



Sexual and Cardiovascular health. Factors Influencing on the Quality of Sexual Life of Coronary Heart Disease Patients - a Narrative Review

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Abstract: Regular sexual activity is comparable to moderate exercise and may be safe for patients with cardiovascular disease (CVD). According to the recommendations of the Princeton III Conference (P3), people with a low risk of adverse cardiac events can undertake sexual activity safely, while other patients must first stabilise their cardiovascular status. Exercise testing is recommended to assess the safety of sexual activity in people with questionable or uncertain cardiac risk (P3). Patients after successful and uncomplicated treatment of myocardial infarction (MI) can return to sexual activity after 3 weeks if the stress test is negative. The 4th Princeton Conference (P4) recommends the use of the 2019 regimen developed by the American College of Cardiology (ACC) and American Heart Association (AHA) to assess the risk of atherosclerotic cardiovascular disease (ASCVD) in men with ED (ACC/AHA ASCVD 2019). Sexual health education plays an important role in the successful return to safe sexual activity, which should include post-MI patients and their relatives. The responsibility for counselling lies with cardiologists, general practitioner (GP) and nursing staff. Sexual rehabilitation should be an integral part of cardiac rehabilitation, and lifestyle modification and optimal treatment of underlying medical conditions are key to maintaining psychophysical well-being and a successful sex life.

Keywords: sexual activity, cardiovascular risk factors, erectile dysfunction, Princeton consensus, myocardial infarction

Introduction

Many articles and books have been written on the subject of sexual activity. The information contained in them often concerns the sexuality of young, healthy people and has the character of a guidebook. In the medical press, the most often we come across discussions of sexual problems in the context of dysfunction. Other issues attributed to sexology are problems related to gender dysphoria and paraphilic disorders (The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)). Another group of patients are those suffering from various somatic diseases, often experiencing restrictions in their intimate lives for a variety of reasons, the breadth and diversity of which are beyond the scope of this paper. This group of patients includes those with cardiovascular disease (CVD), and it is their sexual functioning that is the focus of this article. With cardiac patients in mind, the concept of ‘cardiosexology’ was developed to address the issue of safe sexual activity in patients with CVD. The issues of cardiosexology are extensively described in a paper published by Z. Lew-Starowicz et al.¹ Most attention has been given to men with CVD, particularly ischaemic heart disease and post myocardial infarction (MI). On the sexual functioning of women with CVD, data are considerably limited, as only a few items deal with the sexual health of women after MI.²⁻⁵ The organic risk factors for erectile dysfunction (ED) and CVD are the same. These include: hypercholesterolaemia, hypertension, obesity, physical inactivity, nicotine use, and diabetes. Erectile dysfunction is an independent factor in the onset of CVD,

may be a precursor to other diseases, coexist with other health burdens such as depression, occur in the course of many conditions and can be an effect of the treatment administered. Regardless of the organic background of its occurrence, a psychological context is always present. According to current data, ED occurs in approximately half of men with angiographically confirmed coronary artery disease and precedes the onset of stenocardial symptoms by approximately three years. Furthermore, in addition to ED, low total testosterone levels, reduced frequency of morning erections and sexual fantasies may be independent predictors of major adverse cardiovascular events.⁶ A thorough history and assessment of sexual function should be a mandatory part of the cardiac examination for all men. A patient with confirmed ED, even after cardiac conditions have been ruled out, is given the status of a 'potentially cardiac' patient and is subject to periodic follow-up by a specialist.

Factors Affecting Sexual Activity in Patients With Ischaemic Heart Disease

Satisfactory sexual activity is an important aspect of life for maintaining psycho-physical well-being.⁷⁻¹⁰ Regardless of age, people who declare an interest in sex enjoy better health and are sexually active for longer. The sexual act can be likened to light/moderate physical activity, during which, in healthy people, there is an acceleration of the heart rate and an increase in blood pressure in the range of 40mmHg, an increase in the minute volume and oxygen demand of the heart muscle, which does not compromise health. A man's cardiac condition affects his physical performance, which is necessary to undertake and maintain satisfactory sexual activity. In cardiac patients, this transient mobilisation of the cardiovascular system can lead to the appearance or exacerbation of stenocardial complaints and difficulties in compensation of the oxygen debt, which can cause fear of MI or death and lead to the cessation of intimate contact altogether. Fear of deterioration of health then results in abstinence from sexual activity. As emphasised by many authors, the main factors limiting the frequency of intercourse invariably include the fear of a repeat MI including the possibility of death and, somewhat less frequently, the fear of not being able to perform in a sexual role for reasons arising from the presence of coronary artery disease itself and as a consequence of its treatment.^{2,8,11,12} In the Polish population of people with ischemic heart disease, additional factors influencing cessation of intimate contact were: lack of a regular partner, obesity, poorer quality of life, presence of a depressive syndrome, higher levels of anxiety, lower acceptance of the disease.¹³ Previous information shows that only ¼ of patients do not change the frequency of intercourse after receiving a diagnosis of ischaemic heart disease, half maintain it at a lower frequency and the remaining ¼ never take it back up again.¹⁴ The current consensus among experts is that the mere presence of CVD should not be the main determinant of sexual withdrawal, and that sexual activity should be determined by cardiovascular wellbeing, in addition to many psychological and personality determinants.

Cardiovascular Risk Assessment of Sexual Activity Undertaken Based on Consecutive Expert Consensus From the First Three Princeton Conferences

The first Princeton Consensus Conference was held in 1999 to establish a common expert position for clinical management of sexual dysfunction in patients with CVD. In order to assess the potential cardiovascular risk for sexual activity, patients were dichotomised into those at low and high risk for sexual activity and the results of the meeting were published in 2000 in the *American Journal of Cardiology*.¹⁵ Further conferences were held in 2004 and 2010¹⁶⁻¹⁸ and served to modify and improve guidelines for the management of patients with CVD and ED and the safety of phosphodiesterase type 5 inhibitors (PDE5-I) in these patients. The second conference highlighted the importance of ED as a valuable prognostic marker of cardiovascular disease and recommended periodic cardiac diagnostics in men with ED. Attention was drawn to the need to assess cardiovascular risk factors for sexual activity in patients with CVD and an additional third risk group was created. Lifestyle modification was recommended, and information was updated regarding the limitations of PDE5-I treatment for patients with ED and coexisting heart disease.^{16,17} The third Princeton Consensus Conference (P3) was based on the premise that men with ED have the same vascular risk factors for atherosclerosis that lead to CVD hence there is a need for a scheme to assess this risk. The second area of focus was the re-evaluation and modification of current guidelines for assessing the cardiovascular risk of sexual activity in patients with CVD. Attention was also given to the safety of PDE5-I

and testosterone replacement therapy in cardiac patients.¹⁸ According to P3, patients with New York Heart Association (NYHA) class II (second functional class according to the New York Cardiovascular Society) were classified as being at low risk of adverse cardiac events related to sexual activity, while those with NYHA class III were moved to a moderate risk group, as were those with stable coronary artery disease and those after MI > 6–8 weeks. The term ‘cardiac risk’ means the occurrence of significant cardiac events such as MI, acute stenocardial symptoms and sudden cardiac death.¹⁸ The experts set out principles for the management of conditions with increased CVD risk in men with ED without known CVD. These included the routine determination of total testosterone levels in men with organic ED and the use of testosterone replacement therapy at testosterone levels below 230 ng/dl. It was emphasised that in cases of testosterone deficiency, PDE5-I does not perform its function.¹⁹ If clinically indicated and in the absence of contraindications, testosterone replacement therapy for 4–6 months may be considered in cases of decreased libido and the presence of ED and total testosterone levels between 231–346 ng/dl. Longer therapy may be associated with the risk of a number of complications, particularly in men with congestive circulatory failure, over 70 years of age and burdened by chronic disease. It has been established that men over 30 years of age with ED, without symptoms of CVD are in an increased CVD risk group and require a cardiac risk assessment, which can be defined by an exercise test. An important element in the assessment of cardiovascular risk in all men with ED is a history of physical activity, as there is an association between adverse cardiac events and episodic physical and sexual activity.^{10,20} Appropriate lifestyle modification, in line with common healthy lifestyle guidelines, should also not be overlooked as a basis for the prevention of adverse cardiovascular events. Exercise tolerance can be assessed by walking 1 mile on a flat surface for 20 minutes or by nimbly climbing 2 flights of stairs in 10 seconds, the equivalent of sexual activity. If the patient has been categorised as high cardiovascular risk, they should be placed under the care of a cardiologist. Low risk requires only the implementation of education and treatment of concomitant ED. If the patient is classified as indeterminate/moderate/intermediate risk, an exercise test is required, the result of which determines the shift to low or high risk respectively, with sexual activity equivalent to 4 minutes on a treadmill according to the Bruce protocol (ie 5–6 MET’s, where 1 MET is one metabolic unit equivalent to resting oxygen consumption of 3.5mL/kg/min). The intermediate-risk patient should match their sexual activity to their somatic health. It is worth noting that sexual activity performed in a sustained relationship corresponds to 3 metabolic units (3 MET’s). In men with symptomatic peripheral arteriosclerosis and ED, the carotid artery plaque thickness test or the ankle-arm index is also performed as an alternative to the exercise test, and the risk group is verified on this basis.²¹ In all patients, periodic re-evaluation is necessary to update the degree of cardiovascular risk of the sexual activity undertaken. According to the recommendations of the P3 conference, an asymptomatic patient, after a successfully treated uncomplicated acute coronary syndrome, with a negative result of a control exercise test, can start cohabitation 3–4 weeks after the infarction. Some authors report that sexual activity can be initiated even earlier, provided that the patient does not present stenocardial symptoms with light/moderate physical activity.²² However, according to the guidelines of the third Princeton conference, patients with recent (up to 2 weeks) MI are classified as being at high cardiovascular risk and, according to the recommendations, should maintain sexual abstinence until their cardiovascular disease is stabilised. According to current knowledge, PDE5-I, which have been used for more than 25 years in the treatment of ED, are safe and beneficial from a cardiovascular perspective. They improve vascular endothelial status and exhibit vasodilatory, anticoagulant, antiplatelet and antioxidant effects. Tadalafil compares particularly favourably with all drugs in this group, having accumulated the most data on protective effects on vascular endothelial function. When choosing a particular preparation, attention should be paid to the patient’s individual needs and preferences, as well as the drug’s tolerability. However, as experts emphasise, the treatment of ED should be secondary and subordinate to cardiovascular well-being.²³ On the other hand, the appropriate choice of cardiovascular drugs should not be overlooked and those that do not impair sexual function should be used. Safe drugs from a sexological point of view include nebivolol as the preferred beta-blocker, angiotensin-converting enzyme inhibitors, sartans, eplerenone and some reports report benefits from the combination of statins with PDE5-I. Alternatively, lifestyle changes and improvements in the quality of the relationship which, consequently, leads to improvement of the sexual relationship

Findings of the Expert Panel of the 4th Princeton Conference (P4)

In March 2023, an interdisciplinary group of scientists at The Huntington Medical Research Institutes in Pasadena, California, met for the fourth time (Princeton IV Conference, P4) to update the management algorithm regarding the cardiovascular risk assessment of sexual activity in men with CVD and to establish new recommendations for the treatment of ED in men at risk of developing CVD. The expert group consisted of cardiologists, urologists, sexologists and senior investigators in men's health. The meeting was dedicated to pioneering research into the sexual health of men with ED. Dr Graham Jackson.²⁴ It was detailed that EDs are both a risk marker and a risk-enhancing factor for atherosclerotic cardiovascular disease (ASCVD). ED are considered to have strong predictive value for future cardiovascular events.²⁵ In addition to this (as already established at the earlier Princeton Conference), the P4 panel agreed that ED is still rarely recognised and underestimated in the context of a risk factor for future CVD events. While P3 prioritised stratification of potential cardiovascular risk based on the Framingham Risk Score, and in the context of 40–60 year old men, experts at the recent conference proposed the use of the scheme on atherosclerotic disease risk assessment based on the 2019 American College of Cardiology/American Heart Association (ACC/AHA) guidelines to assess cardiovascular risk for all men with ED who need to undergo such an assessment.²⁶ In men with ED and a mean 10-year risk score determined in accordance with previous recommendations, further risk should be estimated using a coronary artery calcium (CAC) score. Based on the measurement obtained, the risk group is determined and a decision is made whether to start treatment with statins.²⁶ Patients at borderline to moderate risk of cardiovascular events should have their CAC assessed by computed tomography (CT) scan and further management decided. The need for a history of cardiovascular disease and risk factors regardless of the causal substrate of ED was emphasised. Thus, it was noted that even psychogenic ED can be a harbinger of CVD. If ED require treatment and patients engage in sexual activity, they can be categorised into one of four groups: low, intermediate, indeterminate or high risk for sexual activity. If a patient has good exercise tolerance on a treadmill and is classified as low risk, they can be treated for ED with PDE5-I, provided they are not taking nitrates or riociguat. The appropriateness of nitrates should also be reviewed and, if possible, substituted with other antihypertensive drugs. If nitrates are not necessary, consider discontinuing them and trying PDE5-I for the treatment of ED, which is new since P3. All high-risk patients should be under the close care of a cardiologist. It is worth mentioning at this point that recent studies from the last 3 years report that there is no significant association between concomitant use of nitrates and PDE5-I and cardiovascular side effects, ie concomitant use of PDE5-I and nitrates is not necessarily associated with an increased risk of cardiovascular disease. There was no difference in the rate of cardiovascular complications in patients with prescriptions for nitrates and PDE5-I compared to those with prescriptions for nitrates only.^{27,28}

Guidelines for the management of patients with ED and unknown/undetected CVD and diagnosed CVD are shown in Table 1 (Table 1). The expert panel also expressed its opinion on women, concluding that PDE5-I are also safe in women, as indicated by numerous studies, but that the FDA (Food and Drug Administration) has so far only approved the use of these drugs in pulmonary artery hypertension in women.

Selected Aspects of Sexual Functioning in Patients With Cardiovascular Disease - Facts and Myths

Sexual activity effort and its associated cardiovascular consequences account for less than 1% of all acute myocardial ischaemia incidents.²⁹ However, the fear of having another heart attack or even dying during intercourse has long been a major reason for not engaging in intimate contact even in stable, long-term relationships. The fear of compromised health during sexual activity is further compounded by the distorted information about deaths during it that appears in the media and arouses both horror and curiosity. The fact is that the risk of ischaemia during sexual activity is very low if a person can achieve ≥ 3 –5 MET of energy expenditure during an exercise test without ischaemia.²¹ The available literature suggests that sexual activity undertaken after an interruption is associated with an increased risk of major cardiac episodes compared to periods of time without such activity in patients with cardiac disease. However, this risk, associated with one hour of sexual activity per week, has been estimated at 2–3 cases per 10,000 people/year.²⁰ An exacerbation of coronary artery disease symptoms within minutes or hours following sexual activity is known as

Table 1 Management Scheme for Patients With ED and Unknown/Undetected Cardiovascular Disease and Diagnosed CVD. Cardiovascular Risk Assessment of Sexual Activity. As Recommended by the Princeton IV Conference - P4 (Princeton IV Consensus Guidelines)

Men with ED and unknown CVD	<p>I. Regarding vascular ED: Assess 10-year ASCVD risk based on risk assessment according to the ACC/AHA ASCVD 2019 guidelines (applies mainly to men 40–79 years). Score of 5–20% (at borderline moderate risk) CAC score CAC equal to 0: lifestyle change. CAC 1–100: lifestyle modification and inclusion of moderate-to-high-intensity statins and control of other CVD risk factors (hypertension, diabetes, nicotine). CAC >100: high-intensity statins, control of other CVD risk factors, low-dose aspirin for consideration, cardiology consultation for prevention.</p>
Men with ED and confirmed CVD	<p>I. assessment of the patient's exercise ability for age in order to define the risk of having a cardiac event during sexual activity (low, intermediate or indeterminable, high risk): intermediate or indeterminable risk: possibility of additional tests to determine exercise capacity based on exercise stress testing or a chemical stress test (such as dobutamine echocardiogram or chemical nuclear stress test). Low risk: achieving 5–6 METS (within 4 minutes in a standard treadmill test according to the Bruce protocol) without ischaemia. Possible therapy with PDE5 inhibitors. If nitrates are used, review the indications for their use. High risk: Symptoms of ischaemia, especially with light exercise. Cardiological consultation required. Feasibility of revascularisation procedures before risk re-classification.</p>

Notes: *modified and simplified based on the criteria of the Princeton Consensus 2023 (P4) (Kloner et al.).

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; ACC/AHA, American College of Cardiology/American Heart Association; CAC, coronary artery calcium; CVD, cardiovascular disease; ED, erectile dysfunction; METS, metabolic equivalents of task; PDE5, phosphodiesterase type 5.

angina d'amour or coital angina, which is responsible for less than 5% of all exacerbations of the disease.^{29,30} This is most common in men with a history of severe coronary artery disease, in whom angina pain occurs after minimal exercise. However, as already noted at the end of the last century, the relative risk of exacerbation of angina symptoms associated with sexual activity increases only during the first 2 hours after intercourse and applies to physically inactive men as opposed to those who exercise at least twice a week. For women, the risk is even lower. In contrast, the so-called 'sweet death' is a term for a specific situation that leads to sudden death due to these symptoms. According to most available sources, it accounts for between 0.6% and 1.7% of all sudden cardiac deaths, and its risk associated with an extra hour of sexual activity per week is estimated to be less than 1 in 10,000 people/year.²⁰ Its occurrence is favoured by making love with a younger partner in an unfamiliar place, after a hearty meal and a large dose of alcohol usually as part of extramarital activity, also with an erotic service provider and interestingly during masturbation.³¹

Sexual Activity After Myocardial Infarction

A positive correlation was observed between the intensity of anxiety and depression symptoms and the presence of sexual dysfunction in women after their first ever MI. The prevalence of sexual dysfunction is significantly higher in them and the frequency of intercourse significantly lower compared to a control group of healthy women.^{5,32}

Issues related to the sexual functioning of younger people with CVD have not received much study. A study published in 2018 that looked at the health behaviours and eating habits of the US population found that 94% of respondents aged 40 to 59 were sexually active, with those with coronary heart disease and a history of MI engaging in intimate intercourse less frequently compared to those without cardiovascular burden. The authors of the cited article emphasise that 30% of all participants and 41.5% with heart disease report sexual activity less frequently than once a month. Not engaging in intercourse is favoured by smoking, stenocardial pain when walking uphill, identifying as obese, experiencing depression, shortness of breath, and the impact of medication. Men and people in stable relationships regardless of cardiovascular burden engage in sexual activity.³³ Earlier reports have focused on assessing the sex lives of young adults up to a year after MI.^{34,35} In younger people (mean age 48 years), 70% of women and 85% of men are

sexually active, with 57% of women and 51% of men declaring at least 1 problem from the sexual sphere in this time frame. In women, complaints of impaired desire and lubrication predominate, in men it is mainly related to hypolibidemia, problems reaching orgasm and ED.^{34,35} In addition, diabetes and a higher sense of stress appear to have a significant impact on reducing the frequency of intimacy within a year of MI. It is also noteworthy that impairment in this sphere and the dysfunction that occurs as a result are more frequent among young women compared to men in this age group.³⁴ In contrast, a randomised study among a Danish population of cardiac patients in a wider age range reported the opposite relationship. Sexual dysfunction was observed in 55% of men and 29% of women, and in men it was positively associated with age, the presence of hypertension, diabetes, heart failure, beta-blocker intake, and the severity of anxiety and depression symptoms. In women, on the other hand, it was significantly associated only with the level of anxiety. The authors of the cited article also highlighted the lack of sufficient education and counselling in this area for both genders.³

Women in stable relationships returned to sexual activity 4 weeks after the MI, despite fears of another cardiac incident and the lack of specific guidance from the treating cardiologists. Those who raised issues of sexual functioning after a MI initiated the conversation themselves although they expected active support from the doctor in this area.² Both women and men reported satisfaction with intimate relationships although they had sex less frequently after their first MI. For men, sexual activity was no longer such an important part of life; the sexual act itself lasted shorter and did not provide as much satisfaction as before. The authors of this study concluded that the experience of a MI had a greater adverse effect on sexual functioning in men, with women already assessing its quality worse than men at baseline.³⁶ Women complained of a reduction in the frequency of intercourse, a lack of satisfaction with the sexual relationship, and reported doubts about resuming because of fear of reinfarction or sudden death during sexual contact. In addition, they perceived a lack of knowledge and reluctance of health care professionals to educate them on the subject.⁴

Secondary Prevention: How to Support the Cardiac Patient in a Safe Return to Sexual Activity

The literature on this issue addresses the role of rehabilitation, sexual education and counselling in the sphere of sexual functioning for patients with CVD. It is still unclear who exactly should be responsible for providing patients with reliable information that is in line with current medical knowledge about the possibility of returning to smooth and safe intimate functioning after a MI. Both the cardiologist and the general practitioner (GP) seem to have equal roles here. Some authors suggest that a sexologist should also be invited to collaborate, which could enrich the diagnostic and treatment process. Urologists, endocrinologists and nursing staff also play an important role.^{4,37,38}

Among patients who discussed sexual activity with their doctor one month after a MI (12% of women and 19% of men), 68% were given restrictive recommendations, not supported by medical evidence or guidelines from scientific societies. Of these, 35% were to restrict sexual activity, 26% were advised to take a passive role and 23% were to monitor their heart rate and keep it low during intercourse. Women, older people and those who had been sexually inactive in the year before their MI were less likely to discuss their sex life with their GP. Therefore, the authors of the cited article recommend that physicians do not underestimate those post-MI patients who need to be educated about sexual issues, and even offer counselling regardless of the patient's initiative, ie take an active role in this interaction.³⁵ The same authors, in another publication, emphasise the importance of modifiable risk factors and education for patients' sexual health.² A similar position is also taken by many other authors.^{7,8,13,32,37,39,40} Cardiologists do not discuss sexual activity and problems in patients' intimate lives due to several key factors. These are lack of initiative on the part of the patient (54%), time constraints (43%) and insufficient knowledge or lack of training in the treatment of sexual dysfunction (35%). Only 16% of respondents admitted that they regularly discuss difficulties in sexual functioning with their patients.⁴¹ Some researchers point out that a recommendable tool that can be used by professionals to engage in a conversation about sexuality after a MI is Sex After Myocardial Infarction Knowledge Test.^{37,42} Another study found that resumption of sexual activity within the first few months after a MI was associated with a significant improvement in long-term survival.⁷ In addition, a study of the Israeli population after a first heart attack showed that more frequent

sexual activity is associated with lower mortality rates.⁴³ For this reason, there is a need for prompt counselling and sex education immediately after an acute coronary syndrome, which is a key element of secondary prevention.^{7,40,43}

It has been observed that increasing sexual health knowledge in post-MI patients clearly improves the quality of their sexual life. One year after MI, the level of knowledge of the patients increases, but in their partners it does not change significantly compared to one month after the acute cardiac incident. Both patients and their relatives complain about insufficient information gained during medical visits regarding sexual health and sexual activity. Their quality is far below patients' expectations.⁴⁴ The authors of the cited paper support the implementation of counselling in this area. Similarly, sex education is promoted by other researchers, analysing a number of articles.^{45,46}

Regular exercise and cardiac rehabilitation can reduce the risk of cardiac complications associated with sexual activity in patients with ischaemic heart disease.²² In patients in cardiac rehabilitation units, knowledge regarding the possibility of undertaking sexual activity and the safety of ED pharmacotherapy after MI is insufficient. A higher level of knowledge is associated with: younger age, higher level of education, lower severity of ED, presence of dyslipidaemia, better exercise tolerance, more intense weekly physical activity and lower left ventricular end-diastolic dimension and treatment with percutaneous coronary angioplasty. Smoking, on the other hand, is associated with lower levels of knowledge.⁴⁷

There are a number of studies on patients undergoing cardiac rehabilitation. Far fewer publications refer to the sexual rehabilitation of patients with CVD. Studies show that sexual rehabilitation can accelerate the return to sexual activity in people who have undergone MI and have been treated with percutaneous coronary angioplasty.⁴⁸ People with stable coronary artery disease who plan to be sexually active should consider cardiac rehabilitation, which includes regular exercise.²² The return to full sexual performance is an important goal in secondary prevention.³⁹ Supporting cardiac patients to transcend barriers in the intimate sphere after MI is also a challenge for nurses who view sexual functioning more broadly, both from the perspective of the patient and the sexual interaction partner.^{4,37} In male/female partners, decreased sexual activity one year after MI is associated with decreased desire, difficulty achieving orgasm, and overall satisfaction with sex life compared to one year prior to MI.^{8,49} In women, it is particularly important to consider the possibility of anxiety symptoms that may negatively affect their sex life after a heart attack.⁵

Summary

Regular sexual activity corresponds to moderate exercise over a short period of time. Problems with sexual functioning are common in post-heart attack patients. It is recommended that people with cardiovascular disease undertake sexual activity only after assessment of their physical condition. According to the recommendations of the Princeton III Conference (P3), patients with a low risk of adverse cardiac events can safely engage in sexual activity because their risk is comparable to the healthy population, whereas other patients require stabilisation of their cardiovascular status before engaging in/resuming intimate contact. Exercise testing is a recommended form of assessing the safety of sexual activity in patients with questionable or uncertain cardiac risk (P3). Patients after successful revascularisation with a negative exercise test result as early as 3 weeks after MI can return to sexual activity. It is worthwhile to determine testosterone levels in all men with organic ED. A history of myocardial infarction is not a contraindication to treating ED with PDE5 inhibitors, and the use of these drugs is most often safe and effective and clearly improves men's quality of life. The main findings from the 4th Princeton Conference relate to the use of the ACC/AHA ASCVD 2019 regimen to estimate cardiovascular risk for all men with ED, burdened by CVD. In men with ED at borderline moderate risk, further risk should be assessed using CAC. ED are considered to have strong predictive value for future cardiovascular events. Treatment of sexual functioning problems should be an indispensable part of cardiovascular care, which requires adequate knowledge and involvement of the treatment team. Sexual health education should include not only post-MI patients, but also their relatives. The responsibility for counselling lies with both cardiologists, GPs and nursing staff, who could be the first to break down barriers related to sexuality in cardiac patients. Sexual rehabilitation should be universal and an integral part of cardiac rehabilitation. Lifestyle modification, optimal treatment of underlying diseases and elimination of removable risk factors for CVD and sexual dysfunction are also extremely important. Sexual rehabilitation of cardiac patients requires an integrated approach that restores patients' comfort, confidence and ability to enjoy intimate life despite existing health problems. [Table 2](#) shows the elements of sexual rehabilitation for cardiac patients and the proposed further action ([Table 2](#)).

Table 2 Elements of Sexual Rehabilitation of Cardiac Patients and Directions for Action

Elements of sexual rehabilitation of cardiac patients	
1. Education of patient and partner	<ul style="list-style-type: none"> o Explaining the impact of heart disease on sexual life. o Informing about the safety of sexual activity and how to minimise risks. o Advice on reducing stress and anxiety about sexual activity.
2. Assessment of the patient's health	<ul style="list-style-type: none"> o Analysis of physical fitness and general cardiovascular health. o Assessment of the risk of cardiac complications during exercise related to sexual activity.
3. Psychological support	<ul style="list-style-type: none"> o Working with a psychologist to reduce anxiety and stress. o Treatment of depression, which often coexists with heart disease and negatively affects sex life.
4. Pharmacotherapy	<ul style="list-style-type: none"> o Assessment of the impact of cardiac medications used on sexuality o Proper treatment of erectile dysfunction
5. Physiotherapy and exercise	<ul style="list-style-type: none"> o Exercise programme to improve physical performance, resulting in safer sexual activity. o Learning relaxation techniques to reduce stress associated with physical activity.
6. Support for couples	<ul style="list-style-type: none"> o Couples therapy to understand and accept changes in the sexual sphere. o Learning to communicate about needs and expectations.
Sexual rehabilitation of cardiac patients - directions for action	
1. Individualised approach	o Each patient has different needs and limitations that require an individualised rehabilitation plan.
2. Holistic approach	o Consideration of physical, psychological and social aspects in the rehabilitation process.
3. Multidisciplinary integration	o Collaboration between cardiologist, psychologist, physiotherapist, sexologist and nurse.
4. Promotion of healthy lifestyles	o Reduction of cardiovascular risk factors
5. Education on safe practices	<ul style="list-style-type: none"> o Informing about positions and techniques that can minimise physical exertion. o Explaining when to avoid sexual activity

Disclosure

The authors report no conflicts of interest in this work.

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