Shine 2012 final report

PORTICO: *Preparing, Optimising and Reducing Trauma in Cardiac Operations*

Papworth NHS Foundation Trust

March 2014

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Part 1. Abstract

Project title: PORTICO (Preparing, Optimising and Reducing Trauma in Cardiac Operations)

Lead organisation: Papworth NHS Foundation Trust

Partner organisation: N/A

Lead Clinician: Pedro Catarino

Abstract
This project sought to Prepare, Optimize and Reduce Trauma In Cardiac Operations (PORTICO) by applying the principles of Enhanced Recovery (ER).ER is widely practiced in other surgical specialities and is known to reduce post-operative complications and length of hospital stay; however this is the first example of its application in the setting of cardiac surgery.

Patients were selected for the PORTICO programme using the following criteria -

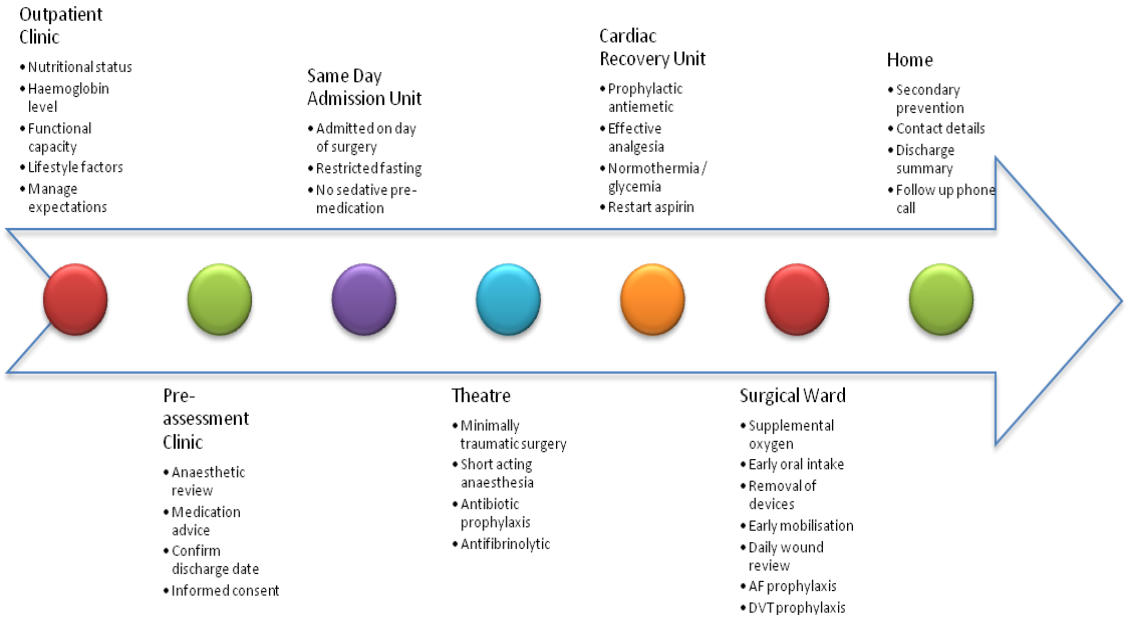
1. Aged 80 years or greater
2. Aged less than 80 years with multiple co-morbidities
3. Have disability and/or frailty

This group are at higher risk of complications, and our primary aim was to reduce length of stay to 6 days.

The programme comprised a series of evidence-based interventions including:-

- Preoptimisation – actively engaging with the patient in preparing for surgery including identifying and managing and pre-existing conditions
- Reduced trauma of surgery – tailored anaesthesia, less invasive surgical techniques and minimising blood loss
- Optimised recovery – faster return to preoperative fitness for the patient
- Importantly the patient was at the centre of the programme and encouraged to take an active role in preparation for, and recovery from their cardiac surgery

Table 1: The PORTICO pathway



Implementation

This started with the project team formation and establishing regular working group meetings to oversee the design, implementation and monitoring of the project against the project plan. The team included a wide range of stakeholders – a lead Consultant Cardiac Surgeon, a lead Consultant Anaesthetist, a dedicated Project Manager and Data Analyst, nursing staff from preassessment clinics, theatres, critical care and the wards, representatives from Pharmacy, Physiotherapy, Occupational Therapy, Audit and Finance.

Initial work streams overseen by the group included:

- Development of the PORTICO Pathway Guideline and achieving sign up by six Cardiac Surgeons for their patients to follow the pathway.
- Specific workstreams to focus on set up for pre-assessment, theatre, critical care and the wards.
- Designing and printing patient information, creating DVDs and patient diaries.
- Creating and implementing a sticker and communication sheet for the patients' notes.

Launch road shows took place to promote and educate staff at the commencement of the project. These proved very successful in reaching a wide audience over a short period of time.

Evaluation of the project took place via monitoring at the working group meetings and was supported by data collection and analysis

Achievements and learning

The implementation of such an ambitious programme has been challenging but the results in terms of the principle outcome measure of reduced length of stay (LoS) have been impressive. As of February 2014, the mean LoS had reduced from 13.2 days to 9.9 days for the full cohort of 142 patients, with 30% achieving the target LoS of 6 days, see graph 1 LOS histogram.

Other achievements have included gaining support for the project from staff and generating a real enthusiasm within Papworth Hospital for working to the PORTICO principles. The project team has worked together well and addressed implementation and maintenance issues as they have arisen.

Further analysis of our data has allowed us to identify three complications (i) bleeding, (ii) atrial fibrillation (iii) delirium/confusion that are associated with prolonged length of stay. See graph 4 post-op complications. We have revised our pathway to incorporate interventions to reduce these complications and plan to roll PORTICO out to all patients undergoing cardiac surgery at our institution.

If this approach were to be adopted by cardiac surgical centres nationally we believe that there would be significant reduction in resource use (see table 2) and improvement in quality of patient care.

Table 2. Savings at Papworth

Year	Mean LoS Enhanced Recovery patients	Bed days saved @ £300/day	% Enhanced Recovery	Number of pts	Savings in year (£)	Costs in year (£)	**Net gain in year (£)**
Savings in 2012-13	9.9	3.3	1%	37	**36,630**	**556**	**36,074**
Savings in 2013-14	9.9	3.3	6%	156	**154,440**	**68,910**	**85,530**
Expected savings in 2014-15	9.9	3.3	25%	728	**720,720**	**70,168**	**650,552**
							772,156

Assumptions
Savings of this magnitude can only be expected in patients fitting the PORTICO selection criteria.
More modest reductions will be achieved in younger & fitter patients already achieving shorter LoS
2012-2014 costs not incurred by Trust
2014 onwards costs will be incurred by Trust

Areas of challenge that have not been entirely resolved at project close include – complete compliance with PORTICO pathway(clinical buy-in), complex discharge planning, patient education and engagement, patient experience data and electronic discharge letter.

Part 2. Quality impact: outcomes

Our primary outcome measure was reduction in length of stay without increase in rate of readmission.

Data (see table 3:PORTICO dataset)was collected from the hospitals Patient Administration System, Intensive care system (CIS), Surgical system (CARDS) & anaesthetics system (Safer sleep) and accuracy checked by cross referencing with the patients notes.

We achieved the target length of stay of 6 days in 30% of PORTICO patients (see graph 1).

The entire Portico project was based on improving quality. This was achieved by establishing the patient at the centre of care and enabling them to play an active role in that care. This can be illustrated by the introduction of Patient Diaries and collection of PROMs questionnaires.

The Portico Pathway (see table 1) is based on recognised best practice and requires implementation of all its elements by the full Multi-disciplinary team (MDT) representing significant changes to ways of working for many staff. Each element of the pathway was monitored to assess for compliance and to inform interpretation of the quality measures mentioned above.

Table 3: PORTICO Data Set

- **procedure performed**
- **personnel**
- **bypass/clamp times**
- **anaesthetic agents and dosage**
- **co-morbidities**
- **Haemoglobin, creatinine and albumin levels**
- **transfusion of fluids and blood products**
- **fasting times**
- **patients' BMI,**
- **temperature, pain and nausea scores**
- **complications including re-exploration**
- **re-admission to hospital post discharge**
- **post-operative complications including infection and atrial fibrillation.**

The project implemented the pathway principles for a selected group of patients requiring cardiac surgery at Papworth Hospital. Patients were identified for inclusion using criteria specific to this project which targeted the older and frailer patients or those with co morbidities as this group was felt to have the greatest potential to benefit from the pathway and also as a rigorous test for Portico.

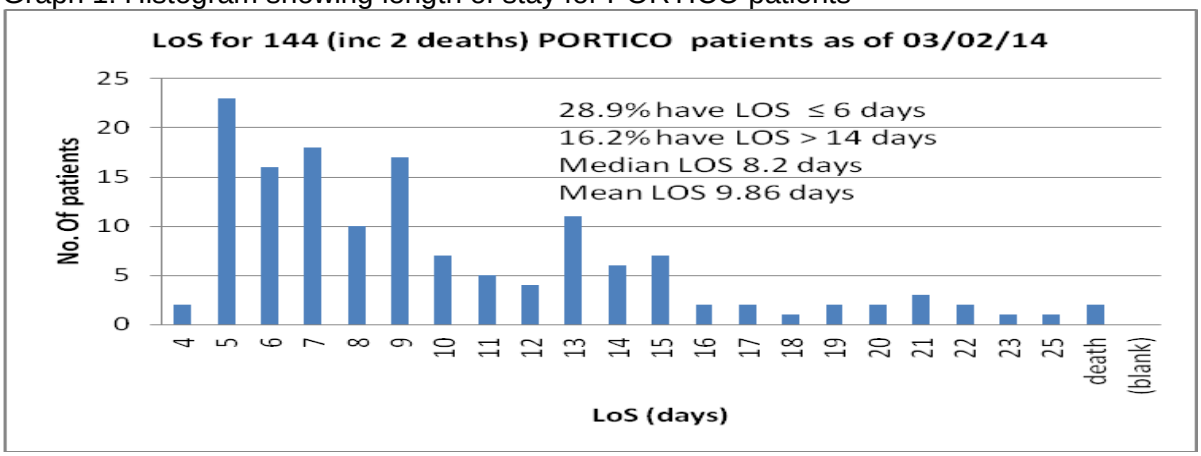
The primary indicator of the success of the project is in a **reduction in post operative length of stay without any concomitant increase in hospital readmission** after discharge or other untoward occurrences. During project set up the target LoS was set at 6

days. Patient experience is also an important quality marker of the project and has been evaluated using a **PROMs questionnaire** pre and post operatively.

Outcome 1 – Length of Stay (LoS)

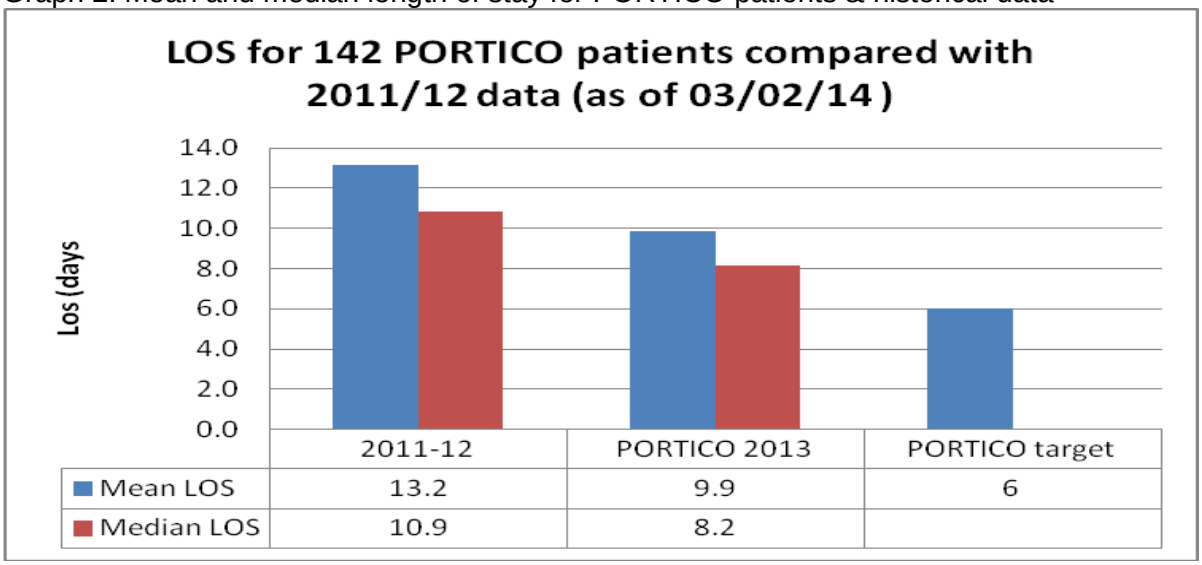
Data was collected from the hospitals PAS system and focused on the post-operative period which had a project target of 6 days. The data was easy to extract and its accuracy was checked using dates recorded in the patients' notes.

Graph 1: Histogram showing length of stay for PORTICO patients



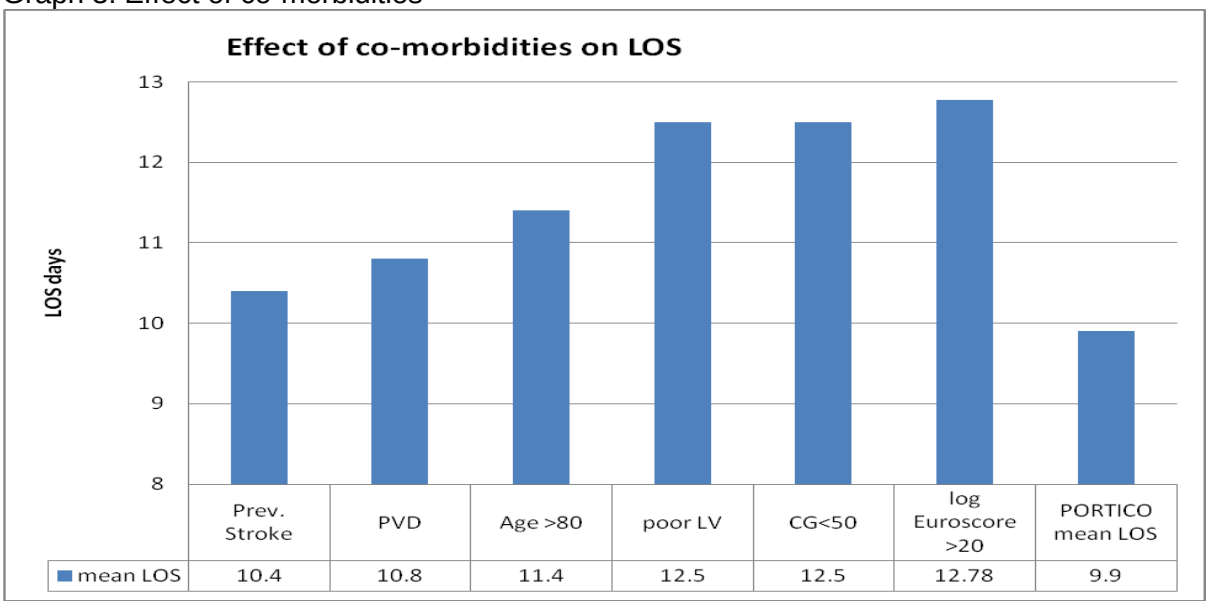
Overall nearly 30% of the PORTICO patients achieved the target LoS. Average length of stay was significantly reduced when compared to a matched cohort from the previous year (mean 9.8 versus 13.2 and median 8.2 versus 10.9 days) see Graph 2.

Graph 2: Mean and median length of stay for PORTICO patients & historical data



Further analysis of the 16.2% patients with the longest length of stay (>14 days) identified these patients tended to have the most serious co-morbidities of pre-existing compromised left ventricular function, disease of the peripheral circulation or previous stroke. The age of these patients and the logistic Euroscore also tend to be higher in this group, see graph 3.

Graph 3: Effect of co-morbidities



Outcome 2 – Readmission
Data was collected from the hospitals PAS system and showed a 30 day readmission rate of 4.4%.

Outcome 3 – PROMs
The data source was the pre and post operative patient questionnaires, which were distributed & collected at the pre-admission clinic (pre-op) and post operatively sent out by post. To date 10 pre & post questionnaires have been received back which have given a strong indication of a high level of patient satisfaction with the outcome of their surgery. A further 8 pre-op questionnaires will be sent out 6 – 8 weeks post discharge.

> ***"Mr Catarino performed my partner's heart surgery under this new scheme. He was petrified and Mr Catarino and his wonderful team have brought him through with a very positive mental attitude"***

Secondary outcomes - Reductions in blood usage, repeat operations, Venous Thrombo Embolism (VTE), Arial Fibrillation (AF), Pressure ulcers & Hospital Acquired Infections (HAI)

Blood usage- although blood usage and re-explorations are included in the PORTICO data set there is no easily available control data to verify the reduction seen.

Data has not been collected for VTE, pressure ulcers & HAI.

As mentioned in section 4 post operative AF is a continuing issue at Papworth, which is still being worked on.

Part 3. Cost impact

The majority of expenditure has been in staff, start-up costs and reporting costs as detailed in appendix 1.

Cost of the Shine Intervention

Beyond the project set up and evaluation costs, the cost of rolling out PORTICO to all cardiac surgical patients is relatively small as most of the change is in working practice.

Table 4 below details the additional costs for workforce, diagnostic tests and patient literature.

Table 4: Operational Costs of PORTICO

	Unit cost/per pt (£)	**Unit number**	**Estimated 2012-13 (£)**	**Actual Spend 2012-13 (£)**	**Revenue costs 2012-13 (£)**	**Revenue costs 2013-14 (£)**	**Revenue costs 2014-15 (£)**	**Total recurring costs to 2015 (£)**	**Source of Funding**
Clinical assessment course (physical examination)	5,000	0	0	0	0	0	0	0	Did not proceed with this intervention
Recliners for Day ward	2,500	6	15,000	0	0	0	0	0	Did not proceed with this intervention
Staffing - ER Coordinator, ALERT team, OP team	30,000	2	0	0	0	62,333	62,333	124,667	Shine till March 2014 - costs start April 2013
Patient booklets + care plans (additional cost only)	2	500	0	0	556	312	1,456	1,768	Shine till March 2014 - costs start April 2013
Additional drugs costs	7		0	0	0	0	0	0	None
Additional blood tests	5			0	0	0	0	0	Yet to quantify
Protein drink	15	4% of pts	0	0	0	0	0	0	Did not proceed with this intervention
Pre-op carbohydrate loading	9	all ER pts	0	0	0	0	0	0	Did not proceed with this intervention
Sub total			15,000	0	556	62,645	63,789	126,435	
Contingency (10%)			1,500	0	0	6,265	6,379	12,643	
TOTAL			**16,500**	**0**	**556**	**68,910**	**70,168**	**139,078**	

Length of stay savings
The financially measurable benefits are found primarily in their reduced post-operative length of stay.

A baseline length of stay for patients was set at median 10.9 days and mean 13.2 days from 2011/12 patient data. See table 2 Savings at Papworth reproduced below from page 5.

Table 2. Savings at Papworth

Year	Mean LoS in ER patients	Bed days saved @ £300/day	% ER	Number of pts	Savings in year (£)	Costs in year (£)	**Net gain in year (£)**
Savings in 2012-13	9.9	3.3	1%	37	**36,630**	**556**	**36,074**
Savings in 2013-14	9.9	3.3	6%	156	**154,440**	**68,910**	**85,530**
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Assumptions
Savings of this magnitude can only be expected in patients fitting the PORTICO selection criteria.
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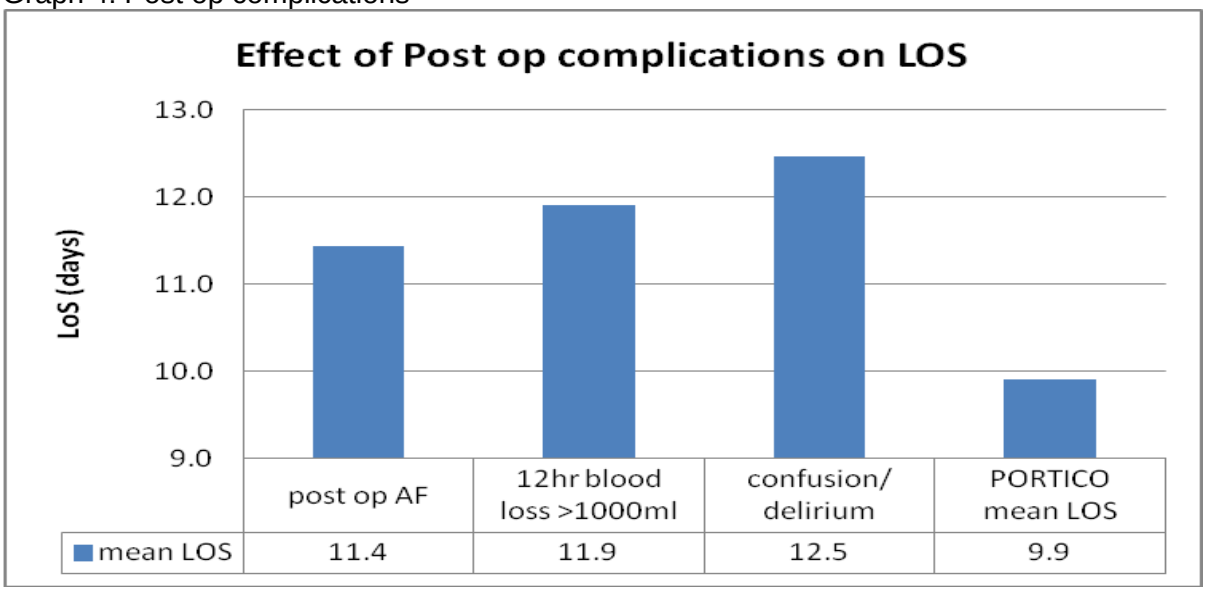
Part 4: Learning from your project

Project Successes

This project has successfully introduced the principles of enhanced recovery into the specific area of cardiac surgery. As well as achieving the primary outcome of reduced post-operative length of stay, the project has received very positive feedback from the patients involved.

A review of notes for those patients with the longer lengths of stay revealed three post operative complications which impacted directly on this (see graph 4):

Graph 4: Post op complications



1. Delirium – it is known that the cardiac surgery cohort is at higher risk of delirium due to bypass pump surgery, however this project has highlighted the impact on Length of Stay – an increase of 2.6 days. A working group has been set up to focus on the identification and management of delirium in order to appropriately manage it when it occurs.

2. Bleeding –A blood loss of > than 1000mL blood in the first 12 hours after surgery is associated with an increase of 2 days on mean LoS.

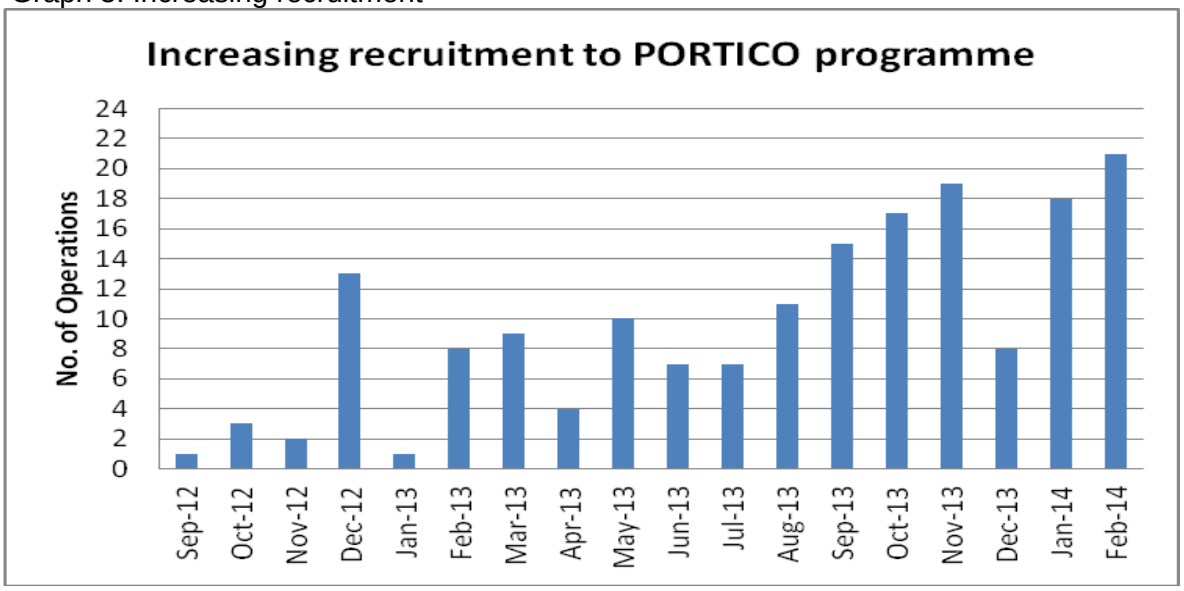
3. Post-Operative Atrial Fibrillation (AF) - 19% of the PORTICO patients suffered from post-operative AF which is associated with an extra 1.5 days length of stay. Our aim is to increase β- blocker prescription within 24hrs of surgery to 90% of patients in order to reduce this incidence. This has been an area of challenge for Papworth, however a new approach to add β- blockers as part of the standard drug prescription package in the intensive care computer system is now being proposed to address this issue.

Whilst these complications are commonly encountered following cardiac surgery they are not so prevalent in other settings where ER has been applied. We have therefore revised our pathway to incorporate interventions to reduce these complications. Elements of the PORTICO Pathway which had less impact for our patient cohort were pre-operative anaemia and pre-operative malnutrition.

Project Challenges

Initial low recruitment – outpatient nurses identifying potential candidates in clinic led to a significant increase in enrolment (see graph 5).

Graph 5. Increasing recruitment



Clinical Buy-in – initial enthusiasm for the project did not always convert into change in practice. Implementing change during the projects early months in particular impacted on the recruitment numbers.

Defining frailty - the test used was the 'Timed up and go' test, which proved difficult to implement in the clinical setting. An alternative test for frailty is being sought.

Complex discharge planning – due to the patient cohort being older and frailer, they often required multi-agency support for discharge. We have learned that discharge planning should occur earlier and this is being addressed via the Trust's LoS Priority Project Group. Some medically fit patients were delayed for over a week whilst waiting for intermediate care or home equipment.

LoS target - the original target to reduce mean length of stay to six days in this elderly, frail, patients was over optimistic. The cohort who almost matched the six day target LoS were 34 male patients under 80 years old spending less than 24 hours in the intensive care unit.

Areas of challenge that have not been entirely resolved at project close include:

Patient education and engagement - Patients are given the educational DVD and diary however the impact this is having is not consistent. More patient support and motivation prior to and during their surgery could improve this element. The Trust is exploring what additional nurse-led support could be available for this and to assist with patient discharge.

Electronic discharge letter – limited uptake has been a persistent issue in spite of investment in IT and space resources for junior medical staff.

Compliance with Portico requirements - Review of data indicates that some changes in practice have been more successfully introduced and sustained than others for example restarting of beta blockers post-surgery has not yet been consistently achieved.

Patient Experience Data - The patient experience questionnaires had a delayed start date of September 2013 so the analysis will be limited by low numbers. However the response rate has been an encouraging 100% with all patients reporting the results of their operation as good or excellent.

Part 5. Plans for sustainability and spread

We plan to roll out revised PORTICO pathway to all patients undergoing cardiac surgery at our hospital and we would like to share our experience with other centres.

Our patients underwent elective Coronary Artery Bypass Grafting x1-4 (CABG), or valve surgery (usually aortic Valve Replacement (AVR) or a combination of CABG & valve. Technically demanding procedures were excluded (surgeon's decision).

Financial benefits are difficult to predict as the potential for saving bed days is more limited in younger, fitter patients who already having short stays (5 or 6 days) in hospital post cardiac surgery.

We achieved a saving of 3 bed days per patients (based on historic data) but to extrapolate this to all cardiac patients would be very misleading. Probably the major benefit for most patients is improved care quality & improved patient experience due to improved education & psychological as well as physical preparation for the ordeal of surgery.

If this approach were to be adopted by cardiac surgical centres nationally we believe that there would be significant reduction in resource use and improvement in quality of patient care.

Sustainability and spread can be supported by clinical engagement and national support via CQUINs. We believe that the modified pathway is transferable to other cardiac surgical units and that Papworth could act as a centre of excellence to support widespread adoption.

Appendix 2: Resources from the project

PORTICO pathway – Nursing staff

Outpatient Clinic (Outpatient Nurse)

Action	Parameter	Result	Consequence	Final Action
Document Patient history	Social Issues	None obvious	For PORTICO if • Surgeon is PORTICO • Age >80 yrs • <80 with Co-morbidities/ disability or frailty	"Consider for PORTICO" as note for surgeon & record in patient notes if accepted
Observe patient's physical capacity/lifestyle facors & consider for PORTICO	Timed Up And Go	>10seconds	?PORTICO	
	BMI	If HIGH give healthy eating advice for wt. loss	If morbidly obese ?PORTICO	
	MUST score	If HIGH refer to Dietician	n/a	
		If MODERATE give nutrition advice	n/a	
	Tobacco & alcohol intake	If EXCESSIVE offer info on local intervention services	n/a	

Pre-admission clinic (Cardiac Support Nurse)

Action	Parameter	Result	Consequence	Final Action
Repeat	BMI & MUST score	If still HIGH or MODERATE	Discuss with Dietician	
Repeat	PORTICO blood tests	If still anaemic or rising Creatinine	Discuss with Surgeon	Potentially refer to Haematologist or defer surgery
Observe patient's physical capacity/lifestyle facors	Significant disability or Morbid Obesity	n/a	n/a	Refer to Physiotherapy, Occupational therapy & Social Care
Confirm	Discharge date	n/a	n/a	Identify & resolve any potential problems

Day Ward/ Admissions Lounge (Nursing Team)

Action	Parameter	Result
Restrict	food	>6hrs before planned surgery
Restrict	Clear fluid	1st case 06:00 2nd case 09:00 3rd case 12:00
Give	Antacid/ prokinetic	If appropriate

Cardiac Recovery Unit (Nursing Team)

Action	Parameter	Result	Consequence	Final Action
Pay particular attention to	Pain relief	n/a		
	Prevention of nausea			
	Maintaining homeostasis			
Encourage patients	After extubation	Restart oral intake	n/a	
		Perform deep breathing exercises		
		Mobilise to chair		
Remove	Drain	Before transfer to ward	Unless documented reason in patient notes	n/a
Give	Aspirin	n/a		
Recommence	Appropriate cardiac meds			

Ward Prophylaxis phase – Day 1, Night 1, Day 2, Night 2 (Nursing Team)

Action	Parameter	Consequence	Final Action
Maintain	good cardiac output, Renal function	Use IV fluids, pacing, dopamine, furosemide liberally	Notify ALERT teams or Consultants if necessary
		Give all patients β-blockers & supplemental O_2	
		Give all patients Enoxaparin	
		Use IV insulin to ensure good blood glucose cintrol	
Prevent	Respiratory complications & AF	Review of D1, CXR & bloods (esp. K & Cr)	
		Review of D2 bloods (esp. K & Cr)	
		Remove Central line, pacing wires & urinary catheter	

On the morning of **D3** , patient is off O_2, eating & drinking, off IV drugs & ready to mobilise

Ward Physical rehab – Day 3, Night 3, Day 4, Night 4Nursing Team)

Action	Parameter	Result	Consequence
Restore normal function	Pain	If not Ok	Specialist referral if needed
	Nausea		
	Diet		
	Bowels		
	Blood glucose levels	Switch from IV insulin to usual regime	
On the morning of **D5** patient is dressed & ready to undergo physio sign off			

Ward Discharge (Nursing Team)

Action	Parameter
Education	What has been done
	What patient needs to do after discharge
	Discharge summary (including drugs
For final discharge re-iteration of the above	Final drugs education
	Signed discharge summary
	Contact details (for post discharge advice)
	Lifestyle advice
Patient should be ready for discharge on the morning of **D5**	

Post discharge (Cardiac Support Nurse)

Follow up phone call to check on progress

Pre-admission PROM questionnaire

Q1. Is anyone helping you fill in this questionnaire? Yes ❑ No ❑

If the answer is yes, please give the relationship to you of the person assisting you:

Family member, e.g. spouse, child,	❑	Friend/neighbour	❑
Other relative	❑	Carer	❑
Healthcare professional	❑	Other	❑

If you are helping to complete this questionnaire on behalf of the patient, please ensure that the information given below is that of the patient and not your own.

Q2. Which statement best describes your living arrangements?

I live with a partner or spouse	❑
I live alone	❑
I live in a nursing home, hospital or other long term care	❑
Other ❑ Please specify	

Q4. How often do you get chest pain (angina)?

❑ Never ❑ Less than once a week ❑ Once a week ❑ More than once a week ❑ Every day

Q5. Do you get chest pain (angina) on exertion?

❑ No ❑ On mild exertion ❑ On moderate exertion ❑ On strenuous exertion

Q6. How often do you feel breathless?

❑ Never ❑ Less than once a week ❑ Once a week ❑ More than once a week ❑ Every day

By placing a tick in one box in each group below, please indicate which statements best describe your own health state today:

Q7. Mobility

I have no problems walking about ❑
I have some problems walking about ❑
I am confined to bed ❑

Q8. Self-Care (washing & dressing)

I have no problems with self-care ❑
I have some problems with self-care ❑
I am unable to wash or dress myself ❑

Q9. Usual Activities (e.g. work, study, housework, family or leisure activities)

I have no problems with performing my usual activities ❑
I have some problems with performing my usual activities ❑
I am unable to perform my usual activities ❑

Q10. Pain/Discomfort:

I have no pain or discomfort ❑
I have moderate pain or discomfort ❑
I have extreme pain or discomfort ❑

Q11. Anxiety/Depression

❑ I am not anxious or depressed

❑ I am moderately anxious or depressed

❑ I am extremely anxious or depressed

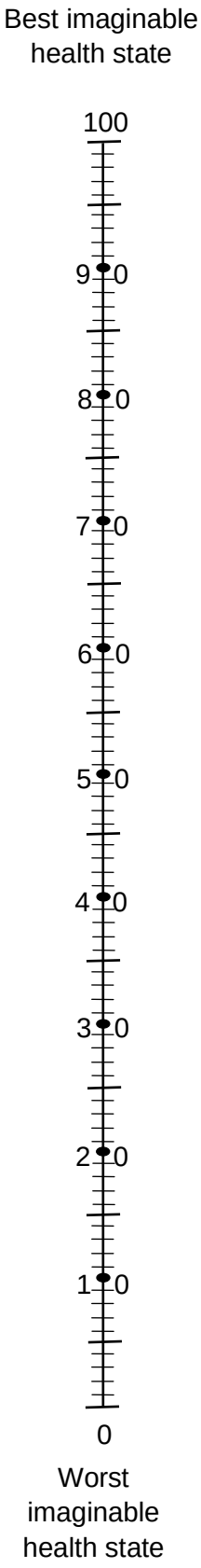
Q12. Compared to my general level of health over the last 12 months, my health today is:

❑ Better ❑ Much the same ❑ Worse

To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

Q13. We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your health state is today.

Your own health state today



Post discharge PROM questionnaire

Q1. Is anyone helping you fill in this questionnaire? Yes ❑ No ❑

If the answer is yes, please give the relationship to you of the person assisting you:

Family member, e.g. spouse, child,	❑	Friend/neighbour	❑
Other relative	❑	Carer	❑
Healthcare professional	❑	Other	❑

If you are helping to complete this questionnaire on behalf of the patient, please ensure that the information given below is that of the patient and not your own.

Q2. Which statement best describes your living arrangements?

I live with a partner or spouse ❑

I live alone ❑

I live in a nursing home, hospital or other long term care ❑

Other ❑ Please specify

Q4 What was your operation date?

Day		Month		Year			

The following questions concern your state of health after surgery:

Q5. How would you describe the results of your operation?

❑ Excellent ❑ Good ❑ Fair ❑ Poor

Q6. Since your operation have you or anyone else noticed any changes in your:

Eyesight	Yes❑	No❑
Mood	Yes❑	No❑
Memory	Yes❑	No❑

Brief details if "yes" to any of the above:

Q7. In the last 4 weeks how often did you get chest pain (angina)?

❑ Never ❑ Less than once a week ❑ Once a week ❑ More than once a week ❑ Every day

Q8. Do you now get chest pain (angina) on exertion?

❑ No ❑ On mild exertion ❑ On moderate exertion ❑ On strenuous exertion

Q9. In the last 4 weeks how often did you feel breathless?

❑ Never ❑ Less than once a week ❑ Once a week ❑ More than once a week ❑ Every day

Q10. Have you had any wound problems? Yes ❑ No ❑

Details if "yes"

If yes, what treatment did you receive?

❑ One course of antibiotics
❑ Two or more courses of antibiotics
❑ Dressings at home
❑ Treatment in hospital

Q11. Have you been re-admitted to hospital since your operation? Yes❑ No❑

If YES please tell us why-

The following questions are about your experience as a Papworth patient. Please tick one box for each statement:

	Yes	Somewhat	No
Q12. I was an active participant in my care.	❑	❑	❑
Q13. I had enough opportunity to discuss my condition with my medical team.	❑	❑	❑
Q14. I understood what my medicines were for.	❑	❑	❑
Q15. I understood who to contact if I had any problems after leaving hospital.	❑	❑	❑
Q16. I was given advice on how to look after myself	❑	❑	❑
Q17. I wish my operation could have been carried out sooner.	❑	❑	❑

If yes was it delayed by: ❑ ❑Referral ❑ Cancellations ❑ ❑ Don't ❑ Investigations

By placing a tick in one box in each group below, please indicate which statements best describe your own health state today:

Q18. Mobility

I have no problems walking about	❑
I have some problems walking about	❑
I am confined to bed	❑

Q19. Self-Care (washing & dressing)

I have no problems with self-care	❑
I have some problems with self-care	❑
I am unable to wash or dress myself	❑

Q20. Usual Activities (e.g. work, study, housework, family or leisure activities)

I have no problems with performing my usual activities	❑
I have some problems with performing my usual activities	❑
I am unable to perform my usual activities	❑

Q21. Pain/Discomfort:

I have no pain or discomfort	❑
I have moderate pain or discomfort	❑
I have extreme pain or discomfort	❑

Q22. Anxiety/Depression

❑	I am not anxious or depressed
❑	I am moderately anxious or depressed
❑	I am extremely anxious or depressed

Q23. Compared to my general level of health over the last 12 months, my health today is:

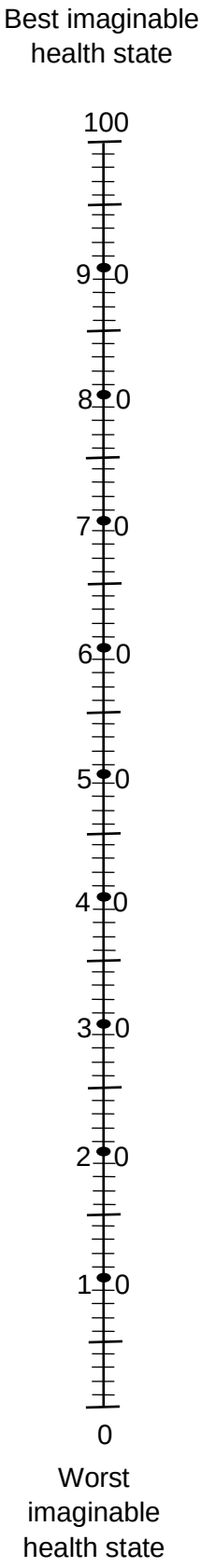
❑ Better ❑ Much the same ❑ Worse

Please turn over page for last question

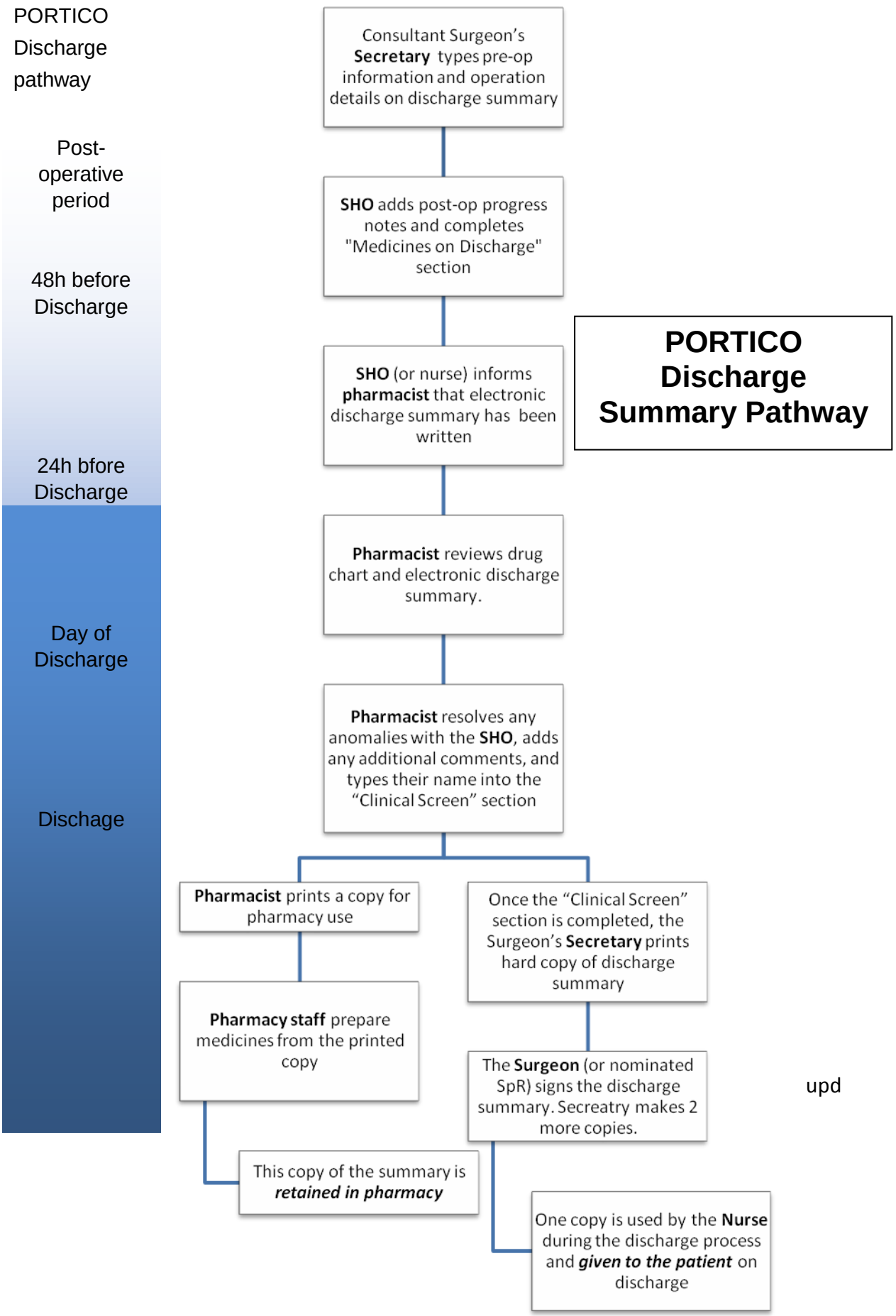
To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

Q24. We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your health state is today.

Your own health state today



PORTICO Discharge pathway



upd

e-mail update colour coded for surgical teams

HOSPITAL NO	PATIENT NAME	DOB	SURGEON	PROCEDURE DATE	PROCEDURE	Admitted to Ward
Cancelled aaaaaa	**Lack of cc beds M Mouse**	dd/mm/yy yy	Surgeon 2	Monday dd/mm/yyyy	**AVR**	Mallard ward
bbbbbb	**AN Other**	dd/mm/yy yy	Surgeon 2	Monday dd/mm/yyyy	**AVR + CABG**	Mallard ward
eeeeee	**P Jones**	dd/mm/yy yy	Surgeon 1	Monday dd/mm/yyyy	**CABGx4**	Day Ward
ffffff	**A Smith**	dd/mm/yy yy	Surgeon 2	Tuesday dd/mm/yyyy	**Pericardectomy**	Mallard ward
gggggg	**B Smith**	dd/mm/yy yy	Surgeon 2	Thursday dd/mm/yyyy	**CABGx3**	Day Ward
hhhhhh	**C Smith**	dd/mm/yy yy	Surgeon 2	Thursday dd/mm/yyyy	**CABGx3**	Day Ward
iiiiiii	**D Smith**	dd/mm/yy yy	Surgeon 1	Friday dd/mm/yyyy	**CABGx4/5**	Day ward
jjjjjj	**D Jones**	dd/mm/yy yy	Surgeon 3	Friday dd/mm/yyyy	**AVR + CABG**	Mallard ward

i

Enhancing your recovery after cardiac surgery

Steps you can take to get
better sooner

Patient's name:.....
Consultant's name:.....
Admission date:.....
Planned discharge date:.....
Type of operation:.....
Date of operation:.....

1

Introduction

We want you to get better as soon as possible after your heart operation.
Research has shown that this can be achieved by:

- Getting you as fit as possible for your operation
- Reducing the stress of surgery on your body
- Getting you up and about soon after your operation

In Papworth, we call this initiative 'PORTICO', which stands for Preparing and Optimising
Patients, and Reducing Trauma In Cardiac Operations. Your surgeon has selected you as
someone who will benefit from PORTICO.
One of the most important principles of PORTICO is that there are lots of things that you can
do to speed up your recovery. This booklet gives you information on how to do these. There is
space for you to monitor your progress and we encourage you to do this.
Remember, if you have questions at any stage, please get in touch or ask when you are in the
clinic or on the ward. You will find our contact information on page 16 of this booklet.

2

1. Live well

Good nutrition is always important but it becomes even more vital before and after surgery. A healthy balanced diet will provide your body with all the nutrients it needs to fight infection and repair tissues.

Studies have shown clearly that people who are underweight, malnourished or overweight have more complications after surgery. People who are a healthy weight and well nourished will heal and recover more quickly.

Prior to surgery your nutritional state will be assessed. If you are identified as malnourished or at risk of malnutrition (this means you are eating and drinking too little or have unintentionally lost weight) you will be provided with some written dietary information to help you to improve your nutrition before surgery. You will also be prescribed supplement drinks and referred to a dietitian for further advice.

For most people a healthy balanced diet includes:

• **Fruit and vegetables** - aim to eat at least five portions per day. Ensure you have a variety and choose from fresh, frozen, tinned, dried or juiced.

• S**tarchy foods** at each mealtime, e.g. rice, bread, pasta and potatoes. Choose wholegrain varieties when you can.

• **Protein-rich foods** such as meat, fish, eggs, beans, lentils or nuts. These should be eaten at least twice a day.

• **Milk and dairy foods each day** - try lowerfat versions if you need to lose weight.

• Limit foods high in fat, sugar and salt.

If you are found to be overweight, you should try to take steps to lose weight before surgery as this will reduce your risk of complications (particularly breathing and wound problems). You should do this sensibly by continuing to eat a healthy balanced diet that includes all the four food groups listed above.

It is important that you continue to eat regular meals but you could cut down on food and drinks high in fat and sugar and reduce your portion sizes. If you need to snack between meals, choose healthy snacks such as fruit and low fat yoghurts. Good nutritional habits set up now will be easier to maintain after your surgery.

My role in my recovery

Before surgery After surgery

Nutritionally balanced + a healthy weight = Quicker recovery and fewer complications

3

Your BMI is _____

4

2. Stay active

While waiting for your heart operation it is important to remain physically active. The stronger and fitter you are before the

operation, the quicker you are likely to go home afterwards.
Physically active means to keep doing the activities you would do in your normal daily life, as much as your symptoms allow. If your symptoms include chest pain/tightness or shortness of breath it is important to discuss your level of activity with the doctor or nurse you see in clinic.
Walking is an important way to remain active, whether you can walk a few steps or a few miles. Here is some simple advice to help you remain safe when walking.
• Dress in loose fitting clothes and wear comfortable shoes.
• Walk at a pace that enables you to maintain your breathing comfortably. An example of this is that you should be able to 'walk and talk' at the same time. If you become too breathless or develop chest pain, you should STOP and rest. Always ensure that you carry your GTN spray if you have been prescribed one.
• Start with a time/distance you can comfortably manage and gradually increase it if you can.
• Avoid extreme weather conditions, e.g. too windy, wet, cold or hot, as they may make you feel more tired or breathless.
• Ensure that you remain hydrated when you exercise by drinking plenty of fluids.
Included in this booklet are some exercises to help flexibility and strength prior to your operation. They have been designed specifically for people who are breathless and weak. If done regularly, they will increase muscle strength, improve circulation, help with shortness of breath and prepare you for your surgery.
• Try to find a comfortable position and relax the muscles not involved in the exercise.
• Avoid holding your breath while exercising.
• Give yourself time to recover your breath after each exercise. Rushing to finish the exercise can make you feel more breathless. Your breathing should sound quiet. Breathe in and out at a comfortable pace. Continue until your breathing feels settled.
• You do not have to do all the exercises in one session. It may be better for you to do

several short sessions of exercise each day, rather than one long session.
• If you feel unwell you may need to stop exercising or reduce the amount you are doing. Gradually build it up again as you start feeling better.
• Try to find a regular pattern for exercise that fits into your daily routine. Avoid exercising for an hour after a meal.
• You may find that some of the exercises become too easy for you; read the 'progression' column to see how to make your muscles work harder.

5

These exercises will help to keep your body and shoulders flexible; do them slowly, five times in each direction. Start these exercises by sitting on an upright chair.

Keeping hips and feet facing straight forwards, turn your head and trunk as far as you can comfortably go, first to the right and then to the left

Breathe out and slowly slump down.

Slowly straighten up whilst taking a breath in

Shrug shoulders up and down

Flexibility exercises

6

Middle and inner range

Sitting on a chair or over edge of the bed.

Lift your foot to straighten knee. Count to five. Relax gently down.

Increase number of repetitions. Add a weight at the ankle (reduce repetitions at first). Repeat using other leg.

Strengthening exercises

Warm-up exercise: sitting on a bed or chair, pump your feet up and down. This helps the movement in your ankles and the blood flow in your legs. Aim: to strengthen your thigh muscles

Straight leg raise

Lying or sitting on a bed - pull foot up towards you.

Keeping knee straight lift leg six inches.

Count to five. Relax down.

Repeat using other leg. Increase number of repetitions. Add a weight at the ankle (reduce repetitions at first).

Inner range

Lying or sitting on a bed, place a rolled

up towel under knee, pull foot up towards you.
Lift foot to straighten knee. Count to five. Relax down. Repeat using other leg
Increase number of repetitions. Add a weight to the ankle (reduce repetitions at first).
7
Step ups
Standing in front of a step or bottom stair. Hold onto a hand rail. Slowly step up onto the stair with both feet, then step down again. Alternate the leg you lead with.
To make this exercise harder, increase the height of the step.
Heel raiser
Hold onto the back of a chair, standing up. Rise up onto toes and back down to floor.
Increase number of repetitions. Then progress onto one foot (reduce repetitions at first).
Squats
Hold onto the back of a chair, standing up. Slowly bend your knees a small way, hold, then stand up straight.
To make this exercise harder, increase the depth of squat by bending your knees more.
Sit to stand
Sitting on a chair with hands on your knees (or on arms of chair).
Stand up, then sit down slowly. Do not use your arms. Increase number of repetitions, then use lower chair or stool.

Calf exercises

Aim: to strengthen your calves
8
You might find it useful to complete this diary of the exercise that you have done to get fit
for your operation. This diary is designed to help you monitor your exercises and show what
progress you have made.
Date Time Activity
Duration/

repetitions
Comment
DD/MM 10:00am Leg exercises 5 of each
3:00pm Flexibility exercises 3 of each
9
3. Get practising
After heart surgery most patients have a wound down the centre of their chest over the breast bone. An important part of wound and bone healing is the restriction of the activities you do with your arms after the operation. This is because certain activities put a lot of stress on the bone that is trying to heal.
The main restriction is NO lifting, pushing or pulling with your arms for the first three months after the operation to allow the wound to heal successfully. As a guide you should not lift any object that is greater than 5lbs/2.2kg in weight.
Some of the activities this will affect are getting in and out of bed, standing up and sitting down in a chair, carrying shopping bags and general everyday living activities within the home.
• Getting in and out of bed
To make getting out of bed easier after the operation it would be beneficial to practise the correct technique beforehand. The usual technique we advise is for you to roll onto either side and gently lower your legs off the edge of the bed, then push down through your elbow and come up into a sitting position on the edge of the bed. For lying down the same process is followed in reverse.
• Getting in and out of a chair
To help you when getting up from a chair without using your arms we advise a technique of sitting on the edge of the chair with your arms crossed on your chest. Then with your feet firmly flat on the floor, rock gently backwards and forwards three times with your nose coming forward over your toes. On the third rock forward push up strongly through your legs and come up into the standing position.
4. Be prepared
Start to make plans for going into hospital and coming home after your operation.

• Think about how you will travel to the hospital. It might involve an early start so try to get some rest the day before.
• Think about what you will take into hospital. Make sure you have a pair of well fitting, flat, comfortable slippers or shoes. If you normally use a walking aid or have glasses, dentures or hearing aids, then make sure you bring these with you.
• Think about how you will get home from hospital. You will be given the date that we expect you to be discharged. Make sure your friends and family know when this will be.
• Check that you have enough support in place for when you get home, as you might need extra help.
• Before going into hospital, it is sensible to stock up your freezer so you don't have to worry about shopping immediately after you are discharged.
• If you are finding it difficult to manage at home prior to your operation, or you cannot get up out of a chair easily without using your arms, do mention this to the nurse at pre-admission clinic.
• If you are the primary carer for someone else, think about how this person will be looked after while you recover from your operation.

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Steps to improve your recovery whilst in hospital

Nutrition

Make sure that you start to eat and drink well so that your body has the fuel it needs to heal.

After surgery your normal appetite may be reduced, but it is important that you try to eat and drink, as this will help stimulate your appetite. If your appetite and food intake remain poor when you go home, you should try to eat six small meals or snacks each day. If your appetite does not return to normal within a few weeks and your weight reduces unintentionally, you should contact your GP for further advice and support.

Exercise

Take exercise as guided by the physiotherapist as this helps your body get strong and fit again. After your surgery you will be

encouraged to be active as soon as possible.
Here is a typical programme for after your operation:

Day 1

The physiotherapist will assess your breathing and check that you can take a deep breath and cough comfortably. You will be taught how to support your wound to ensure you can cough strongly. The aim will be for you to sit out of bed in the morning and again in the afternoon on the first day. You will have information about protecting the healing of your wound and how to move without putting pressure through your arms. You will be taught some simple exercises to help maintain your strength. You may also do some walking on the spot.

Day 2

The physiotherapy team will assess your walking and may still be monitoring your breathing, particularly if you are coughing up phlegm or are unable to take a deep breath effectively. You will be advised on how much walking you should be doing and if it is safe for you to be walking on your own. Our aim is to get you as independent as possible as soon as possible. We will reinforce the information we have given you about your wound and exercises.

Day 3

By day three you should be able to walk around the ward short distances (approximately 10 to 50 metres) on your own. You will be encouraged to do this frequently throughout the day as the more mobile you are the quicker you will be able to go home. You will also be encouraged to be do things for yourself such as washing and dressing.

Day 4 and 5

Your walking will be progressed under the supervision of the physiotherapy team until you are able to walk a distance that is functionally acceptable for going home. Our standard is 100 metres but do not worry if you can’t do this as everyone is different. You will also be assessed on the stairs, if this is felt essential for a safe discharge home. You will be taught flexibility exercises similar to those you did before your operation and given further information about your recovery and

cardiac rehabilitation.
If your stay in hospital is longer than expected then the physiotherapy team may continue to see you. However, if you are independently mobile and have no breathing problems, you may be discharged from regular review by the team.
It might be useful to keep a diary or log so that you can track your daily feelings and progress on the road to recovery.
Be positive about your recovery - remember little steps go a long way!
11

Diary

Day 1 - post surgery

How am I feeling?

How well controlled is my pain?

☐ Well controlled

☐ I'm still sore and would like some more painkillers

What are my goals?

• Start eating and drinking. Try to eat something at each meal and drink at least 6 cups of fluid.
• Sit out of bed with assistance from staff for up to 6 hours.
• Try to get out of bed and on to my feet.

What have I eaten today?

☐ Breakfast.....

☐ Lunch.....

☐ Dinner.....

How many cups of drink have I managed today?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Some nausea is normal on day 1

☐ ***I haven't managed to eat because:***

.....
.....
.....

How active have I been?

☐ Sat out of bed with assistance for …… hours.

☐ Walked on the spot with assistance

☐ Practised supported cough and exercises …… times today

☐ I haven't been able to because:

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.....

What am I proud of achieving?

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.....
.....
12

Day 2 - post surgery

How am I feeling?

How well controlled is my pain?

☐ Well controlled

☐ I'm still sore and would like some more painkillers

What are my goals?

• Eat 3 meals and drink at least 6 cups of fluid
• Continue to follow guidance from the Physiotherapist about walking, exercises and coughing
• Get out of bed (without using arms) and walk a few steps with guidance
• Sit out of bed for up to 6 hours

What have I eaten today?

☐ Breakfast.....

☐ Lunch.....

☐ Dinner.....

How many drinks have I managed today?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

☐ ***I haven't managed to eat because:***

.....
.....
.....

How active have I been?

☐ Sat out of bed

☐ Walked around my bed

☐ Walked …… steps

☐ Practised supported cough and exercises …… times today

☐ I haven't been able to because:

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What am I proud of achieving?

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13

Day 3 - post surgery

How am I feeling?

How well controlled is my pain?

☐ Well controlled

☐ I'm still sore and would like some more painkillers

What are my goals?

• Eat 3 meals and drink at least 6 cups of fluid
• Walk to the bathroom with help
• Check that I have day clothes to get dressed tomorrow

What have I eaten today?

☐ Breakfast.....

☐ Lunch.....

☐ Dinner.....

How many cups of drink have I managed today?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

How active have I been?

☐ Walked …… steps or distance ☐ 1 ☐ 2 ☐ 3 ☐ 4 times today

☐ Have done my exercises …… times today

What am I proud of achieving?

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Are there any changes to my support arrangements at home after discharge? (If yes, talk to your nurse) Yes No

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.....
.....
.....
14

Day 4 - post surgery

How am I feeling?

How well controlled is my pain?

☐ Well controlled

☐ I'm still sore and would like some more painkillers

What are my goals?

• Walk to the bathroom unaided
• Get dressed

• Open my bowels
• Eat 3 meals and drink at least 6 cups of fluid

What have I eaten today?

☐ Breakfast.....

☐ Lunch.....

☐ Dinner.....

How many cups of drink have I managed today?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

How active have I been?

.....
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.....
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What am I proud of achieving?

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Are there any changes to my support arrangements at home after discharge? (If yes, talk to your nurse) Yes No

.....
.....
.....
.....

15

Final post operative period

How am I feeling?

How well controlled is my pain?

☐ Well controlled

☐ I'm still sore and would like some more painkillers

What are my goals?

• Walk up and down 1 flight of stairs
• Walk around the ward on my own with confidence
• Understand my medication
• Prepare for going home

What have I eaten today?

☐ Breakfast.....

☐ Lunch.....

☐ Dinner.....

How many drinks have I managed today?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

How active have I been?

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What am I proud of achieving?

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Going home

If you are not well enough to go home on the planned day of discharge then don't worry. We are all individuals and some of us take longer than others to get better. Don't be surprised if you feel 'down'. This is normal after an operation and your mood will improve.

We are here to support you as you recover and your clinical team will be able to explain things to you and answer any questions that you or your family have.

Steps to improve your recovery after you leave hospital

• Continue to eat and drink well and take regular exercise.

• Take part in your local cardiac rehabilitation.

• Remember we are always here if you have any questions.

Contact details

Cardiac Rehabilitation 01480 364429
Cardiac Support Nurses 01480 364100
Monday to Friday 9.00am - 6.00pm except Bank Holidays

We would appreciate your feedback on this booklet so that we can continue to improve it for future patients:

Have you found this information useful in preparing you for your surgery?

Yes
In parts .....
.....
.....
No .....

.....
.....

Did you find it helpful to keep a diary of your activity and progress?

Yes

At times .....
.....
.....

No .....
.....
.....

Do you feel that you have been an active participant in your care?

Yes

In part .....
.....
.....

No .....
.....
.....

Any other comments .....
.....
.....
.....
.....
.....

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