Cardiac Rehabilitation: Components of care

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What is cardiac rehabilitation ?

- **Exercise**

- **Education**

- **Caring**

- **Behavioral therapy**

- **Lifestyle counseling**

Models lead to components

What determines models

- **Reimbursement**

- **Attendance**

- **Compliance**
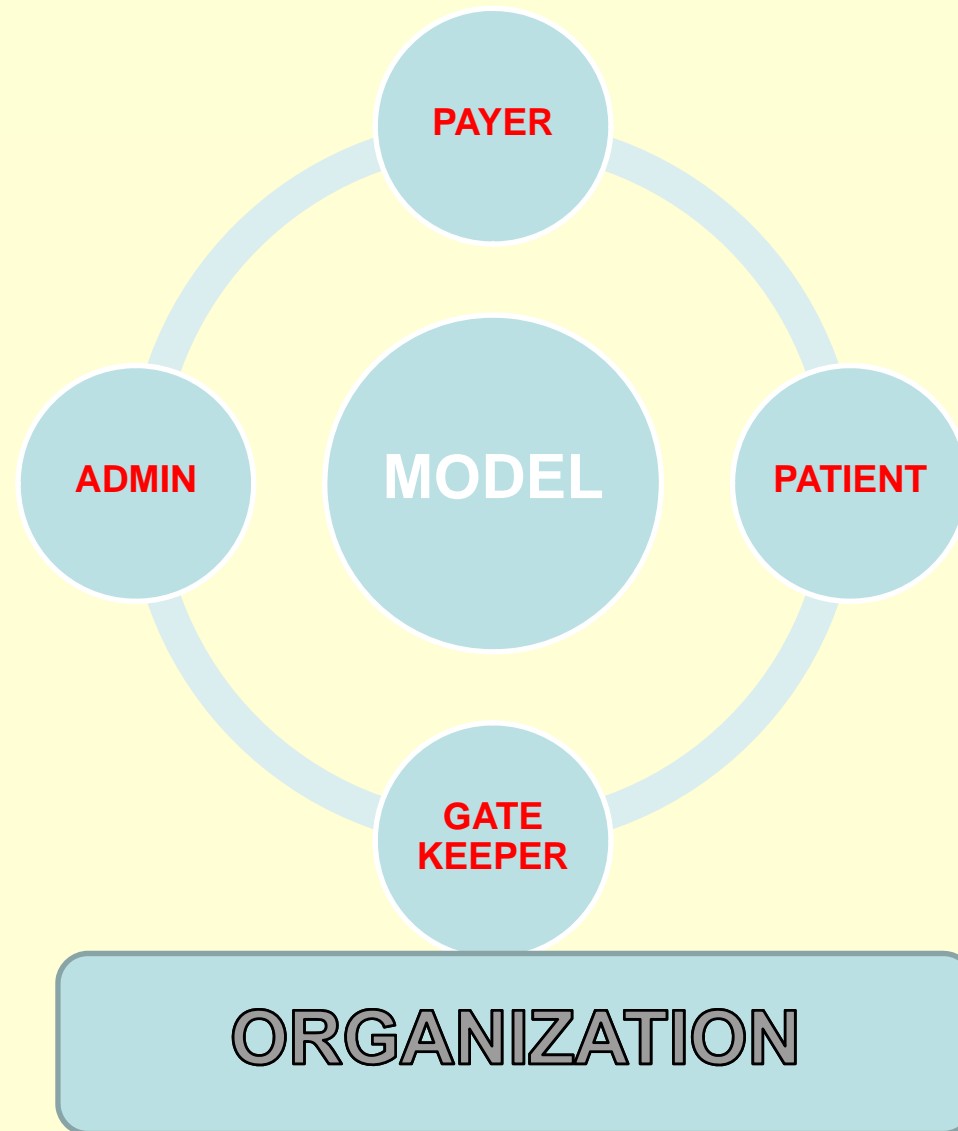
- **Staff numbers**

Services components

- **Education**

- **Exercise**

- **Lifestyle modification**

What good

- **Multidisciplinary**

- **Combine components**

- **Case management (?)**

Components in models

- Patients: high risk V.S. low risk

- Place: hospital V.S. out-side

- Practice: education V.S. exercise

  Monitor V.S. non-monitor

- Participate time: short V.S. long

MODELS

- **Multidisciplinary (Who lead ??)**

- **Home-based/community-based for low risk**

- **Hospital-based for high risk**

- **Question to answer: sessions and duration**

AHA/AACVPR Scientific Statement

Core Components of Cardiac Rehabilitation/Secondary Prevention Programs

A Statement for Healthcare Professionals From the American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation

Writing Group

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Core components of CRH

- **Patient assessment**
- **Lipid management**
- **Hypertension management**
- **Diabetes management**
- **Weight management**

- **Psychosocial management**
- **Exercise training**
- **Physical activity counseling**
- **Nutritional counseling**
- **Smoking cessation**

Table 2 · SUMMARY OF PATIENT ASSESSMENT AND OUTCOMES EVALUATION IN CARDIAC REHABILITATION AND SECONDARY PREVENTION PROGRAMS

Core Component	Assessment and Outcome Evaluation
Patient assessment	Review medical history: diagnoses, interventional procedures, comorbidities, test results, symptoms, risk factors, and medications.
	Assess: Vital signs, current clinical status, administer a battery of standardized measurement tools to assess status in each component of care.
	Goal: Develop a goal-directed treatment plan with short- and long-term goals for cardiovascular risk reduction and improvement in health-related quality of life.
Lipid management	**Assess:** Lipid profile; current treatment and compliance
	Goal: LDL < 100 mg/dL; secondary goals: HDL >40 mg/dL, triglycerides <150 mg/dL.
Hypertension management	**Assess:** Resting blood pressure (BP), current treatment strategies, and patient's adherence.
	Goal: BP <130 mm Hg systolic and <80 mm Hg diastolic
Diabetes management	**Assess:** Diabetes present: HbA_1C and fasting blood glucose (FBG); current treatment strategies and patient's adherence.
	Goal: HbA_1C < 7.0; FBG 80 -110 mg/dL
Weight management	**Assess:** Weight, height; calculate body mass index (BMI): determine risk (obese ≥30 kg/m^2; overweight 25-29.9 kg/m^2)
	Goal: If weight risk identified: energy deficit of 500-1000 kcal/day with diet and exercise to reduce weight by at least 10% (1-2 lb/wk).
Psychosocial management	**Assess:** Psychological distress (depression, anxiety, hostility, etc.); refer patients with clinically significant distress to appropriate mental health specialists for further evaluation and treatment.
	Goal: Reduction of psychological distress; enhance coping and stress management skills. Address issues affecting health-related quality of life.
Exercise training	**Assess:** Functional capacity (maximal or submaximal); physiological responses to exercise.
	Goal: Individualized exercise prescription defining frequency (times/week), intensity (THR, RPE, MET level), duration (minutes), and modality to achieve aerobic, muscular, flexibility, and energy expenditure goals.
Physical activity counseling	**Assess:** Current (past 7 days) physical activity behavior—include leisure and usual activities (occupational, domestic, etc.). Specify: time (minutes/day) frequency (days/week) and intensity (eg, moderate or vigorous).
	Goal: 30 minutes a day on most (at least 5) days/wk for moderate (3-5 MET level); 20 minutes a day for 3-4 days/wk for vigorous (6+ MET level). Promote adherence.
Nutritional counseling	**Assess:** Current dietary behavior: dietary content of fat, cholesterol, sodium, caloric intake; eating and drinking habits.
	Goal: Individualized prescribed diet based on needs assessed. Promote diet adherence.
Smoking cessation	**Assess:** Smoking status: current, recent (quit < 6 months), former, never. If current or recent: stage of change, amount of tobacco/day (or other nicotine).
	Goal: Abstinence from smoking and use of all tobacco products.

Patient assessment

Review medical history: diagnoses, interventional procedures, comorbidities, test results, symptoms, risk factors, and medications.

Assess: Vital signs, current clinical status, administer a battery of standardized measurement tools to assess status in each component of care.

Goal: Develop a goal-directed treatment plan with short- and long-term goals for cardiovascular risk reduction and improvement in health-related quality of life.

Weight management

Assess: Weight, height; calculate body mass index (BMI): determine risk (obese 30 kg/m2; overweight 25-29.9 kg/m2)

Goal: If weight risk identified: energy deficit of 500-1000 kcal/day with diet and exercise to reduce weight by at least 10% (1-2 lb/wk).

Psychosocial management

Assess: Psychological distress (depression, anxiety, hostility, etc.); refer patients with clinically significant distress to appropriate mental health specialists for further evaluation and treatment.

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adherence.

AHA/ACC Guideline

AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update

Endorsed by the National Heart, Lung, and Blood Institute

Sidney C. Smith, Jr, MD; Jerilyn Allen, RN, ScD; Steven N. Blair, PED; Robert O. Bonow, MD; Lawrence M. Brass, MD†; Gregg C. Fonarow, MD; Scott M. Grundy, MD, PhD; Loren Hiratzka, MD; Daniel Jones, MD; Harlan M. Krumholz, MD; Lori Mosca, MD, PhD, MPH; Richard C. Pasternak, MD*; Thomas Pearson, MD, MPH, PhD; Marc A. Pfeffer, MD, PhD; Kathryn A. Taubert, PhD

TABLE 1. AHA/ACC Secondary Prevention for Patients With Coronary and Other Vascular Disease*: 2006 Update

	Intervention Recommendations With Class of Recommendation and Level of Evidence
SMOKING: Goal Complete cessation. No exposure to environmental tobacco smoke.	• Ask about tobacco use status at every visit. I (B) • Advise every tobacco user to quit. I (B) • Assess the tobacco user's willingness to quit. I (B) • Assist by counseling and developing a plan for quitting. I (B) • Arrange follow-up, referral to special programs, or pharmacotherapy (including nicotine replacement and bupropion). I (B) • Urge avoidance of exposure to environmental tobacco smoke at work and home. I (B)
BLOOD PRESSURE CONTROL: Goal <140/90 mm Hg or <130/80 mm Hg if patient has diabetes or chronic kidney disease	**For all patients:** • Initiate or maintain lifestyle modification—weight control; increased physical activity; alcohol moderation; sodium reduction; and emphasis on increased consumption of fresh fruits, vegetables, and low-fat dairy products. I (B) **For patients with blood pressure ≥140/90 mm Hg (or ≥130/80 mm Hg for individuals with chronic kidney disease or diabetes):** • As tolerated, add blood pressure medication, treating initially with β-blockers and/or ACE inhibitors, with addition of other drugs such as thiazides as needed to achieve goal blood pressure. I (A) [For compelling indications for individual drug classes in specific vascular diseases, see Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).][4]

LIPID MANAGEMENT:
 	
Goal
LDL-C <100 mg/dL
If triglycerides are ≥200 mg/dL,
non-HDL-C should be <130 mg/dL†
	For all patients:
	• Start dietary therapy. Reduce intake of saturated fats (to <7% of total calories), *trans*-fatty acids, and cholesterol (to <200 mg/d). I (B)
	• Adding plant stanol/sterols (2 g/d) and viscous fiber (>10 g/d) will further lower LDL-C.
	• Promote daily physical activity and weight management. I (B)
	• Encourage increased consumption of omega-3 fatty acids in the form of fish‡ or in capsule form (1 g/d) for risk reduction. For treatment of elevated triglycerides, higher doses are usually necessary for risk reduction. IIb (B)
	For lipid management:
	Assess fasting lipid profile in all patients, and within 24 hours of hospitalization for those with an acute cardiovascular or coronary event. For hospitalized patients, initiate lipid-lowering medication as recommended below before discharge according to the following schedule:
	• LDL-C should be <100 mg/dL I (A), and
	• Further reduction of LDL-C to <70 mg/dL is reasonable. IIa (A)
	• If baseline LDL-C is ≥100 mg/dL, initiate LDL-lowering drug therapy.§ I (A)
	• If on-treatment LDL-C is ≥100 mg/dL, intensify LDL-lowering drug therapy (may require LDL-lowering drug combination‖). I (A)
	• If baseline LDL-C is 70 to 100 mg/dL, it is reasonable to treat to LDL-C <70 mg/dL. IIa (B)
	• If triglycerides are 200 to 499 mg/dL, non-HDL-C should be <130 mg/dL. I (B), and
	• Further reduction of non-HDL-C to <100 mg/dL is reasonable. IIa (B)
	• Therapeutic options to reduce non-HDL-C are:
	  ⇒ More intense LDL-C−lowering therapy I (B), or
	  ⇒ Niacin¶ (after LDL-C−lowering therapy) IIa (B), or
	  ⇒ Fibrate therapy# (after LDL-C−lowering therapy) IIa (B)
	• If triglycerides are ≥500 mg/dL#, therapeutic options to prevent pancreatitis are fibrate¶ or niacin¶ before LDL-lowering therapy; and treat LDL-C to goal after triglyceride-lowering therapy. Achieve non-HDL-C <130 mg/dL if possible. I (C)

PHYSICAL ACTIVITY: Goal 30 minutes, 7 days per week (minimum 5 days per week)	• For all patients, assess risk with a physical activity history and/or an exercise test, to guide prescription. I (B) • For all patients, encourage 30 to 60 minutes of moderate-intensity aerobic activity, such as brisk walking, on most, preferably all, days of the week, supplemented by an increase in daily lifestyle activities (eg, walking breaks at work, gardening, household work). I (B) • Encourage resistance training 2 days per week. IIb (C) • Advise medically supervised programs for high-risk patients (eg, recent acute coronary syndrome or revascularization, heart failure). I (B)
WEIGHT MANAGEMENT: Goal Body mass index: 18.5 to 24.9 kg/m^2 Waist circumference: men <40 inches, women <35 inches	• Assess body mass index and/or waist circumference on each visit and consistently encourage weight maintenance/reduction through an appropriate balance of physical activity, caloric intake, and formal behavioral programs when indicated to maintain/achieve a body mass index between 18.5 and 24.9 kg/m^2. I (B) • If waist circumference (measured horizontally at the iliac crest) is ≥35 inches in women and ≥40 inches in men, initiate lifestyle changes and consider treatment strategies for metabolic syndrome as indicated. I (B) • The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline. With success, further weight loss can be attempted if indicated through further assessment. I (B)

	Intervention Recommendations With Class of Recommendation and Level of Evidence
DIABETES MANAGEMENT: Goal HbA$_{1c}$ <7%	• Initiate lifestyle and pharmacotherapy to achieve near-normal HbA$_{1c}$. I (B) • Begin vigorous modification of other risk factors (eg, physical activity, weight management, blood pressure control, and cholesterol management as recommended above). I (B) • Coordinate diabetic care with patient's primary care physician or endocrinologist. I (C)
ANTIPLATELET AGENTS/ ANTICOAGULANTS:	• Start aspirin 75 to 162 mg/d and continue indefinitely in all patients unless contraindicated. I (A) ⇒ For patients undergoing coronary artery bypass grafting, aspirin should be started within 48 hours after surgery to reduce saphenous vein graft closure. Dosing regimens ranging from 100 to 325 mg/d appear to be efficacious. Doses higher than 162 mg/d can be continued for up to 1 year. I (B) • Start and continue clopidogrel 75 mg/d in combination with aspirin for up to 12 months in patients after acute coronary syndrome or percutaneous coronary intervention with stent placement ($\geq$1 month for bare metal stent, $\geq$3 months for sirolimus-eluting stent, and $\geq$6 months for paclitaxel-eluting stent). I (B) ⇒ Patients who have undergone percutaneous coronary intervention with stent placement should initially receive higher-dose aspirin at 325 mg/d for 1 month for bare metal stent, 3 months for sirolimus-eluting stent, and 6 months for paclitaxel-eluting stent. I (B) • Manage warfarin to international normalized ratio=2.0 to 3.0 for paroxysmal or chronic atrial fibrillation or flutter, and in post-myocardial infarction patients when clinically indicated (eg, atrial fibrillation, left ventricular thrombus). I (A) • Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding and should be monitored closely. I (B)

Measuring Behavioral Outcomes in Cardiopulmonary Rehabilitation

AN AACVPR STATEMENT

David Verrill, MS, Helen Graham, PhD, Mark Vitcenda, MS, Laura Peno-Green, MD, Valerie Kramer, BS, RN, and Teresa Corbisiero, MBA, RN

■ Outcome measurement in cardiopulmonary rehabilitation is required for optimal assessment of program quality, effectiveness of treatments, and evaluation of patient progress. Recent position statements from the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), American College of Cardiology, American Heart Association, American Thoracic Society, and American College of Chest Physicians have provided state-of-the-art information on the importance of assessing performance and outcome measures for optimal program effectiveness. Such measures are also required for AACVPR program certification. To meet current standards of practice, the AACVPR developed an Outcomes Matrix that includes 4 domains: Health, Clinical, Behavioral, and Service. Although the Clinical and Health domains have been most commonly used in outcome reporting (eg, 6-minute walk test, quality-of-life survey scores), behavioral measures have received less attention, primarily because they have been perceived as being more difficult to measure and quantify over time. This statement describes 5 common behavioral outcome measures:

Components of behaviour

To incorporate the best techniques from:

'cognitive-behavioural chronic disease management'

e.g. Kaiser Permanente MULTIFIT

'self-management' e.g. Stanford Expert Patient Programme

health behaviour change techniques e.g. 'Motivational Interviewing' William Miller, Stephen Rollnick

Individualised menu driven CR. A decade of guidelines

"The process *begins with assessments* regarding all relevant aspects of the patient's status: medical, nutritional, psychosocial, educational, and vocational. *The implementation* of cardiac rehabilitation, *based on these initial assessments*, is designed to address the *individual patient's needs* as *he or she works* toward achieving optimal outcomes."

Wenger NK, Froelicher ES, et al. Clinical Practice Guideline No. 17. October 1995.

"Rehabilitation should be tailored to the *individual needs of the patient…*"

Working Group on Rehabilitation, British Cardiac Society, 1995

"A *menu-based* approach recognises the need to *tailor the delivery of services* to the *individual*, and .. to include specific education to reduce *cardiac misconceptions…*"

SIGN Guideline for CR, 2001

• Comprehensive cardiac rehabilitation should embrace a *case management approach.* (A)
• Hospital based cardiac rehabilitation must be comprehensive and should be *individualised to meet the needs of each patient.* (D)

New Zealand Guidelines 2002

Principles of cognitive-behavioural chronic disease management

"Common elements of effective chronic illness management
- A personalised *written care plan*
- Tailored *education in self management*
- *Monitoring* of outcome and adherence to treatment
- *Targeted use of specialist consultation* of referral
- Protocols for stepped care"

Von Korff M, Organising care for chronic illness, *BMJ*, 2002;325:92-94

- anxiety management
- recognition and treatment of depression
- cognitive behavioural principles of *step by step change* [self-efficacy]
- collaborative problem definition
- goal setting
- motivational techniques
- outcome measurement

Von Korff M, Annals of Internal Medicine, 1997

The process

1 Assessment
- Assess patient's self management beliefs, attitudes and knowledge
- Identify personal barriers and supports
- Collaborate in setting goals
- Develop individually tailored strategies and problem solving

2 Goal setting and personal action plan
- List goals in behavioural terms
- Identify barriers to implementation
- Make plans that address barriers to progress
- Provide a follow up plan
- Share the plan with all members of the healthcare team

3 Active follow up to monitor progress and support patient

Von Korff M, Organising care for chronic illness, *BMJ*, 2002;325:92-94

A hospital based programme incorporating cognitive-behavioural chronic disease management

The Angina Management Programme

12 week group, hospital based, rehabilitation programme

- Eliciting & challenging unhelpful health beliefs (cardiac   misconceptions)
- Goal setting and pacing to return to a fully active life
- Overactivity-rest cycle addressed
- Self-recording of progress
- Simple self-paced home exercise programme based on common
- Built in rewards for success with goals and better coping
- Relaxation, breathing retraining, meditation, biofeedback

Lewin, B. 1997, Journal of Psychosomatic Research 43:453-462

The Angina Management Programme: trial 1

Crossover trial - waiting list to treatment - 82 patients, main findings at 1 year after treatment

57% improvement in exercise duration

72% reduction in self reported disability (SIP)

30% no angina

70% reduction in episodes of angina

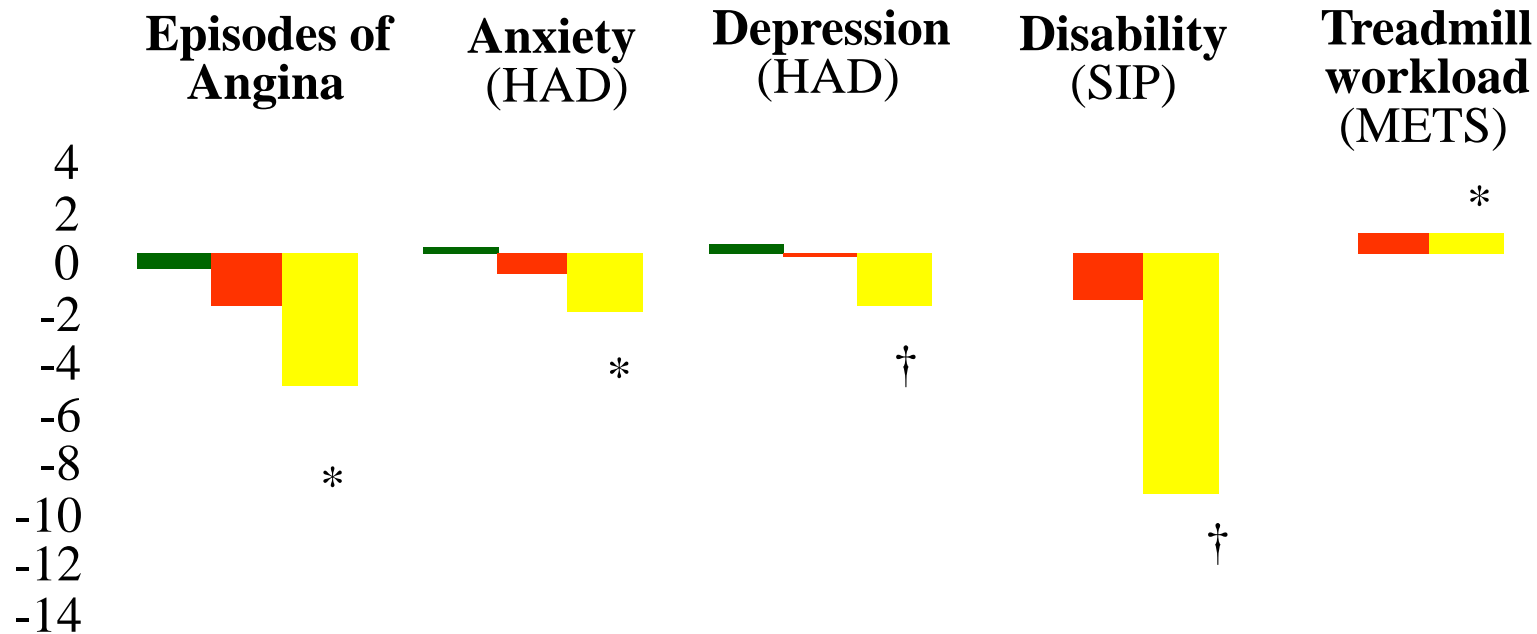50% of patients taken off CABG list

no patient looking for further treatment

The Angina Management Programme: trial 2

226 patients randomly allocated to

| routine care control | Exercise programme | Angina Management Programme |

Episodes of Angina — **Anxiety (HAD)** — **Depression (HAD)** — **Disability (SIP)** — **Treadmill workload (METS)**

4
2
0
-2
-4
-6
-8
-10
-12
-14

*

*

†

†

*

6 months post treatment (* = p<0.01,   ‡ p<0.001)

The Angina Plan

RCT

142 randomised to treatment

Angina Plan 68
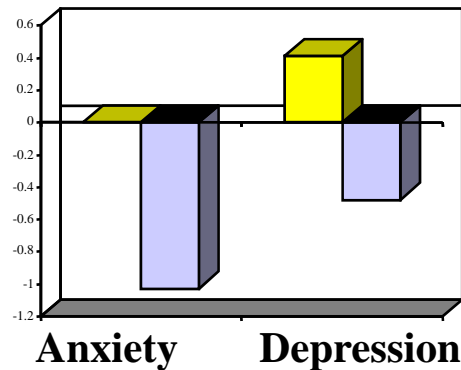
education session 74

90% at 6 month follow-up

63

67
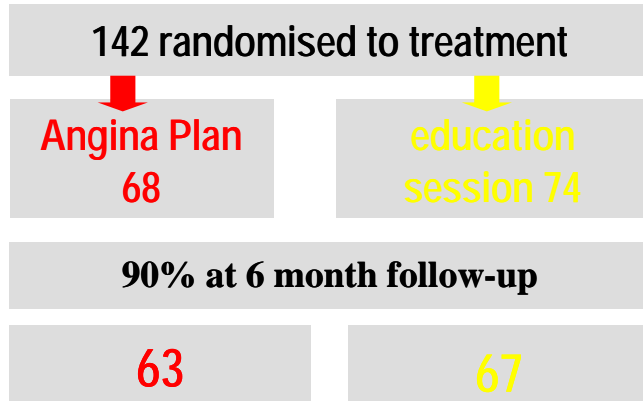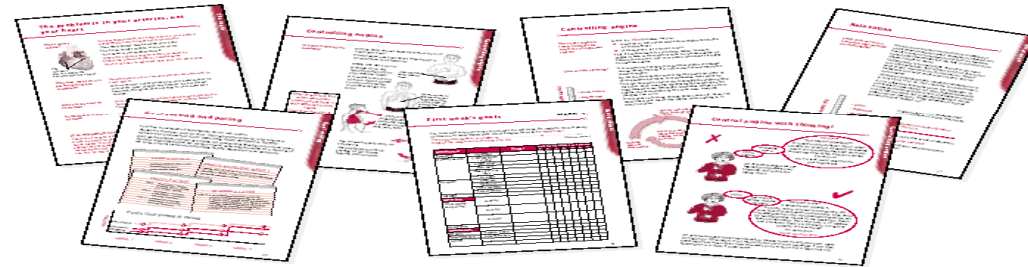
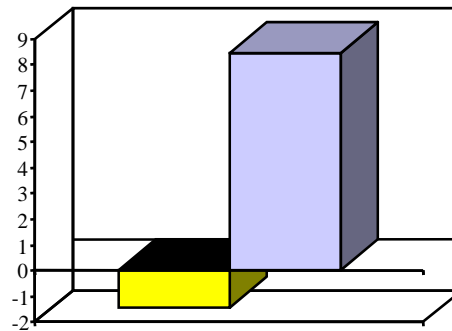home based programme, a patient held manual & trained facilitator

30-60 minutes introduction session

and 4, 10-15 minute phone calls / home /clinic visits, to set further goals, praise progress, encourage adherence
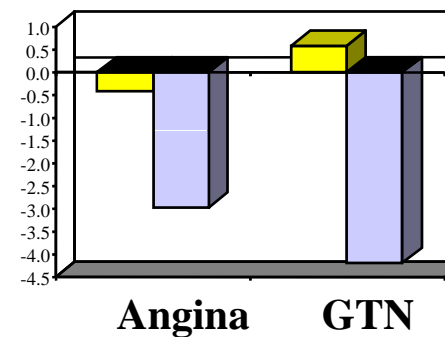
anxiety & depression

Anxiety   Depression

physical activity: SAQ

angina and use of GTN

40% reduction

Angina   GTN

Lewin RJP, British Journal of General Practice,   2002, 52, 194-201

Individualised menu based cardiac rehabilitation

First task. **Assessment***
Medical, lifestyle, psychological, social.

Second task. Check for cardiac misconceptions, discuss and agree goals using motivational techniques, jointly choose a method from the menu.

Discuss Menu, negotiate actions

Repeated (brief) contact
To: review goals; set new targets; provide rewarding feedback; encourage problem solving of any barriers to progress.

Third task. provide method for patient self-recording progress, set initial easy targets with patient.

After a few weeks
Change menu choices if agreed method not working.

Fade out support.

Final task.
Reassess using same measures Discuss long term maintenance & a plan in case of relapse, refer on if necessary, share outcomes.

*BHF BACR Minimum dataset for cardiac rehabilitation.
Lewin, BJC, (in press)   www.cardiacrehabilitation.org.uk

A sample 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
- Tai Chi classes

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
- Buddy system
- Patient support group
- Mentoring scheme

Other services / Professions
1. Sexual medicine clinic
2. Welfare rights bureau
3. Social worker
4. Marriage guidance services
5. specialist heart failure nurse