

Basics of the Ideal Cardiac Rehabilitation Program

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Agenda

- Background (definition, goals, benefits, indications, contraindications of CRP)
- Basic Components of an Ideal Cardiac Rehabilitation Program (CRP)
 - ✓ Baseline patient assessment
 - ✓ Nutritional counseling & weight management
 - ✓ Psychosocial interventions
 - ✓ Physical activity counseling and exercise training
 - ✓ Risk factor management (lipids, BP, diabetes mellitus, and smoking)

Definitions

Definitions

- Exercise-based CRPs were initiated in the 1950s to reverse the physical deconditioning produced by prolonged hospitalizations.
- **Rehabilitation:** The restoration of someone to a useful place in the society.
- CRP is a medically supervised therapeutic approach that includes **exercise training, education and behavioral counseling regarding risk reduction and lifestyle changes** to help cardiac patients recover quickly and improve their overall **physical, mental and social** functioning.

- CRP is not inferior to conventional pharmacologic or interventional care.
- CRP leads to **27 % reduction in total mortality** and **31 % in cardiac mortality**, which is comparable to the effects of our most potent drugs such as BBs, Statins, and ACEIs probably with similar cost-to-benefit ratios.
- Its application is a **class I recommendation** in most contemporary CV clinical practice guidelines, **ACC 2008, ESC 2007, AHA 2007.**

Alexander M. et al, *Ann Intern Med.* 2005;143:659-672

Goals of CRP

Goals of CRP

The primary goal of CRP has changed from regaining muscle strength to modification of atherosclerotic progression and improving prognosis

- To limit the adverse physiologic and psychologic effects of cardiac illness
- To control cardiac symptoms
- To reduce the risk of SCD or reinfarction
- To enhance the patient's psychosocial and vocational status
- To ultimately **stabilize, slow or even reverse progression** of the CVD

Indications Contraindications

Indications for CRP

- Post MI
- Chronic stable angina
- Stable chronic heart failure
- PAD with claudication
- Rheumatic HD
- Congenital HD
- Controlled Arrhythmias
- Post CABG, PCI
- Post heart or heart/lung transplantation
- Post valve repair or replacement (open Heart surgery)
- Post Pace maker

Contraindications for CRP

- Acute coronary syndromes
- Uncontrolled HTN > 200/120 mmHg
- Moderate to severe AS or HOCM
- Any acute systemic illness or fever
- Uncontrolled Arrhythmias
- Active myocarditis
- Pulmonary embolism.
- Uncontrolled DM.
- NYHA III and IV.
- Dissecting aneurysm.

Core Components of an Ideal Cardiac Rehabilitation;

(The multidisciplinary Nature of the modern CRP)

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart
Association
Learn and Live...

AHA/AACVPR Scientific Statement

Core Components of Cardiac Rehabilitation/ Secondary Prevention Programs: 2007 Update

A Scientific Statement From the American Heart Association
Exercise, Cardiac Rehabilitation, and Prevention Committee,
the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing,
Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism;
and the American Association of Cardiovascular and Pulmonary Rehabilitation

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Abstract—The American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation

(*Circulation*. 2007;115:2675-2682.)

Patient Assessment, (Evaluation-Intervention-Outcome)

Patient Assessment, Evaluation

- **Medical History:** Review current and prior CV medical and surgical diagnoses and procedures; co-morbidities; symptoms of CVD; medications; date of influenza vaccination.
- **Physical Examination:** Assess cardiopulmonary systems ; past-CV procedure wound sites; orthopedic and neuromuscular status; and cognitive function.
- **Testing:** Obtain resting 12-lead ECG.

Patient Assessment, Intervention

- **Document the patient assessment information** that reflects the patient's current status and guides the development and implementation of (1) a **patient treatment plan** for risk reduction, and (2) a **discharge/follow-up plan** that reflects progress toward goals and guides long-term secondary prevention plans.
- **Ensure that the patient is taking appropriate doses of the cardioactive drugs** and has had an annual influenza vaccination.

Patient Assessment, Outcome

- **Outcome Report:** Documented evidence of patient outcomes that reflects progress toward goals, including whether the patient is taking appropriate doses of cardioactive drugs and has had an annual influenza vaccination.

Nutritional Counseling (Evaluation-Intervention-Outcome)

Nutritional Counseling Evaluation

- **Obtain estimates of total daily caloric intake and dietary content** of saturated fat, *trans fat*, *cholesterol*, *sodium*, and *nutrients*.
- **Assess eating habits**, including fruit and vegetable, whole grain, and fish consumption; number of meals and snacks; frequency of dining out; and alcohol consumption.
- **Determine target areas for nutrition intervention.**

Nutritional Counseling, Intervention, Outcome

- **Intervention** : Prescribe specific dietary **modifications** aiming to at least attain the saturated fat and cholesterol contents of the Therapeutic Lifestyle Change diet.
Educate patient on dietary goals and how to attain them.
- **Outcome**: Patient understands basic principles of dietary contents, and adheres to prescribed diet

Weight Management, (Evaluation-Intervention-Outcome)

Weight Management, Evaluation

- Measure weight, height, and waist circumference.
- Calculate body mass index (BMI).

Weight Management, Intervention

In patients with BMI > **25 kg/m²** and/or waist > **102 cm in men** and **>88 cm** in women:

- **Establish reasonable short-term and long-term weight goals** (eg, reduce BW by 5% -10% at a rate of 1-2 lb/wk over a period up to 6 months).
- **Develop a combined diet, physical activity/exercise, and behavioral program** to reduce total caloric intake, maintain appropriate intake of nutrients and fiber, and increase energy expenditure. **The exercise component should include daily walking (eg, 60-90 min).**

Weight Management, Outcome

- **Short-term:** Continue to assess and modify interventions until progressive weight loss is achieved. Refer to a dietitian if weight goals are not achieved.
- **Long-term:** Patient adherence aimed toward attainment of established weight goal.

Psychosocial Management Evaluation, Intervention, Outcome

Psychosocial Management Evaluation

- **Identify psychological distress** as indicated by levels of depression, anxiety, anger or hostility, social isolation, marital/family distress, sexual dysfunction/adjustment, and substance abuse, using interview and/or standardized measurement tools.
- **Identify use of psychotropic medications.**

Psychosocial Management Intervention

- **Offer individual and/or small group education and counseling** on adjustment to heart disease, stress management, and health-related lifestyle change.
- Teach and support self-help strategies.
- **Refer patients** with significant psychosocial distress to mental health specialists for further evaluation and treatment.

Psychosocial Management Outcome

- **Emotional well-being** is indicated by the absence of clinically significant psychological distress, social isolation, or drug dependency.
- **Arrange for ongoing management** if important psychosocial issues are present.

Physical Activity Counseling,
Evaluation, Intervention, Outcome

Physical Activity Counseling, Evaluation

- **Assess current physical activity level** (eg, questionnaire) and determine domestic, occupational, and recreational needs.
- **Evaluate activities** relevant to age, gender, and daily life, such as driving, sexual activity, sports, gardening, and household tasks.
- **Assess readiness** to change behavior, and barriers to increased physical activity.

Physical Activity Counseling, Intervention

- **Encourage patients for 30-60 min/d of moderate-intensity physical activity on 5 d/w.**
- **Advise aerobic activity** to minimize risk of musculoskeletal injury. Recommend gradual increases in the volume of physical activity over time.
- **Caution patients to avoid performing unaccustomed vigorous physical activity** (eg, racquet sports and manual snow removal).

Physical Activity Counseling, Outcome

- Patient shows **increased participation** in domestic, occupational, and recreational activities.
- Patient shows **improved psychosocial well-being**, and reduction in stress.
- Patient shows **improved aerobic fitness** and body composition and lessens coronary risk factors

Exercise Training, Evaluation, Intervention, Outcome

Exercise Training, Evaluation

- **Symptom-limited exercise testing prior to participation in a CRP is recommended.** Test parameters should include assessment of HR and rhythm, signs, symptoms, ST-segment changes, hemodynamics, perceived exertion, and exercise capacity.
- Based on patient assessment and the exercise test, **risk stratify the patient to determine the level of supervision and monitoring during exercise training.**

Exercise Training, Intervention

- Exercise prescription should specify **frequency (F), intensity (I), duration (D), modalities (M), and progression (P).**
For aerobic exercise: **F** 3-5 days/wk; **I** 50-80% of exercise capacity; **D** 20-60 minutes; and **M** walking, treadmill, cycling, rowing, stair climbing, arm/leg ergometry, and others.
For resistance exercise: **F** 2-3 days/wk; **I** 10-15 repetitions per set to moderate fatigue; **D** 1-3 sets of 8-10 different upper and lower body exercises; and **M** elastic bands, cuff/hand weights, dumbbells, free weights, or weight machines.
- Include warm-up, cool-down, and flexibility exercises in each exercise session.
- Provide **progressive** updates to the exercise prescription .

Exercise Training, Outcome

- Patient **understands safety issues** during exercise, including warning signs/symptoms.
- Patient **achieves increased cardiorespiratory fitness** and enhanced flexibility, muscular endurance, and strength.
- Patient **achieves reduced symptoms**, physiologic responses to exercise, and improved psychosocial well-being.
- Patient **achieves reduced global CV risk** and mortality.

BP Management, Evaluation, Intervention, Outcome

BP Management, Evaluation

- Measure seated resting BP on 2 visits.
- Measure BP in both arms at program entry.
- To rule out orthostatic hypotension, measure lying, seated, and standing BP at program entry and after adjustments in antihypertensive drugs .
- Assess current treatment and compliance.
- Assess use of nonprescription drugs (NSAIDs) that may adversely affect BP.

BP Management, Intervention

- 1) **If BP is 120-139 mmHg systolic or 80-89 mmHg diastolic: Provide lifestyle modifications**, including regular physical activity/exercise; weight management; moderate Na restriction and increased consumption of fresh fruits, vegetables, and low-fat dairy products; alcohol moderation; and smoking cessation.
- 2) **If BP is >130/80 mmHg in patients with CKD, HF, DM**, Provide drug therapy after lifestyle modification.
- 3) **If BP is >140 mmHg systolic or >90 mmHg diastolic:** Provide lifestyle modification and drug therapy.

Lipid Management, Evaluation, Intervention, Outcome

Lipid Management, Evaluation

- **Obtain fasting TC, HDL, LDL, and TG.** Obtain a detailed history to determine whether diet, drug, and/or other conditions that may affect lipid levels can be altered.
- **Assess current treatment and compliance.**
- Repeat lipid profiles at **4-6 weeks and at 2 months** after initiation or change in lipid-lowering medications.
- Assess CK levels and liver function.

Lipid Management, Intervention

- **Provide nutritional counseling** consistent with the Therapeutic Lifestyle Change diet, such as the recommendation to add plant sterols and fiber and consumption of more omega-3 fatty acids, as well as weight management. **Add or intensify drug treatment in those with LDL >100 mg/dL.**
- . These include nutritional counseling and **Provide interventions to reduce TG to attain non-HDL <130 mg/dL** weight management, exercise, smoking cessation, alcohol moderation, and drug therapy as per NCEP and AHA/ACC.

Lipid Management, Outcome

- **Short-term:** Continue to assess and modify intervention until **LDL is 100 mg/dL and non-HDL cholesterol 130 mg/dL**).
- **Long-term:** **LDL cholesterol <100 mg/dL , Non-HDL cholesterol <130 mg/dL.**

Diabetes Management, Evaluation, Intervention, Outcome

Diabetes Management, Evaluation

From medical record review:

Confirm presence or absence of diabetes .

If a patient is known to be diabetic, identify history of complications such as findings related to heart disease; vascular disease; problems with eyes, kidneys, or feet; or autonomic or peripheral neuropathy.

– From initial patient interview:

- Obtain history of signs/symptoms related to above complications and/or reports of episodes of hypoglycemia or hyperglycemia.

Diabetes Management, Evaluation

Identify treatment regimen, including:
Medications, diet, and BS monitoring and
extent of compliance.

Before starting exercise:

Obtain latest.

Consider stratifying pFPS and HbA1c patient to
high-risk category because of the greater
likelihood of exercise-induced complications.

Diabetes Management, Intervention

- **Educate patient and staff** to be alert for signs/symptoms of hypoglycemia or hyperglycemia .
- In those taking insulin or insulin secretagogues:
 - **Avoid exercise at peak insulin times.**
Advise that insulin be injected in abdomen, not muscle to be exercised.
- Test BS levels pre- and post exercise at each session: if BS value is <100 mg/dL, delay exercise and provide patient 15 g of carbohydrate; retest in 15 min; proceed if BS value is >100 mg/dL; if BS value is >300 mg/d, patient may exercise if he or she feels well, is adequately hydrated, and blood and/or urine ketones are negative; otherwise, contact patient's physician for further treatment.
- **Encourage adequate hydration** to avoid effects of fluid shifts on BS levels.
- Caution patient that BS may continue to drop for 24-48 hours after exercise.

Diabetes Management, Intervention

- In those treated with diet, metformin, alpha glucosidase inhibitors, and/or thiazolidinediones, without insulin or insulin secretagogues, test BS levels prior to exercise for first 6-10 sessions to assess glycemic control; exercise is generally unlikely to cause hypoglycemia.
- Education Recommendations:
Teach and practice self-monitoring skills for use during unsupervised exercise.
Refer to registered dietitian for medical nutrition therapy.

Diabetes Management, Outcome

- **Short-term:**
Communicate with primary physician or endocrinologist about signs/symptoms and medication adjustments.
Confirm patient's ability to recognize signs/symptoms, self-monitor BS status, and self-manage activities.
- **Long-term:**
Attain FPG levels of **90-130 mg/dL and HbA1c <7%**.
Minimize complications and reduce episodes of hypoglycemia or hyperglycemia at rest and/or with exercise.

Tobacco Cessation Evaluation, Intervention, Outcome

Tobacco Cessation Evaluation

- Ask the patient about his or her smoking status and use of other tobacco products. Document status as **never smoked, former smoker, current smoker**. Specify both **amount** of smoking (cigarettes per day) and **duration** of smoking (number of years). Quantify use and type of other tobacco products. Question exposure to second-hand smoke at home and at work.
- Determine readiness to change.
- Assess for psychosocial factors that may impede success.

Tobacco Cessation Intervention

Minimal (brief):

- **Individual education and counseling** by program staff supplemented by self-teaching materials.
- **Social support** provided by physician, program staff, family partner; identify other smokers in the house; discuss how to engage them in the patient's cessation efforts.

Optimal (intense):


- Longer individual counseling or group involvement.
- **Pharmacological support:** nicotine replacement therapy, bupropion hydrochloride.
- **Supplemental strategies** if desired (eg, acupuncture, hypnosis).
If patient has recently quit, emphasize relapse prevention skills.
Urge avoidance of exposure to second-hand smoke at work and home.

Tobacco Cessation Outcome

- **Short-term:** Patient will demonstrate readiness to change by initially expressing decision to quit and selecting a quit date.

Subsequently, patient will quit smoking and all tobacco use and adhere to pharmacological therapy (if prescribed)

- **Long-term:** Complete abstinence from smoking and use of all tobacco products for at least 12 months (maintenance) from quit date.



The role of specialist cardiac rehabilitation programmes

**Our Egyptian CR Association,
Guidelines, Journal, Text book,
Hospitals and specialists**

Cardiovascular Prevention and Rehabilitation
University Hospital Inselspital
Bern/Switzerland

THANKS