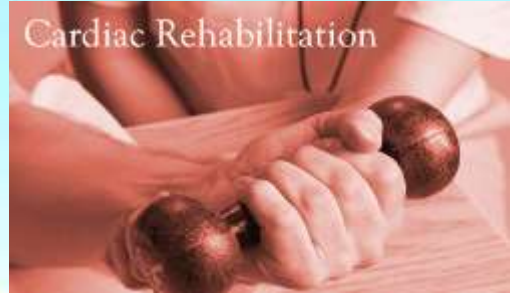


Cardiac Rehabilitation

Cardiac Rehabilitation



"Integrated Treatment to regain physical function, promoting emotional adjustment, secondary prevention of cardiac events and lead active life."

What is Cardiac Rehabilitation?

- Cardiac rehabilitation is a comprehensive exercise, education, and behavior modification program designed to improve the physical and emotional condition of patients with heart disease.
- Prescribed to control symptoms, improve exercise tolerance, and improve overall quality of life.
- The primary goal of cardiac rehabilitation is to enable the participant to achieve his/her optimal physical, psychological, social and vocational functioning through exercise training and lifestyle change.

- World Health Organization classifies CR as 'The sum of activities required to influence favorably the underlying cause of the disease, as well as to ensure the patient the best possible physical, mental and social conditions, so that they may, by their own efforts, preserve or resume when lost, as normal a place as possible in the life of the community' (World Health Organization, 1993).

Evidence Supporting the Guidelines

- Decreases Mortality at up to 5 years Post Participation
- Decreases Cardiovascular Events
- Improves Modifiable Risk Factors
- Improves Adherence with Preventive Medications
- Improves Function and Exercise Capacity
- Improves Quality of Life
- Fosters Lifelong Healthy Behaviors

Core Components of Cardiac Rehabilitation

- Prescribed exercise to improve cardiovascular fitness without exceeding safe limits
- Education about heart disease along with counseling on ways to stabilize or reverse heart disease by improving risk factors
 - Reduction/Cessation of Smoking
 - Lipid Management
 - Controlling High Blood Pressure
 - Weight Loss/Control
 - Improve/Manage Diabetes
 - Increasing Physical Activity
- Encourage Healthy Eating Habits
- Improve Psychological Well Being

Goals of Cardiac Rehab

- Identify, modify, and manage risk factors to reduce disability/morbidity & mortality
- Improve functional capacity
- Alleviate/lessen activity related symptoms
- Educate patients about the management of heart disease
- Improve quality of life
- Daily Activities → Active lifestyle
- Emotional/Psychological adjustment
- Risk Factor Reduction
- Smoking cessation



Goals of Cardiac Rehabilitation

- Limit the adverse physiologic effects of cardiac illness
- Limit the adverse psychological effects of cardiac illness
- Reduce the risk of sudden death or reinfarction
- Control cardiac symptoms
- Stabilize or reduce atherosclerosis
- Improve functional capacity
- Enhance psycho-social and vocational status



Target Patient Groups

- Following Myocardial Infarct
- Post CABG
- Percutaneous Coronary Intervention
- Chronic Stable Angina
- Congestive Heart Failure
- Pacemaker/Valve surgery
- Valvular heart disease
- Peripheral arterial disease
- Cardiovascular prevention in women



PT considerations

- Prevention of pulmonary complications
 - Upright positioning & early mobilization
 - Deep breathing
 - Airway clearance techniques prn
- Incisional precautions *for 2 wks*
 - No submersion in water; running water is alright
 - No cream or lotion directly in incision

PT considerations-- Sternal Precautions

- Do not lift more than 8 pounds. (A gallon of milk weighs 8 pounds.)
- Do not push or pull with your arms when moving in bed and getting out of bed.
- Do not flex or extend your shoulders over 90°.
- Avoid reaching too far across your body.
- Avoid twisting or deep bending.
- Do not hold your breath during activity.
- Brace your chest when coughing or sneezing. This is vital during the first 2 weeks at home.
- No driving.
- Avoid long periods of over the shoulder activity.
- If you feel any pulling or stretching in your chest, stop what you are doing. Do not repeat the motion that caused this feeling.
- Report any clicking or popping noise around your chest bone to your surgeon right away.

Outcome Measures

- Medical
 - Morbidity
 - Mortality
 - Complication rates
 - Hospital LOS
 - Ejection fraction
 - Quality of life
- Rehabilitation
 - Quality of life
 - ADL performance
 - Symptom impact
 - Habitual physical activity level
 - Balance

Cardiac Rehab Professionals

Partners in Patient Care:

- Medical Director
- Referring Physician
- Registered Nurses
- Exercise Physiologists
- Physiotherapist
- Dieticians/Nutritionists
- Social Services/Psychosocial
- Pharmacists

Impairments & Functional Limitations following CABG

- Incisional (sternotomy and donor graft leg) pain and drainage
- Continuous pain from the shoulders and neck
- Thoracic pain
- Respiratory problems
- Feelings of weakness
- Sleeping difficulties including chest wall pain with side lying, waking frequently and early, more nightmares than usual
- Problems with wound healing
- Dissatisfaction with postoperative supportive care
- Problems with eating
- Ineffective coping
- Depression

Components of CR.

- Lifestyle:
 - Diet and weight management
 - Smoking cessation
 - Physical activity and exercise
 - Secondary prevention
 - Education
- Psychosocial care
- Long-term management strategy

Physical Activity

- Assess and risk stratify
- Develop individual exercise plan
- Teach FITT principle
 - F - frequency
 - I - intensity
 - T - duration / time
 - T - mode / type
- Regain/develop physical fitness
- Regain confidence in physical activity
- Develop long-term activity plan
- Self monitoring

Secondary Prevention

- Cholesterol management
- BP management
- Blood sugar management
- Cardio-protective drug therapy

Education

- CHD as a disease
- Treatment including medication
- Recovery process
- CHD risk factors
- Symptom management
- Living with CHD

Psychosocial Care

- Reduce fear and anxiety
- Assist with adjustment
- Promote positive attitude
- Facilitate behaviour change
- Identify need for further support

I. Patient & Family Education

- ◉ Modification of risk factor profile
 - treatment of hyperlipidemia
 - smoking cessation
 - treatment of hypertension
 - control of diabetes
 - regular exercise
 - dietary changes

Behavior modification

- stress management at home
- stress management at work
- creation of hobbies - time out
- conflict resolution skills

Involve the children

- They don't have pathology yet but they have all of the same stresses
- They also should know how to help at home

II. Prevent Deleterious Effects Of Bedrest

Mobilize the patient soon

- Prevent muscle atrophy
- Prevent blood clot formation
- Prevent pneumonia
- Prevent lethargy

III. Provide A Safe Discharge To Home

- Provide enough physical stamina to go home and perform ADL's
- Reduce fear

Assessment



- SYMPTOMS : Chest Pain, Palpitations
- EXAMINATION : CHF, Wound, Concurrent Illness, Musculo-Skeletal disease, Emotional Status (Anxiety/Depression)
- DIAGNOSTIC STUDIES : Lipid Profile, Hb A1C, PFT
- ECG before exercise/Telemetry
- STRESS TEST : Sub maximal modified NAUGHTON'S
 - > 5-7 METS
 - > 80-85% THR

- ECHO : LV functions,
- STRESS THALLIUM : Viable Myocardium
Useful in patients with abnormal ECG's
- VO₂ Max with Stress Test to differentiate
between Cardiac and Pulmonary dyspnoea.



Exercise Training (Rehabilitation)

- Walking for 15-30 mins /3-5 times a week
- Patient can still talk while walking (Brisk Walk for initial 2 weeks)
- Contra indication to exercise training
 - ›Unstable Angina
 - ›Resting BP more than 200 mm/ 100 mm Hg
 - ›Postural BP drop to more than 20 mm Hg
 - ›Aortic Stenosis
 - ›Acute illness or fever
 - ›Uncontrolled Atrial or Ventricular Arrhythmias
 - ›Uncontrolled CHF
 - ›Musculo-Skeletal Disorders

Exercise Prescription

- Aerobic Exercise preferred than resistive or weight training
- Walking/Cycling
- Intensity/Frequency/Duration will depend on tolerance
- THR (220- Age in years) try to achieve 80-85% THR



Exercise Prescription contd.

- Exercise session
 - Warm Up (2-5 mins)
 - Stimulus (conditioning 20-30 mins)
 - Cool Down (5-10 mins, slow speed, prevents low BP and joint pains)
- Graded Exercise with telemetry in high risk population recommended.
- 1-3 months Target 7-8 METS followed by self directed maintenance

Benefits of Exercise Training

- ↑ work capacity ↓ fatigue
- ↓ Heart rate during Exercise
- ↓ symptoms of CHF
- ↓ Atherogenicity by maintaining body weight ↑ HDL ↓ TG ↓ platelet aggregation
- Improve blood glucose level
- Improves coronary blood flow and myocardial perfusion

Benefits of Exercise Training contd.

- Endurance Training
 - ↑ VO_2 max 10-40%, ↓ BP, ↓ HR
- Positive changes in body composition
 - ↓ body weight (1-3 kg), ↓ % fat (1-3%)
- Positive metabolic changes
 - ↑ insulin sensitivity, ↓ cholesterol
- Resistance Training
 - ↑ strength

Phases of Cardiac Rehabilitation

- Phase I: In-patient
- Phase II: Immediate post discharge (Outpatient ecg monitored)
- Phase III: 2-4 weeks post discharge (Outpatient with decreasing monitoring)
- Phase IV: Community based, independent exercise

Phase I

- Post-MI, Post-surgery, Post-stent (no MI), CHF, heart transplant
- Patient may begin if:
 - GP approval/order
 - No chest discomfort (8 hours)
 - No new signs of decompensated heart failure
 - No abnormal EKG changes (8 hours)

Phase I

- **Goals**
 - normal cardiovascular response to changes in position and ADLs
 - reach 3-4 MET activity level by discharge
- **Activity**--Slow progression of activity intensity (increase by 1 MET/day)

Phase I

- **Frequency:** 2 - 3 times daily
Symptom limited by breathlessness / angina / fatigue
- **Timing:** 5-20 minutes <5 minutes rest period
- **Type:** sitting/standing functional activities, ROM exercises, walking

Surgical vs. Medical Patients limitations to activity

- **Post-MI:** HR < 120 beats/min or 20 beats above resting allowed with activity
- **Post-surgery:** 30 beats above resting is allowed
- **Surgical patients** may have sternal precautions

The Evaluation

- **Medical Chart Review**
- **Patient Interview**
- **Patient Examination**
- **Patient's Tolerance For Exercise**

Monitoring

- HR
- BP
- SaO₂
- EKG
- Symptoms
- At each change in position



Who Should Not Do Phase I ?

- Patients with unstable angina
- Patients with acute CHF
- Patients with uncontrolled rhythms
- Patients with a systolic BP >200 mm Hg
- Patients with acute pericarditis
- Patients with recent emboli or clots
- Patients with severe cardiomyopathies
- Patients with uncontrolled DM

Phase II

- Home visits.
- Telephone support.
- Clinics



Phase II

- 2-6 weeks
- Time of high anxiety for the patients
- Heart manual
- Answer questions, reinforce daily walking, home exercise as appropriate, discuss symptoms and activities
- Facilitate review of risk factors modification goals and achievements, and Preparation for phase III
- 30 minutes of walking once or twice daily

Cardiac Rehab Phase II

- Supervised outpatient program 6-8 wks
- Exercise test performed prior to rehab
- EKG monitoring every session
- Goals - increase exercise capacity to 5 METS
- Patient education on HR, exercise, symptoms

Pre-requisites

- Exercise Testing
Prior to starting program



Components of Phase II



50% HRR, 3x/week, 60 minute sessions including warm-up and cool-down

HRR = heart rate reserve
 $HRR = HR_{max} - HR_{rest}$

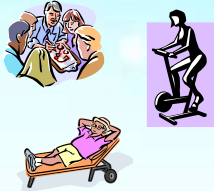
Safety

- Selection of appropriate patients
- Proper monitoring
- All professional exercise personnel must be able to do basic life support, including defibrillators
- Emergency procedures must be specified
- Warm up and cool down are required

Phase III

Reassess health & risk factors first.

- Health Education
- Exercise
- Relaxation



Phase III

- Frequency: 1-2 times/week at a rehabilitation class and 1-2 times/week home exercise circuit , other days at home leisure activities
- Intensity: 60-75% maximal HR
- Time: 20-30 minutes conditioning period exclusive of warm-up and cool down
- Type: aerobic/endurance training involving large muscle groups in dynamic movement

Phase III Outcomes

- Functional capacity goals > 8 METS or $2\times$ energy requirements of work
- Training effects expected
- No cardiac symptoms
- EKG monitoring happens occasionally, or when increasing activity parameters
- Patients learn self-monitoring of HR and symptoms

Cardiac Rehab Phase IV

- Unsupervised program
- Community Based
- Maintenance of exercise/activity
- On-going lifestyle support

Phase IV

- Significant improvement in functional capacity
- Psychological adaptations to chronic diseases
- The foundation of behavioral and life style changes required for continued risk factor modification

Challenges for the Pt and Family

- Frightening, life threatening event (MI, major surgery)
- A chronic illness, reduced life expectancy, symptoms
- Fears for family and partner being left alone
- Threat to employment and financial status
- Medication side effects (lethargy, impotence)
- Being treated differently by other people
- Neurological impairment (esp. cardiac arrest pts.)
- Making lifestyle changes, smoking, diet, activity

Delivering CR

Can be done individually or in a group

Venue: Home
Community
Clinics

Menu: Mixing up of all 4 phases too provide an individualised package of care.

Sample Cardiac Rehabilitation Menu

Activity / Fitness

- hosp exercise group
- home exercise programme
- advice on resumption of active life
- Age Concern Health Mentor
- Walk for Health
- Phase 4 exercise programme

Smoking

- Willpower alone
- smoking cessation clinic
- Nicotine replacement
- Referral for medication
- Internet programme

Diet / Weight loss

- Self-management of diet / medication
- dietetics referral
- Weight Watchers
- Internet programme
- Coach Programme

Education

- Hospital educational programme
- Home educational programme
- Mentor / volunteer / lay-worker
- Internet

Psychological adjustment

- Self help advice materials
- Stress management class
- Stress management on tape
- Counselling psychologist
- Clinical Psychology / Psychiatry

Social support

- Patient support group
- Mentoring scheme

Other services / Professions

1. Sexual medicine clinic
2. Welfare rights bureau
3. Social worker
4. Specialist heart failure nurse

