INFORMATION ABOUT THE COURSE

Cardiac Surgery

1. Basic information

<table>
<tr><td colspan="3">Field of studies
field of medical and health sciences, discipline: medical sciences
Unit responsible for the field of studies
Faculty of Medicine, Bydgoszcz University of Science and Technology
Level of studies
Uniform master's studies
Profile of studies
General academic
Form of studies
Full-time</td><td>Studies cycle
6th year
Course code
KCH-CS-6
Language
English
Obligatory
Yes</td></tr>
<tr><td colspan="3">Prerequisites
Anatomy, Physiology, Pathophysiology, Internal Medicine, Cardiology, Radiology, Anaesthesiology and Intensive Care</td><td></td></tr>
<tr><td colspan="3">Introductory courses
Cardiology, General Surgery, Anaesthesiology and Intensive Care</td><td></td></tr>
<tr><td colspan="3">Coordinator
Prof. Radosław Litwinowicz
Department of Cardiac Surgery, Faculty of Medicine</td><td></td></tr>
<tr><td>Study period
Winter/Summer</td><td>Form of assessment
Written exam (MCQ + short-answer questions) and practical OSCE assessment
Form and hours of classes
Lectures: 10 h | Clinical seminars: 10 h | Clinical clerkship: 10 h</td><td>ECTS credits
2</td><td></td></tr>
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2. Learning outcomes

Code	Description of learning outcomes	Learning outcomes reference
Knowledge (student knows and understands):		
W1	The principles and indications for cardiac surgical procedures, including coronary artery bypass grafting (CABG), valve repair and replacement, surgery of the thoracic aorta, congenital heart defects, and cardiac transplantation.	B.W1, B.W2
W2	The pathophysiology of conditions requiring cardiac surgical treatment: coronary artery disease, valvular heart disease, aortic aneurysm and dissection, heart failure, and cardiomyopathy.	B.W3, B.W5
W3	The principles of cardiopulmonary bypass (extracorporeal circulation), myocardial protection strategies (cardioplegia), and the conduct of cardiac anaesthesia.	B.W6, B.W8
W4	Perioperative management of the cardiac surgical patient: preoperative preparation, intraoperative monitoring, and postoperative care in the Cardiac Surgery Intensive Care Unit (CSICU).	B.W9, B.W10
W5	The most common postoperative complications following cardiac surgery (bleeding, low cardiac output syndrome, arrhythmias, neurological complications, sternal wound infection) and their management.	B.W11, B.W12
Abilities (student can do/perform):		

U1	Obtain a focused history and perform a physical examination of a patient referred for cardiac surgical consultation; identify key findings and formulate a differential diagnosis.	C.U1, C.U2
U2	Interpret basic preoperative investigations relevant to cardiac surgery: ECG, chest X-ray, echocardiography, coronary angiography, and CT aortography.	C.U5, C.U6
U3	Describe the steps of a cardiac surgical procedure observed during clerkship and correctly identify anatomical structures of the heart and great vessels.	C.U9, C.U10
U4	Monitor and assess the condition of a postoperative cardiac surgical patient, recognise signs of haemodynamic instability, and initiate first-line management.	C.U12, C.U14
Social skills (the student is ready to):		
K1	Demonstrate respect for the dignity and autonomy of patients undergoing cardiac surgery, including appropriate communication about high-risk procedures and informed consent.	D.K1, D.K2
K2	Collaborate effectively within the multidisciplinary cardiac surgical team (surgeons, anaesthesiologists, perfusionists, nurses, physiotherapists) and assume appropriate responsibility.	D.K3, D.K4
K3	Critically appraise limitations of one's own knowledge, seek guidance where appropriate, and commit to continuous professional development in cardiac surgery.	D.K5

3. Programme contents

No.	Programme contents	Form of studies	Learning outcomes covered
1	Introduction to cardiac surgery: history, scope, organisation of a cardiac surgery centre, indications and contraindications for surgery.	Lecture	W1, W2
2	Coronary artery disease: pathophysiology, indications for CABG vs. PCI, surgical technique (on-pump and off-pump CABG), conduit selection (LIMA, RIMA, saphenous vein graft).	Lecture	W1, W2, W3
3	Valvular heart disease: aortic stenosis and regurgitation, mitral stenosis and regurgitation - indications, valve repair vs. replacement (mechanical and biological prostheses), TAVI/TAVR overview.	Lecture	W1, W2
4	Surgery of the thoracic aorta: aneurysm and dissection (Stanford classification) - elective and emergency management, hypothermic circulatory arrest.	Lecture	W1, W2, W3
5	Cardiopulmonary bypass: circuit components, priming, anticoagulation, myocardial protection (cardioplegia), weaning from bypass, de-airing.	Lecture / Seminar	W3
6	Perioperative management: preoperative assessment and optimisation, intraoperative monitoring (arterial line, CVP, TOE), CSICU care, fast-track protocols.	Seminar	W4, U1, U4
7	Postoperative complications: haemorrhage and re-exploration, low cardiac output syndrome, atrial fibrillation, acute kidney injury, stroke, sternal wound infection - recognition and management.	Seminar	W5, U4
8	Congenital heart disease in adults: overview of common defects (ASD, VSD, TOF) and principles of surgical correction.	Seminar	W1, W2
9	Heart failure and mechanical circulatory support: indications for cardiac transplantation, ventricular assist devices (VAD, ECMO), bridge-to-transplant strategies.	Seminar	W1, W2, W5

10	Clinical clerkship - operating theatre: observation and participation in cardiac surgical procedures; identification of anatomical structures; scrubbing and sterile technique.	Clerkship	U3, K1, K2
11	Clinical clerkship - cardiac surgery ward: preoperative patient assessment, interpretation of diagnostic workup, case presentations, participation in ward rounds.	Clerkship	U1, U2, K1, K2
12	Clinical clerkship - CSICU: postoperative monitoring, haemodynamic assessment, ventilation management, recognition and initial treatment of complications.	Clerkship	U4, K1, K2, K3

4. Methods of verifying and assessing the learning outcomes achieved by the student

Form of studies		
Lectures	**Methods of studies form:** Frontal lectures with multimedia presentations; case-based discussion. **Methods of verification:** Written exam (MCQ + short-answer questions) - 60% of final grade.	
Clinical seminars	**Methods of studies form:** Interactive problem-based learning; case analysis; interpretation of ECG, echocardiography, and CT. **Methods of verification:** Active participation assessed by the tutor; attendance mandatory.	
Clinical clerkship	**Methods of studies form:** Bedside teaching; operating theatre observation; CSICU rounds; supervised patient assessment. **Methods of verification:** Practical OSCE-style assessment (history + examination + case presentation) - 40% of final grade. Attendance: 100% required.	
Conditions for passing the course:	Minimum 60% score on written exam AND satisfactory practical assessment. Full attendance at seminars and clerkship is mandatory. Students absent from more than 20% of contact hours must repeat the course.	
Learning outcomes	**Methods of verification**	
W1, W2, W3, W4, W5	Written exam (MCQ + short-answer questions)	
U1, U2, U3, U4	Practical OSCE: structured patient examination and case presentation	
K1, K2, K3	Continuous assessment during clerkship: observed behaviour, teamwork, and communication	

5. Literature

Obligatory literature

1. Cohn LH, Adams DH (eds.). Cardiac Surgery in the Adult. 5th ed. McGraw-Hill Education; 2018.
2. Sellke FW, del Nido PJ, Swanson SJ (eds.). Sabiston & Spencer Surgery of the Chest. 9th ed. Elsevier; 2016.
3. Bojar RM. Manual of Perioperative Care in Adult Cardiac Surgery. 5th ed. Wiley-Blackwell; 2011.

Supplementary literature

1. Fuster V, Harrington RA, Narula J, Eapen ZJ (eds.). Hurst's The Heart. 14th ed. McGraw-Hill Education; 2017.
2. ESC/EACTS Guidelines on the management of valvular heart disease (2021). European Heart Journal, 42(7): 561-632.
3. ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease (2022). JACC, 80(24): e223-e393.

6. Student workload - balance of hours and ECTS credits

Students activity	**Student workload**	**Number of hours**
Attendance at lectures		10
Attendance at clinical seminars		10
Attendance at clinical clerkship (ward + operating theatre + CSICU)		10
Students own work (studying, preparation for exams)		20
Total student workload		**50**
ECTS		**2**

One (teaching) hour is 45 minutes.