



Feasibility and clinical utility of a remote monitoring model of care for patients on Home Enteral Nutrition

Jane Stewart¹, Karli Vanvitelli², Carrie Service³, **Kate Graham¹**, Jenelle Loeliger¹, Keryn Coster², Hilda Griffin³, Kath Feely⁴⁻⁶

1. Nutrition & Speech Pathology Department, Peter MacCallum Cancer Centre
2. Nutrition and Food Services Department, Royal Children's Hospital
3. Clinical Nutrition Department, Royal Melbourne Hospital
4. Allied Health, Peter MacCallum Cancer Centre
5. Allied Health, Royal Children's Hospital
6. Allied Health, Royal Melbourne Hospital

Background



**The Royal
Children's
Hospital**



**The Royal
Melbourne
Hospital**



**Peter
MacCallum
Cancer Centre**



Shared Parkville EMR

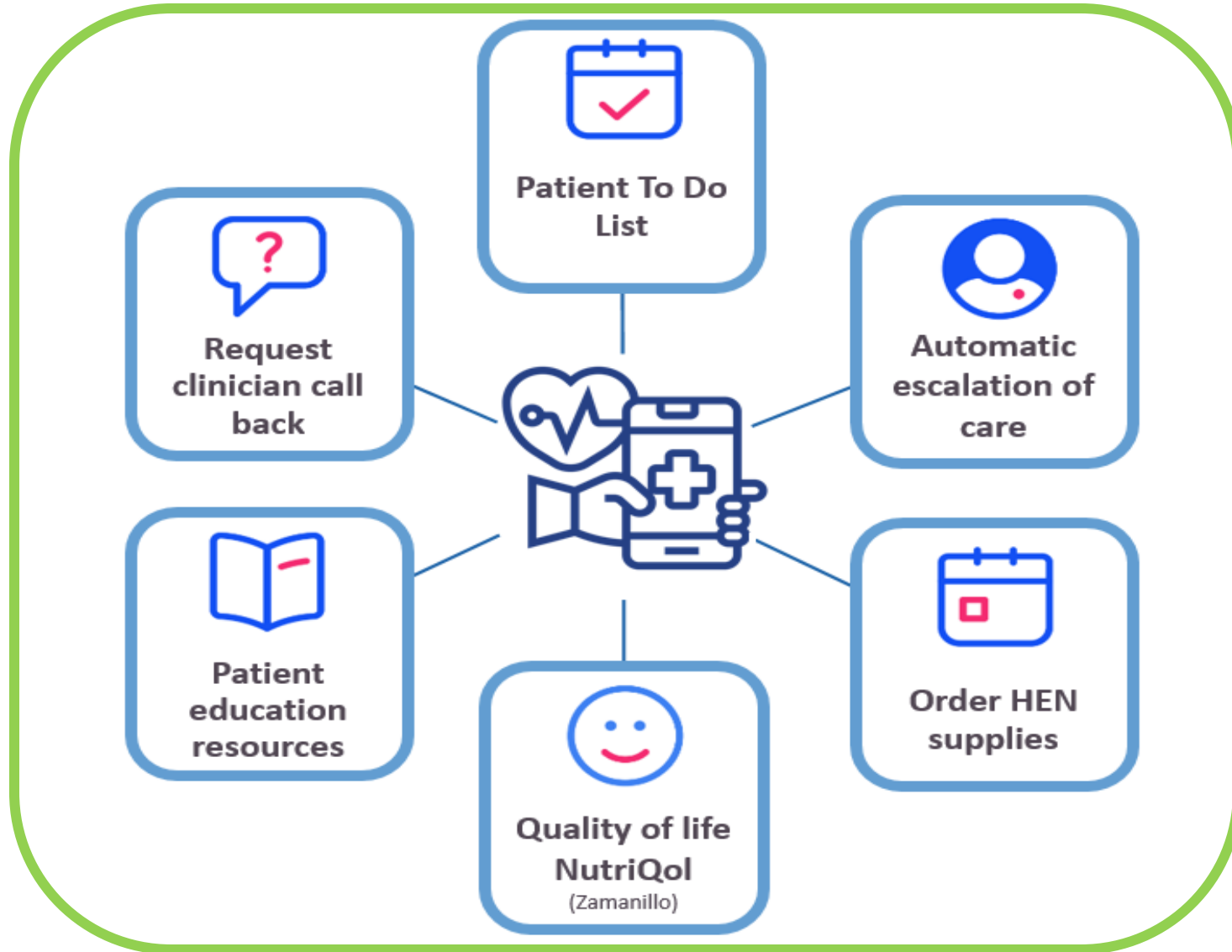
+

Patient Portal



Manage ~ 1000 patients on
home enteral nutrition (HEN)
at any one time

HEN Care Companion

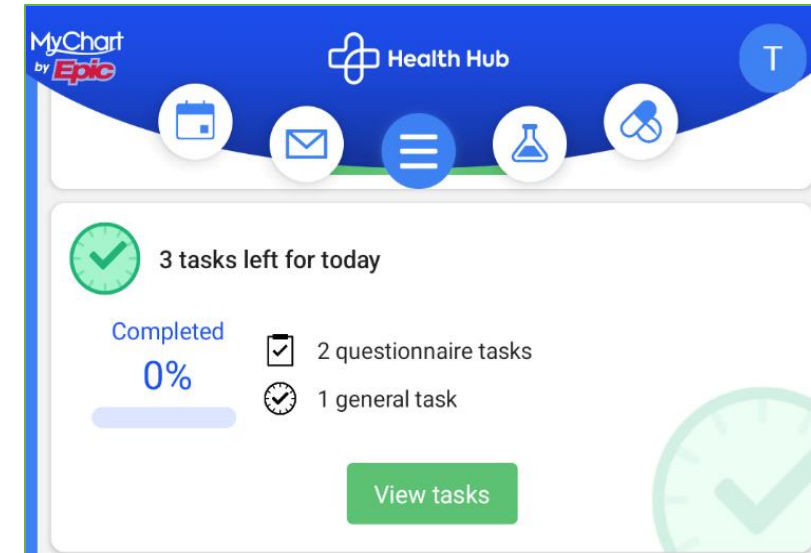


HEN Care Companion

Clinician prescribes care plan

Patient To Do List			
Add reminders + Add		Show: ☐ Past Tasks	Patient View
▲ ¹ Name	Frequency	Next Due Date ▲ ²	End Date
Current			
* Daily Skin Care	Once a week	03/08/2023	01/09/2023
Display Name: Have you completed daily skincare around your feeding tube?			
Description: Please review your skin care education in the education section of the portal.			
* Daily Tube Care	Once a week	03/08/2023	01/09/2023
Display Name: Have you completed your daily tube care?			
Description: Please review the tube care education in the education section of the portal			
* Weight Reminder	Every 3 Months	03/08/2023	
Display Name: Please weigh yourself before filling out the HEN questionnaire			
* Review Feeding Plan	Every 3 Months	03/08/2023	
Display Name: Please review your feeding plan			
Description: Please review your feeding plan in the Letters section of the Portal before answering your HEN Review Questionnaire			
* Annual Blood Test Reminder	Q Year	26/07/2024	
Display Name: Have you had your annual blood test?			
Description: Please remember to have your annual blood test before your review			
* Home Enteral Nutrition Review Questionnaire	Every 3 Months	03/08/2023	
Display Name: Home Enteral Nutrition Review Questionnaire			
Description: A brief questionnaire about how you are managing with your home enteral nutrition			
* Placing Order	Every month	26/08/2023	
Display Name: Stock and Ordering			
* Concerns to Speak to Dietitian	Every month	26/08/2023	
Display Name: Raise Concerns With Dietitian			
* NutriQoL Questionnaire	Q Year	26/07/2024	
Display Name: NutriQoL Questionnaire			

Patient receives tasks via patient portal



HEN Care Companion

Patient completes clinical questionnaire and tasks in the portal

Stoma and Tube

How does your skin around your tube look?

* Can you please upload a photo of your stoma site? ⓘ

 [Add a document](#)

Does your tube have measurement markings?

What cm marking is your tube sitting at the skin level (PEG/PEJ)/nose(NGT/NJT)?

Has the tube moved?



Have you completed daily skincare around your feeding tube?

By end of day

Please review your skin care education in the education section of the portal.



Project Aims

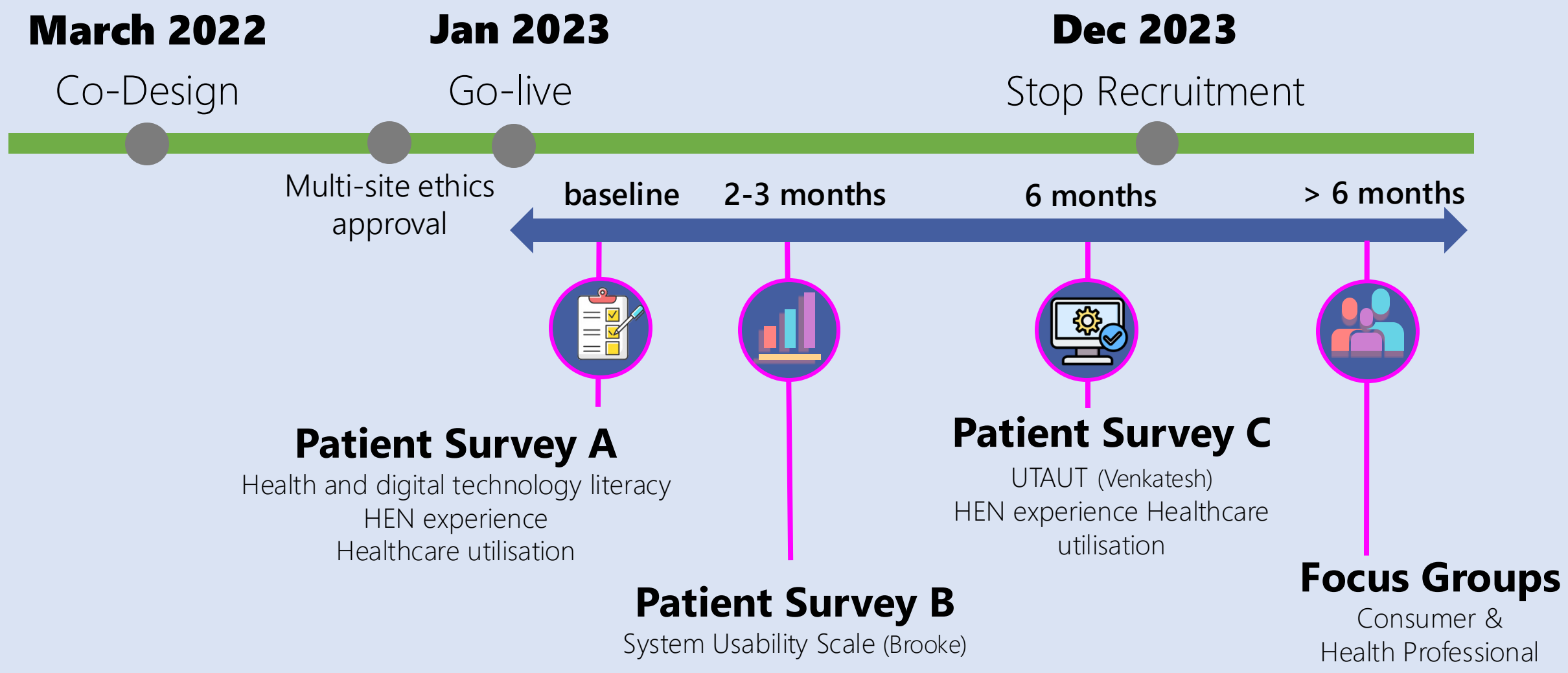


1. Co-design a Home Enteral Nutrition (HEN) remote monitoring model of care



2. Assess feasibility and clinical utility of the model in usual care

Methods



Brooke, J A. Usability Eval. Ind. 1995:189;
Venkatesh V et al. MIS Quarterly 2012;36: 157-178

Results



Diagnosis

Adult cohort (n=50)

Head & Neck Cancer

Paediatric cohort (n=23)

Mixed Cohort



Sex

85% 

55% 



Mean age

64 years

6 years



Health literacy

38% limited/marginal

30% limited/marginal



Use
Confidence

77% use regularly

100% use regularly

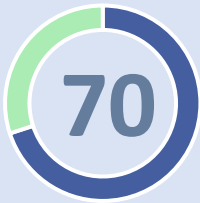
66% confident

95% confident

Results

System Usability Scale

Adult cohort
(n=24)



Paediatric cohort
(n=14)

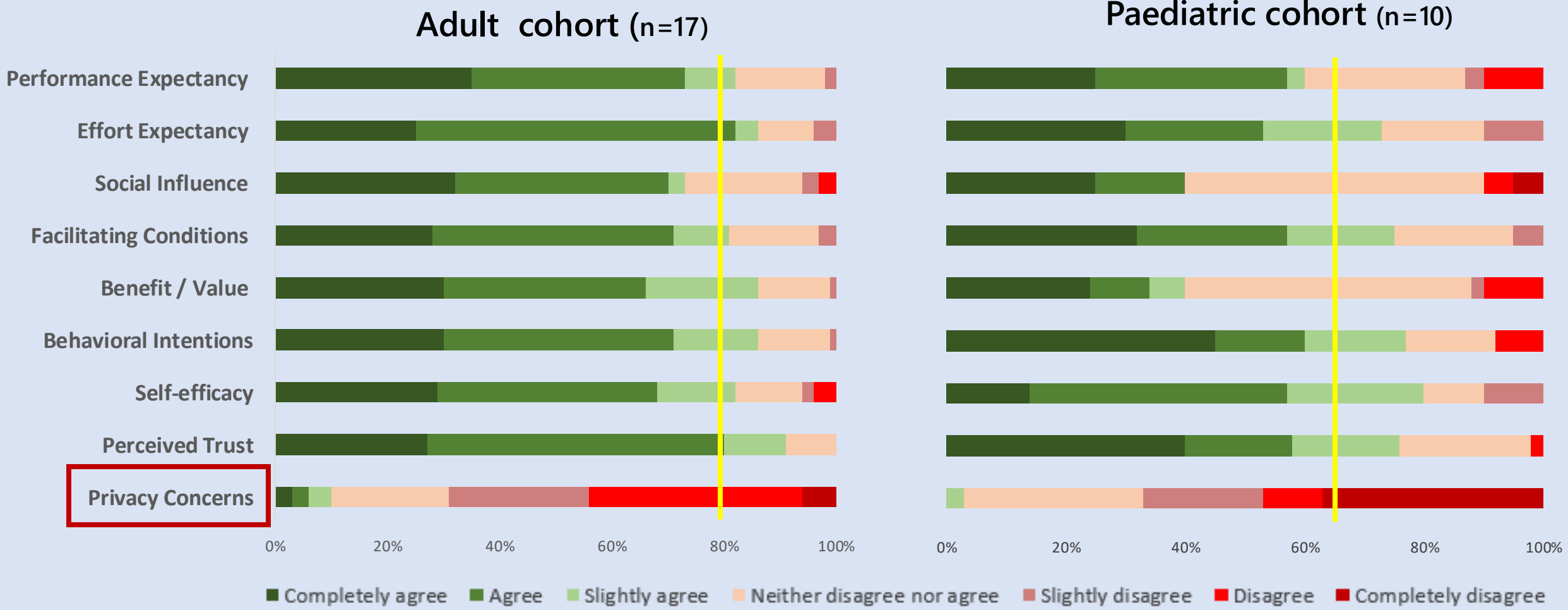


■ Above average (>68) ■ Acceptable (50-68) ■ Unacceptable (<50)

Brooke, J A. Usability Eval. Ind. 1995:189;
Bangor A et al. Journal of Usability Studies. 2009:4(3):114-123.

Results

Unified Theory of Acceptance & Use of Technology



Venkatesh V et al. MIS Quarterly 2012;36: 157-178;
Schomakers et al. JMIR Mhealth Uhealth. 2022;10(1):e27095.

Results

Unified Theory of Acceptance & Use of Technology

90% agreed they had the **necessary knowledge** to use the program

81% agreed the program is **easy to use**

81% agreed the program is **useful in their daily life**

85% agreed they **intended to continue using** the program in the future

89% agreed the program **should be recommended to people** with a similar condition to mine

Results

Focus Groups (n=7 consumers, n=21 health professionals)



Suitability

- Digital technology literacy
- Clinical complexity
- Timing and duration of HEN

"I'm happy with the form. I find it very non-intrusive. I can do it whenever I want to do it." [C2]



Integration

- Clear local processes
- Workflow integration
- Complements existing systems

"I find an advantage"



Potential

- Great potential
- End users receptive and positive
- Further optimisation required

"...Overall, it's really great and I think it has a lot of potential! I can really see... how it will make a big difference, but [there are] just some issues we need to iron out..." [HP1]



Implementation

- Key stakeholder engagement
- Clinical champions
- Training of end users

Lessons Learned

Co-design framework



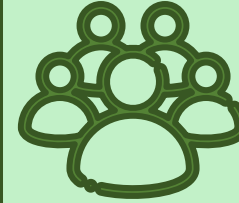
Co-design embedded into design process and optimisation

Patients/carers embrace technology



Proactively telling us what is important to them

Internal Stakeholders



Essential to own, upskill and be the champion

Remote monitoring for HEN



A model of care to support remote monitoring and management of patients on HEN is feasible, usable and acceptable

Acknowledgements



Project Team

Jane Stewart, Peter MacCallum Cancer Centre
Karli Vanvitelli, Royal Children's Hospital Centre
Carrie Service, Royal Melbourne Hospital
Kate Graham, Peter MacCallum Cancer Centre
Kath Feely, CAHIO Parkville EMR
Julia Staples, Acting CAHIO Parkville EMR
Adrian Tan, Parkville EMR team
Simone Schmidt, Digital Health researcher, RMH
Abraham Alvandi, Digital Health researcher, RMH
Andrew Sinclair, PMCC consumer representative
Keith Donohoe, RMH consumer representative
Nicole Zois, RCH consumer representative



Parkville EMR Team



Supervisors

Jenelle Loeliger, Peter MacCallum Cancer Centre
Keryn Coster, Royal Children's Hospital
Hilda Griffin, Royal Melbourne Hospital



Participants

All the patients, carers and health professionals involved in the pilot study.



Contact

kate.graham@petermac.org
jane.stewart@petermac.org