Third National Survey of Cardiac Rehabilitation Service Provision in Ireland: progress on the 1999 National Cardiovascular Health Strategy Recommendations

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THIRD NATIONAL SURVEY OF CARDIAC REHABILITATION SERVICE PROVISION IN IRELAND: progress on the 1999 National Cardiovascular Health Strategy Recommendations

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Summary

Background The National Cardiovascular Health Strategy, including specific plans for cardiac rehabilitation, was launched in Ireland in 1999. A survey of cardiac rehabilitation services was conducted in 2006 to evaluate progress on service provision.

Aim To establish levels of service provision and service formats of cardiac rehabilitation services in 2005, compare them with the status pre-Strategy (1998) and to ascertain areas in which additional resources may be needed to achieve the 10 national recommendations for cardiac rehabilitation.

Method All hospitals in Ireland (n=37) admitting cardiac patients to a coronary or intensive care unit completed surveys by postal questionnaire or telephone follow-up.

Results All hospitals provided Phase I, 97% (36 hospitals) provided Phase II and 95% (35 hospitals) provided Phase III outpatient programmes. Forty–three percent (16 hospitals) provided a formal phase IV programme. Lack of staff (66%) and lack of available space (23%) were cited as the greatest barriers to programme development. Expanding the service to provide cardiac rehabilitation to other types of patient was deemed the most important area for development by 34% of centres. The development and provision of Phase III was prioritised by 39% while 18% prioritised the provision of Phase IV. Although professional input has increased substantially since 1998 (from a mean of 45.9 hours per week in 1998 to a mean of 135 hours per week in 2005, centres reported several concerns with staffing levels. Eleven cardiac rehabilitation centres were being run single-handedly by cardiac rehabilitation coordinators. There was also great variation in recommended multidisciplinary input across centres. Twenty-four centres had dedicated facilities with 10 sharing facilities. Thirty-one centres had an exercise area and 19 had a separate education area.

Conclusions There have been substantial achievements towards the Cardiovascular Health Strategy target of providing cardiac rehabilitation services for all relevant hospitals in Ireland over the past seven years. The next challenge is to ensure that all those who could benefit in each centre is provided with the opportunity to take part in all phases of Cardiac Rehabilitation.

Recommendations

1. Staffing: Increases needed, particularly for units that are understaffed in relation to provision of an adequate range of services comprising multidiscipliniary cardiac rehabilitation. Some single-staffed centres are particularly challenged.

2. New populations: Development and expansion of current service provision to meet changing patient populations, e.g. menu-based service/tailored exercise training for ageing population, women, ethnic groups, heart failure patients.

3. Core facilities: Better funding to ensure provision of minimum facilities and resources.

4. Information systems: Funding and training to enable implementation of national audit information system.

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INTRODUCTION

Mortality rates from coronary heart disease (CHD) continue to decline among the Irish population (1). However, they are still amongst the highest in Europe (2). They accounted for 21% of all Irish deaths in the year 2000, making CHD the second leading cause of death in Ireland (1). The Second Report on the Implementation of the Cardiovascular Health Strategy (3) states that in this context the number of people living with chronic cardiovascular disease is increasing, resulting in an increased need for ongoing disease management, secondary prevention and cardiac rehabilitation. Cardiac rehabilitation has been shown in randomized controlled trials to provide appreciable benefits, including a reduction in cardiac mortality by 26% over succeeding 3 years in MI, PCI and CABG patients (4). Recommendation 9.5 of Ireland's National Cardiovascular Health Strategy Group Report 'Building Healthier Hearts' (1999) (2) proposed that every hospital that treats patients with heart disease should provide a cardiac rehabilitation service.

Cardiac rehabilitation has been defined by the World Health Organisation (5) as the 'sum of activities required to influence favourably the underlying cause of the disease, as well as to ensure the patient the best possible physical, mental and social conditions, so that they may through their own efforts preserve, or resume when lost, as normal a place as possible in the community. Rehabilitation cannot be regarded as an isolated form of therapy but must be integrated with the whole treatment, of which it only forms one facet'. Core components of cardiac rehabilitation programmes typically include a combination of exercise, psychological and educational interventions (6, 7).

Cardiac rehabilitation programmes are typically organised in four phases (2):

- **Phase I** refers to the acute treatment of patients admitted to the intensive care unit and the in-hospital stage in recovery.
- **Phase II** is the early (first 4-8 weeks) period of discharge from hospital and is a period of convalescence for the patient.
- **Phase III** typically involves a 4-12 week outpatient programme incorporating exercise and education classes and is usually commenced between the fourth and eight week post-discharge, depending upon the amount of cardiac damage.
- **Phase IV** refers to the period of long-term maintenance and typically involves community-based exercise sessions.

In the past, service provision for cardiac rehabilitation in Ireland has been poor. A European Union survey of cardiac rehabilitation activity conducted in 1995 found that Ireland ranked among the lowest in relation to the number of cardiac rehabilitation programmes per head of population (8). Following this, the first national survey of cardiac rehabilitation services in 1998 found that only twelve hospitals (29% of all hospitals admitting cardiac patients) provided outpatient programmes (9). In 1999, the National Cardiovascular Health Strategy (2), which aimed to coordinate and prioritise activities in relation to cardiovascular disease management, was launched. As a result additional resources were made available to the development of cardiac rehabilitation services and to the implementation of the ten recommendations relating to cardiac rehabilitation. The first of these recommendations (R9.1) stated that 'every hospital that treats patients with heart disease should provide a cardiac rehabilitation service'.

The aim of the present study was to establish the level of service provision of cardiac rehabilitation in 2005/2006, in order to ascertain areas in which additional resources are required. The geographic distribution of current programmes was evaluated. Staff profiles, programme formats and patient throughput were queried and comparison made with service provision in 2003 and 1998. This will facilitate assessment of the extent to which recommendation R9.1 has been achieved and will evaluate the impact of the Cardiovascular Health Strategy on cardiac rehabilitation service provision in Ireland.

METHOD

All general hospitals admitting cardiac patients to a coronary or intensive care unit in Ireland (n=37) were surveyed in Spring 2006 by postal questionnaire to cardiac rehabilitation coordinators or cardiac rehabilitation nurses.
Information was sought, using a standardised audit tool (10) on the cardiac rehabilitation phases (phases I-IV) provided by the hospital; and on components of each phase and staffing levels. Where phase III outpatient programmes were provided, programme formats (i.e. number of sessions and patients per group) and the number of patients attending in the previous year (2005) was queried. Where outpatient programmes were not provided, information was sought on any plans to develop programmes. Information on collection of patient data, areas in need of development and access to facilities and resources was also collected. Following telephone reminders, all centres provided information.

RESULTS

1. Cardiac Rehabilitation Service Provision

There has been remarkable growth in the provision of Phase III cardiac rehabilitation (CR) since the 1999 Cardiovascular Health Strategy. Services have increased substantially since 1998 when only 12 hospitals provided services (9). This has increased rapidly to 26 hospitals in 2003 (11) and to 35 hospitals in 2006 providing CR (See figure 1). Twenty-four of these programmes have been in existence less than 5 years, 7 have been running for 6-10 years and 4 have been in existence for more than 10 years.

The structured provision of Phases I, II and III cardiac rehabilitation has been implemented in almost every hospital that treats patients with heart disease (R9.1, R9.6 and R9.7). In 2006, all 37 hospitals provide Phase I CR, 36 hospitals provide Phase II and 35 hospitals provide Phase III CR. One acute general hospital in HSE South and one in HSE West do not provide Phase III CR.

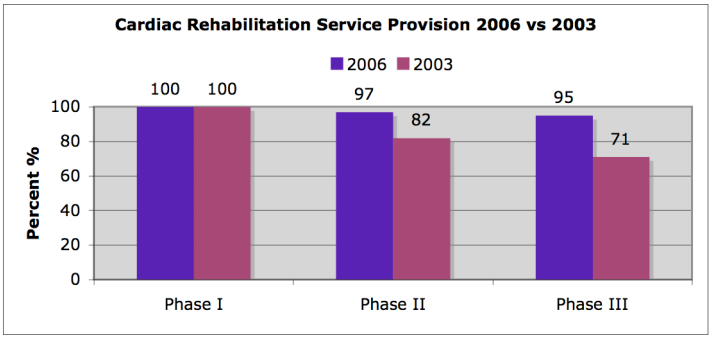

Figure 1: Cardiac Rehabilitation Service Provision in Ireland (2006 vs 2003)

In 2006, the areas identified by CR personnel as most in need of development were:

- Expanding cardiac rehabilitation service provision to other patients groups such as patients with unstable angina and heart failure (noted by 34% of centres)
- The provision of phase IV (noted by 16% of centres)

The establishment of Phase II and III was prioritised by those centres currently without these services. Lack of staff (66%) and lack of available space (23%) were cited as the greatest barriers to further programme development.

2. Cardiac Rehabilitation Staff

There was evidence of a substantial increase in professional input to programmes since 1998 (Table 1). The time designated to the programme by all professional categories increased from a mean of 45.9 hours per week in 1998, to 113.1 hours in 2003 to a mean of 135 hours per week in 2005. The increase in staffing levels has been paralleled with an increase in patient throughput. Because of increased patient throughput, several centres have expressed concerns about staffing levels, with 66% of hospitals describing additional staff as the single most important need for their cardiac rehabilitation centre.

The 1999 National Cardiovascular Strategy, Building Healthier Hearts (2) recommended that the programme should be multidisciplinary, which should include a coordinator (R9.4), nurse, dietician, psychologist, vocational counsellor and pharmacist. Consultant leadership was recommended (R9.3) to develop and maintain programmes. There were large variations reported across centres in the amount of time dedicated by these various health professionals to cardiac rehabilitation. While phase III CR was being provided in 35 hospitals, it was provided by a very limited number of personnel. Many units did not have input from the multidisciplinary team outlined below (see Table 2).

- Cardiac rehabilitation coordinators were running eleven centres single-handedly. Two of these centres were not providing phase III cardiac rehabilitation.
- Fifteen centres lacked the support of a nurse or secretarial support. A lot of clinical staff time could be made available by being able to delegate administrative tasks such as arranging patient appointments and logging patient information.
- Difficulties arose when a cardiac rehabilitation coordinator provided most of the CR programme. In particular, there was no second person available to cover holidays and special leave.

Table 1: Number of Hours per Week Provided To Phase III Programmes by Professional Category

PROFESSIONAL	HOURS PER WEEK 1998 MEAN (SD)	HOURS PER WEEK 2003 MEAN (SD)	HOURS PER WEEK 2005 MEAN (SD)
CR Co-ordinator	28.2 (141)	37.2(25.7)	40.7 (28.3)
CR Nurse	7.5 (12.7)	19.8 (24.6)	24.9 (24.8)
Dietician	3.1 (8.1)	13.0(14.8)	14 (14.9)
Physiotherapist	2.8 (5.1)	17.7 (16.8)	16.7 (16.1)
Psychologist	1.7(4.4)	2.9 (6.6)	4.9 (8.7)
Occupational Therapist	0.7(2.3)	2.8 (7.7)	4. 7 (10.0)
Pharmacist	0.5 (0.5)	2.3 (5.5)	4.1 (9.5)
Social Worker	1.3 (4.7)	2.6 (7.6)	4.5 (10.7)
Vocational Counsellor	<1 centre	0.8 (3.6)	-
Secretary	0.1 (0.2)	10.3 (12.5)	10.3 (11.7)
Smoking cessation officer	-	1.7 (7.3)	2.4 (7.1)
Cardiac Liaison nurse	-	1.1 (6.7)	1.9 (8.4)
Diabetic Nurse	-	0.1 (.34)	-
Health Promotion Tutor	-	0.7 (0.4)	1.4 (4.6)
Total	**45.9 (-)**	**113.1 (67.8)**	**135 (74.2)**

Table 2 highlights the levels of staffing by professional group in 2005, It also shows the need for increased hours from nurses, dieticians, psychologists, physiotherapists, pharmacists and occupational therapists to ensure service provision is multidisciplinary as advised. The column on the far right indicates the number of centres without any input from health professionals in each category, e.g. 19 centres did not have access to smoking cessation personnel and 17 centres did not have access to either a psychologist or social worker.

Table 2: Staffing Level Provided: Number of centres with input from recommended multidisciplinary personnel (n=37)

Personnel	1.5 – 3.5 WTE*	0.75 - 1 WTE	0.25 - 0.5 WTE	<10hrs p/wk	2hrs or less /programme	On request	Number of centres where personnel are not provided
CRC**	4	31					**2 centres did not have appointed coordinators (but run phase III)**
CR nurse**	6	14	3	1			**11 centres were run single-handedly by CRCs**
Dietician**		9	9	11	5		**3 centres did not have any access to a dietician**
Physio-therapist**		13	8	3	2		**11 centres did not have any access to a physiotherapist**
Psychologist and/or Social Worker**	1	7	7	3	2		**17 centres did not have access to a psychologist or social worker**
Pharmacist**			3	9	3	3	**19 centres did not have access to a pharmacist**
Vocational Counsellor**							**No centres had appointed vocational counsellors**
Occupational Therapist		2	6	1	1		**27 centres did not have access to an OT**
Cardiologist/ Physician**						25	**12 centres reported not having access to a physician or cardiologist**
Secretary		2	10	7			**15 centres had no administrative support**
Smoking Cessation						18	**19 centres did not have access to a smoking cessation officer**
Health Promotion			2	3	3		**29 centres did not have access to a health promotion officer**

* WTE: Whole time equivalent staff. ** Recommended member of CR team as per 1999 Cardiovascular Strategy (2).

3. Components of Cardiac Rehabilitation

Phase I (in-hospital)

- Clinical management issues (e.g. education on diagnosis, diagnostic testing, blood pressure, medications and family history) and risk factor management issues (e.g. education on smoking, weight reduction advice, lipid lowering advice and risk factor assessment) were addressed by almost all centres.
- Psychosocial management issues were addressed by the majority of acute general hospitals, but less so by secondary / tertiary referral hospitals:
    - 89% provided psychological advice and sexual counselling
    - 69% provided vocational counselling
    - 83% addressed stress management.
- Post-hospital management issues proved to be the weakest components of Phase I intervention. While 100% of hospitals provided discharge advice, 46% of acute hospitals and 33% of secondary/tertiary referral hospitals provided home needs assessment.
- The Heart Manual (12) (a six-week home-based post MI rehabilitation programme) was issued either in phase I or II in 62% of acute hospitals and in 30% of secondary / tertiary referral hospitals.)

Phase II

- Risk factor education was the main intervention during this phase of CR, with 93% of all hospitals providing some smoking cessation advice and 90% providing some nutrition education on request in phase II.
- Psychosocial management was again less widely addressed:
    - 67% provided psychological advice and vocational counselling
    - 53% provided vocational counselling.
- Mode of delivery of phase II:
    - In the majority of hospitals, care was delivered by telephone (97%)

- Individual outpatient appointments (67%)
- Group outpatient appointments (71%)
- Home visiting was the least frequent method of care delivery (provided by 21%).

Phase III - Education

- A wide range of components was offered by phase III programmes and these matched core components recommended by national and international guidelines (4,5,6). Almost all centres providing phase III (ranging from 95-100%) provided education on cardiac disease, exercise, smoking cessation, medications, diabetes, nutrition and stress management.
- Eighty-three percent provided psychological advice; 83% provided sexual counselling and 61% provided support for vocational rehabilitation. Most time was spent on cardiac education, relaxation training and nutrition education.
- Table 3 demonstrates that while a wide range of components were offered, much cardiac rehabilitation was provided by the cardiac rehabilitation co-ordinator other than by the relevant member of a more multi-disciplinary team.

Table 3: Personnel who delivered Education components of Phase III in 2005

Education Session	**% Delivered by CRC alone**	**% Delivered by Relevant Health Professional**	**% Delivered by CRC and Health Professional**
General Education	65%	N/A	28%
Exercise Education	24%	50% (Physiotherapist)	27%
Smoking Cessation	45%	29% (Smoking Cessation officer)	19%
Nutrition advice	13%	77% (Dietician)	21%
Medication Advice	21%	50% (Pharmacist)	24%
Diabetes advice	32%	13% (Dietician)) 21% (Diabetic nurse)	23%
Stress Management	33%	15% (Psychologist) 33% (OT/ Social Worker)	15%
Psychological Advice	33%	43% (Psychologist) 7% (Social Worker)	13%
Vocational Counselling	60%	14% (OT) 14% (FAS/NADHB)	9%
Sexual Counselling	82%	4% (Psychologist) 8% (OT/SW)	4%
Basic Life support	45%	25% (RTO)	30%

Structure of Phase III Programmes

- Phase III programmes lasted for a median duration of 8 weeks (IQR 6-8.8), comprising a median of 6 education sessions (IQR 3-9.5) and 10 exercise sessions (IQR 3-18) (Table 4).
- Three acute hospitals providing phase III rehabilitation did not provide exercise sessions because of a lack of facilities.
- The mean number of education sessions provided in acute general hospitals was 6.0 and 9.1 in secondary / tertiary referral hospitals.
- Typically 6-8 patients were seen at a time in exercise sessions and 6-11 patients attended group education sessions at a time.
- Sixteen percent of hospitals (3 acute general and 3 secondary / tertiary referral hospitals) provided additional phase III programmes (4 hospital based and 2 community based). The median duration was 9 weeks (with a median 2.5 additional sessions per week).

Table 4: Structure of Phase III Cardiac Rehabilitation Programmes

	Mean (SD)	**Median**	**IQR**
Duration of Programme (weeks)	7.4 (2)	8	6 – 8.8
No of sessions per week (total)	4.6 (5.1)	3	2-4
No of exercise sessions per programme	10.8 (8.8)	10	3-18
No of education sessions per programme	6.8 (4.8)	6	3-9.5
No of patients per exercise session	6.8 (2.5)	6	6-8
No of patients per education session	8.8 (3.4)	8	6-11

Post-Phase III programmes

- Forty percent of hospitals reported that they provided a formal phase IV programme. This was a 13% increase from 2003. An estimated 19% of patients were referred to Phase IV:
  - 12% to hospital sessions
  - 7% to Phase IV Community Service.
- 64% of patients were referred to their GP
- 9% were registered with Heartwatch
- 15% were referred to a patient support group
- 2% were referred to Social Services.

4. Patient Numbers

Patient throughput in Phase III has increased substantially from 1996 (Table 5). All 37 centres provided information for 2005, reporting 4,210 new Phase III patients in that year. A total of 2,448 patients were enrolled in 2002 (information available from 71% of centres) compared with 696 in 1996 (information available from 58% of centres) .

- 10,420 patients were seen in Phase I (median 246, IQR 127-397 per centre) in 2005
- 6,864 patients were seen in Phase II (median 198, IQR 109-300) in 2005
- 4,228 patients were seen in Phase III (median 92, IQR 62-137) in 2005.

Table 5: New Patients entering Phase III Cardiac Rehabilitation Programmes in 1996, 2002 and 2005

HSE /HEALTH BOARD AREA	INFORMATION AVAILABLE IN 1996 (7 centres)	NEW PATIENTS IN 1996	INFORMATION AVAILABLE IN 2002 (20 centres)	NEW PATIENTS IN 2002	INFORMATION AVAILABLE IN 2005 (35 centres)	NEW PATIENTS IN 2005
Eastern Area	4(6)	526	6(8)	1164	9(9)	1820
North-East	1(1)	75	3(4)	197	5(5)	394
North-West	1(1)	22	2(2)	192	2(2)	249
West	0(1)	-	3(4)	293	4(4)	354
Mid-West	-	-	2(2)	135	2(2)*	254
Midlands	0(1)	-	1(3)	50	3(3)	287
South-East	1(2)	73	3(4)	417	4(4)	594
South	-	-	0(1)	-	6(6)*	258
TOTAL	7(12)	**696**	20(28)	**2448**	35(35)	**4210**

*Region has one hospital with a Cardiac Rehabilitation centre that does not currently provide a phase III programme.

5. Referral to Cardiac Rehabilitation

Centres were asked to estimate the proportion of patients referred to CR by each profession. Most referral to cardiac rehabilitation was initiated by members of the cardiac rehabilitation team (mean 36%). Sixteen percent were referred by CCU or ward nurses, 12% by a cardiologist/physician and 9% by the cardiac team. A mean 17% of patients were referred from other hospitals; GP's referred less than 2%, while 3.5% of patients themselves requested attendance at cardiac rehabilitation.

6. Patient Transfer

Transfer of patients was greatest from secondary / tertiary centres to acute general hospitals, mainly due to their location and patients travelling for specific coronary interventions. The median number of patients referred to other centres by tertiary, secondary hospitals and acute hospitals was 409 (IQR 236-808), 112 (IQR 4-308) and 5 (IQR 2-6) respectively. Tertiary hospitals received a median of 46 patients (IQR 15-72) referred from other hospitals; a median of 40 patients were referred from other hospitals to secondary hospitals (IQR 15-75) and acute hospitals received a

median 50 patients (IQR 6-154) referred from other centres. This is a promising marker of both a widely available service but also a service committed to ensuring patient uptake in a location suited to their residence and travel needs.

7. Patient Profiles, Eligibility and Adherence

No centres reported age restrictions on entry to the programme in 2005. From information provided, it appeared that most non-participation was because patients were not offered services, rather than because of patient unwillingness to participate or drop-out. Centres were asked to estimate attendance and adherence rates of eligible patients in 2005.

- A median estimate of 60% of eligible patients attended cardiac rehabilitation in 2005 (IQR 42-79%).
- The median estimated adherence rate was 93% (IQR 75-96%).

A pilot data collection study provided patient data from 16 cardiac rehabilitation centres from the period January 1st to June 30th 2005 (on 3069 patients):

- Over two-thirds of the patients recorded were men and half were GMS cardholders.
- The age of patients ranged from 19 to 89 years. The average age range was 62 years.
- The most common initiating event was a PCI (31% of patients) followed by MI (23%) (consisting of STEMI (13%) and NSTEMI (10%)). Angina (19%), CABG (16%), Other surgery (5%), heart failure (3%) and other event (3%) accounted for the remaining 11%.

At present, cardiac rehabilitation is predominately offered to patients following acute coronary syndromes, percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery (13). However, the prevalence of other cardiovascular conditions such as chronic heart failure is increasing. Research has shown that exercise training has positive secondary prevention benefits and positive effects on quality of life in such groups (14,15).

A recent meta-analysis of service provision in the UK (16) showed that there also tended to be lower rate of referral and attendance among specific patient groups such as older people, women, ethnic minorities and lower socio-economic groups.

8. Data Collection Process

Recommendation 9.5 of Ireland's National Cardiovascular Health Strategy Group Report ' Building Healthier Hearts' (1999) proposed that a standard format of audit should be agreed nationally to allow comparison across cardiac rehabilitation programmes (2). A core national dataset for cardiac rehabilitation, compatible with other European data standards (10), was developed as part of a research programme for the Cardiovascular Health Strategy (called the Cardiac Rehabilitation Information Systems Project (CRIS)). CRIS is compatible with the data standards on acute coronary syndromes (ACI), percutaneous coronary intervention (PCI) and Electrophysiological Interventions (ablation, pacemakers and implantable cardioverter defibrillators), developed by the Cardiac Audit and Registration Data Standards (CARDS) initiative (17). CRIS is a minimum data standard for the purpose of clinical audit and service planning at national level. It is intended that the CRIS data standards will be incorporated into existing methods of data collection used in cardiac rehabilitation centres. The ideal solution will be to collect the CRIS data on a clinical management system and export the data to a central database for analysis. It is intended that instant reporting will be available over a secure network for individual centres as has been implemented in the UK (18). This review was conducted using part of the CRIS dataset.

Plans to develop a national system based on the CRIS model in Ireland are currently curtailed by insufficient resources:

- Only 17% of hospitals have integrated clinical management systems at present.

- 73% of centres in 2006 cited lack of staff as the single biggest barrier to the collection of CRIS data.
- Funding for an audit system was not seen as a priority when other basic facilities were still lacking in some, centres as outlined below.

9. Location and Resources

The 1999 Cardiovascular Strategy recommended the urgent provision of adequate funding for equipment and facilities (R9.10) and listed the minimum facilities and resources necessary to provide a cardiac rehabilitation service (listed in Table 6). Twenty three percent of centres in 2006 reported additional space as the single biggest need for the development of their cardiac rehabilitation service. In sum:

- All but one phase III programmes were outpatient based (one community based programme). Twenty-four of the hospital-based centres had dedicated facilities with 10 sharing facilities.
- Thirty-one centres had an exercise area and 19 had a separate education area. (Three centres did not provide exercise sessions as part of their phase III programme).
- Many centres lacked facilities supportive of patient dignity and comfort. For instance, 17 centres did not provide a changing room and 13 had no shower facilities following (hour-long) exercise classes.
- All centres had basic safety equipment.
- Twenty-eight centres reported having dedicated office space.

Table 6: Number of centres in 2005 (n=34) without minimum facilities necessary to provide a cardiac rehabilitation service (as detailed in the Cardiovascular Health Strategy (2))

General Facilities	No of centres without facility	Exercise and Emergency Equipment	No of centres without facility
Changing Room	**17**	Versa Climber	**14**
Separate Education Area	**15**	Medicine Ball	**10**
Shower	**13**	Dual cycle ergometer	**6**
Dedicated Office Space for cardiac rehabilitation	**6**	Minute Timer	**5**
Drinking Water in exercise room	**6**	Hand Crank	**5**
Exercise Area	**3**	Treadmill	**4**
Couch	**3**	Stepper	**4**
Toilet	**2**	Rowing Machine	**4**
Music system	**2**	Multigym weights systems / dumb bells	**4**
Desk	**2**	Central monitor and telemetry	**4**
Computer	**1**	Scales and stadiometer	**2**
Chair	**0**	Blood pressure monitor	**2**
TV/ Video Recorder	**0**	Equipped emergency trolley, portable suction, defibrillator and oxygen	**0**
Selection of Videos/Booklet	**0**		

DISCUSSION

The third national survey of cardiac rehabilitation service provision in Ireland demonstrates that substantial progress has been made in achieving Recommendation R9.1 of the National Cardiovascular Health Strategy, i.e. 95% of hospitals now provide an outpatient programme. There has been rapid growth and expansion of services since 1998 when only 29% of hospitals provided programmes. The next stage highlighted for development by service co-ordinators is expanding the service to different patient populations, e.g. heart failure patients and providing and developing Phase IV, the latter of which is now available to some extent in 40% of centres. However, hospitals

have reported several obstacles in achieving their plans, e.g. lack of funding, staffing and available space.

The increases in programme numbers have been paralleled by increases in patient throughput. There have also been marked increases in the time dedicated to programmes by health professionals since 1998. All categories of health professionals are now giving more time to cardiac rehabilitation programmes. Furthermore, additional types of health professionals are involved in the multidisciplinary team, such as smoking cessation officers, cardiac liaison nurses, diabetic nurses and health promotion tutors. Despite these additions, concerns over staffing levels remain. In particular centres have highlighted need for increased hours from psychologists, dieticians, nursing cover and increased administrative support. Eleven centres are run single-handedly by coordinators and service can be compromised due to lack of necessary relief and administrative back-up in these centres.

In phase III, all centres addressed core components as recommended by national and international guidelines. A minority of centres did not offer psychological advice or education on sexual and vocational rehabilitation in phase III. These issues were also less well addressed in phase I and phase II. There was also evidence that many coordinators were delivering components such as vocational counselling, psychological and nutritional advice due to lack of support from or availability of relevant health professionals. Post-discharge issues were also less widely addressed, both after the phase I period (where issues such as home needs assessment and use of the Heart Manual were not widely addressed) and after the phase III programme (where only 40% of centres provided Phase IV intervention). As the aim of cardiac rehabilitation is to facilitate long-term life-style changes (19), interventions dealing with the issues of long-term maintenance are desirable.

The rapid expansion in cardiac rehabilitation services in Ireland is evident following a focused health service strategy in which cardiac rehabilitation was prioritised. This suggests that service provision of cardiac rehabilitation can benefit from collective efforts made across centres to encourage the prioritization of cardiac rehabilitation in other national health policy initiatives.

The crucial challenge for the future is to ensure optimum levels of service uptake among cardiac patients. While mortality from coronary heart disease is decreasing, prevalence is increasing due to greater survival rates, an ever-aging population, the availability of major treatment interventions (PCI, CABG etc) and of effective medications. The changing cardiac patient population profile needs to be anticipated and accommodated. The adoption of the standardised CRIS audit system can allow centres to track patient uptake of services and assess patient outcomes. This will facilitate an evidence-based continuous improvement approach to the provision of cardiac rehabilitation services in Ireland.

CONCLUSIONS

There have been substantial achievements towards the Cardiovascular Health Strategy target of providing cardiac rehabilitation services for all relevant hospitals in Ireland over the past seven years. The next challenge is to ensure that all those who could benefit in each centre are provided with the opportunity to take part in all phases of cardiac rehabilitation.

RECOMMENDATIONS

1. *Staffing: Increases needed, particularly for units that are understaffed in relation to provision of an adequate range of services comprising multidisciplinary cardiac rehabilitation. Some single-staffed centres are particularly challenged.*

2. *New populations: Development and expansion of current service provision to meet changing patient population, e.g. menu-based service/tailored exercise training for ageing population, women, ethnic groups, heart failure patients.*

3. *Core facilities: Better funding to ensure provision of minimum facilities and resources.*

4. *Information systems: Funding and training to enable implementation of national audit information system.*

REFERENCES

1. Bennett K, Kabir Z, Unal B et al. Explaining the recent decrease in coronary heart disease mortality rates in Ireland, 1985-2000. *J Epidemiol Community Health* 2006 60(4): 322-7.

2. Department of Health. (1999). *Building healthier hearts. The report of the cardiovascular health strategy group*. Stationery Office: Dublin 1999.

3. *Ireland's Changing Heart: Second Report on Implementation of the Cardiovascular Health Strategy*. 2003, Heart Health Task Force: Dublin.

4. Taylor RS, Brown A, Ebrahim S, Jollife J, Noorani H, Rees K, et al. Exercise-based rehabilitation for patients with coronary heart disease: systemic review and meta-analysis of randomised controlled trials. *Am J Med* 2004: 116:682-692.

5. World Health Organisation. *Needs and action priorities in cardiac rehabilitation and secondary prevention in patients with coronary heart disease.* WHO Regional Office for Europe: Geneva 1993.

6. Giannuzzi P, Saner H, Bjornstad H et al. Secondary prevention through cardiac rehabilitation: position paper of the Working Group on Cardiac Rehabilitation and Exercise Physiology of the European Society of Cardiology. *Eur Heart J* 2003:24; 1273-1278.

7. Balady G, Ades PA, Comoss P et al. 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. *Circulation* 2000:102:1069-73.

8. Vanhees L, McGee HM, Dugmore LD, Schepers D, Van Dael P. A Representativie Study of Cardiac Rehabilitation Activities in European Union Member States. The Carinex Survey. *J Cardiopulm Rehab* 2002:22:264-272.

9. McGee HM, Hevey D, Horgan JH. Cardiac rehabilitation service provision in Ireland. *Ir J Med Sci* 2001:170:159-162.

10. Lavin, D, Hevey, D, Mc Gee, HM et al (2004). Cardiac rehabilitation information systems: Irish developments in a European context. *Eur J Cardiovasc Prev and Rehabil*: 11: Supplement 1: O26.

11. Lavin D, Hevey D, McGee HM et al. Cardiac rehabilitation services in Ireland: the impact of a coordinated national development strategy. *Eur J Cardiovasc Prev and Rehabil*: 11: Supplement 1: O88

12. Lewin B, Robertson IH, Cay EL, Irving JB, Campbell M. Effects of self-help post-myocardial infarction rehabilitation on psychological adjustment and use of health services. *Lancet* 1992: 339:1036-40.

13. Beswick AD, Rees K, West RR et al. Improving uptake and adherence in cardiac rehabilitation: literature review. *J Adv Nurs* 2005: 49(5): 538-55.

14. Rees K, Taylor RS, Singh, S et al. Exercise based rehabilitation for heart failure. *Cochrane Database Syst Rev* 2004 (3): p. CD003331.

15. Lloyd-Williams, F, Mair FS, Leitner, M. Exercise training and heart failure: a systematic review of current evidence. *Br J Gen Pract* 2003: 52(474): 47-55.

16. Beswick AD, Rees, K, Griebsh I et al. Provision, uptake and cost of cardiac rehabilitation programmes: improving services to under-represented groups. *Health Technology Assessment* 2004: 8(41).

17. Flynn MR, Barrett C, Cosío FG et al. The Cardiology Audit and Registration Data Standards (CARDS), European data standards for clinical cardiology practice. Eur Heart J 2004: 26(3): 308-313.

18. Central Cardiac Audit Database. http://www.ccad.org.uk/, Accessed on 15th May 2006.

19. Smith TW, Leon AS. *Coronary heart disease: a behavioural perspective.* Champaign, Illinois: Research Press 1992.