Successful Quality Outcomes through Cardiac Rehabilitation

Hot Topics, The Heart of the Matter
February 20, 2018
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Objectives
- Understand the indications and limitations of cardiac rehabilitation
- Understand impact of exercise on general health conditions, including cardiac disease
- Understand CR effectiveness and impact on morbidity and mortality

Overview
- Definition and history of Cardiac Rehabilitation (CR)
- General effectiveness of exercise on health
- CR objectives, indications and components
- Typical CR course
- Benefits and risks of CR
- Measuring quality outcomes in CR
- Increasing utilization of CR
Why do we have cardiac rehab?

- 1 in 3 deaths are from cardiovascular disease (CVD)
- 90% of morbidity and mortality of CVD is due to preventable risk factors
- CVD costs $200 billion/year in the U.S.

Cardiac Rehab definition

- "The sum of activities required to influence favourably the underlying cause of the disease, as well as to provide the best possible physical, mental and social conditions, so that the patients may, by their own efforts, preserve or resume when lost as normal a place as possible in the community." (World Health Organization, 2007)

What is Cardiac Rehab?

- Cardiac rehabilitation is a medically supervised, multi-disciplinary program to improve cardiovascular health after a major cardiac event
- Divided into three phases
- Indicated for a specific group of patients
- Typical focus is outpatient due to shorter hospital stays, but the rehab program starts in the inpatient setting
History of Cardiac Rehab

- Chair therapy introduced after AMI in the 1940s
- Daily walking for 3-5 minutes, beginning 4 weeks post-op, advised in the 1950s
- Pivotal research done by Hellerstein in the 1950s that evolved into the multi-disciplinary rehabilitation program that CR is today
- While originally focused on inpatients, CR evolved into an outpatient program in the 1980s
- The American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) was founded in 1985. This serves as an accrediting body for CR programs and its members are multi-disciplinary healthcare professionals in both cardiac and pulmonary rehab programs

Exercise Benefits

- Regular physical activity decreases all-cause mortality by 28%
- Exercising for 7 hours per week lowers your risk of premature death by 40%
- Regular physical activity decreases recurrent MI by 24%
- Exercise lowers your risk of breast cancer, lung cancer, colon cancer and endometrial cancer
- Exercise prevents osteoporosis and hip fracture
- Regular exercise reduces depression and prevents insomnia
- Exercise lowers risk of Alzheimer’s and diabetes mellitus

Exercise is Medicine™

- Exercise is Medicine® (EIM), a global initiative managed by the American College of Sports Medicine (ACSM), encourages primary care physicians and other health care providers to include physical activity when designing treatment plans and to refer patients to evidence-based exercise programs and qualified exercise professionals, especially those with the EIM credential.
CR objectives
(World Health Organization, 1993)
- Help patients regain autonomy and improved regular physical activity after major cardiac event
- Help patients do regular physical activity; increases HDL, decreases visceral fat, decreases glycemia and blood pressure
- Control modifiable risk factors – smoking cessation, hypertension, diabetes mellitus and dyslipidemia - via therapeutic education to increase patient autonomy and responsibility for medical treatment and lifestyle changes
- Manage psychosocial and professional problems of cardiac patients: anxiety, depression, stress management

CR Indications
- Acute myocardial infarction
- Valve replacement or repair
- Percutaneous transluminal coronary angioplasty or coronary stenting
- Coronary Artery Bypass Graft
- Stable angina pectoris
- Heart or heart-lung transplant
- Stable, chronic heart failure
  - Ejection Fraction less than 35%, NYHA class II-IV symptoms despite being on optimal therapy for 6 weeks, and patients who have not had a major cardiac hospitalization or procedure in the last 6 weeks or planned in the next 6 months

CR Exclusions
- Unstable angina
- Systolic blood pressure > 200 mmHg
- Severe aortic stenosis
- Uncontrolled cardiac arrhythmia
- Acute infection or other medical disorder
- Acute pulmonary embolus or pulmonary infarction
- Acute myocarditis, pericarditis or thrombophlebitis
- Recent change in resting ECG suggesting significant ischemia
- Physical disability that precludes ability to exercise
CR major components

- Physician prescribed exercise
- Cardiac risk factor modification
- Psychosocial assessment
- Outcomes assessment
- Individual treatment plans

Core components of CR

1. Patient assessment – Complete physical and mental evaluation, risk profile, 6 minute walk test, set goals
2. Exercise training – Gain endurance, resistance, and strength. Exercise prescription that specifies type, intensity, duration and frequency of exercise
3. Physical activity counseling – Goal is 30 minutes/day, at least 5 days per week of moderate intensity exercise. This is defined as 60-75% max heart rate or rate of perceived exertion 12-14 on Borg scale. Should also have two days of strength training per week
4. Tobacco cessation – Most important and cost-effective of all lifestyle modifications. Decreases mortality if history of AMI, CABG, or PTCA
5. Nutritional counseling – Goal is saturated fat less than 7%, fiber to 20-30 g/d, and balance of 50-60% carbs, 15% protein, 25-35% fat
6. Weight management – Goal BMI is 18.5-24.9 and waist circumference <40" for men and <35" for women. Initial weight loss goal 10% from baseline
Components, cont.

7. Lipid management – Hypercholesterolemia is the risk factor with the highest percentage of attributable risk post AMI. Goal is LDL <100 (sometimes <70), non-HDL <130 if TG >200 and HDL >40 in high risk patients

8. Blood pressure management – Lowering SBP by 10 mmHg can decrease mortality by 20-40%. Decreasing DBP 5-6 mmHg can decrease stroke risk by 42%. Goal is <120/80 and pharmacotherapy should be initiated if >140/90

Components, cont.

9. Diabetes management: Goal is HbA1c <7.0%. 26% of CR patients have DM

10. Psychosocial and professional issues – Depression and anxiety are present in 20% of patients s/p AMI. INTERHEART study showed that stress is the third most important risk factor (behind lipids and smoking.) This also involves sexual counseling and alcohol modification when needed

Initial screening and assessment

- Medical and surgical history
- Physical examination – especially cardiac and MSK exam
- Resting 12-lead ECG
- Current medications
- CVD risk profile: Age, gender, menopausal status, tobacco use, h/o HTN, h/o dyslipidemia, body composition (BMI, waist circumference), FBG/HbgA1c, PA status, psychosocial history
Risk Stratification

- Risk factors: Smoking, dyslipidemia, HTN, physical inactivity, overweight/obesity, diabetes mellitus
- Stratify into low, moderate and high risk for cardiac events during exercise training. Involves: angina, ventricular arrhythmias, ejection fraction, HF, depression, functional capacity, presence of ischemia, h/o MI/revascularization procedure, blood pressure during and after exercise

Typical CR course

- Phase I – Starts immediately following cardiac event as inpatient. Involves early, progressive mobilization
- Phase II – Maintained for 3-6 months following cardiac event as outpatient. Involves monitored exercise and aggressive risk factor reduction
- Phase III – Lifetime maintenance phase

Start assessment for phase II within 1-6 weeks after cardiac event
- Referral for 6-12 weeks of monitored exercise and therapeutic education. Length of time is determined by risk factors
- Sessions last 45-60 minutes, three days per week
- Immediate goals: Rebuild strength after cardiac event, build confidence for return to exercise, instill life-long habit of regular physical activity, and therapeutic education on lifestyle modifications
A Day in Cardiac Rehab

- Assess baseline vital signs, blood glucose, weight, symptoms
- Exercise at 40-70% maximum heart rate while being monitored for:
  - Signs/symptoms of difficulty with effort
  - Continuous ECG monitoring
  - Blood pressure and pulse monitoring
  - Monitoring rate of perceived exertion (RPE)

A Day in Cardiac Rehab, cont

- Exercise can be performed in a variety of ways:
  - Treadmill
  - Step machine
  - Elliptical
  - Rowing machine
  - Exercise bikes
  - Weights/dumbbells
  - Resistance bands
  - Upper body ergometer

Education in Cardiac Rehab

- Classes may be offered throughout the program on:
  - Stress management
  - Managing medications
  - Nutrition – salt, lipids, portion size, restaurant choices, etc.
  - Weight management
  - Counseling for mental health disorders as needed
  - Diabetes management
  - Tobacco cessation
  - Physiology of regular physical activity
  - Cardiac anatomy and physiology
  - Blood pressure management
  - Cholesterol strategies and goals
Cardiac Rehab Benefits and Effectiveness Research

- Participation in CR has shown a 17% decreased risk in recurrent AMI at 12 months discharge and decreased 47% mortality at 2 years discharge
- Large study of 600,000 Medicare patients showed 2.2% mortality at 1 year with CR and 5.3% without CR, 16.3% mortality at 5 years with CR and 24.6% without CR
- Participants in CR had 31% decrease in hospital readmissions

Cardiac Rehab Benefits and Effectiveness Research

- CR:
  - Reduces risk of repeat cardiac events in next year
  - Improves blood pressure control and lipids
  - Reduces angina, fatigue, shortness of air
  - Increases adherence to cardiac medications 3 years later
  - Improves exercise performance
  - Improves psychosocial scores
  - Decreases inflammation
  - Increases overall sense of well-being

Cardiac Rehab Risks

- One adverse cardiac event for every 8,484 exercise tests performed
- One cardiac event for every 50,000 patient hours of exercise
- 1.3 cardiac arrests for every 1,000,000 patient hours of exercise
- Situations with highest risks: residual ischemia, complex ventricular arrhythmias, and severe left ventricular dysfunction with EF <35%
Measuring CR outcomes

- AACVPR Outcomes Matrix recommends a systematic approach to assessing patient outcomes. Outcomes should be assessed at entry to the program, during program, and at discharge, as well as during a follow-up period after discharge.
- Matrix includes the following categories (with examples):
  - Overall management (self-efficacy, pt knowledge, med adherence)
  - Exercise testing and training (EEMT, blood pressure, oximetry)
  - Strength and flexibility training (grip, sit and reach)
  - Lipid management (lipid levels, adherence to diet/PA/meds)
  - Hypertension management (resting BP, diet/PA stage of change)
  - Diabetes management (FBG, HbA1c, adherence to diet/PA/meds)
  - Nutrition and weight management (ht, wt, BMI, waist, diet logs)
  - Psychosocial management (mood/cognitive measures, coping skills)
  - Smoking cessation (cigs/day, serum cotinine levels, smoking stage of change)

Measuring CR outcomes

- Two National Quality Forum endorsed measures related to Cardiac Rehab:
  - 0642: CR patient referral from an inpatient setting (percentage of patients referred to CR prior to inpatient discharge)
  - 0643: CR patient referral from an outpatient setting (percentage of patients with qualifying event in last 12 months with CR referral)

CR performance measures for program certification

- Optimal blood pressure control at completion of CR
- Improvement in depression at completion of CR
- Improvement in functional capacity at completion of CR
- Tobacco use intervention for CR
Underutilization of CR

- CR is a proven secondary prevention tool and is recommended by the AHA and the ACC, but is underused. In 2015, only 20% of Medicare CR-eligible patients participated in CR after AMI; 19-34% participated in 2016.
- Millions Hearts™ states 20% of patients are referred and only half of those participate. For every day a patient waits to start CR, they are 1% less likely to enroll.
- The elderly, patients of low socioeconomic status, minorities and women are less likely to be referred to CR.

Barriers to CR utilization (AHA)

- Lack of referral to participate from the patient’s physician.
- Lack of perceived need for rehabilitation/awareness of CR.
- Limited, or no health care coverage (cost).
- Limited follow-up or facilitation of enrollment after referral.
- Work or home responsibilities.
- Hours of operation conflicting with work demands.
- Scarcity of programs in rural areas and/or low income communities.
- Distance to CR facility from patient’s home.
- Access to public transportation or parking issues.
- Male gender-dominated programs and little racial staff diversity.
- Language problems and cultural beliefs.

Million Hearts™ initiative

- 5-year initiative launched in 2012 by the CDC and CMS to address the 800,000 deaths due to CVD each year.
- CR goals: Increase CR use to 70% of eligible patients.
- Million Hearts and ACVPR has Roadmap to Reform with specific strategies to increase participation in CR and adherence to participation/completion - https://millionhearts.hhs.gov/tools/protocols/tools/cardiac-rehabilitation.html.
Summary

- Cardiac rehabilitation is an important multi-disciplinary program for secondary prevention of cardiovascular disease
- CR involves monitored exercise and therapeutic education
- CR has shown tremendous benefit to patients by increasing physical activity levels and modifying preventable cardiac risk factors
- CR is underutilized and minorities, elderly, women and those of low SE status are disproportionately under-referred

A patient perspective

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References

References, cont.


