



Cardiac Rehabilitation in the Modern Era of Cardiology



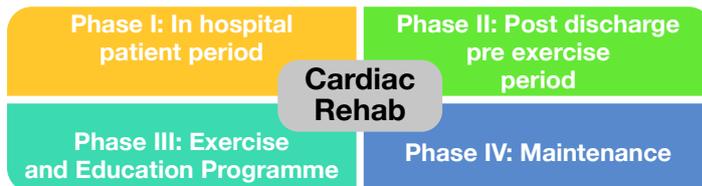
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Mr Gallagher works primarily with Beaumont Hospital's multi award-winning CR programme which is internationally recognised as a centre of excellence for cardiac rehabilitation and secondary prevention. In 2020, he was instrumental in Beaumont becoming the first CR centre in Europe to successfully achieve AACVPR Programme Certification. He was also selected by the World Health Organization (WHO) to represent Ireland on a panel of international experts to compile guidelines for improving CR access in low-income countries. His clinical and research interests include behavioural cardiology, insomnia, medication adherence and quality improvement in cardiac care.

Cardiac Rehabilitation (CR) is a multi-component outpatient model of care for the secondary prevention of cardiovascular disease and is a Class 1A recommendation for patients with acute coronary syndrome (ACS) and heart failure (HF). Systematic reviews continue to demonstrate that CR participation decreases mortality and hospitalizations in cardiac patients, as well as improvements in psychological distress (e.g. depression, anxiety) and quality of life.

A common misconception is that CR is a supervised exercise programme, however the core components of comprehensive CR encompass patient assessment, physical activity counselling, exercise training, diet/nutritional counselling, risk factor control, patient education, psychosocial management and vocational counselling for return to work. These CR components operate synergistically and while exercise training is central to reducing mortality and morbidity, the psychological component of CR also drives reductions in these outcomes.

From the patient perspective, CR allows people to recover fully after a cardiac event (e.g. myocardial infarction) and to actively return to their lives as quickly as possible. As patients safely progress through CR, their confidence increases, and they are supported by the CR team to take maximum responsibility for their own recovery. This empowers patients to proactively manage their



health, to manage symptoms and to reduce the risk of future cardiac events.

Cardiac Rehabilitation (CR) In Beaumont Hospital

Beaumont Hospital's multi award-winning CR programme delivers the largest annual patient volume in Ireland and is internationally recognized as a centre of excellence for CR and secondary prevention. Patients are provided with a high concentration of multi-disciplinary expertise and can access support at several points throughout the continuum of care. Modelled on the Mayo Clinic 'high performance' CR programme, Beaumont Hospital is also the first CR Centre in Europe to successfully achieve AACVPR accreditation.

Continuum of Care

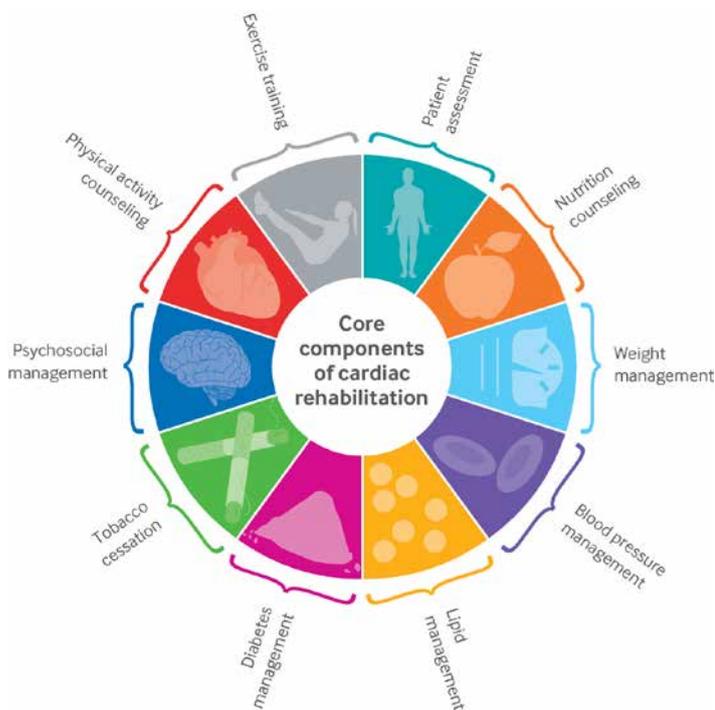
CR begins in Coronary Care (Phase 1), which is a particularly vulnerable time for newly diagnosed patients. All eligible patients are systematically referred to CR and before discharge, a dedicated CR nurse (CR Coordinator) meets with each patient to discuss the CR programme and promote participation. During this beside consultation a relationship is established, and the patient learns about CR (benefits, enrolment process) and any barriers to participation are identified and discussed. Patients also have an opportunity to discuss their health-related worries and fears at this point, and a referral to the cardiac psychologist may be arranged. Each patient is further advised on how to manage their condition upon discharge (e.g. appropriate physical activity, responding to

dangerous symptoms), and this is reinforced with corresponding educational literature. Finally, patients are provided with an initial CR appointment, and the CR nurse also serves as a contact person should they have any cardiac concerns (e.g. medication side-effects) in the period before commencing the CR programme (Phase 2). Soon afterwards the patient attends the hospital-based outpatient CR programme (Phase 3).

CR Programme (Phase 3)

Beaumont Hospital's streamlined CR programme operates at capacity with 8 CR groups per day running hourly from 8:00am to 4:00pm. At the outset, a comprehensive assessment of each patient is undertaken (including risk assessment) aided by an exercise stress test (EST). Each patient is provided with an individualised exercise prescription and cardiac monitoring (telemetry) is used to ensure that patients exercise with confidence and safely increase their exercise intensity during CR. Close monitoring of heart rhythm, blood pressure, lipids and glucose tolerance are conducted throughout the CR programme. Cardiovascular risk factors are appropriately managed during CR and medications are reviewed in a dedicated cardiology clinic as necessary.

CR attendance (i.e. number of exercise sessions completed) is strongly associated with lower mortality in a dose-response manner. In Beaumont Hospital, patients attend a 10-week group exercise programme three times weekly (30 supervised exercise sessions) in conjunction with 1-2 education sessions





per week delivered by either a nurse, dietitian, pharmacist or psychologist. The Medical Director supervises the quality of care provided by the CR team and integrated care is ensured by seamless cooperation between members of the multidisciplinary team (MDT).

For example, the CR team routinely screen for modifiable barriers to medication adherence (e.g. concerns about medicines, forgetting) which can then be followed up by the pharmacist and/or cardiology clinic. This 'no-blame' patient-centred intervention allows for treatment to be optimised before the patient completes the CR programme.

At the end of the CR programme patients are re-assessed and undergo repeat exercise testing. A summative discharge letter outlining the patient's progress and long-term prevention plan is then sent to the attending GP and cardiologist. To maintain the gains achieved during CR patients may also be referred to a community-based exercise maintenance programme (Phase 4) and/or linked in with the Irish Heart Foundation Patient Support Network.

Psychological Support during Cardiac Rehabilitation

Psychological distress is highly prevalent in patients with CVD, and cardiac patients with psychological disorders suffer two-fold greater rates of morbidity and mortality on top of their distress, versus cardiac patients without. In addition to anxiety and depression, posttraumatic stress disorder (PTSD), insomnia and anger / hostility are frequent concomitants of cardiovascular

disease and are similarly associated with poorer prognosis.

International guidelines recommend that comprehensive CR programmes provide psychological interventions to promote patients' psychosocial well-being to address this excess risk. It is important that evidence-based psychological interventions are delivered in CR (e.g. cognitive-behavioral therapy), by appropriately trained mental health professionals (e.g. psychologists), and that patients are followed in a stepped manner through to remission. Psychiatric medications are also effective, and many are established as safe in cardiac patients.

Beaumont Hospital has a dedicated Cardiac Psychology service which is fully integrated with the CR programme. All patients routinely meet with the psychologist at the beginning of CR, and this enables timely identification of patients at increased risk of psychological difficulties. As well as affording each patient the time and space to tell their individual story, patients identify the role of the psychologist as an integral component of CR. This normalises the inclusion of psychological issues in cardiac care and ensures high levels of patient engagement.

As part of a stepped-care pathway, we also offer patients a comprehensive *Stress Management Training (SMT) Programme* specifically designed for cardiac patients. This multicomponent intervention combines psychoeducation, group support and cognitive behaviour therapy for groups of

10-12 patients. Patients learn a range of relaxation techniques and psychological skills targeting anxiety, sleep and anger/ hostility. Importantly, this stress management model has been shown to provide an *incremental* benefit on hard cardiac endpoints (morbidity, mortality, hospitalizations) when combined with CR.

Beaumont Hospital have also developed a comprehensive *Heart Failure Self-Management Programme* to support patients living with HF, including those unable to participate in exercise-based CR. Our 'UPBEAT' programme targets the health of both patients and their caregivers (e.g. caregiver burden) and has been shown to be effective in improving HF self-management, psychological distress and medication adherence in patients living with HF.

Finally, all patients are reviewed by the psychologist at the end of the CR programme. For patients requiring additional support at this point, treatment options are discussed with the patient and onward referrals are made as appropriate (e.g. cardiac psychology referral, GP, community mental health team and/or cardiac support group).

CR Outcomes

Continuous clinical audit has demonstrated the effectiveness of Beaumont Hospital's CR programme in improving both clinical and patient reported outcomes (PROs). Psychometrically robust

measures (validated in cardiac populations) were used to evaluate improvements in psychological distress, quality of life and patient satisfaction with cardiac care.

The CR referral rate was 92% with a subsequent CR enrolment of 61.2% of eligible patients. The 'dose' of exercise (CR adherence) obtained by patients was also high. 79% (23.7 sessions) of all CR exercise sessions were attended by patients, and the dropout rate was exceptionally low at 7%.

33% of patients had their medications reviewed / adjusted in the CR Cardiology Clinic. Furthermore, whereas only 49% of patients were meeting blood pressure targets at CR baseline, 75% of patients achieved this target after CR. 21% of patients also evidenced an improvement in medication adherence.

29% of patients of CR patients at programme entry reported clinically significant depressive symptoms, and this figure reduced to 6% by the end of CR, representing an 80% improvement. Significant improvements in health-related quality of life were also observed, in addition to high levels of patient satisfaction with care.

CR During Covid-19 Pandemic

Beaumont Hospital's CR programme is continually innovating, and patient feedback has been systematically incorporated to enhance and/or redesign healthcare delivery. By responding directly to patients' needs and leveraging technology, our CR programme has evolved to provide several unique service features (e.g. behavioural treatment of insomnia, body composition analysis) and alternative models of CR delivery (e.g. home-based CR & telehealth). These innovations have enabled an agile response to the recent COVID pandemic whereby we successfully mitigated the impact of disruptions in care to this high-risk population.

In addition, by working closely with our infection control colleagues we were also able to adapt our existing CR model via the implementation of rigorous safety measures and protocols. This ensured that we were able to support cardiac patients both medically and psychologically throughout the ebb and flow of COVID-19.

