

Exercise Training in Heart Failure

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Background

Exercise Training in Heart Failure





What Did We Think?

Paradox:

'Exercise good for you' – everyday message – many benefits

'Exercise is dangerous for damaged hearts' Vague notions about 'strain' and 'exercise-arrhythmias' Exclusion of patients with severe LVSD from CR programmes





What Do We Think Now?

- Better understanding of exercise physiology
- More experience of CR and of heart failure
- Heart failure patients identified earlier and kept
 healthier
- Paradigm shift: heart a muscle and NEEDS exercise, if impaired even more need
- Solid evidence base for exercise training in heart failure cohorts





Fig 3 Kaplan-Meier cumulative two year survival (top) and Kaplan-Meier cumulative two year survival or free from admission to hospital (bottom)





Fig 4 Effect of exercise training on death

	Training	Control			Hazard ratio (95% CI)	χ^2	P	value
eve	nts / risk	events / risk	Dea	ath			Ellect	IIIIeraction
Sex								
Male	79/349	95/354	-		0.60 (0.41 to 0.87)	7.30	0.01	0.27
Female	9/46	10/52		•	1.17 (0.41 to 3.34)	0.09	0.77	
Age								
≥60 years	52/202	65/205			0.64 (0.41 to 0.99)	3.97	0.05	0 74
<60 years	36/193	40/201	-	-	0.65 (0.36 to 1.18)	2.02	0.16	0.74
Functional clas	55							
NYHA I-II	45/206	43/206	-	-	0.69 (0.40 to 1.20)	1.75	0.19	0.84
NYHA III-IV	43/189	62/200	-		0.63 (0.40 to 0.99)	4.03	0.05	0.04
Cause								
Ischaemic	54/256	75/253			0.54 (0.35 to 0.83)	7.78	0.01	0.10
Non-ischaemic	34/139	30/153		_	0.93 (0.52 to 1.68)	0.06	0.81	0.10
Left ventricula	r ejection fra	action						
≥27%	38/193	36/187		_	0.83 (0.45 to 1.50)	0.40	0.53	0.20
<27%	50/202	69/219			0.59 (0.38 to 0.92)	5.54	0.02	0.30
Peak oxygen c	onsumption							
≥15 ml/kg/min	36/177	32/173		_	0.74 (0.39 to 1.40)	0.86	0.35	0.42
<15 ml/kg/min	52/218	73/233	-		0.63 (0.42 to 0.96)	4.59	0.03	0.43
Duration of tra	ining							
≥28 weeks	41/216	60/219			0.64 (0.41 to 0.99)	4.08	0.04	0.50
<28 weeks	47/179	45/187		_	0.66 (0.37 to 1.19)	1.88	0.17	0.53
Total	88/395	105/406	_ -		0.65 (0.46 to 0.92)	5.92	0.015	
		0.2	25 0.5	1 2 4	ł			
		E	Exercise	Exercise worse				

BMJ 2004;328:189



Fig 5 Effect of exercise training on death or admission to hospital

	Training Control		Death or			Hazard ratio	χ^2	P value	
۱ e	No of / No at vents / risk	No of / No at events / risk	admission to hospital			(95% CI)		Effect	Interaction
Sex									
Male	113/349	152/354	-			0.73 (0.57 to 0.95)	5.63	0.02	0.73
Female	14/46	21/52		<u> </u>		0.65 (0.28 to 1.48)	0.23	0.63	0.70
Age									
≽60 years	76/202	98/205	-	ł		0.75 (0.54 to 1.02)	3.34	0.07	0.28
<60 years	51/193	75/201	+	ł		0.73 (0.50 to 1.06)	2.69	1.01	0.20
Functional cl	ass								
NYHA I-II	59/206	65/206		┝		0.89 (0.61 to 1.29)	0.39	0.53	0.55
NYHA III-IV	68/189	108/200				0.65 (0.47 to 0.90)	6.80	0.01	
Cause									
Ischaemic	75/256	117/253				0.64 (0.47 to 0.87)	8.01	0.00	0.15
Non-ischaem	ic 52/139	56/153	+	-		0.99 (0.66 to 1.47)	0.01	0.94	0.15
Left ventricu	lar ejection fra	ction							
≽27%	53/193	63/187		+		0.82 (0.55 to 1.21)	0.99	0.32	0.00
<27%	74/202	110/219	-			0.71 (0.52 to 0.97)	4.75	0.03	0.90
Peak oxygen	consumption								
≽15 ml/kg/mi	in 48/177	53/173		+		0.85 (0.56 to 1.30)	0.54	0.46	0.66
<15 ml/kg/mi	in 79/218	120/233	-			0.70 (0.52 to 0.95)	5.28	0.02	
Duration of t	raining								
≽28 weeks	72/216	107/219	-			0.62 (0.45 to 0.86)	8.39	0.00	0.07
<28 weeks	55/179	66/187		+		0.93 (0.65 to 1.35)	0.13	0.71	0.37
Total	127/395	173/406	+			0.72 (0.56 to 0.93)	6.44	0.011	
		0.2	25 0.5	1 2	4				
		E	Exercise better	Exerci wor	ise 'se				

BMJ 2004;328:189





More evidence ...

- In a US study of 68 class IV patients awaiting transplant 31 improved on exercise and were taken off list (Ades, 2001)
- Symptom improvements and better exercise tolerance (Lloyd-Williams et al, 2002; Beniaminvitz et al, 2002)
- In one study NYHA class fell from 2.4 to 1.3 after 406 months training (Sullivan et al, 1989)
- Possible improvement in LVEF (ELVD-CHF, 2002)







How does it work?

Various Mechanisms

- Reduce weight
- Reduce blood pressure
- Improve blood count
- Endothelial Tissue Perfusion
- Reduce HR (thereby increasing diastolic filling time)
- Remodelling (Frank-Starling Effect)
- Psychological (control, stress, sleep, well being, hope)





Is it safe?

Arrhythmias



- No studies have reported serious ventricular arrhythmias during exercise training (Appleton, 2004)
- Exercise reduces sympathetic activity thereby reducing risks of sudden death / arrhythmia (Coats et al, 1990 and 1992)

Haemodynamic

- No negative haemodynamic responses (Lloyd-Williams et al, 2000)
- No increased adverse effects if patients exercised on ACE-Inhibitors or beta-blockers (Meyer et al, 1991; Demopoulus et al, 1997)
- Some evidence of reduced risks during exercise programmes (Coats et al, 1992; Belardinelli et al, 1995)





Suitable for all?

- <u>Contra-indications</u>
 - ✓ Decompensated heart failure
 - ✓ Unstable coronary artery disease
 - Significant valvular stenosis or outflow tract obstructive disorders
 - ✓ Active myocarditis or restrictive myocardial fibrosis
 - \checkmark Hx of exercised induced arrhythmias
 - ✓ Structural heart disease with intra-cardiac shunts
 - ✓ Physical or mental incapacity
- Note: NYHA IV class not a contra-indication Severe LVSD not a contra-indication





Cost Effectiveness

Health Service

- Reduction of admissions and readmissions
- Reduction in other usages (e.g. GP visits)
 <u>Societal</u>
- Possible improvement return to work







- 900 000 patients with heart failure in UK
 - Similar number with damaged hearts but as yet undiagnosed
- Average GP 30 patients with HF
 - 10 more suspected per year
- First year Mortality as high as 40%
 - then 10% per annum
- Over 1m in-patient bed days per annum (2% total)
 - 5% emergency medical admissions
- Annual £716m cost to NHS (1.8% total budget)

NICE CG5 Chronic Heart Failure (2003)





Local Situation

Exercise Training in Heart Failure











Service Provision

NHS Provision

- CR through secondary care (AMI, PCI)
- 'Exercise Your Options'

Private Provision

• Phase 4 CR exercise classes in local gyms

Third Sector Provision

HeartBeat





Service Inequalities





HF Service Activity

- All patients on caseload had exercise explained and signposted
- 25% eligible patients doing exercise
- Access not comparable
 - Chorley and South Ribble not well provided
 - Non AMI/PCI patients less well provided







Response

Exercise Training in Heart Failure





'Getting it on the Agenda'

- Make clinical case AND business case
- Have a plan!
 - Written; with a short executive summary and larger supporting document
- Presentation of evidence at education events, meetings and to key stakeholders/managers
- Once presented get ACTIONS agreed. Keep the process moving.







'Carrots and Sticks'

- We did all the carrot work on benefits etc
- BUT...big driver came with a stick
 Health Care Commission heart failure report, 2007
- RISK ... 'of not complying with report'







Options

- Expand existing secondary care CR to include all heart failure patients
- Develop exercise training as part of PCT heart failure service
- Set up a stand alone PCT CR service







Service Specification

- Within PCT Heart Failure Service
- Community based in Chorley and South Ribble
- Internal referral by Heart Failure Specialist Nurses
- Managed by PCT Provider Services
- I day per week (assessments and classes)
- Rolling Programme for up to 12 patients
- Staffing: 1 HFSN (0.8) and 1 Physio (0.2) and secretarial (0.2)







Implementation Problems

Exercise Training in Heart Failure





Problem 1

- Agreeing the Service Specification
 - Minimum Necessary (Management Position)
 - Gold Plated Service (Clinicians Position)
 - How many patients?
 - How many staff?
 - Types/grade of staff?
 - Length of programme?
 - Set, rolling or drop in format?
 - Location of classes?
 - Content of classes?





Problem 2

<u>Recruitment</u>

- Nurse Specialist (got lucky, skill set needed)
- Physio 1 day a week big problem, secondary problem lack of CR experienced candidates

<u>Solution</u>

 Look within organisation; transferred 1 day a week from COPD team and provide CR training







Problem 3

'Disappearing' funds

- Non-recurrent funds
 - Needed for set up equipment
- Recurrent funds
 - Needed for room hire

Solution

- Double up with Pulmonary Rehabilitation (new service) for rooms
- Spare monies for equipment within PR set up budget bought for 'joint' use





Where are we now?

Exercise Training in Heart Failure





June 2010

- All Staff in post
- All rooms and equipment bought, tested, in place
- All Protocols, procedures, documentation in place
- Waiting list of patients established
- First patients having assessments and starting classes this month







Good Things

- We have something running!
- We have expanded the offering for patients (place, type)
- We have this as part of our service (can adapt and develop it)
- We are doing this cheaply and at low risk
- Less Good Things
 - Limited scope
 - Smallness means not as robust as larger service





Where do you go

Exercise training in Heart Failure





Network Cardiac Strategy



- Covers period 2010-2015
- Heart Failure chapter pp 85-97
- Heart Failure part of other chapters
- Evidence Based Review
- Recommendations to Commissioners and Providers





- National Service Framework for Coronary Heart Disease
 - Chapter 6, Standard 11
- National Institute for Health and Clinical Excellence
 - NICE CG5 Chronic Heart Failure
 - NICE TA 120 (CRT)
 - NICE TA 95 (ICD)
- HCC HF Audit 2007
- CQC
- National HF Audit
- Department of Health Priorities and Initiatives
- World class commissioning
- The NHS in England: The operating framework for 2009/10' (2008)
- Delivering the 18 week patient treatment pathway
- The 'Care Closer to Home' initiative outlined in chapter 6 of the white paper 'Our health, our care, our say' (2006)
- 'Commissioning framework for health and well-being'(2007)
- Transforming Community Services
- Advancing Quality
- Considering the impact of patient choice
- The Expert patients programme
- 'A stronger local voice: a framework for creating a stronger local voice in the development of health and social care services' (2006)
- 'Standards for better health' (2004, 2006)
- Focus on: Heart Failure, NHS Institute for Innovation and Improvement (2009)





Process/Strategy

- First Step
 - What should you have (evidence, local needs)
 - What have you got (existing resources)
 - How do you meet the mismatch (alternatives)
 - New resources needed
- Second Step
 - Getting it agreed (politics, other people)
 - Delivering it (up to you!!)





Lessons

- Persistence (if you are right you will be proved right)
- Have all your arguments and data prepared
- Stress RISKS of not changing
- Identify people in right positions with authority and budgets
- Be willing to compromise and adapt
- Collect data on activity, quality and outcomes







Future Planning

- More care out of hospitals
- More care focused on lifestyle and activities of living
- More preventative and early interventions
- Efficiency savings
- Integrated cross boundary working?
- New partners?







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