CHAPTER 17

Perioperative Psychiatric Follow-Up In Cardiovascular Surgery

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INTRODUCTION

Cardiac surgeries are among the highest psychiatric comorbidities in surgical interventions. Individuals with cardiac diseases often present every day behaviors that places them under a high risk group to begin with. These patients may need psychotherapeutic interventions due to their high probability of uncontrolled smoking and alcohol use, non- compliance with necessary regimen rules, and demonstrating Type A behavioral characteristics (competitive, perfectionist, hasty). Increased stress due to invasive cardiac procedures can cause of anxiety or depressive disorders in the preoperative period.

Additionally, the surgical intervention itself can result in psychiatric complications. Neurological damage is a significant complication of cardiac surgeries. Postoperative cognitive dysfunction, depression, anxiety disorders, and post-traumatic stress disorder can develop due to the stress created by the surgical intervention and neurological damage. Although its etiology not entirely explicable, it is thought that cerebral hypoperfusion and impairment of oxygenation, microemboli, and systemic inflammatory responses may play a role in neurological damage (1). Identified risk factors for the emergence of psychiatric comorbidities in the postoperative period are age, preoperative cognitive functions and cognitive reserve (2) and the presence of pre-disease psychiatric disorders (3).

Throughout this section, the connection between the perioperative period of cardiac surgeries and mental disorders and the possible mental interventions will be discussed.

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1. Van Harten AE, Scheeren TWL, Absalom AR. A review of postoperative cognitive dysfunction and neuroinflammation associated with cardiac surgery and anaesthesia. *Anaesthesia*. 2012;67(3):280–93. doi:10.1111/j.1365-2044.2011.07008.x
2. Gao L, Taha R, Gauvin D et al. Postoperative cognitive dysfunction after cardiac surgery. *Chest*. 2005;128(5):3664–70. doi:10.1378/chest.128.5.3664
3. Rao V, Lyketsos CG. Psychiatric aspects of traumatic brain injury. *Psychiatric Clinics of North America*. 2002;25(1):43–69. doi:10.1016/s0193-953x(03)00052-2.
4. Rothenhäusler HB, Grieser B, Nollert G et al. Psychiatric and psychosocial outcome of cardiac surgery with cardiopulmonary bypass: a prospective 12-month follow-up study. *General Hospital Psychiatry*. 2005;27(1):18–28.doi:10.1016/j.genhosppsych.2004.09.001.
5. Connerney I, Shapiro P, McLaughlin J et al. Relation between depression after coronary artery bypass surgery and 12-month outcome: a prospective study *The Lancet*. 2001 Nov 24;358(9295):1766-71.doi:10.1016/S0140-6736(01)06803-9.
6. McKhann GM, Borowicz LM, Goldsborough MA et al. Depression and cognitive decline after coronary artery bypass grafting. *The Lancet*. 1997;349(9061):1282–4. doi:10.1016/S0140-6736(96)09466-4.
7. Albus C, Ladwig KH, Herrmann-Lingen C. Psychocardiology: Clinically relevant recommendations regarding selected cardiovascular diseases. *Deutsch Medizinische Wochenschrift*. 2014 Mar 1;139:596–601.doi:10.1055/s-0033-1360102
8. Thombs B, Bass E, Ford Det al. Prevalence of Depression in Survivors of Acute Myocardial Infarction. *Journal of General Internal Medicine*. 2006 Feb 1;21:30–8. doi:10.1111/j.1525-1497.2005.00269.x.
9. Borowicz L Jr, Royall R, Grega Met al. Depression and cardiac morbidity 5 years after coronary artery bypass surgery. *Psychosomatics*. 2002 Nov-Dec;43(6):464-71. doi:10.1176/appi.psy.43.6.464.
10. Peterson JC, Charlson ME, Williams-Russo Pet al. New postoperative depressive symptoms and long-term cardiac outcomes after coronary artery bypass surgery. *The American Journal of Geriatric Psychiatry*. 2002;10(2):192–8. doi:10.1097/00019442-200203000-00010
11. Tully PJ, Baker RA, Winefield HRet al. Depression, anxiety disorders and Type D personality as risk factors for delirium after cardiac surgery. *Australian & New Zealand Journal of Psychiatry*. 2010;44(11):1005–11. doi:10.3109/00048674.2010.495053
12. Magyar-Russell G, Thombs B, Cai J et al. The prevalence of anxiety and depression in adults with implantable cardioverter defibrillators: A systematic review *Journal of Psychosomatic Research*. 2011 Oct 1;71:223–31. doi:10.1016/j.jpsychores.2011.02.014
13. Tzeis S, Kolb C, Baumert Jet al. Effect of Depression on Mortality in Implantable Cardioverter Defibrillator Recipients-Findings from the Prospective LICAD Study. *Pacing and Clinical Electrophysiology*. 2011 Mar 1;34:991–7. doi:10.1111/j.1540-8159.2011.03081.x
14. Spaderna H, Weidner G, Koch KC et al. Medical and psychosocial predictors of mechanical circulatory support device implantation and competing outcomes in the Waiting for a New Heart Study. *Journal Heart Lung Transplant*. 2011 Sep 27;31:16–26. doi:10.1016/j.healun.2011.07.018
15. Dew M, Rosenberger E, Myaskovsky Let al. Depression and Anxiety as Risk Factors for Morbidity and Mortality After Organ Transplantation: A Systematic Review and Meta-Analysis. *Transplantation*. 2015 Oct 22;100. doi:10.1097/TP.0000000000000901
16. Gallagher R, McKinley S. Stressors and Anxiety in Patients Undergoing Coronary Artery Bypass Surgery. *American Journal of Critical Care*. 2007 Jun 1;16:248–57. doi:10.4037/ajcc2007.16.3.248
17. Ludlow M, Baker R, Kneebone A et al. Mood state as a predictor of neuropsychological deficits following cardiac surgery. *Journal of Psychosomatic Research*. 2000 Jun 1;48:537–46.

doi:10.1016/S0022-3999(00)00089-1.
18. Corbett L, Simpson J, Stewart M. A systematic review of pre-operative predictors of post-operative depression and anxiety in individuals who have undergone coronary artery bypass graft surgery. *Psychology Health and Medicine*. 2010 Jan 1;15:74–93. doi:10.1080/13548500903483486.
19. Botzet K, Dalyanoglu H, Schäfer R et al. Anxiety and Depression in Patients Undergoing Mitral Valve Surgery: A Prospective Clinical Study. *The Thoracic and Cardiovascular Surgeon*. 2017 Aug 6;66. doi:10.1055/s-0037-1604461.
20. Heilmann C, Kaps J, Hartmann Aet al. Mental health status of patients with mechanical aortic valves, with ventricular assist devices and after heart transplantation.*Interactive CardioVascular and Thoracic Surgery*. 2016 May 5;23 doi:10.1093/icvts/ivw111. 2016
21. Baba A, Hirata G, Yokoyama Fet al. Psychiatric problems of heart transplant candidates with left ventricular assist devices. *Journal of Artificial Organs*. 2006 Feb 1;9:203–8. doi:10.1007/s10047-006-0353-0.
22. Kugler C, Bara C, Waldthausen Tet al. Association of depression symptoms with quality of life and chronic artery vasculopathy: A cross-sectional study in heart transplant patients. *Journal of Psychosomatic Research*. 2014 Aug 1;77. doi:10.1016/j.jpsychores.2014.06.007.
23. Maciver J, Ross H. Quality of Life and Left Ventricular Assist Device Support. *Circulation*. 2012 Aug 14;126:866–74. doi:10.1161/CIRCULATIONAHA.111.040279
24. Bostwick J, Sola C. An Updated Review of Implantable Cardioverter/Defibrillators, Induced Anxiety, and Quality of Life. *Heart Failure Clinics*. 2011 Jan 31;7:101–8. doi:10.1016/j.hfc.2010.10.003
25. Roest A, Zuidersma M, Jonge P. Myocardial infarction and generalised anxiety disorder: 10-Year follow-up. *The British Journal of Psychiatry: The Journal of Mental Science*. 2012 Mar 8;200:324–9. doi:10.1192/bjp.bp.111.103549
26. Schelling G, Roozendaal B, Krauseneck T et al. Efficacy of Hydrocortisone in Preventing Posttraumatic Stress Disorder Following Critical Illness and Major Surgery. *Annals of the New York Academy of Sciences*. 2006;1071. doi:10.1196/annals.1364.005
27. Schelling G, Richter M, Roozendaal Bet al. Exposure to high stress in the intensive care unit may have negative effects on health-related quality-of-life outcomes after cardiac surgery. *Critical Care Medicine*. 2003;31(7). doi:10.1097/01.CCM.0000069512.10544.40
28. Tigges-Limmer K, Sitzer M, Gummert J. Perioperative Psychological Interventions in Heart Surgery: Opportunities and Clinical Benefit. *DeutschesÄrzteblatt International*. 2021;118(19–20):339. doi:10.3238/arztebl.m2021.0116
29. Brocks Y, Zittermann A, Grisse D et al. Adherence of Heart Transplant Recipients to Prescribed Medication and Recommended Lifestyle Habits: A Single-Center Experience. *Progress in Transplantation*. 2017 Mar 22;27:152692481769995. doi:10.1177/1526924817699959
30. Schelling G, Kilger E, Roozendaal Bet al. Stress doses of hydrocortisone, traumatic memories, and symptoms of posttraumatic stress disorder in patients after cardiac surgery: a randomized study. *Biological Psychiatry*. 2004 Mar 15;55(6):627–33. doi:10.1016/j.biopsych.2003.09.014
31. Weis F, Kilger E, Roozendaal Bet al. Stress doses of hydrocortisone reduce chronic stress symptoms and improve health-related quality of life in high-risk patients after cardiac surgery: A randomized study. *The Journalof Thoracic and Cardiovascular Surgery*. 2006 Feb 1;131(2):277-282.e1. doi:10.1016/j.jtcvs.2005.07.063
32. Indja B, Seco M, Seamark Ret al. Neurocognitive and psychiatric issues post cardiac surgery. *Heart, Lung and Circulation*. 2017;26(8):779–85. doi:10.1016/j.hlc.2016.12.010
33. Lin Y, Chen J, Wang Z. Meta-Analysis of Factors Which Influence Delirium Following Cardiac Surgery. *Journal of Cardiac Surgery*. 2012 Jul 1;27(4):481–92. doi:10.1111/j.1540-8191.2012.01472.x
34. Gosselt ANC, Slooter AJC, Boere PRQ et al. Risk factors for delirium after on-pump cardiac surgery: a systematic review. *Critical Care*. 2015;19(1):346. doi:10.1186/s13054-015-1060-0

35. Levett DZH, Grimmett C. Psychological factors, prehabilitation and surgical outcomes: evidence and future directions. *Anaesthesia*. 2019 Jan 1;74(S1):36–42. doi:10.1111/anae.14507
36. Salzmann S, Salzmann-Djufri M, Wilhelm M et al.Psychological preparation for cardiac surgery. *Current Cardiology Reports*. 2020;22:1–10. doi: 0.1007/s11886-020-01424-9
37. Juergens MC, Seekatz B, Moosdorf RG et al. Illness beliefs before cardiac surgery predict disability, quality of life, and depression 3 months later. *Journal of Psychosomatic Research*. 2010;68(6):553–60. doi:10.1016/j.jpsychores.2009.10.004
38. van Middendorp H, Lumley MA, Jacobs JWG et al. The effects of anger and sadness on clinical pain reports and experimentally-induced pain thresholds in women with and without fibromyalgia. *Arthritis Care Research*. 2010 Oct 1;62(10):1370–6. doi:10.1002/acr.20230
39. Broadbent E, Koschwanez H. The psychology of wound healing. *Current Opinion in Psychiatry*. 2011 Dec 12;25:135–40. doi:10.1097/YCO.0b013e32834e1424
40. Chandrababu R, Nayak B, Pai Vet al. Effect of Preoperative Education on Postoperative Outcomes Among Patients Undergoing Cardiac Surgery: A Systematic Review and Meta-Analysis. *Journal of Perianesthesia Nursing*. 2017 Apr 13;32. doi:10.1016/j.jopan.2016.11.011
41. Lee J, Jung J, Noh J et al. Perioperative Psycho-Educational Intervention Can Reduce Postoperative Delirium in Patients After Cardiac Surgery: A Pilot Study. *The International Journal of Psychiatry in Medicine*. 2013 Aug 27;45:143–58. doi:10.2190/PM.45.2.d
42. Powell R, Bruce J, Johnston Met al. Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. *In: Cohrane Database of Systematic Reviews*. 2010. doi:10.1002/14651858.CD008646.pub2
43. Poole L, Ronaldson A, Kidd T et al.Pre-surgical depression and anxiety and recovery following coronary artery bypass graft surgery. *Journal of Behavioral Medicine*. 2017;40(2):249–58. doi:10.1007/s10865-016-9775-1
44. Sachs M, Kahr P, Scheld H et al. Need for Psychosocial Assistance in Patients Undergoing Cardiothoracic Surgery Evaluated by a Seven-Item Questionnaire. *The Thoracic and Cardiovascular Surgeon*. 2014 May 1;62. doi:10.1055/s-0034-1371532
45. Heilmann C, Fritzsche K, Beyersdorf Fet al. Short-term intervention to reduce anxiety before artery coronary bypass surgery - A randomised controlled study. *The Thoracic and Cardiovascular Surgeon*. 2014 Feb 10;62. doi:10.1055/s-0034-1367087
46. Lawton JS, Tamis-Holland JE, Bangalore S et al, 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Journal of the American College of Cardiology*. 2022 Jan 18;79(2):e21-e129. doi: 10.1016/j.jacc.2021.09.006.
47. Bingel U, Wanigasekera V, Wiech Ket al. The Effect of Treatment Expectation on Drug Efficacy: Imaging the Analgesic Benefit of the Opioid Remifentanil. *Science Translational Medicine*. 2011 Feb 1;3:70ra14. doi:10.1126/scitranslmed.3001244
48. Ronaldson A, Poole L, Kidd T et al. Optimism measured pre-operatively is associated with reduced pain intensity and physical symptom reporting after coronary artery bypass graft surgery. *Journal of Psychosomatic Research*. 2014 Oct 1;77. doi:10.1016/j.jpsychores.2014.07.018
49. Doering L, Chen B, Deng M et al. Perceived control and health-related quality of life in heart transplant recipients. *European Journal of Cardiovascular Nursing*. 2017 Dec 1;17:1474515117749225. doi:10.1177/1474515117749225
50. Rief W, Shedden-Mora M, Laferton Jet al. Preoperative optimization of patient expectations improves long-term outcome in heart surgery patients: Results of the randomized controlled PSY-HEART trial. *BMC Medicine*. 2017 Jan 10;15. doi:10.1186/s12916-016-0767-3