

Guidelines for Sexual Counseling in Patients with Cardiovascular Disease

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Sexual intimacy has been considered to be an important element in determining the quality of life. Cardiovascular diseases (CVD) often attribute to many sexual disorders that may have a lasting impact on both the quality of life and functioning of both the patient and their partners. Due to its sensitive nature, the topic might not always be discussed after a cardiac event but patients do report asking for counseling specific to their cardiovascular disease. Various factors may serve, as obstacles to a proper sexual counseling so regular assessment for sexual dysfunction must be assessed in such patients. This articles aim to list out the various aspects of the sexual counseling physicians must consider while counseling his patients. Moreover, disease specific guidelines must also be explained to these patients as they may potentially lower the long-term morbidity.

INTRODUCTION

Sexual intimacy is an important factor in determining the quality of life in individuals. Its effects can be easily noticed in patients developing sexual dysfunctions post cardiovascular events. Even though patients report wanting information regarding sexual activity after such events, various factors (the sensitive nature of the topic, lack of the doctor's training in this topic, patients current condition being too ill and added anxiety to patient) serve as obstacles for this information flow from their healthcare providers.¹⁻⁴ The importance of overcoming such barriers have been emphasized by Steinke et al in a recent article published from the American Heart Association.⁵ In this review we list out the most important disease specific points, which needs to be remembered while counseling such patients.

ASSESSMENT

Before proceeding with the sexual counseling, it is essential for the physician to assess the patient's current condition and willingness to discuss the topic. The concerns regarding sexual activity after a cardiac event are often not adequately voiced even though some patients do report asking for specific information.^{1,6,7} As a result, routine assessment of the patients for such concerns is truly the most effective way of detecting

and addressing the problem. Because of its sensitive nature, the method of counseling varies in different cultures and services.⁸⁻¹¹ Steinke et al reports that since these problems last a while, patients need to be counseled and followed up through a number of appointments.⁵ This way a thorough assessment can be done along with providing a continuous guidance to the patient.⁵ More importantly, the concerns in many of these patients are more than just physical so the physicians must also consider the psychological aspect while counseling. A cardiac event has been quite extensively correlated with psychological issues such fear¹²⁻¹⁴ anxiety¹⁵⁻¹⁷ and depression,^{16, 18, 19} so it is important that psychological support must be carefully provided.

There have been two established methods that may be used by physicians to assess and provide the necessary sexual counseling. They are summarized in Table 1 (*page 32*). The PLISSIT method has been used for more than 35 years for clinical practice and research. However, some may argue that it is outdated and BETTER acronym might be a more appropriate approach to addressing the sexual concerns with the patient. Moreover, specific enquires related to the condition of the patients must be addressed to provide a more individualized counseling. In order to optimize these counseling sessions, assessment tools such as Index of Erectile Function-5 (ILEF-5),²¹ Brief Male Sexual Function Inventory (BMSFI),²² Brief Index of Sexual Functioning for Women (BISF-W),²³ Female Sexual Function Index (FSFI),²⁴ Arizona Sexual Experience Scale (ASEX),²⁵ Changes in Sexual

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TABLE 1:

Comparison between PLISSIT and BETTER method of assessment in sexual counseling

P.L.I.S.S.I.T	B.E.T.T.E.R
<p>Permission – patient/partner is passively allowed to bring up the topic of sexuality and open up to the physician</p> <p>Limited Information – once patient/partner bring up the topic, provide general but limited information to them</p> <p>Specific Suggestions- if further specific query is made by the patient/partner, then provide more information about it</p> <p>Intensive Therapy – further counseling done by sex therapist or counselor or by the physician if he has the training for it.</p>	<p>Bring up the topic of sexuality,</p> <p>Explain concerns you have about the patient’s quality of life that may be impacted by their cardiac disease/event,</p> <p>Tell patients you can help guide them to resources that can address their concerns,</p> <p>Timing – assure the patient that these topics may be discussed in the future</p> <p>Educate patients about the potential effects of their cardiac disease/event/treatments on their sexual functioning,</p> <p>Record or document the assessment and interventions provided</p>

Functioning Questionnaire (CSFQ) and Changes in Sexual Functioning- Short Form (CSFQ-SF)^{26, 27} may be utilized by the healthcare providers. Steinke et al have briefly summarized these assessment tools in the consensus article published by American Heart Association.⁵

GENERAL RECOMMENDATIONS FOR SEXUAL COUNSELING

Sexual counseling lead by a healthcare provider, to both the patient and their partners is generally helpful in aiding them to return to their sexual habits. The forms of assistance can be not only in form of appointment based counseling but also by information pamphlets or videos.^{8, 28, 29} It is also necessary to remember that in addition to counseling the patient, the partners needs must also be addressed simultaneously³⁰⁻³² Since part of the counseling comprises a thorough assessment, healthcare professionals who are involved in such counseling must be trained to take focused history. These providers must also be equipped with the appropriate communications skills so they can provide the most appropriate and relevant data to the patient and their partners. Not to mention the need for individualized counseling geared towards their specific problem.^{6, 8, 33, 34}

In general, healthcare providers must keep the following points in mind when counseling the patient and their partners:

- Evaluate the patient first to determine the readiness for him/her to resume sexual activity and advice them according to their current condition. If deemed low risk, the patient may be encouraged to become sexually active. However, if the patients condition poses a major threat

to his/her health then they must be advised to withhold any sexual activity till his/her condition stable or has been properly managed.^{5,28}

- If the patient’s current condition is not deemed stable, (e.g. Patients with compromised heart function) then the couples should be encouraged to resort to activities which require less energy such as hugging, kissing or fondling instead of engaging in sexual intercourse. The patients must receive the appropriate treatments and their conditions must be stabilized before the resumption of sexual activity.^{5, 28, 35, 36}
- Patients should be made aware of the possible symptoms that may appear during sexual activity and must be encouraged to report any of the symptoms to the physician. These symptoms can range from chest pain, shortness of breath, palpitations, and dizziness to insomnia or fatigue after sexual activity.³⁷⁻⁴⁰
- If the patient experiences chest pain during sexual activity then they may be prescribed nitroglycerine for use during or before intercourse.³⁹ However, if the chest pain persists beyond the scope of intercourse, they must be encouraged to contact the healthcare providers immediately.
- Patients must be advised to assume sexual positions, which are most comfortable for them.⁴¹ Steinke et al has elaborated the various sexual position which may benefit for patients with chronic illness or stroke in the consensus document published by the American Heart Association.⁵

- Patients are encouraged to have sex in a familiar surrounding and with the usual partner as they have shown to be less stressful to the heart compared to a setting that is unfamiliar or in a secretive relationship.^{37, 42, 43}
- If the patients condition permits, he/she should be encouraged to exercise regularly as that is associated with reduced risk for experience any cardiovascular accidents.²⁸
- It is essential for the health care providers to have an idea about the medications the patient is currently on as some medications may be responsible for sexual dysfunction⁷ (beta-blockers and diuretics may be responsible for erectile dysfunction, decreased libido, impaired ejaculation)^{28, 44} The patients must also be made aware of these possible side effects. They should be encouraged to report the side effects of these medications immediately and also not to stop the medications just because they are facing these problems. The medications may be altered only if the change does not compromise the beneficial effects on the heart.

Disease specific guidelines that may be useful when counseling patients of cardiovascular diseases include:

Recommendations for Coronary Artery Disease, Angina, and Myocardial Infarction (MI):

- In an uncomplicated MI where the patients do not elicit any cardiac symptoms on mild to moderate activity, they may resume sexual activity after a week of the incident.^{5, 28}
- After an MI, patients must be encouraged to gradually proceed with the sexual activity starting from activities, which require less stress on the body such as foreplay before engaging in an intercourse. As a result, the patient may have a greater understanding of their tolerance to sexual activity⁵
- While counseling, patients must be reassured that < 5% of angina attacks are from sexual activity and it is less likely to occur to individuals who do not suffer from angina due to physical exercise. However, if the angina does persist beyond 15 minutes or beyond 5 minutes after nitrate use, they should be advised to contact the emergency services immediately.⁴⁵
- As Phosphodiesterase type 5 (PDE5) inhibitors are contraindicated with nitrates, patients using PDE5 inhibitors before sexual activity must be warned of the potential adverse effects of using these medications together. If coital angina does appear during sexual

activity in patients using PDE5 inhibitors, they should be advised to contact the emergency services immediately instead of using a nitrates.^{46, 47}

Recommendations for CABG, cardiac transplantation, and left ventricular assist device:

- Sexual activity in many patients may be disrupted after a CABG surgery due to poor self-image, preoperative functional impairments or from partner's anxiety or fears.⁴⁸⁻⁵¹ This problem can often be tackled by a having a detailed counseling session emphasizing on the instructions, which allow them to resume their normal sexual activity.⁵²⁻⁵⁴ Patients must also be encouraged to participate in cardiac rehabilitation and therapy as they have proven to improve the sexual activity and satisfaction.⁵⁵⁻⁵⁷
- If the surgery was uncomplicated and depending on the degree of post-operative recovery, patients may resume sexual activity after 6 to 8 weeks after a standard CABG surgery.²⁸
- Patients may resume sexual activity after placement of a left ventricular assist device (LVAD) as long as they have been given counseling sessions discussing the hooking up of the batteries, sexual position changes to accommodate the device and use of binders or barriers to protect the LVAD.^{58,59}
- Cardiac rehabilitation in patients with heart transplant has shown to be useful in increasing their exercise capacity which in turn may play a pivotal role in improving their sexual performance.⁶⁰⁻⁶³

Recommendations for Heart Failure (HF) patients:

- Patients with compensated or mild HF (New York Heart Association class I or II) may be able to engage in sexual activity so the topic may be discussed during their routine visits to their healthcare provider.²⁸
- During the counseling sessions the patients must be advised to engage in sexually activity only after their conditions have been optimally managed and stabilized.²⁸
- Heart Failure patients must be advised to have a better understand their tolerance for sexual activity. Some general strategies such as taking rest before engaging or coital positions which are less stressful may be advised to ensure their sexual practices are more suited to their conditions.⁴¹

- Patients with decompensated or advanced (New York Heart Association class III or IV) Heart Failure must be advised not to take part in sexual activities until their condition is stabilized and/or optimally managed.²⁸

Recommendations after ICD Implantation:

- Sexual activity may be advised after an ICD is implanted, and it is generally safe for those who had the ICD implanted for preventive measures.²⁸
- Sexual counseling in these patients must encompass certain factors such as the right time to resume sex, the potential for an ICD shock with intercourse, what to do if a shock occurs with sex, that an ICD shock will not harm the partner, the level of sexual activity that is safe and pregnancy counseling for women who wish to become pregnant.^{13, 41, 64}

Recommendations for Congenital Heart Disease (CHD):

- Sexual activity is advisable for most patients with congenital heart disease (CHD), although those with decompensated or advanced Heart failure or history of previous cardiac accidents may need further evaluation and counseling before engaging in any form of sexual activity.²⁸
- The sexual counseling of CHD patients comprise of psychological manifestations such as fear and anxiety, body image and self-esteem, contraception and pregnancy planning. Severity of the CHD may play a pivotal role in causing such manifestations, which in turn affect the sexual performance.^{65, 66}

Recommendations after stroke:

- Recommendation for stroke patients is dependent on their current condition and proper assessment of their current physical condition must be done before any advise can be given.⁶⁷
- All stroke survivors and their partners should be inquired about their sexual activity on a regular basis to ensure appropriate guidance.⁶⁷
- Sexual activity may be advisable for patients after stroke but consideration to the concerns and difficulties must be addressed for both the patient and the partner. They must be made aware of the current condition and limitations to avoid provoking unnecessary stress and anxiety.⁶⁹

- Patients may have to adopt new coital positions to ensure low stress during the sexual activity so they must be educated about the various coital position which allow the least possible physical stress on the patient's body.^{5, 68}

CONCLUSION

Sexual health is an important determinant for a person's quality of life. The sexual counseling after a patient suffers a cardiac accident is often considered a sensitive topic; nonetheless it is a very important aspect, which should be kept in mind by the healthcare providers. Several studies mentioned in this article highlight the potential benefits of sexual counseling in such patient population. Patients must also be made aware of the resources available to them, including online resources (as listed out by Steinke et al).⁷ Also more attention must be paid to make sure the healthcare professionals receive more training so patients receive more general as well as specific guidance relevant to their conditions. The use of PLISSIT or BETTER method may also enable the patients to convey their problems more readily to their physician. If developed and practiced correctly, sexual counseling not only has the potential to benefit patients greatly to return to their normal sexual activity but also help them improve their overall quality of life in the long run.

REFERENCES

1. Steinke, E.E. (2013) How Can Heart Failure Patients and Their Partners Be Counseled on Sexual Activity? *Curr. Heart Fail Rep.*;10:262–269
2. Medina, M., Walker, C. & Steinke, E.E. (2009) : Sexual concerns and sexual counseling in heart failure. *Progr Cardiovasc Nurse* 24(4): 141–8.
3. Hoekstra, T., Lesman-Leegte, I., Couperus, M.F. (2012): What keeps nurses from the sexual counseling of patients with heart failure? *Heart Lung*; 41:492–9.
4. Byrne, M., Doherty, S., McGee, H.M., & Murphy, A.W.(2010): General practitioner views about discussing sexual issues with patients with coronary heart disease: a national survey in Ireland. *BMC Fam Pract.*; 11:40. Doi: 10.1186/1471-2296-11-40.
5. Steinke, E.E., Jaarsma, T., Barnason, S.A., Byrne, M., Doherty, S., Dougherty, C.M., Fridlund, B., Kautz, D.D., Mårtensson, J., Mosack, V., & Moser, D.K. (2013) on behalf of the Council on Cardiovascular and Stroke Nursing of the American Heart Association and the ESC Council on Cardiovascular Nursing and Allied Professions (CCNAP). Sexual counseling for individuals with cardiovascular disease and their partners: a consensus document from the American Heart Association and the ESC Council on Cardiovascular Nursing and Allied Professions (CCNAP). *Circulation.*; 128:2075–2096.
6. Steinke, E.E., & Patterson-Midgley, P. (1998): Importance and timing of sexual counseling after myocardial infarction. *J Cardiopulm Rehabil.*; 18:401–407.
7. Mosack, V., & Steinke, E.E. (2009): Trends in sexual concerns after myocardial infarction. *J Cardiovasc Nurs.* 24:162–170.
8. Steinke, E.E., Barnason, S., Mosack, V., & Wright, D.W. (2011) Changes in myocardial infarction-specific sexual counseling by cardiac nurses. *Dimens Crit Care Nurs.* 30:331–338.
9. Goossens, E., Norekvål, T.M., Faerch, J., Hody, L., Olsen, S.S., Darmer, M.R.,

- Jaarsma, T., & Moons, P. (2011) Sexual counseling of cardiac patients in Europe: culture matters. *Int J Clin Pract.* 65:1092–1099
10. Giami, A. & Pacey, S. (2006) Training health professionals in sexuality. *Sex Relation Ther.* 21:267–271.
 11. Rosen, R.C., Fisher, W.A., Eardley, I., Niederberger, C., Nadel, A. & Sand, M. (2004) Men's Attitudes to Life Events and Sexuality (MALES) Study. The multinational Men's Attitudes to Life Events and Sexuality (MALES) study, I: prevalence of erectile dysfunction and related health concerns in the general population. *Curr Med Res Opin.* 20:607–617.
 12. Altiok, M., & Yilmaz, M. (2011) Opinions of individuals who have had myocardial infarction about sex. *Sex Disabil.* 29:263–273.
 13. Vazquez, L.D., Sears, S.F., Shea, J.B. & Vazquez, P.M. (2010) Sexual health for patients with an implantable cardioverter defibrillator. *Circulation.* 122:e465–e467.
 14. Zayac, S. & Finch, N. (2009) Recipients' of implanted cardioverter-defibrillators actual and perceived adaptation: a review of the literature. *J Am Acad Nurse Pract.* 21:549–556.
 15. Steinke, E.E., Gill-Hopple, K., Valdez, D. & Wooster, M. (2005) Sexual concerns and educational needs after an implantable cardioverter defibrillator. *Heart Lung.* 34:299–308
 16. Hallas, C.N., Wray, J., Andreou, P. & Banner, N.R. (2011) Depression and perceptions about heart failure predict quality of life in patients with advanced heart failure. *Heart Lung.* 40:111–121.
 17. Trotter, R., Gallagher, R. & Donoghue, J. (2011) Anxiety in patients undergoing percutaneous coronary interventions. *Heart Lung.* 40:185–192.
 18. Koivula, M., Halme, N. & Astedt-Kurki, P. (2010) Predictors of depressive symptoms among coronary heart disease patients: a cross-sectional study nine years after coronary artery bypass grafting. *Heart Lung.* 39:421–431.
 19. Khoueiry, G., Flory, M., Abi Rafeh, N., Zgheib, M.H., Goldman, M., Abdallah, T., Wettimuny, S., Telesford, B., Costantino, T. & McGinn, J.T. (2011) Depression, disability, and quality of life after off-pump coronary artery bypass grafting: a prospective 9-month follow-up study. *Heart Lung.* 40:217–225.
 20. Hordern, A. (2008) Intimacy and sexuality after cancer: a critical review of the literature. *Cancer Nurs.* 31:E9–E17.
 21. Rosen RC, Cappelleri JC, Smith MD, Lipsky J, Peña BM. Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. *Int J Impot Res.* 1999;11:319–326.
 22. Mykletun A, Dahl AA, O'Leary MP, Fosså SD. Assessment of male sexual function by the Brief Sexual Function Inventory. *BJU Int.* 2006;97:316–323.
 23. Taylor JF, Rosen RC, Leiblum SR. Self-report assessment of female sexual function: psychometric evaluation of the Brief Index of Sexual Functioning for Women. *Arch Sex Behav.* 1994;23:627–643.
 24. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, Ferguson D, D'Agostino R Jr. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther.* 2000;26:191–208
 25. McGahuey CA, Gelenberg AJ, Laukes CA, Moreno FA, Delgado PL, McKnight KM, Manber R. The Arizona Sexual Experience Scale (ASEX): reliability and validity. *J Sex Marital Ther.* 2000;26:25–40.
 26. Clayton AH, McGarvey EL, Clavet GJ. The Changes in Sexual Functioning Questionnaire (CSFQ): development, reliability, and validity. *Psychopharmacol Bull.* 1997;33:731–745.
 27. Keller A, McGarvey EL, Clayton AH. Reliability and construct validity of the Changes in Sexual Functioning Questionnaire short-form (CSFQ- 14). *J Sex Marital Ther.* 2006;32:43–52.
 28. Levine, G.N., Steinke, E.E., Bakaeen, F.G., Bozkurt, B., Cheitlin, M.D., Conti, J.B., Foster, E., Jaarsma, T., Kloner, R.A., Lange, R.A., Lindau, S.T., Maron, B.J., Moser, D.K., Ohman, E.M., Seftel, A.D. & Stewart WJ (2012) Sexual activity and cardiovascular disease: a scientific statement from the American Heart Association. *Circulation.*; 125:1058–1072.
 29. Steinke, E.E. (2002) A videotape intervention for sexual counseling after myocardial infarction. *Heart Lung.* 31:348–354.
 30. Fisher, W.A., Rosen, R.C., Eardley, I., Sand, M. & Goldstein, I. (2006) Sexual experience of female partners of men with erectile dysfunction: the Female Experience of Men's Attitudes to Life Events and Sexuality (FEMALES) study. *J Sex Med.* 3:189
 31. Agren, S., Frisman, G.H., Berg, S., Svedjeholm, R. & Strömberg, A. (2009) Addressing spouses' unique needs after cardiac surgery when recovery is complicated by heart failure. *Heart Lung.* 38:284–291.
 32. O'Farrell, P., Murray, J. & Hotz, S.B. (2000) Psychological distress among spouses of patients undergoing cardiac rehabilitation. *Heart Lung.* 29:97–104.
 33. Steinke, E.E., & Swan, J.H. (2004) Effectiveness of videotape for sexual counseling after myocardial infarction. *Res Nurs Health.*; 27:269–280.
 34. Ivarsson, B., Fridlund, B., & Sjöberg, T. (2010) Health professionals' views on sexual information following MI. *Br J Nurs.* 19:1052–1054.
 35. Kostis, J.B., Jackson, G., Rosen, R. Barrett-Connor, E., Billups, K., Burnett, A.L., Carson, C. 3rd, Cheitlin, M., Debusk, R., Fonseca, V., Ganz, P., Goldstein, I., Guay, A., Hatzichristou, D., Hollander, J.E., Hutter, A., Katz, S., Kloner, R.A., Mittleman, M., Montorsi, F., Montorsi, P., Nehra, A., Sadosky, R. & Shabsigh, R. (2005) Sexual dysfunction and cardiac risk (the Second Princeton Consensus Conference). *Am J Cardiol.* 96:313–321.
 36. DeBusk, R., Drory, Y., Goldstein, I., Jackson, G., Kaul, S., Kimmel, S.E., Kostis, J.B., Kloner, R.A., Lakin, M., Meston, C.M., Mittleman, M., Muller, J.E., Padma-Nathan, H., Rosen, R.C., Stein, R.A. & Zusman, J. (2000) Management of sexual dysfunction in patients with cardiovascular disease: recommendations of the Princeton Consensus Panel. *Am J Cardiol.* 86:175–181
 37. Whipple, B. (1987) Sexual counseling of couples after a mastectomy or myocardial infarction. *Nurs Forum.* 23:85–91
 38. Seidl, A., Bullough, B., Haughey, B. Scherer, Y., Rhodes, M. & Brown, G. (1991) Understanding the effects of a myocardial infarction on sexual functioning: a basis for sexual counseling. *Rehabil Nurs.* 16:255–264.
 39. Boone, T., Kelley, R. (1990) Sexual issues and research in counseling the post myocardial infarction patient. *J Cardiovasc Nurs.* 4:65–75.
 40. Franklin, B.A., Munnings, F. (1994) Sex after a heart attack: making a full recovery. *Physicians Sports med.* 22:84–89.
 41. Steinke, E.E. (2005) Intimacy needs and chronic illness: strategies for sexual counseling and self-management. *J Gerontol Nurs.* 31:40–50.
 42. Steinke, E.E. & Jaarsma, T. (2008) Impact of cardiovascular disease on sexuality. In: Moser, D.K., Riegel, B., eds. *Cardiac Nursing: A Companion to Braunwald's Heart Disease.* St Louis, MO: Saunders Elsevier; 241–253.
 43. Lee, S., Chae, J. & Cho, Y. (2006) Causes of sudden death related to sexual activity: results of a medicolegal postmortem study from 2001 to 2005. *J Korean Med Sci.* 21:995–999.
 44. Fridlund, B. (2009) Healthy sexual life after a cardiac event: what do we know and what do we do now? *Eur J Cardiovasc Nurs.* 8:159–160.
 45. DeBusk, R.F. (2003) Sexual activity in patients with angina. *JAMA.* 290: 3129–3132.
 46. DeBusk, R.F. (2005) Erectile dysfunction therapy in special populations and applications: coronary artery disease. *Am J Cardiol.* 96:62M–66M.
 47. Carson, C.C. 3rd. (2005) Cardiac safety in clinical trials of phosphodiesterase 5 inhibitors. *Am J Cardiol.* 96:37M–41M.
 48. Gundle, M.J., Reeves, B.R. Jr., Tate, S., Raft, D. & McLaurin, L.P. (1980) Psychosocial outcome after coronary artery surgery. *Am J Psychiatry.* 137:1591–1594.

49. Kornfeld, D.S., Heller, S.S., Frank, K.A., Wilson, S.N. & Malm, J.R. (1982) Psychological and behavioral responses after coronary artery bypass surgery. *Circulation*. 66(pt 2):III24–III28.
50. Nashef, S.A. & Mackenzie, M. (1991) Sexual function after coronary surgery. *BMJ* 302:724.
51. Thurer, S.L. & Thurer, R.L. (1983) The sexual adjustment of coronary bypass surgery patients: a 4-year follow up. *Rehabil Couns Bull*. 27:108–112.
52. Djurović, A., Marić, D., Brdareski, Z., Konstantinović, L., Rafajlovski, S., Obradović, S., Ilić, R. & Mijailović Z. (2010) Sexual rehabilitation after myocardial infarction and coronary bypass surgery: why do we not perform our job? *Vojnosanit Pregl*. 67:579–587.
53. Papadopoulos, C., Shelley, S.I., Piccolo, M., Beaumont, C. & Barnett, L. (1986) Sexual activity after coronary bypass surgery. *Chest*. 90:681–685.
54. Renshaw, D.C. & Karstaedt, A. (1988). Is there (sex) life after coronary bypass? *Compr Ther*. 14:61–66.
55. Ross, A.B., Brodie, E.E., Carroll, D., Niven, C.A. & Hotchkiss, R. (2000) The psychosocial and physical impact of exercise rehabilitation following coronary artery bypass surgery. *Coron Health Care*. 4:63–70.
56. Roviario, S., Holmes, D.S., & Holmsten, R.D. (1984) Influence of a cardiac rehabilitation program on the cardiovascular, psychological, and social functioning of cardiac patients. *J Behav Med*. 7:61–81
57. Hoad, N.A. & Crawford, I.C. (1990) Rehabilitation after coronary artery by-pass grafting and improved quality of life. *Br J Sports Med*. 24:120–122.
58. Samuels, L.E., Holmes, E.C. & Petrucci, R. (2004) Psychosocial and sexual concerns of patients with implantable left ventricular assist devices: a pilot study. *J Thorac Cardiovasc Surg*. 127:1432–1435.
59. Marcuccilli, L., Casida, J.J., Peters, R.M. & Wright, S. (2011) Sex and intimacy among patients with implantable left-ventricular assist devices. *J Cardiovasc Nurs*. 26:504–511.
60. Palmeri, S.T., Kostis, J.B., Casazza, L., Sleeper, L.A., Lu, M., Nezgoda, J. & Rosen, R.S. (2007) Heart rate and blood pressure response in adult men and women during exercise and sexual activity. *Am J Cardiol*. 100:1795–1801.
61. Kavanagh, T. (1991) Exercise training in patients after heart transplantation. *Herz*. 16:243–250.
62. Keteyian, S., Shepard, R., Ehrman, J., Fedel, F., Glick, C., Rhoads, K. & Levine, T.B. (1991) Cardiovascular responses of heart transplant patients to exercise training. *J Appl Physiol*. 70:2627–2631.
63. Kobashigawa, J.A., Leaf, D.A., Lee, N., Gleeson, M.P., Liu, H., Hamilton, M.A., Moriguchi, J.D., Kawata, N., Einhorn, K., Herlihy, E. & Laks, H. (1999) A controlled trial of exercise rehabilitation after heart transplantation. *N Engl J Med*. 340:976
64. Walker, R.L., Campbell, K.A., Sears, S.F., Glenn, B.A., Sotile, R., Curtis, A.B. & Conti, J.B. (2004) Women and the implantable cardioverter defibrillator: a lifespan perspective on key psychosocial issues. *Clin Cardiol*. 2004; 27:543–546
65. Moons, P., Van Deyk, K., Marquet, K., De Bleser, L., Budts, W. & De Geest, S. (2007) Sexual functioning and congenital heart disease: something to worry about? *Int J Cardiol*. 121:30–35.
66. Rogers, P., Mansour, D., Mattinson, A. & O'Sullivan, J.J. (2007) A collaborative clinic between contraception and sexual health services and an adult congenital heart disease clinic. *J Fam Plann Reprod Health Care*. 33:17–21
67. Kautz, D.D., Van Horn, E.R., & Moore, C. (2009) Sex after stroke: an integrative review and recommendations for clinical practice. *Crit Rev Phys Rehabil Med*; 21:99–115.
68. Monga, T.N., Lawson, J.S. & Inglis, J. (1986) Sexual dysfunction in stroke patients. *Arch Phys Med Rehabil*. 67:19–22.
69. Annon, J.S. (1976) The PLISSIT model: a proposed conceptual scheme for the behavioral treatment of sexual problems. *J Sex Educ Ther*. 2:1–15.
70. Mick, J., Hughes, M. & Cohen, M.Z. (2004) Using the BETTER Model to assess sexuality. *Clin J Oncol Nurs*. 8:84–86.