



Imperial College Healthcare
NHS Trust

Remote Monitoring in Heart Failure: The Imperial Experience

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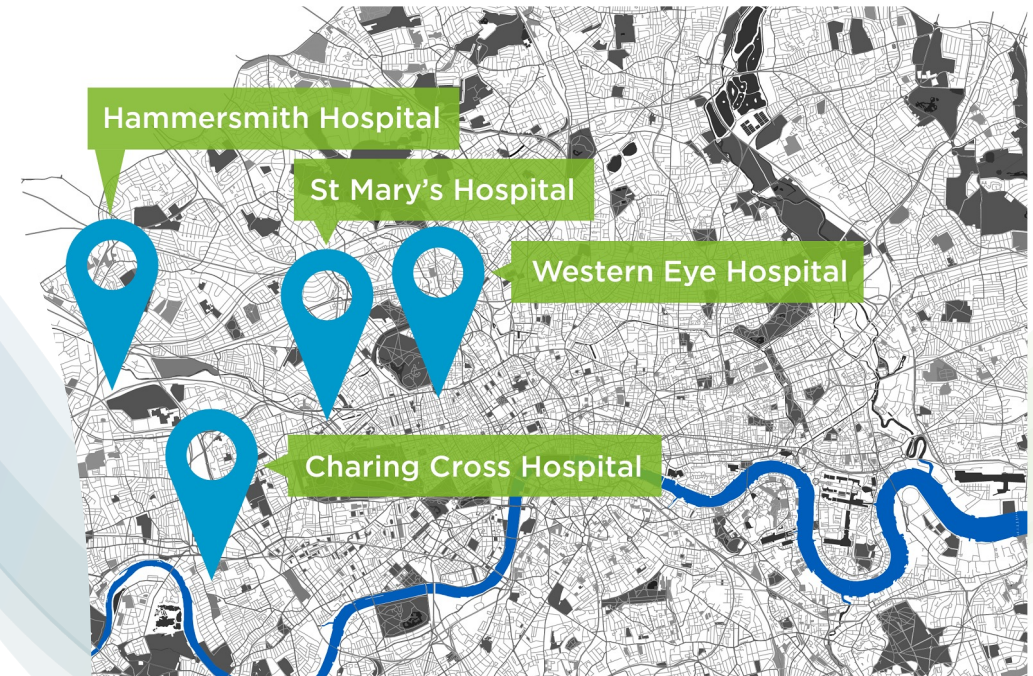
Imperial College Healthcare NHS Trust

Disclosures

- Educational honoraria from AstraZeneca, Pharmacosmos, Novartis

Setting the Heart Failure scene

- ~ 1000 admissions to our hospital per year with heart failure
- Massive geographical base in north west London
- Fully integrated HF service (community & acute):
 - 6 consultant clinics per week
 - 16 HFSN/ HFSP clinics per week



The Current Story of Heart Failure

Development of remote monitoring platform

Aims:

Reduce unscheduled hospital attendances

Facilitate less need for f2f interactions

Rapid optimization of prognostic medications

50% at 5 years

- Prognosis is worse than many cancers

Frequent hospitalisations

- £2 billion / year

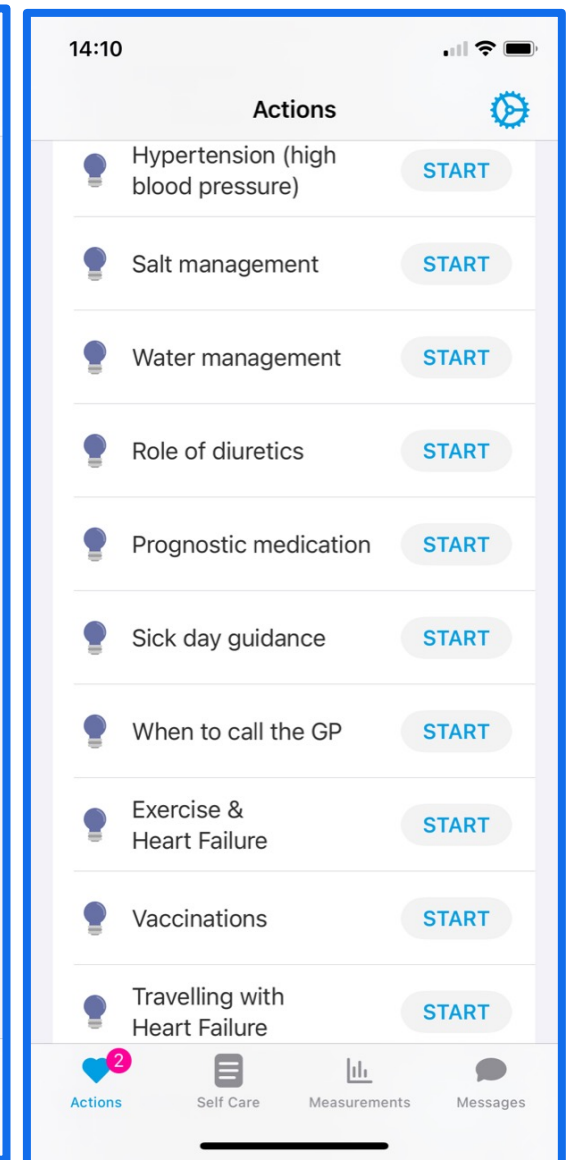
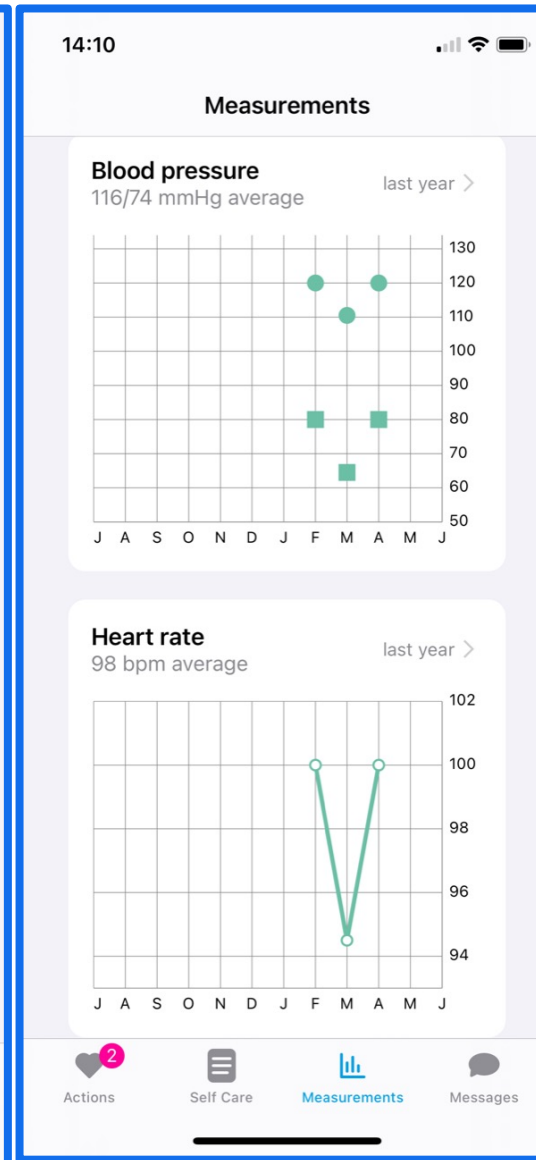
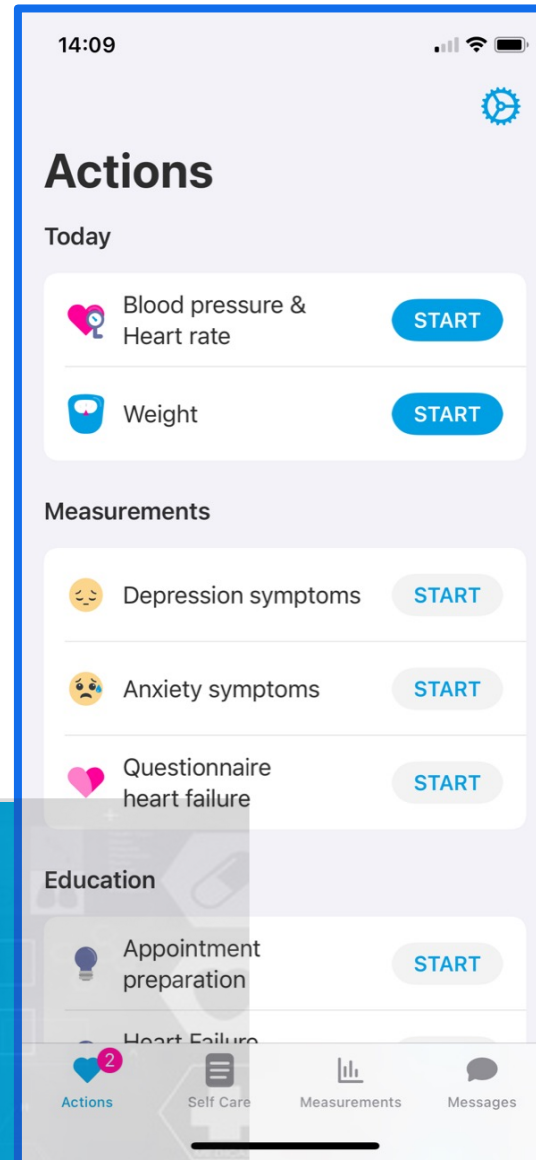
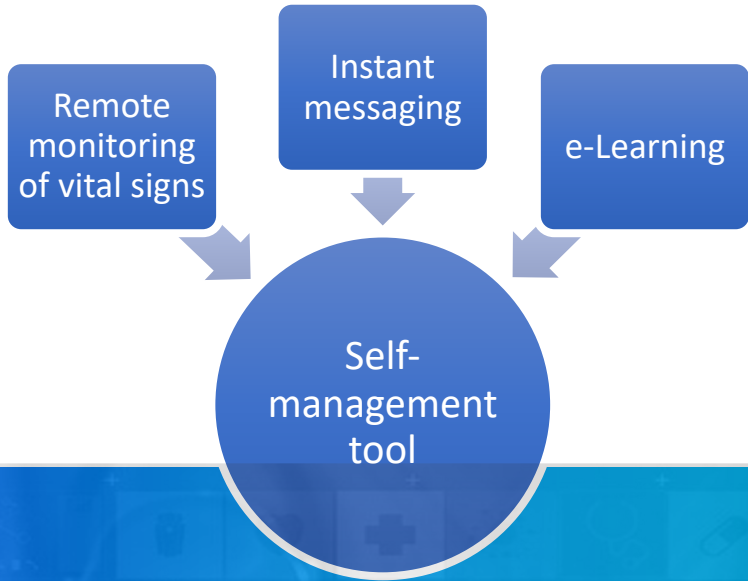
Prognostic medications decrease mortality

- Up to 50% reduced mortality

Optimising medications is undertaken face-to-face

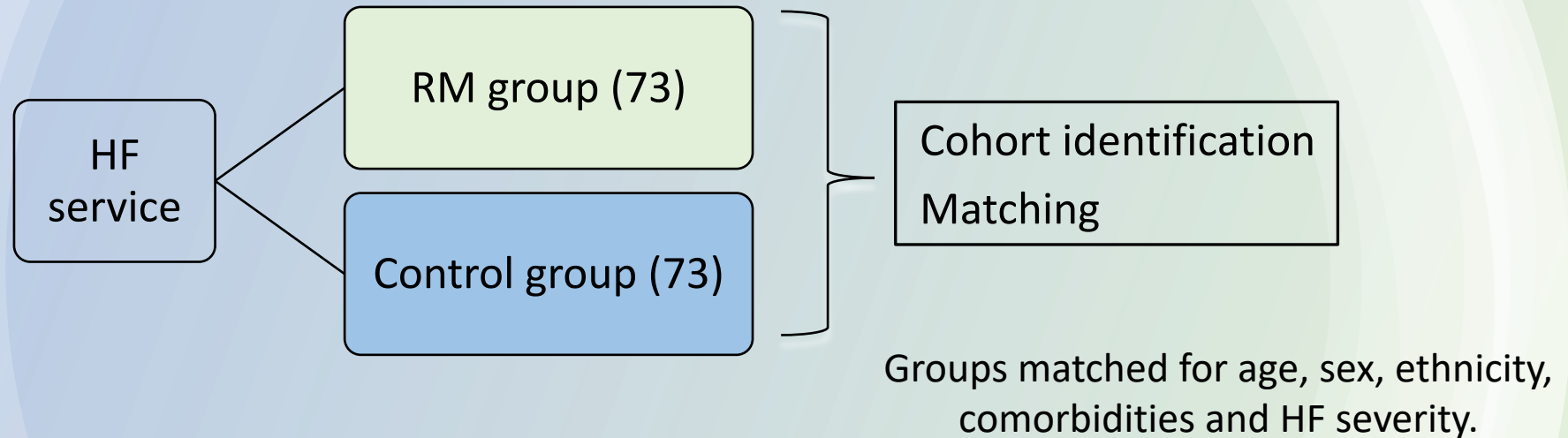
- Frequent HFSN appointments over several months

Luscii remote patient monitoring



Service analysis: 3 months

Retrospective analysis of 2 matched cohorts with new diagnosis of HFrEF



Outcomes:

- Secondary healthcare usage (ED attendances & unplanned admissions)
- Secondary healthcare costs

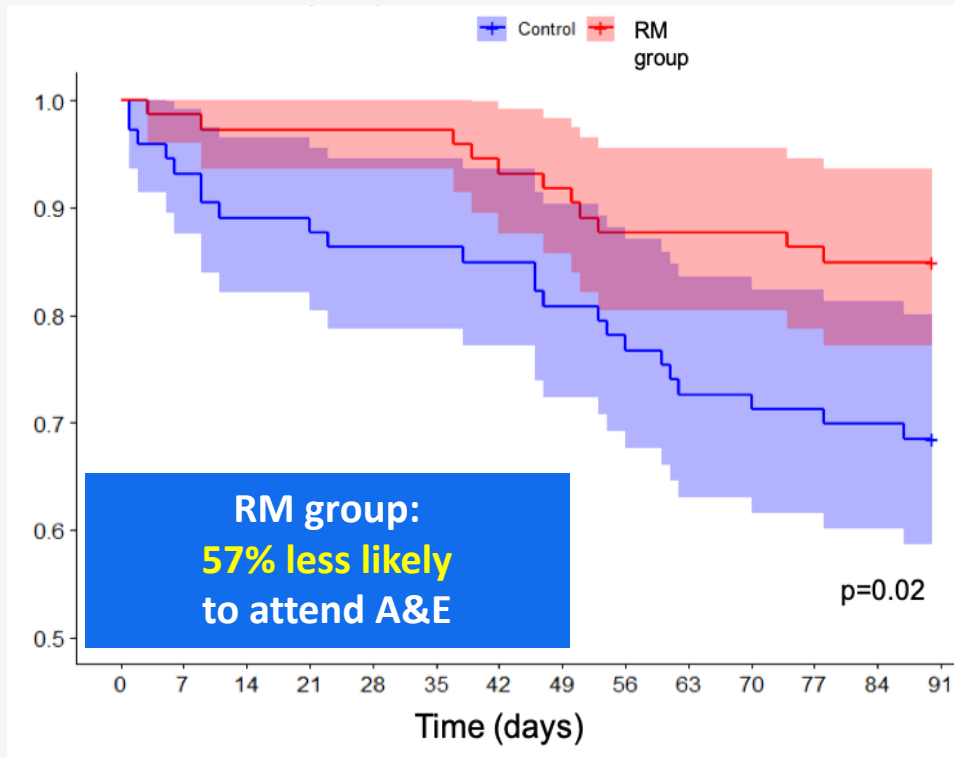
Well matched for all characteristics except hypertension



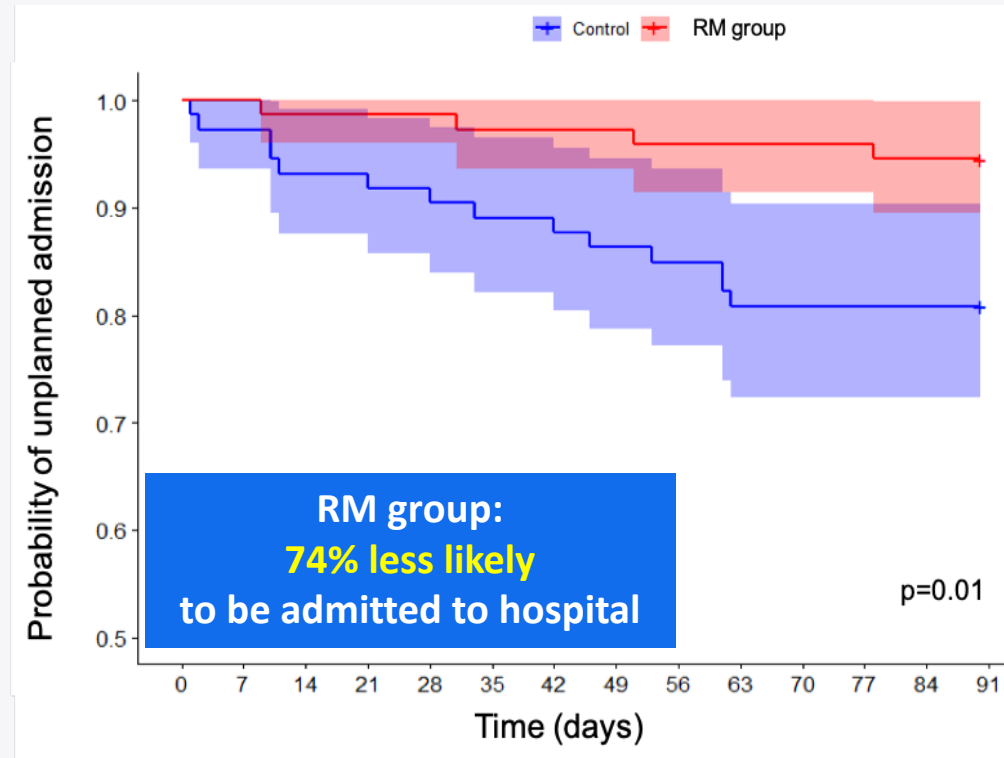
Baseline characteristic	RM group (n=73)	Control group (n=73)	p-value
<i>Demographics</i>			
Mean age (years)(std)	63.0 (13.2)	64.5 (13.0)	0.49
Female	21 (29%)	21 (29%)	1.00
<i>Heart failure parameters</i>			
Mean LVEF (std)	33% (10%)	32% (9%)	0.87
NYHA grade			
I	11 (15%)	14 (19%)	0.57
II	36 (49%)	33 (45%)	0.67
III	22 (30%)	25 (34%)	0.65
IV	4 (5%)	1 (1%)	0.37

Reduced A+E attendance and hospital admissions at 3 months

A&E Attendances



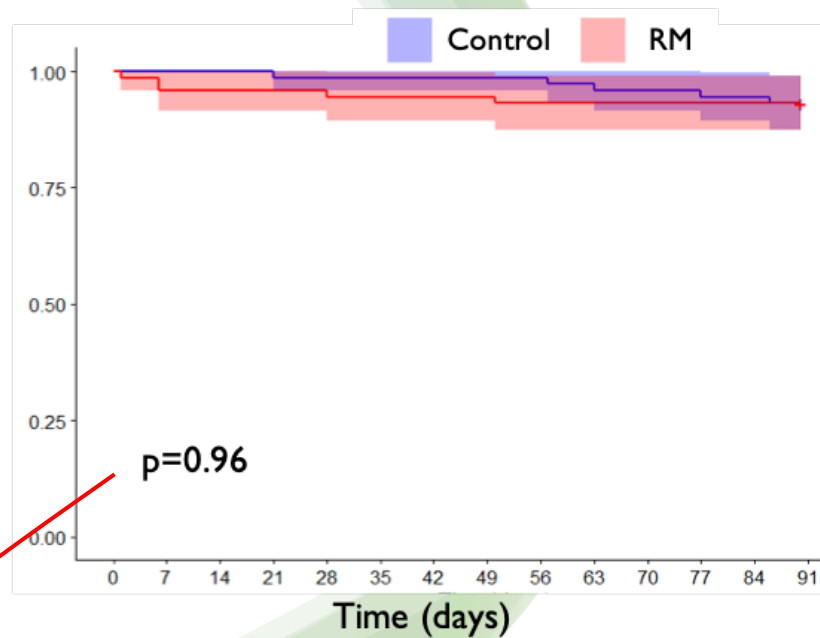
Hospital admissions



Did RM lead to more outpatient costs?

Luscii patients **did not** have more risk of elective admissions or outpatient clinic use

Elective hospital admissions

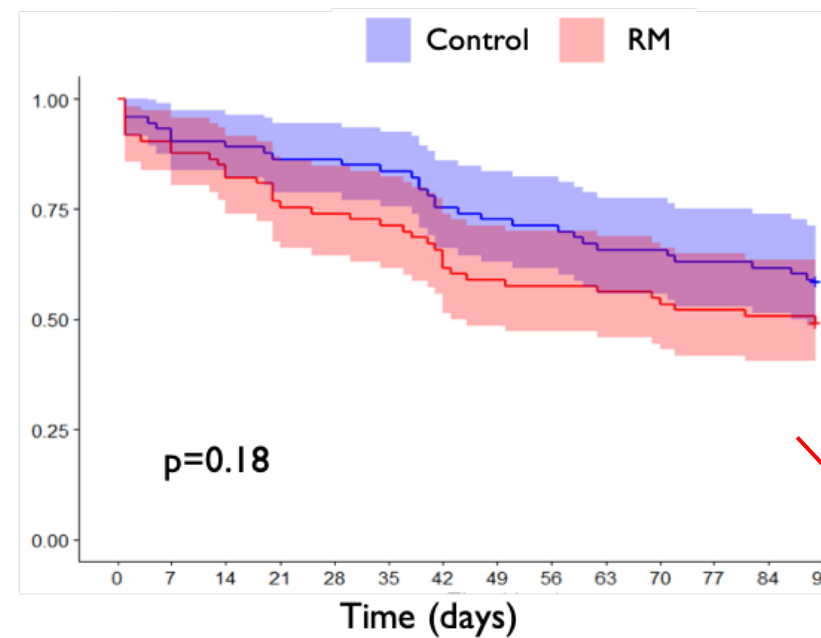


Probability of not using the service

$p=0.96$

Time (days)

Cardiology outpatient clinic appointments



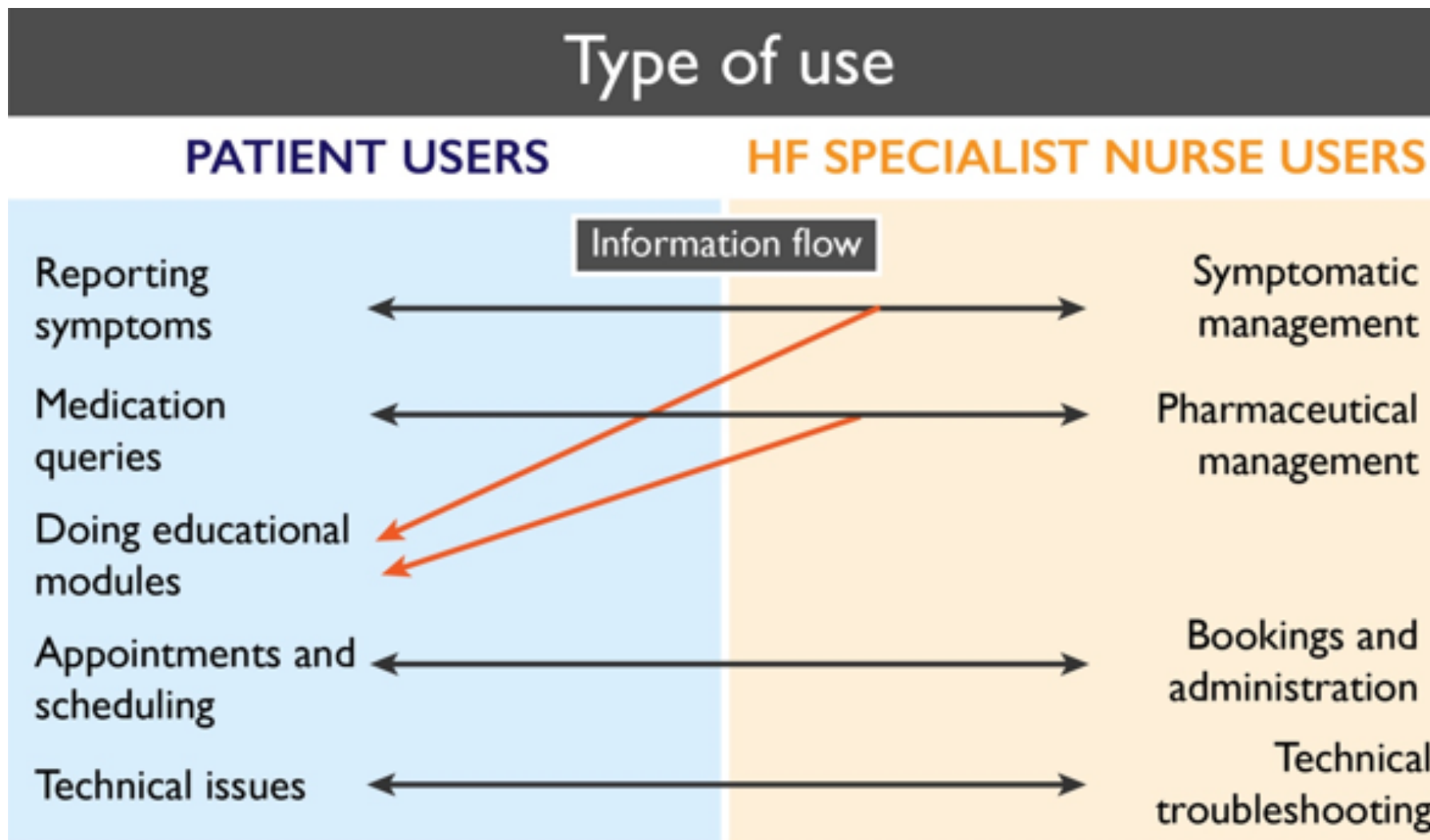
$p=0.18$

Time (days)

No difference
in elective admissions

Followed-up for 3 months

No difference
in outpatient usage



Value: Cost Saving Remote Monitoring Smartphone App



Reduce unplanned HF hospital admissions to secondary care



Improve HF patient experience and outcomes

After 3 months follow-up	Remote monitoring patients, n=73	HF Patients with remote monitoring, n=73	
Healthcare usage			
A&E attendances (count)	46	16	← 65% reduction in A&E attendances
Unplanned admissions (count)	21	4	← 81% reduction in unplanned admissions
Healthcare costs			
A&E costs (£ per patient)	£318	£233	← 27% lower A&E costs
Unplanned admission costs (£ per patient)	£8377	£2916	← 65% lower unplanned hospital costs
	£6,205	£398,653	
	A&E savings for 73 patients in 3 months	hospital savings for 73 patients in 3 months	

Patient testimonials:

“More engagement & understanding...better able to manage my condition”

“Makes me pay closer attention to my weight and blood pressure”

“I feel much safer...peace of mind knowing a team is watching over me”

“makes me feel protected without...being in hospital”

“allows patients to express their concerns and knowing there is somebody there who will listen and reply to them”

Clinician testimonials



"..increased patients
self-management"



"...**avoided admissions**"



".. **greater collaboration**
between acute trusts
and community
stakeholders in NWL
with ICB"



"trend monitoring with
early intervention"



"...**medication
adherence**"

Remote Monitoring in Heart Failure: The Imperial Experience Summary:



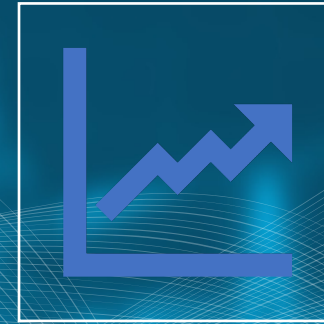
Within 3 months

65-81% reduction in ED attendances/unplanned admissions

65% lower hospital **costs**

No increase in outpatient usage

Overall positive user experience



Unknowns

Long-term HF impact >3months

Scalability

Impact on HFSN workflow

Acknowledgements:

Dr Sameer Zaman
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- Thank you
- Questions?