

## Putting NICE guidance into practice

### **Resource impact report: Chronic heart failure in adults: diagnosis and management (NG106)**

Published: September 2018

## Summary

This report focuses on the recommendation from NICE's guideline on [Chronic heart failure in adults \(update\)](#) that we think will have the greatest resource impact nationally (for England), and will need the most additional resources to implement or potentially generate the biggest saving. It is:

- Offer people with heart failure a personalised, exercise-based cardiac rehabilitation programme.

The estimated annual cost of implementing this guideline for the population of England based on the resource impact assumptions is shown in table 1.

**Table 1 Estimated annual cost/(saving) of implementing the guideline**

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Estimated uptake of people with heart failure receiving cardiac rehabilitation (%)	5.3	5.3	12.2	19.2	26.1	33.0
<b>Total budget impact (£m)</b>	<b>0</b>	<b>1.0</b>	<b>(0.9)</b>	<b>(2.8)</b>	<b>(4.7)</b>	<b>(7.7)</b>

Implementing the guideline may result in the following additional costs:

- Provision of additional cardiac rehabilitation services
- Investment in services may need to happen before potential savings can be achieved.

Implementing NICE's guideline may result in the following benefit and saving:

- Avoidance of hospital readmissions.

This report is supported by a [resource impact template](#) which may be used to calculate the resource impact of implementing the guidance by amending the variables.

Chronic heart failure services are commissioned by clinical commissioning groups (CCGs). Providers are NHS hospital trusts, GPs, primary care and community services.

# 1 Introduction

- 1.1 The guideline offers best practice advice on chronic heart failure and is an update to CG108 Chronic heart failure in adults: management.
- 1.2 This report discusses the resource impact of implementing our guideline on [chronic heart failure in adults: diagnosis and management \(update\)](#) in England. It aims to help organisations plan for the financial implications of implementing this NICE guideline.
- 1.3 A resource impact template accompanies this report to help with assessing the resource impact at a local level in England, Wales or Northern Ireland.
- 1.4 We have considered direct costs and savings to the NHS and not those for the individual, the private sector or the not-for-profit sector. Any cost savings arising from a change in practice have been offset against the cost of implementing the change.
- 1.5 Chronic heart failure services are commissioned by clinical commissioning groups (CCGs). Providers are NHS hospital trusts, GPs, primary care and community services.

# 2 Background

- 2.1 Heart failure is a common complex clinical syndrome of symptoms and signs caused by impairment of the heart's action as a pump supporting the circulation. It is caused by structural or functional abnormalities of the heart. Heart failure commonly co-exists with other co-morbidities including hypertension, diabetes, ischaemic heart diseases, atrial fibrillation and chronic obstructive pulmonary disease.
- 2.2 Around 440,000 people have been diagnosed with heart failure in England ([Quality and Outcomes Framework 2016/17 results](#)). The Resource impact report: Chronic heart failure in adults (update) (September 2018)

incidence of heart failure increases steeply with age, with the average age at diagnosis being 77 years. The prevalence of heart failure is rising overall despite improvements in care through a combination of improved survival of people with ischaemic heart disease and the effects of an aging population.

- 2.3 It is estimated that heart failure accounts for a total of 1 million inpatient bed days (2% of all NHS inpatient bed days), 5% of all emergency medical admissions to hospital, and costs around £2bn (2% of the total NHS budget) ([All Party Parliamentary Group on Heart Disease Inquiry into Living with Heart Failure 2016](#)).
- 2.4 Heart failure was the cause of over 81,000 emergency admissions in 2016/17 ([Hospital admitted patient care activity, 2016-17](#)) and is the most common cause of admission in people over 65. The average length of stay is 6—9 days depending on the requirement for additional specialist cardiology management ([National Institute for Cardiovascular Outcomes Research \(NICOR\), National heart failure audit 2017](#)). Readmissions are common: about 1 in 4 patients are readmitted in 3 months.
- 2.5 On average, a GP will look after 30 patients with heart failure and suspect a new diagnosis of heart failure in 10 patients annually. Those who work in more deprived areas are likely to have more patients with suspected heart failure. The cost of GP consultations for heart failure has been estimated at £50 million per year, with an additional £50 million for GP referrals to outpatient clinics. In addition, community-based drug therapy for heart failure costs £150 million per year.

### **3 Significant resource impact recommendations**

#### **3.1 Cardiac rehabilitation**

The guidelines recommends:

Offer people with heart failure a personalised, exercise-based cardiac rehabilitation programme, unless their condition is unstable.

The programme:

- should be preceded by an assessment to ensure that it is suitable for the person
- should be provided in a format and setting (at home, in the community or in the hospital) that is easily accessible for the person
- should include a psychological and educational component
- may be incorporated within an existing cardiac rehabilitation programme
- should be accompanied by information about support available from healthcare professionals when the person is doing the programme (recommendation 1.9.1).

#### **Background**

3.1.1 Cardiac rehabilitation for people with heart failure was recommended in the previous guideline (CG108). The impact was modelled in the published costing tools and was found to be cost saving. Uptake in the model was assumed to be 45% by 2014/15, based on expert opinion. Actual uptake of cardiac rehabilitation for this population is much lower than predicted (currently 5.3%) and savings are still to be realised.

3.1.2 In the quality standard for chronic heart failure in adults ([QS9](#)) there is a developmental statement which recommends offering adults with chronic heart failure a choice of settings, including home programmes, for cardiac rehabilitation.

- 3.1.3 The updated guideline also now recommends home cardiac rehabilitation where appropriate. This costs less to provide and additional savings are available where it is implemented.

### **Assumptions made**

- 3.1.4 The number of hospital admissions for heart failure is assumed to be around 81,400 per year (Emergency admissions from [Hospital admitted Patient Care Activity, 2016-17](#)).
- 3.1.5 It is assumed that current uptake of cardiac rehabilitation programmes for people with heart failure is currently only 5.3% of people admitted to hospital for heart failure ([National audit of cardiac rehabilitation 2017](#)).
- 3.1.6 Future uptake of cardiac rehabilitation is assumed to be 33% of hospital admissions for heart failure at year 5 based on ambition stated in [NHS England Cardiovascular Disease Outcomes Strategy 2013](#). This variable has been included in the sensitivity analysis (see paragraph 6.3 of this report and the resource impact template).
- 3.1.7 It is assumed that organisations will begin to develop additional cardiac rehabilitation services a year in advance of hospital readmissions being avoided. Costs have therefore been modelled as incurring a year in advance of savings being realised.
- 3.1.8 The percentage increase in costs is assumed to increase evenly from a 25% increase in 2019/20 to a 100% increase in 2022/23.
- 3.1.9 The increase in uptake of cardiac rehabilitation for people with heart failure, and associated savings, is assumed to be zero in 2019/20 and then to increase evenly to 33% in 2023/24.
- 3.1.10 It is assumed that the completion rate for cardiac rehabilitation programmes for people with heart failure is the same as for all

other conditions at 77% ([National audit of cardiac rehabilitation 2017](#)).

3.1.11 It is estimated that the reduced risk of readmissions for people with heart failure who have completed cardiac rehabilitation programmes is 30% ([NHS Improvement Heart – Making the case for cardiac rehabilitation 2013](#)).

**Table 2 Population figures for cardiac rehabilitation for people with heart failure**

Variable	%	Number of people
Total population of England	100	55,300,000
Number of annual hospital admissions for heart failure	0.15	81,400
Number of people with heart failure currently referred to cardiac rehabilitation programme	5.3	4,300
Number of people with heart failure currently completing a cardiac rehabilitation programme (a)	77	3,300
Number of people with heart failure predicted to be referred to cardiac rehabilitation programme after implementation	33	26,900
Number of people with heart failure predicted to complete a cardiac rehabilitation programme after implementation (b)	77	20,700
Increase in number of people with heart failure receiving cardiac rehabilitation at year 5 (b-a)	-	17,400
Decrease in readmissions to hospital for people with heart failure receiving cardiac rehabilitation at year 5	30	5,200

3.1.12 The unit cost of group-based cardiac rehabilitation is assumed to be £243 ([NHS Reference costs 2016/17 HRG VC38Z Rehabilitation for Acute Myocardial Infarction of Other Cardiac Disorders](#)).

The unit cost of home-based cardiac rehabilitation is assumed to be £197 ([Cowie A et al. Home- versus hospital-based exercise training in heart failure: British Journal of Cardiology. 2014; 21:76](#)).

This variable has been included in the sensitivity analysis which highlighted that adjusting the cost of home-based cardiac rehabilitation does not have a significant effect on the resource impact (see the resource impact template).

- 3.1.13 The weighted unit cost of cardiac rehabilitation for heart failure patients is assumed to be £241, based on the costs identified above and weighted 95% to group-based and 5% to home-based ([National audit of cardiac rehabilitation 2017](#)).
- 3.1.14 The unit cost of a heart failure hospital readmission is estimated to be £2,274. This is calculated based on the non-elective tariffs for heart failure healthcare resource groups ([National tariff payment system 2018/19](#) HRGs EB03 A-E) and weighted with corresponding activity from the latest reference costs submission ([NHS Reference costs 2016/17](#)).

### **Costs/Savings**

- 3.1.15 Organisations may need to develop additional cardiac rehabilitation services in order to implement the guideline recommendation. Savings could be made to offset the initial investment by avoidance of hospital readmissions. Costs are assumed to be incurred 12 months in advance of savings.
- 3.1.16 The net saving of the cardiac rehabilitation recommendation is summarised in table 3.

**Table 3 Estimated annual cost/(saving) of providing cardiac rehabilitation and number of people affected.**

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Additional costs (£m)	0	1.0	2.1	3.1	4.2	4.2
Additional savings (£m)	0	0	(3.0)	(5.9)	(8.9)	(11.9)
<b>Total resource impact for England (£m)</b>	<b>0</b>	<b>1.0</b>	<b>(0.9)</b>	<b>(2.8)</b>	<b>(4.7)</b>	<b>(7.7)</b>
Estimated uptake of people with heart failure receiving cardiac rehabilitation (%)	5.3	5.3	12.2	19.2	26.1	33.0
Number of people with heart failure receiving cardiac rehabilitation	4,300	4,300	10,000	15,600	21,200	26,900

### **Benefits and savings**

3.1.17 Offering cardiac rehabilitation services to people with heart failure is expected to benefit physical and mental health which may result in reduced hospital readmissions. This will offset the costs of investment of providing the additional cardiac rehabilitation capacity.

3.1.18 The provision of cardiac rehabilitation may also lead to a reduction in other treatment costs for comorbidities, for example, treatment costs for hypertension, diabetes, ischaemic heart diseases, atrial fibrillation and chronic obstructive pulmonary disease. These savings are likely to be achieved over the medium-longer term so have not been included in the above analysis.

3.1.19 People with heart failure should be referred to existing cardiac rehabilitation services where available. It may be necessary to establish additional services in some areas and, where possible, these should be created in primary care. This is because costs are

anticipated to be lower than in an acute setting. If new services need to be commissioned, NHS England have developed [cardiac rehabilitation resources](#) to aid service development.

### 3.2 ***Other recommendations with a potential resource impact***

#### **Background**

- 3.2.1 Several other recommendations in the guideline have the potential to lead to more effective use of NHS resources when implemented. The extent of changes will depend on local current arrangements and the degree to which the recommendations are already part of existing practice.
- 3.2.2 The composition of the core specialist heart failure multidisciplinary team has been outlined in the guideline (recommendation 1.1.1). Although the composition is thought to be common practice, there may be implementation and resource impact issues where services are not configured in this way, or there are recruitment issues. This could result in costs or savings at a local level and the impact should be modelled locally.
- 3.2.3 The guideline recommends that long-term home oxygen therapy should not be offered for advanced heart failure (recommendation 1.10.1), although long-term home oxygen therapy may be offered for comorbidities, such as for some people with chronic obstructive pulmonary disease. Home oxygen therapy is costly to provide and the service is in high demand from other clinical services. Where current clinical practice for advanced heart failure would change as a result of guideline implementation, there may be a financial saving or home oxygen services could be deployed to treat other conditions. The impact of this recommendation should be modelled locally.

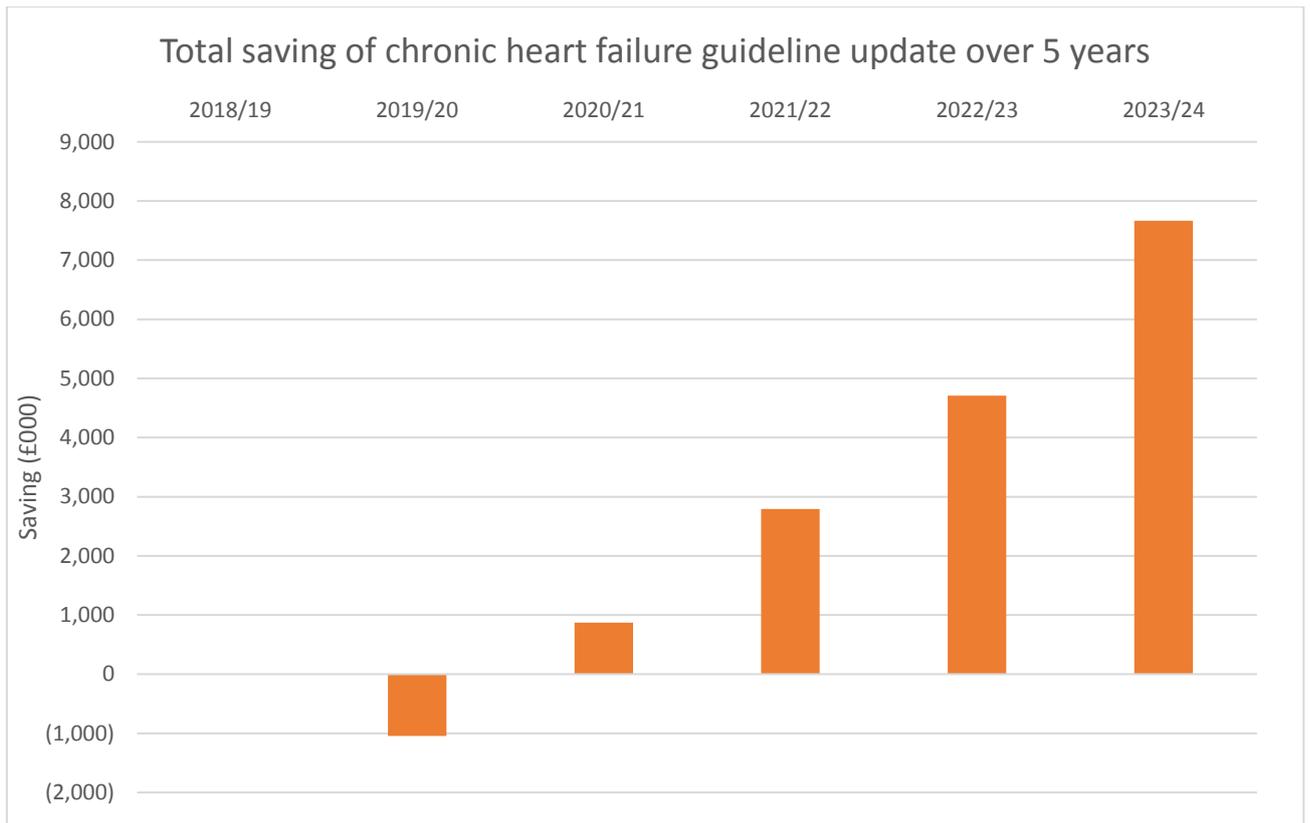
3.2.4 The local [resource impact template](#) can be used by organisations to model any additional investment in these areas and any associated savings.

## 4 Resource impact over time

4.1 The estimated annual saving of implementing this guideline for the population of England based on the uptake in the resource impact assumptions is shown in table 4 and the graph below. The saving from year 5 once steady state is reached is equivalent to £14,000 per 100,000 population.

**Table 4 Resource impact of implementing the guideline using NICE assumptions**

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Additional costs (£m)	0	1.0	2.1	3.1	4.2	4.2
Additional savings (£m)	0	0	(3.0)	(5.9)	(8.9)	(11.9)
<b>Total resource impact for England (£m)</b>	<b>0</b>	<b>1.0</b>	<b>(0.9)</b>	<b>(2.8)</b>	<b>(4.7)</b>	<b>(7.7)</b>
<b>Resource impact per 100,000 population (£000)</b>	<b>0</b>	<b>2</b>	<b>(2)</b>	<b>(5)</b>	<b>(9)</b>	<b>(14)</b>



## **5 Implications for commissioners**

5.1 Commissioners may need to review cardiac rehabilitation services to ensure recommendations on access for people with heart failure can be implemented. Demand and capacity planning may be needed to model any changes. A further implementation tool is in development and will aim to support the business case for investment in cardiac rehabilitation services.

5.2 A key implementation issue from the guideline consultation was whether the NTproBNP test is widely available in primary care (recommendation 1.2.2). Commissioners, along with providers, may also need to review local services in order to meet this recommendation. The implementation will not have a substantial resource impact at a national level, and has not included it in this report and accompanying template.

- 5.3 Chronic heart failure falls under programme budgeting category 10X Problems of circulation.

## **6 Sensitivity analysis**

- 6.1 There are some assumptions in the model for which no empirical evidence exists, so we cannot be as certain about them. Appropriate minimum and maximum values of variables were used in the sensitivity analysis to assess which variables have the biggest impact on the net cost or saving. This enables users to identify the significant cost drivers.

Appendix A is a table listing all variables modified. The key conclusions are discussed below.

- 6.2 Varying the decrease in readmission from 25% to 35% leads to a resource impact from between (£5.7m) and (£9.6m).
- 6.3 Varying the future uptake of cardiac rehabilitation for people with heart failure from 25% to 40% leads to a resource impact from between (£5.5m) to (£9.6m).

## Appendix A. Results of sensitivity analysis

Individual variable sensitivity	Recurrent resource impact							
	Baseline value	Minimum value	Maximum value	Baseline resource impact (£000)	Minimum resource impact (£000)	Maximum resource impact (£000)	Change (£000)	Sensitivity ratio
Heart failure hospital admissions	18.41%	12.00%	25.00%	-7,669	-4,999	-10,414	-5,415	0.65
Completion of cardiac rehabilitation programme	77%	70%	90%	-7,669	-6,971	-8,963	-1,992	0.65
Future uptake of cardiac rehabilitation for heart failure	33%	25%	40%	-7,669	-5,454	-9,606	-4,152	0.77
Decrease in readmissions	30%	25%	35%	-7,669	-5,694	-9,643	-3,949	1.00
Unit cost - Group based rehabilitation	£243	£243	£500	-7,669	-7,669	-3,429	4,240	0.34
Unit cost - Home based rehabilitation	£197	£50	£197	-7,669	-7,796	-7,669	127	0.01
Unit cost - home based rehabilitation percentage split	5%	5%	25%	-7,669	-7,669	-7,830	-161	0.00

## About this resource impact report

This resource impact report accompanies the NICE guideline on [Chronic heart failure in adults \(update\)](#) and should be read in conjunction with it. See [terms and conditions](#) on the NICE website.

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