NSW GOVERNMENT

AGENCY FOR CLINICAL INNOVATION

Spotlight on virtual care: In-home monitoring program for people with chronic conditions

Far West Local Health District

MAY 2021

Virtual Care Initiative

A collaboration between local health districts, speciality health networks, the ACI and eHealth NSW.

The 'Spotlight on Virtual Care' reports showcase innovation and leadership in virtual health care delivery across NSW. The series aims to support sharing of learnings across the health system and outlines the key considerations for implementation as identified by local teams.

Each initiative within the series was selected and reviewed through a peer-based process. While many of the initiatives have not undergone a full health and economic evaluation process, they provide models that others may wish to consider and learn from.

These reports have been documented by the Virtual Care Accelerator (VCA). The VCA is a multiagency, clinically focused unit established as a key partnership between eHealth NSW and the ACI to accelerate and optimise the use of virtual care across NSW Health as a result of COVID-19. The Virtual Care Accelerator works closely with Local Health Districts (LHDs) and Specialty Health Networks (SHNs), other Pillars and the Ministry of Health.

Contents

Introduction

The Far West Local Health District (FWLHD) In-home Monitoring Program addresses an increasing burden of chronic disease by remotely monitoring people in their own homes and building capacity to self-manage.

Chronic conditions are the leading contributor to the burden of disease in NSW. Over the last decade, the number of people living with one or more chronic conditions has increased across the state. This is associated with risk factors such as insufficient physical activity, excessive alcohol consumption, tobacco smoking, dietary intake and poor social determinants of health and fragility.

Management of chronic conditions involves several key principles including health education, psychosocial assessment and treatment and risk modification. Providing quality and connected healthcare can therefore be a complex challenge for primary and secondary health service providers.

If services and providers operate in silos, the journey for a patient with a chronic condition can be fragmented and confusing. Patients can become disengaged and fall through the gaps, resulting in preventable hospitalisations. Providing patient-centred care can help to overcome this through support of self-management, development of relationships to optimise multidisciplinary care and health coaching for intervention and mental and physical wellbeing.

The increasing burden of chronic disease across NSW is exaggerated in Far West Local Health District (FWLHD) due to the relationship between chronic disease risk factors and the following demographic characteristics:

- an ageing population of residents, with those aged 65 and older representing 22% of the population compared to 16% across NSW (2016 Census)
- increased risk-taking behaviour (drug and alcohol)
- fragmented service provision and patient journeys between acute and primary care settings
- a dispersed population within the most sparsely populated LHD in NSW
- the highest proportional regional population of Aboriginal and Torres Strait Islander residents in NSW.

In 2015, a 12 month pilot began in Broken Hill to test the effectiveness of remote monitoring for chronic disease management. This provided:

- a remote monitoring kit to measure biometrics at home
- a tablet device to collect observations and securely upload data into an Integrated Care Platform (ICP)
- monitoring by dedicated clinicians (including intervention and escalation as needed).

To support this program, the Western NSW Primary Health Network facilitated collaboration between FWLHD, the Broken Hill GP Super Clinic and Maari Ma Health. FWLHD continues to strengthen this engagement as patients from each practice complete the program.

Following the successful pilot, this program has been adopted as an ongoing model of care delivered by the Integrated Care for People with Chronic Conditions (ICPCC) team in collaboration with local General Practitioners (GPs).

Reported benefits of the model

Patient benefits:

- Living well in the community and improved quality of life
- Increased satisfaction with access to care
- Ability to be an active participant in their own care
- Care that rapidly responds to changes in the patient's condition
- Increased capacity to actively self-manage chronic conditions.

Clinician benefits:

- Strengthened collaboration between clinicians, GPs and patients resulting from improved integration and shared care planning
- Ability to support patients remotely
- Ease of access to real time patient data
- Increased capability for early intervention for patients at risk of chronic disease through improved monitoring and response capabilities
- Clearly defined pathways for escalation.

Service benefits:

- Increased efficiency of care delivery
- Reduced potentially preventable hospitalisations
- Reduced length of hospital stays
- Improved system integration between primary care and acute care.

Overview of the model

Key elements of the model

Element	Detail
Patient cohort	Clinical enrolment criteria: People with diagnosed chronic condition(s) e.g. diabetes, chronic heart failure, chronic obstructive pulmonary disease, hypertension etc. or risk factors for chronic conditions who are: • aged over 16 and have presented to ED more than once annually with an average length of stay >1 day with a diagnosed chronic condition; OR • aged 20-55 years old who have risk factors for chronic disease and have been identified to benefit from goal setting and health coaching; AND • have no cognition/psychological impairment/s that impact on self-monitoring ability; AND • are not on a palliative care pathway.
Referral pathways	Referrals can be made by: • Nurses and allied health staff within ICPCC team, ED ward or medical staff • General practices and Aboriginal Community Controlled Health Services • Self-referral (in a rural setting people may become aware of the program through word of mouth).
Healthcare team	• FWLHD ICPCC clinical team – One dedicated position - clinical nurse specialist (provides majority of on boarding/off boarding and technical support, care coordination) – Supported by FWLHD Chronic Care Team – including community based practice nurse, registered nurse, care navigators and/or Aboriginal Health Worker • Community GPs
Technology*	A remote monitoring kit, including the ICP tablet, collects observations via Bluetooth from peripheral equipment (depending on patient need) such as: • blood pressure monitor • pulse oximeter • thermometer • weighing scales • peak flow monitor/Lung monitor • one lead ECG • blood glucose meter • coagulation meter

* FWLHD purchased remote monitoring kits containing the above devices from Tunstall Healthcare. The characteristics and functionality of this equipment, which underpinned the remote monitoring service (i.e. Bluetooth-enabled communication and tablet transmission of clinical information to a secure database) may be available from a number of vendors.

Service

Admission

In addition to the clinical enrolment criteria (table above), selection protocol includes:

In scope	Out of scope
Reliable access to mobile reception	No reliable access to mobile reception
Understanding/willingness to undertake self-management goals	Lack of engagement/poor motivation
Have their own GP or caseworker to connect with the GP	No GP or caseworker to connect with GP identified
Signed consent*	Consent not gained

Cognition screening clinical tools, the Depression, Anxiety and Stress Scale (DASS-21) and the Patient-Reported Outcomes Measurement Information System (PROMIS-29) are used to measure people's motivation and engagement, as in figure 1.

Set-up

Prior to commencing, the program ICPCC team complete a detailed telehealth referral form and enter the data into the Integrated Care Platform (ICP). This determines the monitoring plan and survey questions that will take place during daily observations.**

Additional steps for enrolling patients include:

- GP assessment to determine the individual's biometric parameters, including appropriate action to take if their readings are 'outside the flags' or they are severely compromised.

- GP discussion with the individual to determine the goals they aim to achieve through the program.

- ICPCC team conduct a home visit to install and educate the individual on the remote monitoring kit.

Monitoring

- Patients take daily observations, which are securely uploaded into the ICP via Bluetooth from their device.

- The ICPCC team complete daily monitoring Monday to Friday and review observations via the ICP dashboard. A patient is contacted if their clinical indicators are out of range and escalated to the GP per the agreed escalation plan, depending on risk factors. Patients are also contacted by the ICPCC team should they miss their daily observations.

- Monitoring generally occurs in the morning to allow for follow up and escalation if required.

- On weekends, patients are encouraged to self-monitor and contact their GP if required.

* See example patient consent form in Supporting documents list
** See in home monitoring admission procedure in Supporting documents list

Discharge

The program is designed to monitor individuals for eight to twelve weeks, with further assessment thereafter by the ICPCC clinical team and GP. Those who reach their goals and feel confident to self-manage return to GP management, others are managed by the ICPCC team as required. Where appropriate some people may also be referred to other services, e.g. occupational therapy, mental health and Aboriginal Health Workers, to support ongoing self management. People may re-enrol in the program or be extended if determined to be appropriate.

Discharge within the recommended eight to twelve weeks may be influenced by the following factors:

Enablers:

- Health coaching from clinicians and care navigators
- Engagement with GPs
- Tailored management plans and individual targets/goals
- Family/support person inclusion in goal setting
- Engagement with Care Navigation, Care Coordination and patient advocates.

Barriers:

- Patients may fear deterioration or being seen to be a failure if they don't continue to meet goals beyond discharge
- Patients living alone can become dependent or reliant on the monitoring to combat social isolation and loneliness (in these cases, individuals are connected with services which facilitate social interactions).

A patient from FWLHD taking part in in-home monitoring for chronic disease.

Workflow diagrams

Figure 1: Admission to In-home Monitoring Program


```
┌─────────────────────────────┐  ┌──────────────┐  ┌──────────────┐
│ Ward referrals either from  │  │ Self referrals│  │ GP referrals │
│ ICPCC staff, ward staff or  │  │              │  │              │
│ medical staff               │  │              │  │              │
└─────────────────────────────┘  └──────────────┘  └──────────────┘
```

Patient scoping completed by ICPCC Team using the following assessments:
- Cognition screening tools
- DASS 21
- PROMIS 29.

Out of scope → **Patient referred elsewhere within the integrated care team e.g. Social worker, mental health team.**

In scope

ICPCC Team complete FWLHD: Telehealth Referral Form* and commence input into the ICP platform.

→ **ICP platform determines monitoring plan and scripting based on patient's condition.**

ICPCC staff member assigned to patient:
- send letter to GP**
- identify hardware available to assign to patient
- register on ICP patient flow / document in EMR
- identify PROMs to be used from GP assessment and input into ICP.

Letter to GP → **GP conduct initial assessment:**
- complete GP Parameter Form*** (vital sign target parameters are individualized according to their condition, comorbidities and recent medical history)
- set goals for discharge.

ICPCC Staff member conduct home visit:
- complete patient consent form
- conduct home safety check
- set time for daily IPC interview
- education and training session on tablet and peripheral devices (including run through of scripted questions)
- discuss shared care plan and goals
- commence health coaching
- provide central intake contact number.

* See referral form in Supporting documents list
** See example introductory letter to GP in Supporting documents list
*** See parameter form in Supporting documents list

Figure 2: Monitoring activities

Patient In Home Monitoring:
- at agreed time the monitor signals it is time to measure vital signs and answer symptomatic health questions
- the monitor then guides the patient through a series of measurements and health related questions.*

Data sent via secure webiste

ICPCC Monitoring (from clinician's work stations):
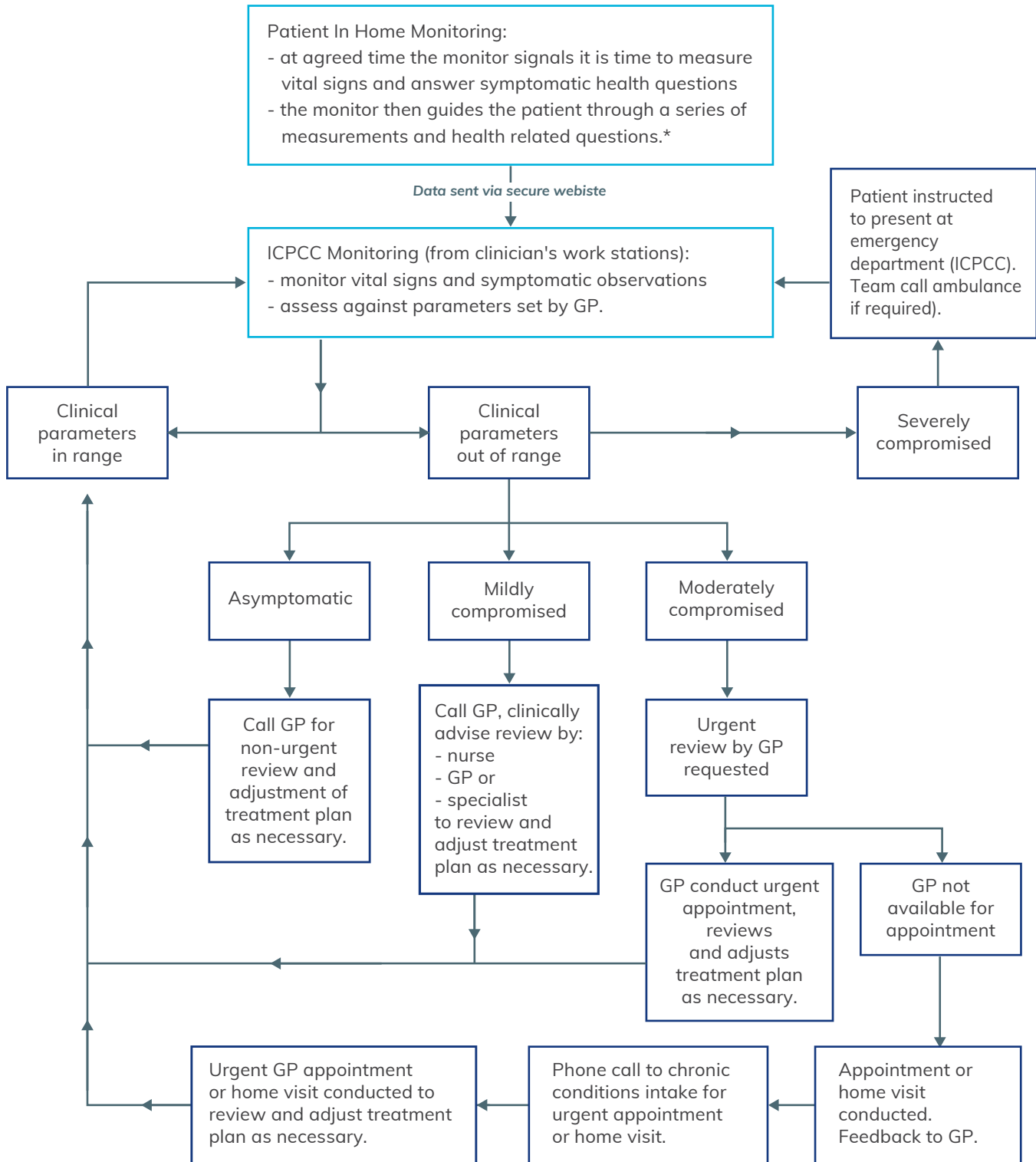- monitor vital signs and symptomatic observations
- assess against parameters set by GP.

Patient instructed to present at emergency department (ICPCC). Team call ambulance if required).

Clinical parameters in range

Clinical parameters out of range

Severely compromised

Asymptomatic

Mildly compromised

Moderately compromised

Call GP for non-urgent review and adjustment of treatment plan as necessary.

Call GP, clinically advise review by:
- nurse
- GP or
- specialist
to review and adjust treatment plan as necessary.

Urgent review by GP requested

GP conduct urgent appointment, reviews and adjusts treatment plan as necessary.

GP not available for appointment

Urgent GP appointment or home visit conducted to review and adjust treatment plan as necessary.

Phone call to chronic conditions intake for urgent appointment or home visit.

Appointment or home visit conducted. Feedback to GP.

* See monitoring scripts in Supporting documents list

Figure 3: Discharge from In-home Monitoring Program

Patient completed eight to twelve weeks of in home monitoring and:
- is asymptomatic
- has not presented to ED for an avoidable / preventable admission
- has stabilised medications.

Care plan discussion with ICPCC team and GP to determine path for discharge based on individual patient outcomes. Discharge criteria is not prescriptive but considers the following:
- is patient confident in self management?
- have goals set at admission been reached?
- does the patient understand their condition? (able to recognise when gradual deterioration)
- has there been improvement in DASS 21 and PROMIS 29 assessments.

Requires ongonig support

Discharged to ICPCC management patient continues to be monitored by the clinical team through regular phone calls and home visits.

Improved and able to self manage

Discharged to GP management continue to self monitor at home and engage with GP through care plan.

Letter sent to GP documenting discharge discussion and plan. Patients encouraged to frequently use their own monitoring equipment to observe their condition.

ICPCC staff member conducts home visit to retrieve monitoring equipment and to re-confirm the plan for ongoing self monitoring.

Making it happen

This section outlines the key enablers and challenges identified by those involved in implementing this model. Addressing these factors effectively has been critical to successful implementation and these learnings can be used by other health services in the development of local models. The resources listed in the supporting documents section at the end of this report also supplement these learnings and have been identified throughout the following sections.
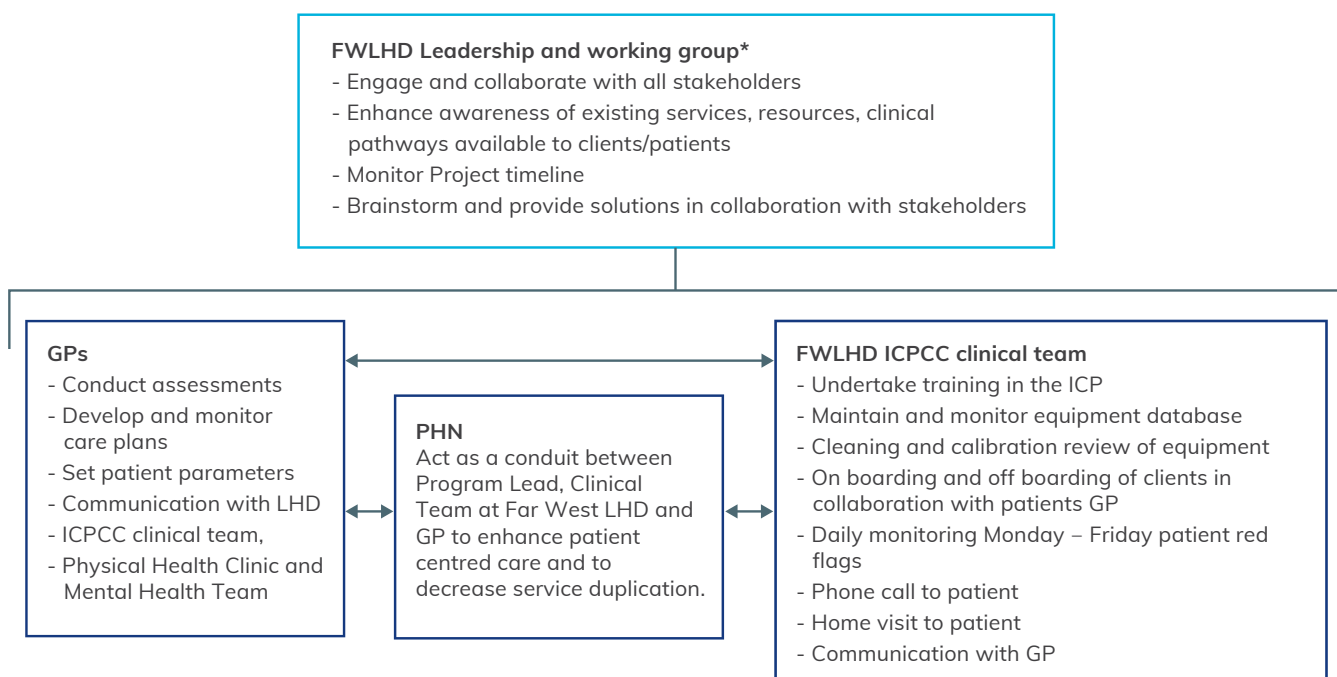
Local planning, service design and governance

Process documentation and clinical protocols have been flagged by the FWLHD team as critical to this model's success. Several elements contribute to a defined clinical governance structure and service model.

Local clinical governance

- Collaboration between clinical, leadership and advisory stakeholders has been key to the success of this model.

- A robust clinical governance structure (see figure 4), audits and reporting are in place. This means factors like changing leadership structures and staff turnover do not undermine the clinical integrity of the program.

- Patient experience and feedback is built into clinical governance. Minor feedback is handled operationally and significant matters (improvement of processes etc.) are managed within FWLHD leadership by the Leading Better Value Care (LBVC) steering committee.

Figure 4: Clinical governance structure

FWLHD Leadership and working group*
- Engage and collaborate with all stakeholders
- Enhance awareness of existing services, resources, clinical
  pathways available to clients/patients
- Monitor Project timeline
- Brainstorm and provide solutions in collaboration with stakeholders

GPs
- Conduct assessments
- Develop and monitor
  care plans
- Set patient parameters
- Communication with LHD
- ICPCC clinical team,
- Physical Health Clinic and
  Mental Health Team

PHN
Act as a conduit between
Program Lead, Clinical
Team at Far West LHD and
GP to enhance patient
centred care and to
decrease service duplication.

FWLHD ICPCC clinical team
- Undertake training in the ICP
- Maintain and monitor equipment database
- Cleaning and calibration review of equipment
- On boarding and off boarding of clients in
  collaboration with patients GP
- Daily monitoring Monday – Friday patient red
  flags
- Phone call to patient
- Home visit to patient
- Communication with GP

* See example Terms of Reference in Supporting documents list

Clear escalation procedures

- Ensure GPs maintain medical responsibility during the program while enabling the ICPCC clinical team to provide monitoring and coaching.

- The agreed parameter flags and escalation plan are determined on admission to the program.

Strong executive sponsorship and strategic focus

- Executive sponsorship and connection to other strategies helped to build program momentum and ensure longevity. The program's implementation was strengthened by:

  - being built into the Leading Better Value Care service agreement

  - alignment to values and priorities set out in the FWLHD Strategic Plan

  - executive sponsorship from Chief Executive and Remote Services General Manager.

Collaborative service design

- Design of this model included GPs, Aboriginal Controlled Medical Services and the Primary Health Network (PHN). This process identified that GPs would maintain medical responsibility for the entirety of the program and facilitate monitoring responsibilities with the ICPCC clinical team.

- The PHN played a key role in supporting GPs to improve uptake of the program. Initiallythe program had poor up take due to clinician and patient uncertainty. Effective care liaison between clinicians and patients, stable technology and collaboration between the district and general practice helped overcome this.

'If the foundations are not in place, the program is not going to run properly.'

EXECUTIVE SPONSOR

'From a service point of view, clinical team members were always allocated a case load dedicated to remote monitoring patients – the program was never a tack on.'

EXECUTIVE SPONSOR

Building engagement

GP and clinical team relationships

The In-home Monitoring Program relies on building productive relationships between GPs and the District clinical teams. Initially the program had lower GP uptake than expected, but GP referrals to the program grew as they observed increased patient engagement in self-monitoring and improvement in clinical indicators.

Other successful GP engagement strategies included:

- hosting an In-home Monitoring Symposium* to introduce the program, share resources and demonstrate benefits. This attracted by-in from GPs, broadly educated the local community and encouraged people to discuss remote monitoring with their GPs.

- equipment demonstrations with partnering general practices to encourage co-monitoring of participants. A remote monitoring solution that allowed GPs to access patients' parameter dashboard was a key enabler of buy-in for both GPs and patients.

- having Care Navigators who work within general practices to promote the program and encourage referrals.

- continually building and strengthening relationships and trust with GP's through regular contact and daily monitoring of patient data.

Engaging patients

Positive outcomes from in-home remote monitoring rely heavily on ensuring individuals are fully engaged. Strategies to achieve this include:

- providing multiple options for referral into the program, including self-referral through word of mouth.

- The ICPCC Aboriginal Health Worker and Care Navigators within Community Controlled Organisations help to communicate benefits and facilitate culturally safe engagement with the program for Aboriginal people.

- goal setting discussions with individuals and GPs to set the scene for health coaching during the program and to build patient capability and capacity, health coaching may include:

  - strategies to maintain mental and physical wellbeing during intervention eg. dietary strategies.

  - psychosocial and physical exercise programs

  - risk-taking cessation programs.

- conducting a home visit to welcome people into the program, discuss goals and educate them on how to use the tablet device and peripheral devices.

- including family or support people in goal setting discussions and home visits.

- include audio and visual instructions on tablet devices to support people who have low reading and/or digital literacy levels or are visually impaired, deaf or hard of hearing.

- use of hard copy patient resources to introduce participants to remote monitoring, explain how it may help them and familiarise them with monitoring equipment.

* See example symposium presentation in Supporting documents list

FWLHD In-home Monitoring Program – patient story

Having experienced shortness of breath, 'blacking out' and cold sweats for six years with no explanation, a scan in March 2020 indicated Robert Smith* may have been at risk of pulmonary fibrosis.

A visit to a thoracic specialist was required to confirm Robert's diagnosis, but the closest option was located 500km away from his home in Broken Hill. Even if making this trip was safe and feasible, COVID-19 travel restrictions made it impossible.

In-home remote monitoring was offered as a solution until it was safe for Robert to travel. This helped to ensure the chronic care nurses and Robert's GP would be notified if blood pressure readings went too far out of the ordinary and appropriate support would be provided.

Robert was initially apprehensive and thought he may not be able to use the technology due to his age. However, once the device was set up in his home and he was given training and support from the nursing team, he felt confident.

'I felt like I had all the support I needed and a good health team. It was reassuring to have my readings monitored after a medication change.'

A pulmonary fibrosis diagnosis has since been confirmed. From his involvement in the program Robert is now confident in completing his own readings independently and using his own equipment to manage his condition.

* Name changed to protect patient privacy and confidentiality

Staff engagement and ownership

- The additional layer of data entry required to copy daily observations between the ICP and LHD eMR presented a barrier to staff engagement to start off with. However, engagement increased over time as staff recognised the patient outcomes (e.g. improvement in self-monitoring and reduction in hospital admissions) and efficiency gains (e.g. reduction in travel time, logistics planning and home visits).

- Executive sponsorship and consistent clinical leadership have sustained engagement amongst the clinical staff leading the program.

- To engage clinicians from other disciplines, communicating potential benefits or improvements relevant to their care setting will increase buy-in and appropriate referrals (for example, reductions in repeat emergency department presentations).

'Selling the program [to GPs] is not a problem. It is integrated and caters to a variety of co-morbidities, it is a no brainer....[it allows you to] interact with the chronic care team at the hospital and they can liaise with the specialists .... [this will] prevent patients from having to access the hospital and I will also avoid frequent GP visits; appointments are very precious' GP

Workforce, technology and resourcing

Dedicated staffing

- Onboarding and off-boarding patients is critical to fostering engagement, but requires the largest time investment. Having a dedicated Care Coordinator to oversee the program and provide technical support to clinical staff and patients is a key enabler.

- Clinical staff are allocated a dedicated case load of remote in-home patients to monitor. This helps build relationships between the clinician, individual and wider care team. The consistency of a dedicated clinical team member adds to the continuity of a patient's care and their success in the program. As this allocation is within the ICPCC team, there is potential for this engagement to continue after a patient is discharged from the program.

- The total number of enrolments in the program is a function of the number of remote monitoring kits available. The caseload for clinical staff is determined based on complexity and condition of patients in line with standard ICPCC allocation procedures.

Appropriate technology and internet access

Equipment at clinical team end:

- The ICPCC team and GPs can access monitoring data through a secure webpage portal. In Broken Hill this takes place at clinicians' workstations, but can be securely accessed anywhere with internet access.

Equipment at patient end:

- Access to mobile reception is all that is required if the patient does not have their own device or internet.

- If a participant has their own device (smartphone or tablet) to download the monitoring app, only peripheral equipment is required. If they do not have a capable device, the ICP table device is also installed in their home.

- The combination of peripheral equipment required at the patient end will vary depending on their chronic disease management plan. The Figure 5 table is an indicative guide:

Figure 5: Peripheral equipment used for in-home monitoring

Condition	Blood pressure monitor	Pulse oximeter	Thermometer	Weighing scales	Lung monitor	Blood glucose meter	Coagulation meter
COPD		✔	✔		✔		
CHF		✔		✔			
Diabetes		✔		✔		✔	
Anticoagulation therapy	✔	✔					✔

Staff training

- Clinical team members are upskilled in remote monitoring technology, including how to educate patients through a train the trainer model. A key nominated clinical staff member is responsible for this training and knowledge sharing.

- Infection control measures are built into processes for equipment retrieval, cleaning and storage and are included in team training.

Asset management and maintenance

- A dedicated space is allocated to store in-home monitoring kits.

- Procedures should be in place for the maintenance of equipment and hardware to ensure it continues to operate as intended.

- Asset management procedures for audit and storage of the kits is essential for equipment to remain operational as it transitions between patients completing and beginning the program.

- A contingency plan should be in place for lost or stolen equipment. In Broken Hill, if this unlikely event does occur, an incident report and police report are completed and both are submitted to the LHD insurance provider.

Documentation:

Integration of ICPs, eMR and GP records is an opportunity for in home remote monitoring to enhance the process of clinical documentation. As this is not currently available, this model uses the below methods of documenting patient data and clinical notes:

- Remote monitoring observations are transferred from the ICP into the LHD eMR via a manual process. As clinicians conduct daily monitoring they copy across data from the monitoring dashboard to the eMR.

- GPs make their own clinical notes on the parameters and monitoring data to which they have access through the ICP.

- Shared care planning discussions are separately documented by both GPs and the LHD clinical team.

Funding considerations

LHD funding:

- Remote monitoring equipment was purchased outright by FWLHD, using a one-off pilot grant.

- Ongoing technical support is approximately $12,000 annually to support 19 remote monitoring kits (this requires an annual business case submission).

- The dedicated time of the Clinical Nurse Specialist and ICPCC support team members is sourced from integrated care block funding.

Activity reporting for occasions of service is completed as below:

- 'other technology-NEC' is selected for daily monitoring of observations

- 'audiovisual – clinician end' or 'audio- clinician end' is selected when a patient is contacted

- if contact with GP is required, 'non-client contact - case planning and review' is selected.

GP billing:

- Patients have access to Medicare rebates for GP appointments related to in-home remote monitoring. They are not required to cover any out of pocket expenses.

- The exact Medicare Benefits Schedule (MBS) item numbers billed by GPs will vary based on individual circumstances. Options include billing for initial assessments, recall appointments and care planning sessions. Case conferencing item numbers may also be available for multi-disciplinary team discussions.

- The below table provides an example of relevant MBS item numbers:

Item no	Description
23 or 23	Patient parameters are 'out of the flags'. GP required to conduct a review
721	Patient is new to the program and requires parameter assessment and preparation of the GP management plan
703	Assessment of a patient aged over 75 or aged over 45 at risk of developing a chronic disease

Sustainability

Financial sustainability is a potential benefit of in-home remote monitoring. A CSIRO study which supported the 2015 pilot suggested that:

- for chronically ill people, an annual expenditure of $2,760 on the model could generate a saving of between $16,383 and $19,263 per annum

- this represents a return on investment of between 4.9 and 6.0 (based on a single Clinical Care Coordinator managing 100 people).

'Someone [from the clinical team] has to be in the patient's home for education, on boarding and off boarding patients, enabling software updates – it is important to think of the most effective way to manage this.' CLINICAL TEAM

In-home monitoring also results in broader improvements to the sustainability of service delivery, including:

- reduced patient and clinician travel time

- increased clinical workforce flexibility

- reduced material, technical and human resource requirements from reductions in hospital admissions and lengths of stay.

Benefits of the model

Results

The program now covers over
100,000 km² of remote NSW.

**In a 2017 patient satisfaction survey, the program achieved
a net promoter score of 100%**

Patients highlighted **access to clinicians, supportive technology, and improved self-dependence** as useful aspects of the program.

An evaluation of the 2015 pilot completed by the Australian e-Health Reach Centre and CSRIO showed that:

Early recognition and timely intervention by ICPCC clinical team and GPs reduced avoidable hospital admissions by at least 10%

The evaluation also found that:

Length of stay in hospital decreased by 10% for patients enrolled in the program.

These outcomes were quantified in comparison to admissions and length of stay of face-to-face chronic disease management patients.

Benefits

1. **Proactive, collaborative and patient-centred healthcare management** – framed around patient goal setting and monitoring.

2. **Strengthening capacity** – increased engagement in management, increased medication compliance and increased understanding of chronic conditions.

3. **Increased confidence to self manage** – health conditions immediately after discharge.

4. **Increased continuity of integrated care** – GP remains the main caregiver and oversees the care plan.

5. **Reduction of emergency department admissions** – through early intervention and prevention.

Monitoring and evaluation

The FWLHD Working Group has implemented ongoing enhancements to the model of care. Key lessons learnt include:

- using the local clinical governance framework as a mechanism to analyse and implement feedback from patients and clinicians

- a thorough record keeping system is imperative to distribute and operate of remote monitoring kits (e.g. assets register, maintenance schedule and infection control processes)

- clearly identifying how the program will be evaluated and ideally building PROMs and PREMs into daily monitoring

- unless clinically necessary, adhering to the program timeframes to avoid dependency.

The 2015 pilot (along with other NSW Health remote monitoring programs) was evaluated by Deloitte*. Key recommendations for overcoming barriers to implementation included:

- comprehensive clinical governance and escalation procedures

- selection criteria guidance for vendors or equipment, for example adherence to patient safety and privacy

- defined detailed patient eligibility to inform the most suitable cohorts for remote monitoring.

Since the pilot, FWLHD has continued to refine the model to implement these recommendations.

Ongoing program monitoring and evaluation to date has focused on patient experience and outcomes.

- At discharge, participants are asked to rate their level of satisfaction with the technology, support they received and their ability to self-manage their health more effectively.

- Patient outcomes including improvements in patient scores in the Problem Areas in Diabetes (PAID) study and PROMIS 29 are evaluated before discharge.

- For future iterations, FWLHD plans to use the same PROMs and PREMs collected in face-to-face chronic disease monitoring models to compare health and experience during remote monitoring.

Opportunities

FWLHD opportunities

Through procuring additional remote monitoring kits, FWLHD plans to expand the program to:

- build in an ongoing element of evaluation after discharge, to understand how the program has impacted the patient's life 6 or 12 months later

- utilise ICP reporting capabilities for evaluation of between the flag trends

- continue implementing the Deloitte report recommendations, including building in additional program enrollment considerations to ensure the 'right care at the right time' of the person's journey

- trial shared care planning for multiple co-morbidities

- build a central intake email and phoneline at LHD and at each GP centre to direct enquires.

System opportunities

Remote monitoring technologies represent many opportunities for patients, clinicians and the system as a whole. These include:

- workforce innovation, for example, centralising the monitoring of the patients either at an LHD level or state level may allow seven day a week or even 24/7 monitoring

- integration into eMRs to reduce data entry time and support care management as other providers would have access to recent data and trends

- building PROMs and PREMs into remote monitoring platforms may add to the evidence base to assess the readiness of patient cohorts and the appropriateness and cost effectiveness of different technologies

- the development and integration of health education platforms within in-home remote monitoring programs may significantly improve the health literacy of patient cohorts

- further develop programs and resources to ensure culturally safe delivery for Aboriginal People.

* Final Progress Evaluation Report: Remote Monitoring, NSW Ministry of Health, Deloitte, 2017.

References and links

Tunstall Healthcare – telehealth solutions patient information guide – what is telehealth? How can the technology help? Introduction to monitoring equipment

Supporting documents

GP engagement material

FWLHD – In-home Monitoring Device Symposium – presentation shared with GPs to commence patient referrals into the program

Example introductory letter to GP – request for GP to complete referral and parameter form when a patient has shown interest in program

Referral form

In-home Monitoring parameter form - to be completed by GP prior to admission

Clinical procedures

Monitoring script for alcohol withdrawal patients

Monitoring script for smoking cessation patients

Admitting a Patient to the In Home Monitoring Program – FWLHD Referral, enrolment and onboarding

Governance

Example of FWLHD In Home Monitoring Device Working Group Terms of Reference

Chronic & Complex Care patient consent form – FWLHD

Acknowledgements

We would like to acknowledge the current FWLHD Remote In-home Monitoring Program team for their involvement in documenting this model of care, along with all past and present staff who have been involved in its development and ongoing delivery.

Georgina Drewery   District Nurse Manager, Chronic and Complex Care Team - FWLHD

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Juanita White   Project Manager - Patient Reported Measures, Integrated Care - FWLHD

Sharyn Cowie   Telehealth Manager - FWLHD

We would also like to thank the clinicians, consumers and virtual care experts involved in reviewing the write-up of this model of care.

The Agency for Clinical Innovation (ACI) is the lead agency for innovation in clinical care.

We bring consumers, clinicians and healthcare managers together to support the design, assessment and implementation of clinical innovations across the NSW public health system to change the way that care is delivered.

The ACI's clinical networks, institutes and taskforces are chaired by senior clinicians and consumers who have a keen interest and track record in innovative clinical care.

We also work closely with the Ministry of Health and the four other pillars of NSW Health to pilot, scale and spread solutions to healthcare system-wide challenges. We seek to improve the care and outcomes for patients by re-designing and transforming the NSW public health system.

Our innovations are:

- person-centred
- clinically-led
- evidence-based
- value-driven.

www.aci.health.nsw.gov.au

Our vision is to create the future of healthcare, and healthier futures for the people of NSW.