

7. Management of Cardiac Rehabilitation

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7.1. Staffing

The successful delivery of cardiac rehabilitation service requires a multidisciplinary team of professionals with appropriate qualifications and experience. Optimally, a cardiac rehabilitation team should comprise [1]:

- A cardiologist (serving as the medical director);
- Exercise specialists (physiotherapists, exercise physiologists);
- Nurses;
- A psychologist;
- A nutritionist;
- A social worker;
- A smoking cessation specialist;
- Other physicians (physiatrist, cardiac surgeon, vascular surgeon).

The staff included will depend on local recommendations, staff availability, or the phase of cardiac rehabilitation. It is essential to assign specific duties to all staff members regarding staff competencies [2]. The cardiologist should serve as the medical director/be in charge of the cardiac rehabilitation department and should have sufficient experience with and profound knowledge of the management of cardiac rehabilitation centers. Medical director responsibilities include:

- establishing policies and procedures;
- coordinating emergencies;
- conducting daily briefings;
- adjusting exercise prescription;
- supervising medical procedures.

The position of medical director requires adequate organizational skills and experience to organize the program appropriately. The cardiologist evaluates a patient before commencing an exercise program, stratifies the cardiovascular risk, manages risk factors, and supervises exercise tests. Physiotherapists are responsible for the safe early mobilization of all eligible patients during phase I of cardiac rehabilitation, which typically occurs within an intensive care unit, coronary care unit, cardiology department, or cardiac surgery department. During supervised exercise sessions, exercise specialists are responsible for the proper implementation of exercise intensity and cooperate closely with a cardiologist in order to progress exercise training. Typically, one exercise specialist supervises five to ten low- or

intermediate-risk patients, and for high-risk patients the ratio should be lower [3]. For safety purposes, it is essential for at least two healthcare professionals to stay at the exercise training area during each exercise session. Nursing staff play an important role in managing medical emergencies and are usually responsible for education regarding diet, physical activities, and control of risk factors. The tasks of nutritionists include the assessment of nutritional status and dietary counseling, which is of particular importance in case of patients with diabetes and dyslipidemia. Psychologists conduct screening for psychosocial abnormalities—i.e., depression, anxiety, and post-traumatic stress disorder. Additional tasks of psychologists include the management of stress workshops and instructing patients regarding relaxation techniques. If available, social workers facilitate social reintegration and deliver vocational counseling in close cooperation with cardiologists [4]. Regular meetings of personnel—e.g., every week—are essential and provide the opportunity to discuss patient treatment plans or complex clinical cases in detail.

7.2. Facility

Cardiac rehabilitation facilities should provide dedicated consultation, exercise, and education areas [1]. Consultation areas are utilized for medical assessments and investigations (e.g., echocardiography), psychological evaluations, and interventions. Exercise facilities/gymnasiums with equipment for the assessment of functional capacity and exercise training should allow for appropriate space around patients and equipment—i.e., 3.0 to 4.0 sq. m per individual [4]. There should be appropriate space for conducting the six-minute walk test. The exercise area should be covered with a non-slip floor surface and should provide temperature and humidity control (with an optimal temperature of about 22 °C). A source of water should be available on site for all exercising patients. Monitoring equipment must be available during exercise for patients at high risk, whereas low-risk patients do not need monitoring in most cases [3]. Educational areas should allow for group education/intervention and should include TV presentations and educational booklets. Centre-based phase II cardiac rehabilitation facilities should include a reception, waiting area, changing rooms with separate toilets, showers, and lockers for patients, as well as offices and toilets for personnel. An emergency call system should be available in all exercise areas. Participants with disabilities should have full access to all cardiac rehabilitation facilities.

7.3. Equipment

The equipment in cardiac rehabilitation centers can be utilized for clinical assessment, exercise testing and training (for both endurance and strength), medical evaluation, and in the case of medical emergencies [1]. The equipment used for the assessment of clinical status and the measurement of vital signs typically includes a

sphygmomanometer; ECG monitoring and heart rate monitoring; a digital oximeter; a blood glucose meter; equipment for measuring height, and a weight scale.

For medical evaluation, echocardiography machines and ECG Holter monitoring equipment on site are essential. Mandatory emergency equipment in the exercise area comprises an automated external defibrillator with ECG printout, portable oxygen with nasal cannula and face mask, intubation equipment, and portable suction equipment [2].

Endurance exercise training can be performed on calibrated leg cycle ergometers, treadmills with speed and grade control, arm ergometers, elliptical machines, or rowing machines. As a minimum, treadmills and cycle ergometers should be available. Strength training equipment should include multi-weight machines, dumbbells, and elastic bands [5].

7.4. Documentation

Each patient should have an individual record with sufficient information.

Records must be completed after each session and should include [1,5]:

- Patient's data;
- Referral form;
- Medical history and physical examination report completed on admission;
- Other assessments (nutritional, psychological);
- Diagnostic tests reports;
- Informed consent for treatment;
- Progress notes.

Functional capacity assessments and the patient's progress in exercise training should be documented.

Exercise test reports should include the test modality and protocol, test duration, heart rate and blood pressure values (at rest, maximal exercise, and following exercise cessation), functional capacity assessment, reason for test termination, rate of perceived exertion, ECG analysis, and clinical interpretation [6]. Cardiopulmonary testing reports should include gas exchange and ventilatory data at peak exercise and at ventilatory threshold (if determined) in absolute values and as percentages relative to a reference [7]. Exercise sessions documentation should be completed after each training session and should include the recording of vital signs and exercise parameters—i.e., exercise modality, intensity, total session duration, and potential clinical complications [5]. Administrative records (organizational chart, policies and procedures, qualification, and health records of personnel) should be kept in a safe location.

7.5. Medical Emergencies

Properly conducted cardiac rehabilitation is safe, with a very low risk of major adverse events risk documented—i.e., 1 cardiac arrest per 116,906 patient-hours [8]. However, the potential for unpredictable complications still exists. Therefore, it is crucial for cardiac rehabilitation personnel to appropriately manage medical emergencies. All patients should be routinely screened before each exercise session regarding their change in clinical status, the presence of symptoms since the last training session, their change in heart rate and/or blood pressure, any gain in weight, or changes in their medication regimen.

Cardiac rehabilitation personnel must be familiar with the local protocol for specific emergencies—in particular, cardiac arrest—and chest pain [1]. Guidelines for managing emergencies should be included in program policies and procedures. All incidents must be adequately documented in the patient's chart. Emergency equipment should be immediately available to the exercise area. Emergency carts, resuscitation equipment, and medications must be checked regularly, and defibrillators must be checked daily before sessions commence [2]. All cardiac rehabilitation team members should have completed a valid basic life support course and at least one team member should have completed a valid advanced cardiac life support course. All emergency policies and procedures should be regularly reviewed by the program medical director, and regular emergency drills should be conducted.

References

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