Breaking the COPD Readmission Cycle: How the Respiratory Integrated Care Team's Virtual Care Model Achieved a 50% Reduction in Hospital Returns to Letterkenny University Hospital

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Community Acute Respiratory Excellence CARE Virtual Ward QI Programme

Background and National Context

Chronic Obstructive Pulmonary Disease (COPD) remains the leading cause of adult emergency admissions in Ireland, placing a significant burden on the health system, particularly in Donegal, where Letterkenny University Hospital records the highest national readmission rate at 28.7%. Serving a rural, ageing population with limited transport infrastructure, the current model is heavily reliant on hospital-based, reactive care. Patients themselves express a strong preference for home-based care and wish to avoid repeated hospitalisations.

Funded by the **Sláintecare Integration Innovation Fund (Round 2)**, the CARE project responds to these challenges by harnessing the expertise of the Respiratory Integrated Care team to transform scheduled outpatient services into a responsive, unscheduled alternative to hospital admission.

This digitally-enabled, integrated virtual ward delivers proactive monitoring, early intervention, and patient education, enabling people to remain safely at home, supported by their families and communities.

CARE aimed to enhance the quality of life, reduce readmissions, and address rural healthcare inequalities while strengthening long-term system sustainability.

Pre-Interventions

Letterkenny University Hospital recorded the highest national readmission rate for COPD while having one of the shortest average lengths of stay in Ireland. Multiple factors contribute to these readmissions.
The challenge has whether the CARE Virtual Ward could improve patient outcomes and provide an alternative to a hospital admission.

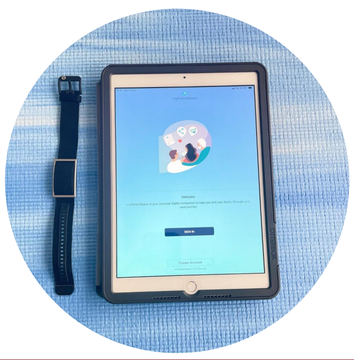
Measures

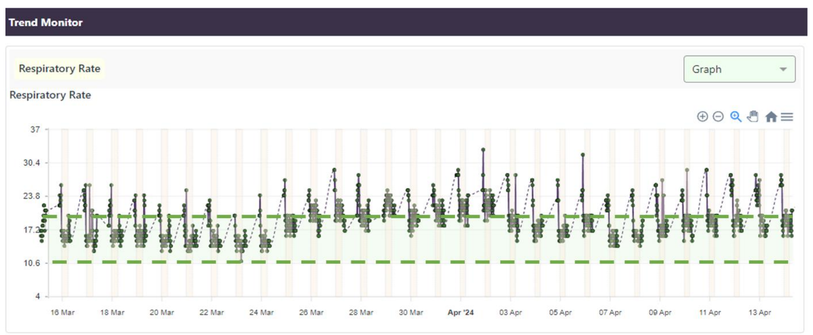
Setting: Donegal, Ireland – 20-bed virtual ward operating
Monday-Friday, 08:00-16:00 for COPD patients requiring enhanced monitoring.

Technology Platform: MyPatientSpace provides real-time vital sign monitoring (Respiratory Rate, Oxygen saturation, Pulse rate, Temperature, and symptom scoring), featuring video calling and educational resources. Green/Amber/Red clinical alerts trigger automated escalation protocols, while a comprehensive dashboard provides healthcare teams with trend analysis and risk stratification.

Clinical Governance: Daily, 12.30 consultant-led safety huddles review all patients, including risk assessments and care plan updates. Advanced nurse practitioners conduct home visits and virtual consultations, supported by 24/7 escalation protocols with the national ambulance, community paramedic and out-of-hours GP services receiving daily communication from the CARE virtual ward.

Outcome Measures: The program tracks clinical outcomes (readmission rates, length of stay, ED visits and exacerbation frequency), patient-reported outcomes (CAT scores, health literacy, quality of life, satisfaction, medication adherence), and system efficiency metrics (bed days saved, cost per episode, staff utilisation, resource allocation, service capacity).





Analysis

The CARE Virtual Ward delivered a 50% reduction in COPD readmissions (from 27.8% to 13.8%), managing 219 admissions virtually, and saving 934 acute bed days while avoiding 156 emergency department visits.

Economic analysis demonstrates direct cost savings of €809,600 (€747,200 from bed days saved and €62,400 from avoided ED visits). A significant improvement in patient-reported outcomes, including 100% enhancement in COPD knowledge, 95% patient satisfaction rates, and substantial reductions in CAT scores, indicating better symptom management.

Additional system benefits included 18% overall admission reduction, 156 rescue prescriptions issued proactively, and measurable improvements in daily functioning and quality of life. Technology-enabled virtual care delivered superior clinical outcomes while reducing healthcare costs and enhancing patient experience.

A Virtual ward would allow patients to receive care at home, supported by technology, avoiding the need for hospital admission.
Respiratory Rate (RR) is one of the most important physiologic measures for predicting patients' deterioration of clinical condition, and it was to be central to the design of the solution

Lessons Learnt

The transition from a scheduled to an unscheduled service within the Respiratory Integrated Care underscores increased flexibility and responsiveness to patient requirements, enabling more prompt and individualised interventions.
Delivering advanced, disease-specific education improves patients' understanding of their condition, encouraging better self-management and adherence to treatment regimens. By prioritising antibiotic stewardship through regular sputum analysis, the approach ensures judicious use of antibiotics and helps prevent resistance, supported by our proactive rescue prescriptions.
Together, these strategies enhance the effectiveness and sustainability of the virtual ward, exemplifying a patient-centred model that adapts to evolving needs and fosters long-term health improvements.

Improvements

Integrated, digitally-enabled care: Hospital-level monitoring at home, reducing inpatient admissions.
Patient empowerment: Multimedia education, self-management tools, pre-dispense rescue prescriptions, and digital literacy training to boost health knowledge and caregiver involvement.
Proactive healthcare delivery: Early warning systems and preventive interventions reduce emergency department pressures and hospital strain.
Rural healthcare innovation: A Scalable, community-based model overcoming geographical barriers while ensuring equitable access to respiratory integrated care throughout the county. The CARE Virtual Ward has developed coordinated care pathways with the National Ambulance Service and out-of-hours services to ensure timely patient support and escalation of care when required.

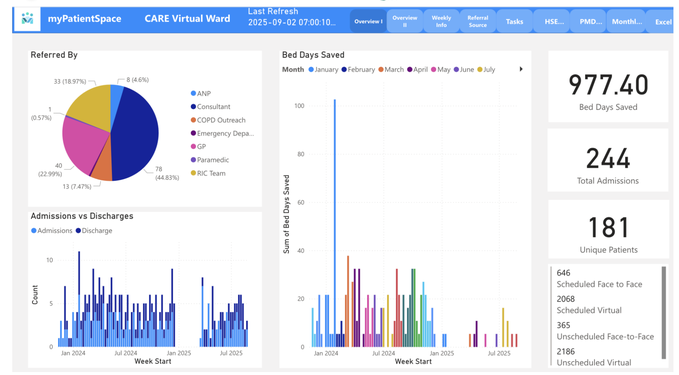
HEALTH

DONEGAL'S INTEGRATED CARE TEAMS CELEBRATE LIFE-CHANGING SERVICES

written by Contributor | December 21, 2024

Control

Respiratory Integrated Care maintains rigorous clinical controls through consultant-led safety huddles, weekly multidisciplinary team reviews, and continuous real-time monitoring via analytics dashboards.
Quality assurance is ensured through regular clinical audits, structured escalation protocols with 24/7 hospital backup, and integration within established respiratory care pathways.



Conclusion

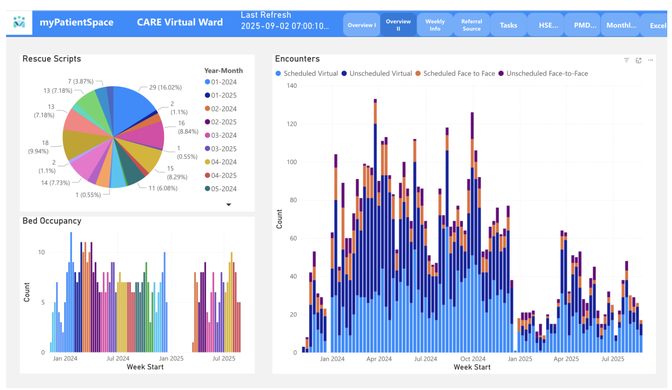
The CARE Virtual Ward represents a groundbreaking innovation in chronic disease management, achieving substantial clinical and economic benefits. Through an integrated, digitally-enabled model, the program has realised a 50% reduction in COPD readmissions, saved 934 acute bed days, and generated direct cost savings of €809,600.

The initiative maintains rigorous clinical controls, including daily safety huddles, multidisciplinary reviews, and real-time remote monitoring, ensuring high standards of safety and quality. Its comprehensive governance framework and integration within existing respiratory care pathways underscore a strong commitment to patient safety and care excellence.

Looking ahead, the program's expansion plans to increase bed capacity, develop multi-condition pathways, and incorporate AI-powered predictive tools align with the hospital's strategic goals of enhancing service capacity, optimising resource utilisation, and addressing rural healthcare inequalities.

Adopting and scaling such digitally-enabled care models positions the hospital as a leader in innovative, patient-centred healthcare, ultimately improving outcomes, experiences, and sustainability.

Recommendation: Support the ongoing development and expansion of the virtual ward program to harness its full potential in transforming patient care and improving community health.
To progress this model of care and build on patient empowerment and partnership.



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Antibiotic Stewardship in Acute COPD Exacerbations: A Quality Improvement Project For Guideline Adherence in Emergency and Inpatient Care

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Affiliation: Letterkenny University Hospital, Letterkenny.

Introduction

Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) are common emergency presentations. Empiric antibiotic use is frequent, Yet overprescribing outside GOLD 2024 and NICE 2023 criteria increases antimicrobial resistance, healthcare costs, and adverse outcomes.

Objective

To assess adherence to evidence-based antibiotic prescribing in hospitalized AECOPD patients, focusing on ED and early inpatient decision-making.

Introduction

Guideline	Recommended First-Line Antibiotics	Duration
GOLD 2024	Amoxicillin/clavulanate, macrolides (azithromycin, clarithromycin), or tetracyclines (doxycycline)	5–7 days
NICE 2023	Amoxicillin, doxycycline, clarithromycin	5 days
LUH MEG Guidelines	Consider broader spectrum (e.g., fluoroquinolones) in severe cases	5–7 days

Methods and Materials

Data Source

- Retrospective chart review of hospitalized COPD exacerbation cases (3 months).
- Electronic Medical Records (EMR) and paper charts (if applicable).
- Standardized form (Excel) to ensure consistency.
- Pilot testing on 10–20 charts to refine variables.
- Blinded review by 2 auditors to reduce bias.

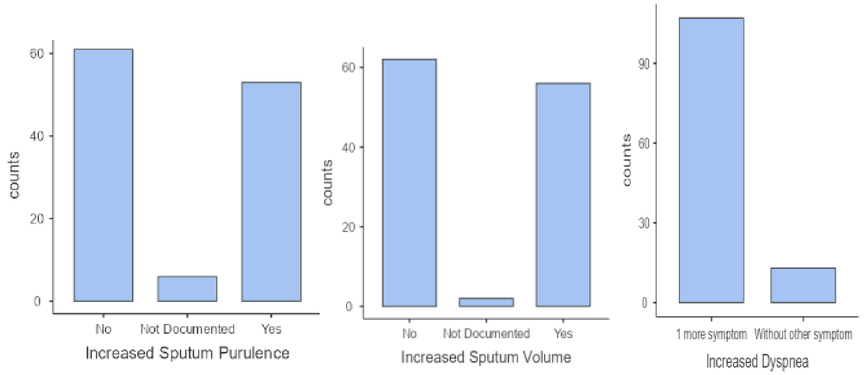
Analysis Plan: Descriptive statistics: % compliance with guidelines.

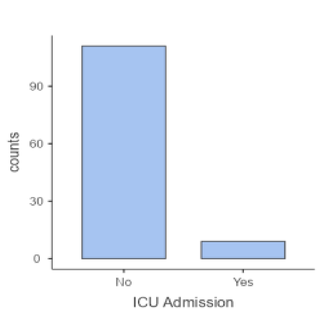
Results

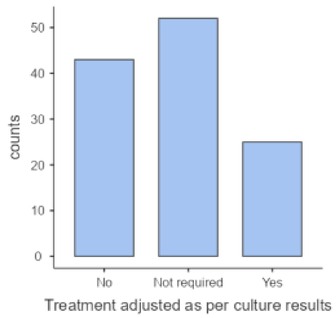
Baseline Characteristics of Study Population (n=120)

Features	Subgroup	Percentage
Age Distribution	75 years:	56.7%
	65-75 years:	32.5%
	<65 years	10.8%
Smoking Status:	Current smoker:	17.5%
	Ex-smoker:	80%
Comorbidities:	1-2 comorbidities:	30%
	≥3 comorbidities	65.8%
Oxygen Therapy at Home	LTOT	6.7%
	No	80.8%
	LTOT + prior NIV	12.5%

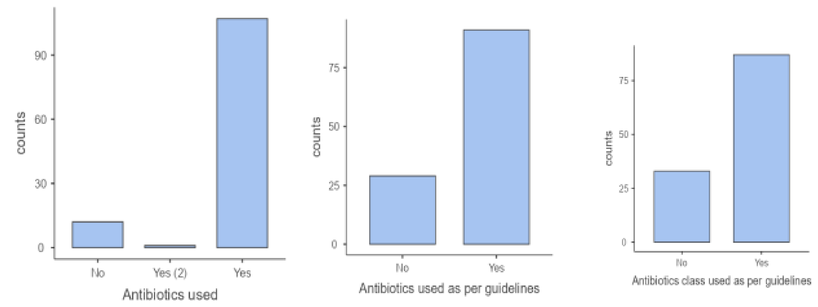
Clinical Features of Exacerbations







Adherence to Guidelines in Management



	Features	Percentage
Antibiotic Prescribing Practices	Appropriate indication:	75.8%
	Correct antibiotic class	72.5
	Correct duration	54.1

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	Correct antibiotic class	72.5
	Correct duration	54.1

Conclusions

The majority of COPD exacerbation cases involved patients over 75 years and those with significant comorbidities (≥3 in 66%).

While 89% of patients received antibiotics, only ~76% had prescriptions aligned with guideline indications, and just 53% followed the recommended duration.

Sputum cultures were underutilized, particularly in high-risk patients with frequent exacerbations (≥2 in 52.5%).

There is clear room for improvement in aligning clinical practice with GOLD/NICE guidelines,

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References
1. Patel N. An update on COPD prevention, diagnosis, and management: The 2024 GOLD Report. The Nurse Practitioner. 2024 Jun 1;49(6):29-36.
2. Anzueto A, Cohen M, Echazarreta AL, Elassal G, Godoy I, Paramo R, Sayiner A, Torres-Duque CA, Acharya S, Aggarwal B, Erkus H. Delphi consensus on clinical applications of GOLD 2023 recommendations in COPD management: how aligned are recommendations with clinical practice?. Pulmonary Therapy. 2024 Mar;10(1):69-84.
3. McGrattan M. Managing acute exacerbations of COPD. Journal of Prescribing Practice. 2025 May 2;7(5):200-4.
4. Halpin D. NICE guidance for COPD. Thorax. 2004 Mar 1;59(3):181-2.

Improving the assessment, prescription and follow up of inpatients newly commenced on home oxygen therapy in St. James's Hospital

Project Team: Dr. Parthiban Nadarajan, Ms. Ciara Gleeson, Ms. Christina Gray

Background

Guidance exists regarding the assessment, prescription and follow up of persons with hypoxaemia requiring home oxygen therapy (British Thoracic Society Guideline (BTS) for home oxygen use in adults (Hardinge et al 2015)).

Our perception that the processes surrounding the provision of home oxygen therapy to patients on discharge from hospitalisation at our centre was uncoordinated and not person-centred was investigated with an initial clinical audit.

Baseline Findings

A clinical audit on the adherence of home oxygen therapy prescription over a twelve-month period (n=127 patients) to the BTS Guidelines for home oxygen use in adults was conducted

Key findings of the audit included

- 35% of patients did not have an ABG before long term oxygen therapy (LTOT) was prescribed
- 66% of patients had an ABG that did not meet criteria for prescription of LTOT
- 57% of patients did not receive education before discharge regarding use / safety of home supplemental oxygen
- 91% of patients did not attend for a follow up review appointment at 3 months.

The care of patients in relation to LTOT was not standardised and this prompted a quality improvement (QI) project with the aim being to increase the adherence of staff to oxygen prescribing guidelines for all inpatients prescribed home oxygen from 0% to 100% over a 12-month period.

Measure

The project team used QI methodology which involved:

(1) stakeholder engagement (both patients and staff)

(2) formulation of a process map to identify areas for process improvement

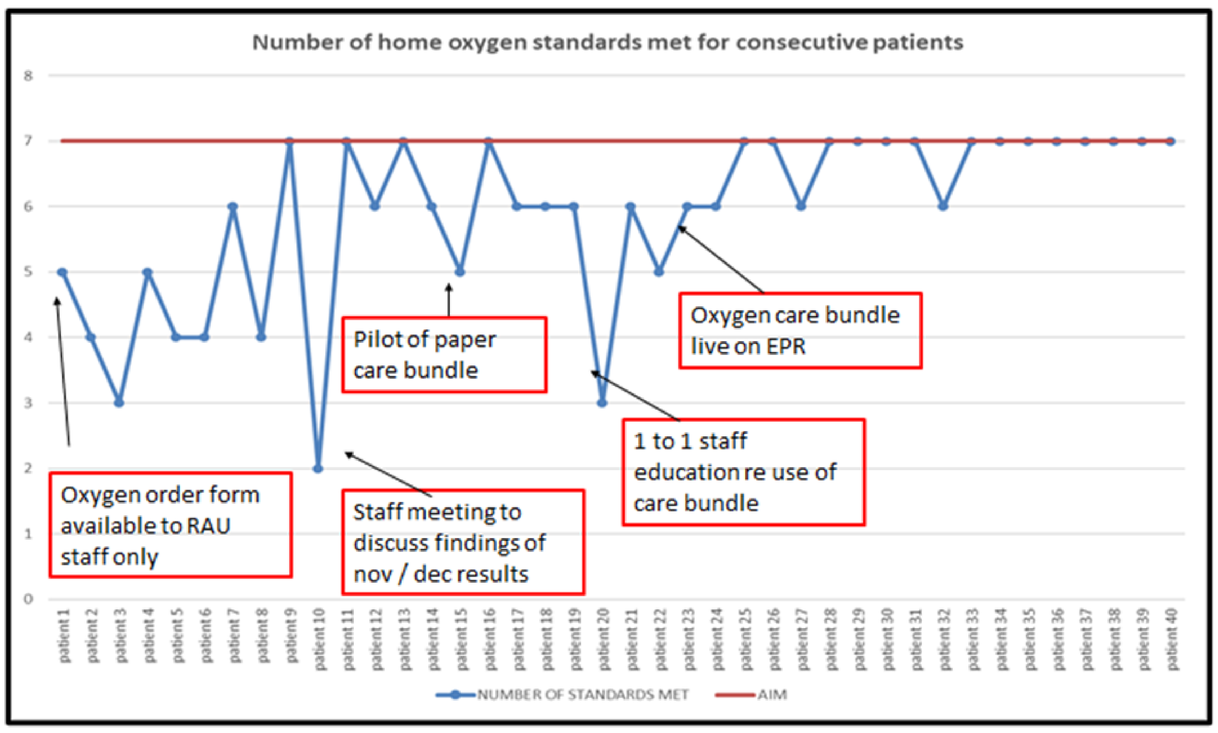
(3) a driver diagram to illustrate our 'theory of change' and to plan improvement activities

(4) Several Plan Do Study Act (PDSA) cycles to test and implement changes

(5) development of a home oxygen care bundle

(6) run charts to demonstrate the number of standards being met in consecutive patients

Analysis



Annotated run chart demonstrating the number of standards relating to the assessment, prescription and follow up of home oxygen being met in consecutive patients over the 12 month study period.

Improvements

All home oxygen referrals were directed through a Respiratory Assessment Unit.

The development of an electronic home oxygen care bundle significantly reduced the variation in adherence to seven standards relating to oxygen assessment, prescription and follow up.

Cost savings were calculated based on the number of inappropriate orders sent compared with the previous audit and savings made through removal of equipment at follow up.

	November 2016 - February 2017-	November 2019 - February 2020
Number (%) of home oxygen orders sent that were inappropriate	**25 (65%)**	**9 (18%)**
Costs of those inappropriate orders over four months	**E 4200**	**E1500**
Costs of those inappropriate orders if continued over one year	**E 12600**	**E4500**

Control

At the forefront of this project was patient safety and wellbeing – prescription of home oxygen for the right patient at the right time and under the right circumstances.

Use of quality improvement methodology led to standardisation of care for patients prescribed home oxygen on discharge from hospitalisation.

Feedback received from both staff and patients was largely positive.

RespLink Fridge Magnets: Enhancing Access to Patient Education for Chronic Respiratory Conditions Through QR Code Technology.

Hermi Lo (hlo@stjames.ie) | Respiratory Assessment Unit, St. James's Hospital

BACKGROUND

Well-informed patients are more likely to adhere to treatment plans and engage in effective self-management strategies.[1,2]

However, traditional educational formats such as booklets and pamphlets can be overwhelming in volume, forgotten over time, and largely ignored due to the cognitive load on patients managing complex conditions.[3]

Additionally, reliance on paper materials can lead to significant waste and does not account for the dynamic, ongoing nature of patient education.[4]

RespLink addresses these issues by using a QR code system that links patients to curated, accessible, and engaging resources, including videos and informational files.

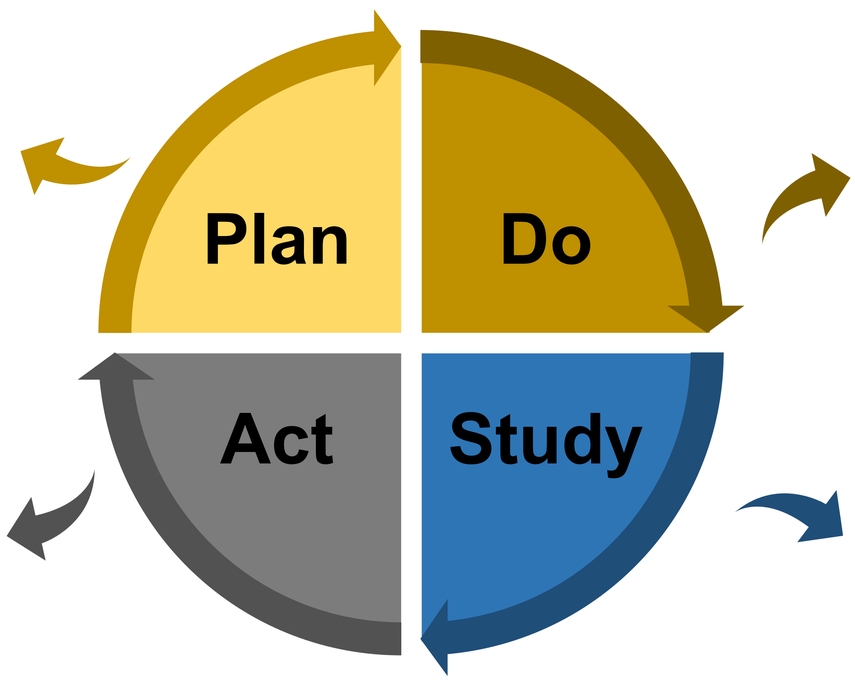
AIM

The aim of this project is to improve educational engagement and provide support beyond the clinic, allowing patients with conditions such as COPD, asthma, and pulmonary fibrosis to access relevant resources at their convenience.

METHODS

In the **Plan** phase, the need for accessible, digital resources was identified, addressing limitations of traditional printed materials. Funding was secured from Spark Seed Innovation Programme

The **Do** phase implemented RespLink within the Respiratory Assessment Unit, providing the QR codes to patients for easy access to relevant guides and videos.

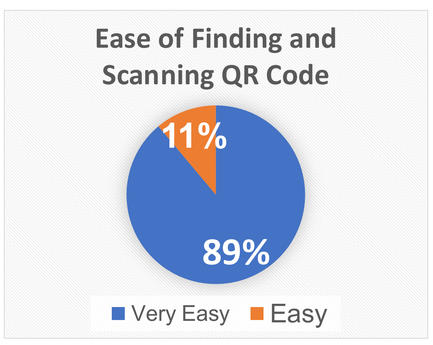


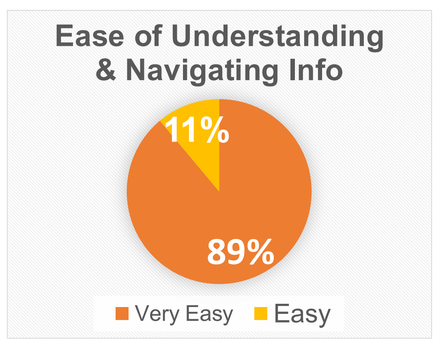
In the **Act** phase, the RAU team recommended distributing RespLink QR codes on fridge magnets to promote consistent usage and enhance long-term engagement with the resources.

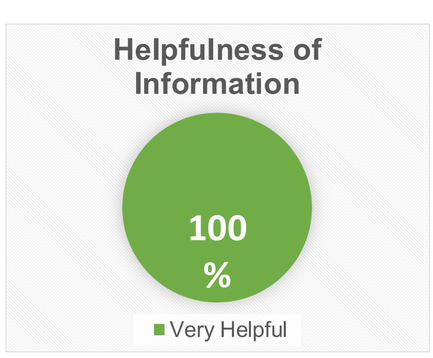
During the **Study** phase, patient feedback were gathered.

RESULTS

Among the 9 respondents (64% response rate; average age 66), 88% found the QR code on the fridge magnet very easy to locate and scan, and 88% also found the linked information very easy to understand and navigate. All respondents (100%) reported that the information was very helpful, and unanimously agreed that it helped them or their family feel more confident in managing their condition. Additionally, every respondent (100%) said they would recommend the RespLink fridge magnet to other patients and families.







Patient comments highlighted both convenience and impact:
"It's easy to find out more about my illness. It also helped my daughter understand my COPD more." – 54-year-old patient
"The fact that all information is in the same place and easily accessible." – 80-year-old patient
"No paper everywhere." – 67-year-old patient
"Clear and easy to use." – 79-year-old patient
"Great idea to make them into fridge magnets!" – 70-year-old patient

CONCLUSION

The RespLink project demonstrated that providing patients with a QR code for accessing digital resources on respiratory conditions can have the potential to **enhance patient experience** and support a more **patient-centred approach** in the Respiratory Assessment Unit. By using an **accessible digital platform**, RespLink empowers patients to make **informed health decisions** while helping **reduce the environmental footprint** associated with printed materials.

References:

[1]Cravo, A., Attar, D., Freeman, D., Holmes, S., Ip, L., & Singh, S. J. (2022). The Importance of Self-Management in the Context of Personalized Care in COPD. *International Journal of Chronic Obstructive Pulmonary Disease*, *17*, 231. https://doi.org/10.2147/COPD.S343108

[2]Cross, A. J., Liang, J., Thomas, D., Zairina, E., Abramson, M. J., & George, J. (2022). Educational interventions for health professionals managing chronic obstructive pulmonary disease in primary care. *The Cochrane Database of Systematic Reviews*, *2022*(5), CD012652. https://doi.org/10.1002/14651858.CD012652.PUB2

[3]Holt, C. L., Kreuter, M. W., Clark, E. M., & Scharff, D. (2001). Understanding the Effects of Printed Health Education Materials: Which Features Lead to Which Outcomes? *Journal of Health Communications*, *6*, 265–279.

[4]Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: Addressing the paradox of sustainment amid ongoing change. *Implementation Science*, *8*(1), 1–11. https://doi.org/10.1186/1748-5908-8-117/TABLES/3