

Home exercise program



Sukajan Pongprapai M.D.
Vichaiyut Hospital
June 19, 2012

Medical evaluation
General medical evaluation
Risk stratification
Functional evaluation

Behaviour modification
Stress reduction
Counselling
Support group

Risk modification
DM, HT, DLP
obesity, inactivity

Smoking cessation
Counselling
Nicotine replacement

Exercise prescription
Aerobic exercise
Resistance exercise

Dietary management
Dietary counselling
Weight management

1° & 2° prevention

Phase III exercise program



Home – based CR program

Phase III exercise program



Community based activity
Long term compliance
Enjoyable & Convenient

CARES THAI 's recommendation

PA at moderate intensity
(50-80% VO_2 max)

20-60 minutes

3-5 days/wk

2008 Physical Activity Guidelines for Americans & American Heart Association (2010)

Aerobic exercise

Moderate intensity	150 min/wk 30 mins ,5/wk
Vigorous intensity	75 min/wk 25 mins ,3/wk

Resistance exercise

8-12 muscles	2 /wk
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Reduced CHD risk 20-25%



Light < 3 METs

Moderate 3 – 6 METs

Vigorous > 6 METs

MET = metabolic equivalent

1 MET = resting energy consumption
supine position

3.5 ml O₂/ kg/min

1.2 cal/min or 72 cal/hr

TABLE 2. MET equivalents of common physical activities classified as light, moderate or vigorous intensity.

Light <3.0 METs	Moderate 3.0 – 5.9 METs	Vigorous ≥6.0 METs
Walking Walking slowly around home, store or office = 2.0*	Walking Walking 3.0 mph = 3.3* Walking at very brisk pace (4 mph) = 5.0*	Walking, jogging & running Walking at very brisk pace (4.5 mph) = 6.3* Walking/hiking at moderate pace and grade with no or light pack (<10 lb) = 7.0 Hiking at steep grade and pack 10–42 lb = 7.5–9.0 Jogging at 5 mph = 8.0* Jogging at 6 mph = 10.0* Running at 7 mph = 11.0*
Household & occupation Sitting — using computer work at desk using light hand tools = 1.5 Standing performing light work such as making bed, washing dishes, ironing, preparing food or store clerk = 2.0–2.5	Cleaning — heavy: washing windows, car, clean garage = 3.0 Sweeping floors or carpet, vacuuming, mopping = 3.0–3.5 Carpentry — general = 3.5 Carrying & stacking wood = 5.5 Moving lawn — with power mower = 5.5	Shoveling sand, coal, etc. = 7.0 Carrying heavy loads such as bricks = 7.5 Heavy farming such as baling hay = 8.0 Shoveling, digging ditches = 8.5
Leisure time & sports Arch & snuff, playing cards = 1.5 Billiards = 2.5 Boating — power = 2.5 Crouching = 2.5 Darts = 2.5 Fishing — sitting = 2.5 Playing most musical instruments = 2.0–2.5	Badminton — recreational = 4.5 Basketball — shooting around = 4.5 Bicycling — on flat, light effort (10–12 mph) = 6.0 Dancing — ballroom slow = 3.0; ballroom fast = 4.5 Fishing from river bank & walking = 4.0 Golf — walking putting clubs = 4.5 Sailing boat, wind surfing = 3.5 Swimming leisurely = 6.0† Table tennis = 4.0 Tennis doubles = 5.0 Volleyball — noncompetitive = 3.0–4.0	Basketball game = 8.0 Bicycling — on flat, moderate effort (12–14 mph) = 6.0; fast (15–18 mph) = 10 Skiing cross country — slow (2.5 mph = 7.0; fast (5.0–7.0 mph) = 8.0 Soccer — casual = 7.0; competitive = 10.0 Swimming — moderate/fast = 8–11† Tennis singles = 8.0 Volleyball — competitive at gym or beach = 8.0

Arnsperth, et al. 2000 (1). * On flat, hard surface. † MET values can vary substantially from person to person during swimming as a result of different strokes and skill levels.

Exercise-related events during CR

Cardiac arrest 1/117,000 patient-hours

Non-fatal MI 1/220,000 patient-hours

Death 1/750,000 patient-hours

Sudden cardiac arrest (unknown heart disease)

tennis 1/ 375,000 person-hours
jogging 1/ 888,000 person-hours

Franklin BA , Chest 1998

Circulation 2007.

Safety of exercise-based CR

Screening, excluding high-risk patients from
some activities.

Reporting and evaluating **prodromal** symptoms.

Preparing fitness personnel and facilities
for cardiovascular emergencies.

Recommending prudent exercise programs.

ตารางความเหนื่อย

Borg scale

ค่าความ ระดับความเหนื่อย
เหนื่อย

6-7 ไม่เหนื่อยเลย

8-9 เริ่มเหนื่อย

10-11 เหนื่อยเล็กน้อย

12-13 เหนื่อยปานกลาง

14-15 เหนื่อยมากขึ้น

16-18 เหนื่อยมาก

19-20 เหนื่อยมากที่สุด

Safety of exercise-based CR

TABLE 5. Prodromal Symptoms Reported by 45 Subjects Within 1 Week of Their SCD

Symptom	Reports, n
Chest pain/angina	15
Increasing fatigue	12
Indigestion/heartburn/gastrointestinal symptoms	10
Excessive breathlessness	6
Ear or neck pain	5
Vague malaise	5
Upper respiratory tract infection	4
Dizziness/palpitations	3
Severe headache	2

Adapted from Northcote et al.⁵⁷

Circulation 2007

Important Warnings to Stop Exercising

Stop exercising if you experience any of the following symptoms. Rest for a few minutes, and if the symptom persists, seek immediate medical attention.

- Chest pain
- Pain that spreads to the arms, ear, jaws, or back
- Light-headedness or dizziness
- Excessive fatigue
- Shortness of breath
- Excessive sweating
- Nausea or vomiting
- Irregular pulse
- Increased pulse rate that persists for more than five or six minutes after you stop exercising

In addition, stop exercising if you experience any unusual joint or muscle pain that may indicate an orthopedic injury.

TABLE 9. INDICATIONS FOR EXERCISE TERMINATION

Chest pain suggestive of ischemia
Ischemic ECG changes
Complex ectopy
Second or third degree heart block
Fall in systolic pressure ≥ 20 mm Hg from the highest value during the test
Hypertension (> 250 mm Hg systolic; > 120 mm Hg diastolic)
Severe desaturation: $SpO_2 \leq 80\%$ when accompanied by symptoms and signs of severe hypoxemia
Sudden pallor
Loss of coordination
Mental confusion
Dizziness or faintness
Signs of respiratory failure

HR > 120 / min
HR increase > 30 / min
drop > 10 / min

Circulation 2001

Overall cardiac complication rate
from exercise CR
(syncope ,arrhythmia , MI , sudden death)

Morning 3/100,000 patient-hours

Afternoon 2.4/100,000 patient-hours

Murray PA , Arch Intern Med 1993

Guidelines for Home Exercise Conditioning

- Set aside a specific time to exercise three or four times a week and stick to it. Some people prefer to work out in the early morning; others find that a session at the end of the workday helps change gears and relax. The time of day is not as important as making it a part of your regular routine.
- Wear loose-fitting, comfortable clothing that is appropriate for the temperature and weather.
- Pay particular attention to your shoes. Invest in a good pair of exercise shoes that are designed specifically for your chosen activity (for example, walking or jogging).

- Always include warm-up and cool-down exercises in each session. These help prevent the orthopedic problems that put many exercisers on the sidelines.
- Do not exercise immediately after a meal; wait at least 30 to 60 minutes.
- When it is hot and humid, plan your exercise for the coolest part of the day, or exercise in an air-conditioned indoor area.
- Avoid exercising outdoors during periods of smog or heavy air pollution.
- Avoid exercising outdoors when temperatures fall below freezing or when there is excessive wind.

Sex after heart attack

Resume 2nd week after MI

Safe if can climb 20 stairs within 10-15 sec.
or 2 flights of stairs. (**5 METs**)

HR < 20-30 / min from RHR

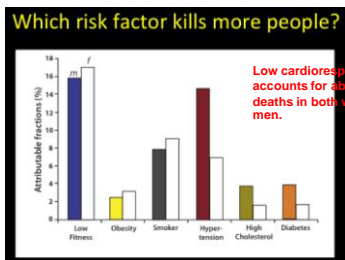
NTG can be taken beforehand
be careful with **viagra**

Any position

Compliance of CR



1st World Congress of EIM ; June 2010
Prof. Karim Khan & Prof. Steven Blair
Inactivity even worse than Smokadiabesity



Low cardiorespiratory fitness
accounts for about 16% of all
deaths in both women and
men.

Smokadiabesity
(smoking, diabetes, obesity)

Review Article

Systematic Review of the Effect of Diet and Exercise Lifestyle Interventions in the Secondary Prevention of Coronary Heart Disease

Cardiology Research and Practice 2010

Judith A. Cole,¹ Susan M. Smith,² Nigel Hart,¹ and Margaret E. Cupples¹

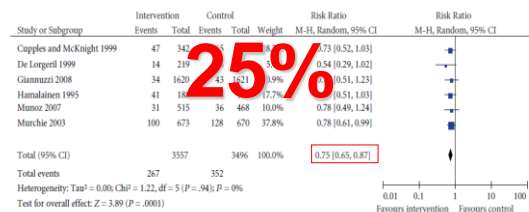


FIGURE 2: Effect of interventions on all-cause mortality: comparison of intervention versus control groups.

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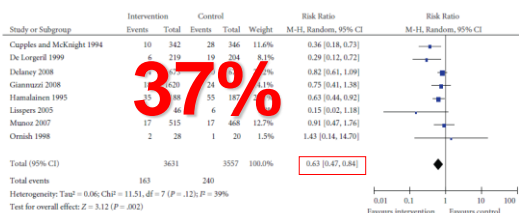


FIGURE 3: Effect of interventions on cardiovascular mortality: comparison of intervention versus control groups.

Effect of exercise on cardiac risk factors

DM	decrease HbA1C	0.8%
Dyslipidemia	increase HDL	2.5 mg%
HTN	decrease BP	3.4/2.4 mmHg
Obesity	weight loss	6.7 kg/1yr.
	(diet + exercise)	

Exercise Prescription and Primary Prevention of Cardiovascular Disease
Thomas S. Metkiss, Jr, Kenneth L. Baughman and Paul D. Thompson

Circulation June 15, 2010



Compliance of CR



Phase III exercise program



Home – based CR program

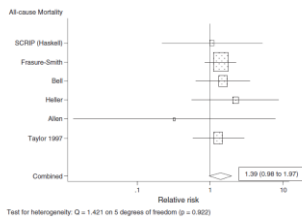


International Journal of Cardiology 111 (2006) 343–351

Review

Home-based cardiac rehabilitation compared with centre-based rehabilitation and usual care: A systematic review and meta-analysis

Kate Jolly^a, Rod S. Taylor^a, Gregory Y.H. Lip^{b,*}, Andrew Stevens^a



International Journal of Cardiology
www.elsevier.com/locate/ijcard

BMJ 2010

RESEARCH

Home based versus centre based cardiac rehabilitation: Cochrane systematic review and meta-analysis

Hasnain M Dabal, honorary clinical lecturer,¹ general practitioner,² Anna Zawada, senior analyst,³ Kate Jolly, senior lecturer in public health and epidemiology,⁴ Tiffany Moxham, information specialist,⁵ Rod S Taylor, associate professor in health services research⁶

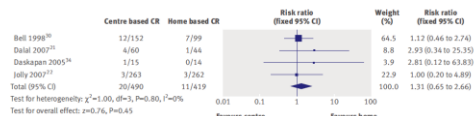


Fig 10 | Mortality with home based and centre based cardiac rehabilitation at 3-12 months of follow-up

The Heart Manual is the UK's leading home-based supported self management programme for individuals with CHD who may be recovering from acute Myocardial Infarction and revascularisation.

The Heart Manual



This Manual has been given to you by a healthcare professional (usually a nurse) who has been specially trained to work with patients using the Manual. We call this person a **facilitator**.

Week 1: Getting Home – Getting Better

Welcome to the first week of your 6 week recovery programme

In this first week we shall:

- answer some more questions about your heart attack and about why you feel the way you do
- introduce you to the Exercise and Relaxation Plans which will play an important part in your recovery and afterwards
- look at some of the things which might be worrying you, and show you how you can fight back.
- if you live with someone, get them to read this section - it can help them as much as it helps you.

Relaxation

Week 2

Last week you were listening to two different ways of relaxing on the relaxation CD. This week, please go on listening at least once a day to whichever method you find best.

If you like them both, listen to them both.

To get the full benefits you should go on listening regularly for at least 12 weeks.

The relaxation course continues on the relaxation CD. It includes several other ways of relaxing that you may find useful.

You may choose to listen to them all now, but they will probably be more effective if you work through them in the order suggested on the CD.

Week 3

Exercise/Activity Plan Gradually building up your plan

How much activity should I be aiming for?

It is important to take your time and build up your activity gradually. This may mean taking regular smaller walks throughout the day rather than one longer one. The general recommendations are to increase your physical activity until you are doing at least 30 minutes of exercise on at least 5 days of the week. The activity should make you breathe faster and feel warmer. For some people this may take several weeks or longer to achieve.

Walking record

Date.....	I think I can easily.....			
That was:	<u>Too Easy</u>	<u>Fairly Easy</u>	<u>Fairly Hard</u>	<u>Too Hard</u>
Date.....	I think I can easily.....			
That was:	<u>Too Easy</u>	<u>Fairly Easy</u>	<u>Fairly Hard</u>	<u>Too Hard</u>
Date.....	I think I can easily.....			
That was:	<u>Too Easy</u>	<u>Fairly Easy</u>	<u>Fairly Hard</u>	<u>Too Hard</u>

Week 4:

Getting Better All The Time

You are into the second half of your 6-week programme. Most people are feeling much better by now. Here's what the Manual programme covers in Week 4:

This week you'll carry on building up your regular exercise and doing regular relaxation. Most people at this stage are feeling considerably better and making good progress towards a full recovery. If you still don't feel quite as well as you think you should, discuss your feelings with your doctor or facilitator.

Week 5: Feeling More Like Yourself?

Week 5 – as you work towards the end of this programme you should be feeling much more like your old self.

Here's what the Manual programme covers in Week 5

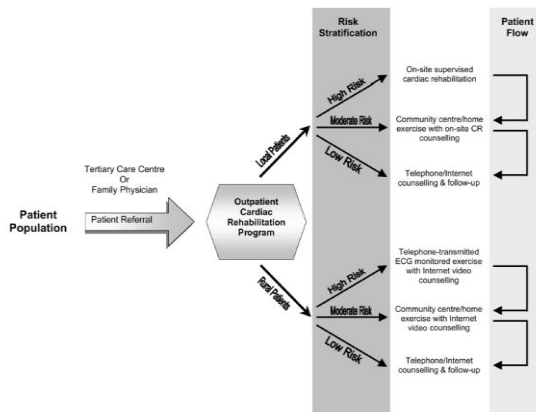
This week you should keep up your regular exercise and regular relaxation. Most people at this stage are feeling much more like their old selves. Many people who have used the Manual are already feeling better than they did before their heart attack. This is Week 5 of the 6-week programme, but it doesn't mean that it is the beginning of the end. Think of it as getting near the end of the beginning – of a new and healthier lifestyle than you led before.

What has happened over the last 6 weeks

Over the last 6 weeks we have covered all of the most important things that you need to know about and what to do after a heart attack.

Information:

- what a heart attack is and what causes it
- what coronary artery disease is and what causes it
- wrong ideas about heart attacks and coronary artery disease
- how to fight back and reduce the risk of having another heart attack
- what to do if you think that you may be having another heart attack.



Risk stratification

AACVPR guideline

Low	EF > 50 % No resting or exercise induced dysrhythmia Functional capacity > 7 METs
Moderate	EF 40-49 % Functional capacity 5 - 6.9 METs
High	EF < 40 % Functional capacity < 5 METs Survival of cardiac arrest Ventricular dysrhythmia at rest or exercise Clinically significant depression

Don't do any exercise in ;

Unstable angina
Class IV heart failure
Uncontrolled sustained tachyarrhythmias or bradyarrhythmias

Severe and symptomatic aortic or mitral stenosis
Hypertrophic obstructive cardiomyopathy
Severe pulmonary hypertension
Resting systolic blood pressure 200 mm Hg or resting diastolic blood pressure 110 mm Hg

Active or suspected myocarditis or pericarditis, thrombophlebitis

Recent significant systemic or pulmonary embolus.

Exercise prescription

Aerobic exercise
Resistive exercise

plus

Slow deep breathing exercise
Increased physical activity

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
Gary J. Balady, Mark A. Williams, Philip A. Ades, Vera Bittner, Patricia Comoss, JoAnne M. Foody, Barry Franklin, Bonnie Sanderson and Douglas Southard
Circulation 2007;115:2675-2682; originally published online May 18, 2007;

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Aerobic exercise

F 3-5 days/wk
I 50-80% VO₂ max
D 20-60 mins
M continuous aerobics or interval training

Resistance exercise

F 2-3 days/wk
I 10-15 rep./set ,40-60% of 1RM
D 1-3 sets of 8-10 exercises
M elastic bands
weight cuff
dumbbells
weight machine

Unsupervised program

Estimated maximal HR

Intensity 60-75% VO_2 max
talk test
Borg scale
increased HR 10-20 / min

Duration 30 mins

Frequency 3 per week

Thompson P. , Circulation 2005

การคำนวณชีพจรเป้าหมาย
ตามสูตรของ Karvonen

$$\text{ชีพจรเป้าหมาย} = [(\text{HRmax} - \text{RHR}) \times \text{intensity \%}] + \text{RHR}$$

HRmax = maximum HR , RHR = resting HR

$$\begin{aligned} &= [(220-60=160) - 80] \times 0.6] + 80 \\ &= 48+80 \\ &= 128 \end{aligned}$$

Circulation 2001

TABLE 7. Classification of Physical Activity Intensity

Intensity	Relative Intensity		
	$\dot{V}\text{O}_2$ max, %	Maximum Heart Rate, %	RPE†
Very light	<20	<35	<10
Light	20–39	35–54	10–11
Moderate	40–59	55–69	12–13
Hard	60–84	70–89	14–16
Very hard	≥85	≥90	17–19
Maximum‡	100	100	20

ตารางความเหนื่อย

Borg scale

ค่าความ ระดับความเหนื่อย
เหนื่อย

6-7 ไม่เหนื่อยเลย

8-9 เริ่มเหนื่อย

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Circulation 2001

TABLE 8. Energy Requirements of Selected Daily Activities*

Activities	METs
Leisure	
Mild	
Billiards	2.4
Canoeing (leisurely)	2.5
Dancing (ballroom)	2.9
Golf (with cart)	2.5
Horseback riding (walking)	2.3
Playing a musical instrument	
Accordion	1.8
Cello	2.3
Flute	2.0
Piano	2.3
Violin	2.5
Volleyball (noncompetitive)	2.9
Walking (2 mph)	2.5

Moderate

Calisthenics (no weight)	4.0
Cycling (leisurely)	3.5
Golf (without cart)	4.4
Swimming (slow)	4.5
Walking (3 mph)	3.3
Walking (4 mph)	4.5

Activities	METs
Raking lawn	4.0
Riding in a vehicle	1.0
Sitting; light activity	1.5
Taking out trash	3.0
Vacuuming	3.5
Walking the dog	3.0
Walking from house to car or bus	2.5
Watering plants	2.5

Activities of daily living

Gardening (no lifting)	4.4
Household tasks, moderate effort	3.5
Lifting items continuously	4.0
Loading/unloading car	3.0
Lying quietly	1.0
Mopping	3.5
Mowing lawn (power mower)	4.5

Vigorous

Chopping wood	4.9
Climbing hills (no load)	6.9
Climbing hills (5 kg load)	7.4
Cycling (moderately)	5.7
Dancing	
Aerobic or ballet	6.0
Ballroom (fast) or square	5.5
Jogging (10 min mile)	10.2
Rope skipping	12.0
Skating	
Ice	5.5
Roller	6.5

Post PCI (angioplasty and/or stent)

Start exercise training
7-14 days post PCI

Post ICD

Limit target HR at least
10 to 15 beats/min lower than
the threshold discharge rate.

Post pacemaker

Avoid high intensity resistance exercise
Fixed-rate pacemakers;
Activity intensity must be gauged
by other methods eg. Borg scale

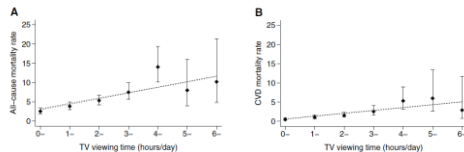
Post CABG

Avoid upper body exercise
for 3 months.

Circulation 2010



Television Viewing Time and Mortality: The Australian Diabetes, Obesity and Lifestyle Study (AusDiab)
D.W. Dunstan, E.L.M. Barr, G.N. Healy, J. Salmon, J.E. Shaw, B. Balkau, D.J. Magliano, A.J. Cameron, P.Z. Zimmet and N. Owen



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Original Contribution

Leisure Time Spent Sitting in Relation to Total Mortality in a Prospective Cohort of US Adults

Alpa V. Patel¹*, Leslie Bernstein, Anusila Deka, Heather Spencer Feigelson, Peter T. Campbell, Susan M. Gapstur, Graham A. Colditz, and Michael J. Thun

RR for sitting > 6 hr/day

Male 1.94
Female 1.48

Take home message

**Drugs don't work when
patients do not take them.**

**Exercise doesn't work in
patients who do not follow
recommendations.**



Thank You for Your Attention