complex	Advanced
Primary CABG, Normal EF, First Sternotomy	Primary CABG, Low EF, First Sternotomy Primary Valve-CABG Redosternotomy, Primary CABG	Redo CABG LV Aneurysm Repair Post-infarct VSD
Complications		
Routine	Complex	Advanced
Atrial fibrillation, postoperative hypotension, bleeding,	Graft occlusion, tamponade, protamine reaction	Iatrogenic type A dissection, Inability to wean from cardio-pulmonary bypass

## PC2: Mechanical Circulatory Support Examples of Routine, Complex, and Advanced

Procedures		
Routine	Advanced	
ECMO Intra-aortic balloon pump  From the former complex category: Temporary MCS (Impella, Centrimag, Tandem)	Durable LVAD, BiVAD	
Complications		
Routine	Complex	Advanced
bleeding, coagulopathy, thrombus in pump or circuit, arrhythmias, suction events	peripheral ischemia, LV distension/pulmonary edema	Right ventricular failure, Acute pump thrombosis, Differential upper and lower extremity perfusion

### PC3: Valvular Disease Examples of Routine, Complex, and Advanced

Diseases		
Routine	Complex	
	<i>surgical vs. transcatheter</i>	
Procedures		
Routine	Complex	Advanced
Aortic Valve Replacement Mitral Valve Replacement  BASIC <i>paravalvular leak, systolic anterior motion</i>	Aortic Root Replacement (Bentall) Mitral Valve Repair Double Valve Replacement Arrhythmia Procedures	Aortic Valve Repair Aortic Root Replacement (any other than Bentall) Redo Valve Replacement Aortic root enlargement
Complications		
Routine	Complex	advanced
heart block, atrial fibrillation, hypotension, bleeding, tamponade	SAM, small aortic root/PPM, occluded/kinked coronary button, paravalvular leak, left circumflex injury, calcified mitral annulus, A-V groove disruption	Management of aortic root abscess Management of complications of multi-valve surgery

### PC4: Great Vessel Disease Examples of Routine, Complex, and Advanced

Procedures		
Routine	Complex	Advanced
Ascending Aortic Replacement	Type A Aortic Dissection Repair Combined Valve-Ascending Aortic Surgery	TEVAR Thoraco-abdominal Aortic Aneurysm Surgery
Complications		
Routine	Complex	Advanced
Bleeding, hypothermia	Acute coronary ischemia Need for aortic arch replacement Acute cerebral ischemia	Acute spinal cord ischemia Acute end-organ ischemia following repair

## PC 5: Esophagus Examples of Routine, Complex, and Advanced

Diseases		
Routine	Complex	
Initial Reflux Foreign body impaction Leiomyoma Diverticula Barrets PEH Hiatal Hernia	Achalasia/Mobility Disorders Perforation Esophageal Cancer Stricture Fistula Trauma Congenital disorders Post-endoscopic Complications Recurrent Reflux Recurrent Hernia Giant PEH	
Procedures		
Routine	Complex	Advanced
EGD Dilation Hiatal hernia repair First time fundoplication	Stent Heller myotomy Collis Repair esophageal perforation Esophageal diversion Open esophagectomy MIE (VATS or robotic) POEM Enucleation Diverticulectomy Giant PEH Penetrating injuries	Redo plication Belsey fundoplication Esophagectomy with non-gastric conduit Complex esophagectomy (prior fundoplication) Management corrosive injury
Complications		
Routine	Complex	Advanced
Stricture Afib	Leak Dehiscence	

Atelectasis Pneumonia Fever Arrhythmia Recurrent nerve injury Aspiration DVT/PE Ileus Bleeding UTI	Chylothorax Fistula Conduit necrosis Death Empyema Airway injury Perforation Conduit dysmotility	
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## PC6: Lung and Airway Examples of Routine, Complex, and Advanced

Diseases			
Routine		Complex	
Solitary Lung Nodule Early Stage Lung Cancer Metastasis to Lung Stable Hemoptysis Tracheal Stenosis Pulmonary Sequestration Carcinoid		Locally Advanced Lung Cancer Severe Bullous Emphysema End Stage COPD End Stage Lung Disease (Cystic Fibrosis, etc) Lung Abscess Bronchopleural Fistula Massive Hemoptysis Tracheal Malignancy	
Procedures			
Bedside procedures/components	Routine	Complex	Advanced
Flexible Bronchoscopy Port Placement Thoracotomy Division of individual structures during lobectomy (vein, artery)	Lung biopsy Wedge resection Lobectomy Tracheostomy	Segmentectomy Pneumonectomy Extended pulmonary resections Minimally invasive lobectomy Interventional Bronchoscopy / EBUS	Sleeve/ bronchoplasty Tracheal resection Pancoast Tumor Lung Volume Resection Surgery Rigid Bronchoscopy
(Post-operative) Complications			
Routine (simple)		Complex	Advanced
Hemothorax Effusion Prolonged airleak Atrial fibrillation Surgical site infection Nerve injury		Bronchopleural fistula Empyema Respiratory failure Vascular injury Chylothorax Tracheo-Innominate fistula	

<b>PC7: Chest Wall/Pleura/Mediastinum Examples of Routine, Complex, and Advanced</b>			
<b>Diseases</b>			
<b>Routine</b>		<b>Complex</b>	
Chylothorax		Malignant Pleural Mesothelioma	
Hyperhidrosis		Thoracic Outlet Syndromes	
Hemothorax		Chest wall tumors	
Pneumothorax/Pneumomediastinum		Pectus Excavatum	
Malignant effusion		Mediastinal Tumors	
Fibrothorax		Bronchopleural fistula	
Chest Wall Infections		Diaphragm Rupture	
<b>Procedures</b>			
<b>Bedside procedures/components</b>	<b>Basic</b>	<b>Complex</b>	<b>Advanced</b>
Port placement Thoracotomy Tube thoracostomy Thoracentesis Intercostal muscle harvest	Mediastinoscopy/ Chamberlin Pleurodesis PleurX Catheter Pleural Biopsy Rib Plating Evacuation of Hemothorax Sympathectomy Mediastinal drainage Pericardial window	Decortication Diaphragm repair/ resection Mediastinal mass/cyst resection Thoracic Outlet Syndrome Pectus excavatum Chest wall/ Sternal reconstruction Diaphragm plication Congenital diaphragmatic hernia Congenital cystic adenomatoid malformation (CCAM)	Pancoast Tumor Extra Pleural Pneumonectomy with Pleurectomy Decortication Pericardiectomy
<b>Complications</b>			
<b>Routine (simple)</b>		<b>Complex</b>	<b>Advanced</b>
Effusion Hemothorax Pneumothorax Atrial fibrillation Nerve injury (Recurrent/Phrenic) Surgical site infection		Empyema Infected hardware/implant Vascular injury Diaphragmatic disruption Chylothorax	

## PC 8: Critical Care Examples of Routine, Complex, and Advanced

Diseases		
Routine	Complex	
<ul style="list-style-type: none"> <li>-Distributive shock</li> <li>-Cardiogenic shock</li> <li>-Obstructive shock</li> <li>-Hypovolemic shock</li> <li>-Workup for cardiac transplantation</li> <li>-Workup for pulmonary transplantation</li> <li>-Postop care for pulmonary transplantation without complications</li> <li>-Postop care for cardiac transplantation without complications</li> <li>-Postop care for routine cardiac operations (CABG, isolated valve, valve + CABG, uncomplicated aortic replacement)</li> <li>-Routine postop care for cardiopulmonary operations complicated by 1 or less additional organ dysfunction (GI bleed, renal failure, liver failure, respiratory failure, etc)</li> <li>-Management of nutritional deficiencies</li> <li>-Management of kidney injury (initial workup, treatment, fluid and diuretic management, recognizing the need for renal replacement)</li> <li>-Management of respiratory failure and adjuncts for treatment</li> </ul>	<ul style="list-style-type: none"> <li>-Any shock with complications</li> <li>-Heart failure treated with &gt; 1 inotrope</li> <li>-Heart failure treated with a temporary or permanent device</li> <li>-RV failure treated with a temporary device (percutaneous or central RVAD)</li> <li>-RV failure treated with inhaled pulmonary vasodilators (NO, veletri, etc)</li> <li>-Hemodynamic instability treated with &gt; 1 vasoactive infusion</li> <li>-Hypertensive emergency with complications (dissection, PAU) with the need for vasoactive infusions</li> <li>-Postop care for PTE</li> <li>-Postop care for complicated aortic surgery</li> <li>-Postop care for cardiac transplantation with complications (hemorrhage, tamponade, persistent lactate, open chest, mechanical support, etc)</li> <li>-Postop care for pulmonary transplantation (hemorrhage, tamponade, persistent lactate, open chest, mechanical support, etc)</li> <li>-Care of a patient with a disease complicated by multi-organ system dysfunction (renal failure, liver failure, respiratory failure, etc)</li> </ul>	
Procedures		
Routine	Complex	Advanced
<ul style="list-style-type: none"> <li>-Central line (internal jugular, subclavian, femoral)</li> <li>-Arterial line (radial)</li> <li>-Intubation</li> <li>-Temporary dialysis catheter placement</li> <li>-Transcutaneous pacing and defibrillation</li> <li>-Cardioversion</li> <li>-Management of epicardial pacemaker</li> </ul>	<ul style="list-style-type: none"> <li>-Arterial line (femoral, brachial)</li> <li>-TTE</li> <li>-TEE</li> <li>-IABP placement</li> <li>-Flexible bronchoscopy with or without BAL, lavage, brushings, etc</li> <li>-Transvenous pacemaker placement</li> <li>-Intubation</li> <li>-CPAP/BiPAP/ Invasive ventilator management</li> </ul>	<ul style="list-style-type: none"> <li>-Arterial line (cut down approach)</li> <li>-Bedside surgical procedures (ex-lap, thoracotomy, reopening of sternotomy)</li> <li>-IABP placement</li> <li>-Placement of temporary mechanical support (ECMO, Impella, percutaneous RVAD)</li> <li>-Tracheostomy</li> <li>-Percutaneous gastrostomy tube placement (PEG)</li> </ul>

-Management of nutritional deficiencies with enteral or parenteral nutrition		-EGD -Rigid bronchoscopy -Flexible bronchoscopy with biopsy
<b>Complications</b>		
<b>Routine</b>	<b>Complex</b>	Advanced
-Single organ complication (hemorrhage, isolated organ failure, etc.)	-Multorgan system failure	