NSW GOVERNMENT | AGENCY FOR CLINICAL INNOVATION

Spotlight on virtual care: COVID-19 remote monitoring

Illawarra Shoalhaven Local Health District, Southern New South Wales Local Health District, Sydney Local Health District and St Vincent's Health Network

JUNE 2021

Virtual Care Initiative

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 multi-agency, 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 COVID-19 pandemic has been an unprecedented catalyst for the implementation of in-home remote monitoring across NSW. The scale and complexity of the disease made it imperative to reduce the risk of COVID-19 infections in the community and amongst clinicians, whilst also managing hospital resources. Where appropriate, it has been shown that people who are COVID-19 positive can be monitored effectively using alternative methods to in-person care in the isolation of their own homes, or hotel quarantine.

Virtual care has become an important tool for the health system in its delivery of care to people who are COVID-19 positive and in isolation. This includes assessment, care and support, monitoring and escalation. Remote monitoring allows healthcare workers to continue to deliver care to patients beyond an initial virtual visit or screening. This includes in-home monitoring of symptoms, underlying health conditions, risk factors, virtual clinical assessment and use of connected devices enabling timely intervention and escalation in the event of deterioration.

This document outlines the common elements of successful in-home remote monitoring initiatives and details the key features of three initiatives in the following parts:

- Part 1 – Remote COVID-19 monitoring: Core elements

- Part 2 – Illawarra Shoalhaven Local Health District (ISLHD) and Southern New South Wales Local Health District (SNSWLHD): Virtual Care Centre

- Part 3 – Sydney Local Health District (SLHD): RPA Virtual Hospital

- Part 4 – St Vincent's Health Network (SVHN): Virtual Care Unit

To form a thorough understanding of each initiative and its implementation, it is necessary to consider this document in its entirety.

Each initiative is supplemented by the core elements section to represent the complete in-home remote monitoring model. Details of the unique components of each initiative are summarised in Table 1.

Reported benefits of remote monitoring for COVID-19

Patient benefits:

- Timely and safe access to clinical care when in home isolation or hotel quarantine

- Positive experience receiving care, having daily contact with clinical teams and the reassurance of an escalation plan for deterioration

- Increased confidence knowing symptoms are being regularly monitored, and they are not alone in their care

- More comfortable in their own familiar environment, when at home, or in comfortable accommodation rather than in hospital.

Clinician benefits:

- Positive experiences providing care to patients in need, while maintaining a reduced risk of exposure to COVID-19

- Clearly defined pathways for escalation

- Increased opportunity to work and deliver services remotely.

Service benefits:

- Increased flexibility to respond to surge workforce demands resulting from COVID-19 outbreaks

- Increased safety as people receive care within home isolation or hotel quarantine, minimising the risk of onward transmission to staff, patients, visitors and the community

- Appropriate prioritisation of hospital resources, including bed management through increased use of virtual care

- Reduced strain on Public Health Units (PHUs) through incorporation of wellbeing and isolation checks

- Improved continuity of care through shared care planning involving all members of the multi-disciplinary team (including general practitioners (GPs))

- Improved efficiency and sustainability of service provision with people receiving care at home.

Part 1
COVID-19 remote monitoring: Core elements

Overview

Services

Remote monitoring of COVID-19 positive patients follows a standardised, protocol-driven approach for the provision of short-term care. Where clinically appropriate, COVID-19 positive patients are cared for remotely by clinicians, either in their own homes or in hotel quarantine, using virtual modalities to monitor for signs of clinical deterioration.

Elements of the standardised model of care include:

- multiple channels for referral of patients for virtual care including the PHU, emergency departments, hospital wards and general practitioner (GP) referrals

- risk stratification of symptoms and risk factors (e.g. age, pre-existing conditions, certain medications), aligned with the Communicable Diseases Network Australia (CDNA) national guidelines*

- defined regular observations and wellbeing checks based on risk category

- defined clinical criteria for escalation of deterioration; Between the Flags is recommended as per Ministry of Health requirements

- clinically led and protocol informed discharge.

The framework around which these services are provided is based on the following foundations:

- Education on remote monitoring technology for staff and patients

- Infrastructure:

  – Technology to enable secure capture and transmission of observations

  – Patient access to stable internet or phone connections

  – Private environment for consultations.

- Governance structures and processes:

  – Defined medical responsibility at each stage of the patient journey

  – Detailed nurse-led monitoring procedures based on risk category

  – Medical escalation pathways to ensure timely and appropriate review and early identification of deterioration.

- Safety guidelines which incorporate shared care planning and multidisciplinary support services:

  – Links with GPs to facilitate continuity of care

  – Monitoring and evaluation.

---

* See CDNA National Guidelines in Supporting documents list.

Table 1 - Key elements

Element	Description
Patient population	People with COVID-19 who meet the following criteria: • Low or moderate acuity*; • Assessed as suitable to undertake home monitoring based on physical, mental, social, literacy and cognitive function; • Do not require hospital admission; and • Willing to participate in home monitoring. Exclusions do apply to some in-home remote monitoring services for patients such as residential aged care facility (RACF) residents.
Referral pathway	• PHU • GP • Stepped down from inpatient care
Initial referral	Upon referral patients are assigned care pathways based on assessments including: • A-G assessment (structured approach to assessment modified for virtual care)** • mental wellbeing assessment • cognition (sight/hearing/memory) assessment • literacy (preferred language/reading ability) assessment.
Healthcare team	Flexible teams allow services to expand capacity based on workforce demand and include: • medical officers (infectious disease physicians, respiratory physicians or public health consultants) • community nursing staff (chronic conditions nurse practitioners and clinical nurse specialists, registered nurses and nurse educators, etc.) • allied health staff (respiratory physiotherapist, social worker, psychologist, Aboriginal Health clinician etc.) • GPs, Note that not all clinical teams operate 24/7. In case of deterioration outside hours of operation, patients attend ED.

* CDNA guidelines have since been updated to include only patients with mild illness in in-home remote monitoring programs.

** See VCC A-G Assessment in Supporting documents list.

Healthcare team training	All clinicians, including medical officers, receive orientation to clinical protocols, monitoring platforms and between the flags triggers for escalation.
	Specific platform software training and virtual care training may be delivered by LHD Virtual Care/ Telehealth teams, IT support teams or external technology providers.
	Experienced nursing staff support administration and onboarding of clinical staff in referral processes, contactless delivery/collection and cleaning protocols.
Technology	Technology that enables in-home remote monitoring of COVID-19 positive patients has a minimum set of requirements, which can be expanded based on availability, the patient's condition and clinician and patient capacity.
	Minimum technology requirements: Clinical end: • Telephone • Computer with video conferencing capability or webcam • Headset and microphone • eMR. Patient end: • Thermometer • Telephone • Video conferencing enabled device (tablet, mobile phone or computer) • Client education resources.

Making it happen

The following section highlights the key common enablers and challenges identified by those implementing in-home remote monitoring models. 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.

Readiness

Pre-existing infrastructure and 'on the ground' enthusiasm were essential enablers to the success of rapid transition to COVID-19 remote monitoring in all three models of care. In each case, remote monitoring champions had already been identified and were disseminating knowledge and technical skills amongst clinical staff.

Several strategic and practical factors influenced a high level of readiness for change across all three models including:

- access to funding for the purchase of remote monitoring equipment
- support to drive innovation in virtual care from executive leaders
- existing clinical governance frameworks for remote monitoring in Hospital in the Home (HiTH) or chronic disease monitoring settings
- high levels of change acceptance amongst clinical staff.

Technology

COVID-19 remote monitoring initiatives employ a range of virtually enabled technologies, ranging from wearable devices to monitor patient observations in patents' homes, to dashboards at clinical workstations.

Remote monitoring kits for patients are specific to each initiative and may contain some or all of the following equipment:

- A tablet/device
- Monitoring equipment (i.e. blood pressure machine, pulse oximeter, thermometer) or disposable wearables
- Patient education resources.

The functionalities of the devices which make up the minimum technology requirements underpin the standardised model, enabling patients to remain in isolation while receiving clinical monitoring. Additions such as Bluetooth-enabled communication and tablet transmission of clinical information to a secure database may enable additional functions and/or enhance interoperability.

Local planning, service design and governance

Processes and clinical protocols

The following local processes and protocols were common across the initiatives:

- Referral pathways
  - PHUs must be a primary referral pathway
- Risk stratification
- Admission processes including:
  - review of eligibility to participate in service
  - initial contact pathway
  - agreed action plan (how and when a patient will be contacted)
  - provision of education materials
  - delivery of monitoring equipment and relevant information if required.
- Escalation pathways for deteriorating patients, including mental health deterioration
- Clear discharge criteria based on COVID-19 CDNA National Guidelines and local processes
- Monitoring and evaluation processes.

Local clinical governance

When developing governance structures for in-home remote monitoring it is important to ensure these align with existing local governance structures.

- Governance structures are supported by executive sponsors and may include:
  - monitoring committee
  - evaluation committee
  - consumer engagement
  - clinical engagement.
- Local community needs must be considered and the specific needs of vulnerable groups should be accounted for, including:
  - children
  - Aboriginal people
  - people with mental health needs
  - CALD community members, including those who require an interpreter
  - low socio-economic groups
  - people who are homeless or in temporary shared accommodations
  - people in RACFs and disability residential settings.

.

Building engagement

Patient stakeholders

Anecdotally, people admitted to COVID-19 remote monitoring services have shown to be highly engaged at each stage of their journey. Reflective of the nature of such a crisis, potentially passive patients were more actively involved in their care. However, the circumstances of the COVID-19 pandemic may have contributed to the very active involvement of people in their care.

In developing broader remote monitoring models, patient engagement should be considered, including recognising partnerships with patients as key stakeholders. Patients should be included from the early stages of planning and implementation to evaluation and improvement.

As demonstrated in Figure 1, patients must remain at the centre of care provision throughout COVID-19 remote monitoring. Consistent, frequent and personable communication facilitates meaningful relationships with patients. Engagement can be supported with:

- education packs
- assessment screenings
- GP discussions
- technical support from the clinical team
- referral to allied health services as required (for example, psychology to support mental wellbeing).

In cases of home isolation, patients' families were often key to keeping patients nourished and supporting their hygiene and psychological needs. This makes engagement with families and carers important. Relationships can be enhanced through quality information sharing.

Other stakeholders

Other stakeholders, including GPs and their practices, allied health service providers, primary health networks (PHNs), community services and technology providers should also be engaged, where needed, to enhance care.

Stakeholder engagement is supported by well-documented:

- shared care planning
- referral and discharge procedures
- protocols clearly defining medical governance
- deterioration escalation plans
- training and education materials.

Figure 1 – workflow diagram

Service consideration

- Notified of positive result
- Referral to service
- Assessed for suitability into service.

Service entry

- Initial contact with service staff
- Initial assessment incl. risk stratification, mental health wellbeing, observations
- Monitoring equipment delivered if required
- Monitoring requirements agreed on (may include discussion with GP).

Communication

- Once patient enters service, communication to:
  - patient's GP
  - Public Health Unit
  - community groups.

Monitoring

- Daily monitoring includes:
  - patient observations
  - compliance with home isolation
  - clinical team contact with patient
  - mental and social wellbeing check, e.g. food or medication delivery
  - risk assessment and escalation planning - observations are consistent with the clinical situation to support early identification of deterioration, optimise supportive care and ensure safe, rapid admission to a hospital facility.

Discharge

- Patient assessed as suitable and ready for discharge as per protocol
- Discharge summary sent to GP
- Notification sent to PHU
- Monitoring equipment retrieved, if required.

Monitoring and evaluation

Building patient outcomes and experiences into monitoring technology is a common feature across all models.

Successful models should aim to establish procedures for monitoring and evaluation, including:

- evaluation of patient and clinician experience
- collation of evidence of case for change and value propositions
- mechanisms for continuous quality improvement based on clinical and experience outcomes
- cost benefit analysis.

Opportunities

When the demand for COVID-19 remote monitoring services decreases, the in-home monitoring initiatives may transition to deliver a range of other virtually-enabled care in patients' homes including:

- chronic and complex disease management
- medication monitoring for multiple cohorts, including immune-supressed patients and mental health patients
- mental health wellbeing support
- residential aged care facilities support
- rehabilitation including cardiovascular, respiratory and post-operative care
- expansion of HiTH services and ambulatory care units
- wound care and wound management.

As COVID-19 remote monitoring models transition to the delivery of virtual care across different areas, there will be opportunities to leverage lessons learned or system improvements from during the pandemic. These include advancements in interoperability, building patient outcomes and experience measures into monitoring and contributing to clinical evidence based best practice.

Moving into broader applications of remote monitoring, patient engagement will be a key enabler to sustained uptake and success of virtual care services. Patients should have the opportunity to influence processes through mechanisms such as:

- embedding patient feedback for the purposes of ongoing refinement
- embracing consumer representatives as partners in service provision, design, improvement and evaluation
- clearly defining protocols for collecting and analysing patient feedback data.

Part 2
ISLHD and SNSWLHD: Virtual Care Centre

To form a thorough understanding of the Virtual Care Centre (VCC) initiative it is assumed this section is considered in conjunction with the core elements in Part 1.

Overview

The Illawarra Shoalhaven Local Health District (ISLHD) and Southern NSW Local Health District (SNSWLHD) developed a joint response to the COVID-19 pandemic, establishing the COVID-19 Virtual Care Centre (VCC) to remotely monitor COVID-19 positive patients.

The VCC supports low and moderate risk COVID-19 positive patients to be monitored for deterioration in their own homes. This lowers the risk of exposure to COVID-19, for VCC clinicians, hospital staff and inpatients, household members and the community including GPs.

As of December 2020, there have been 68 cases of COVID-19 in the SNSWLHD and 144 confirmed cases in the ISLHD.

Populations in both LHDs have higher than average representations of demographic characteristics, which increase the risk of COVID-19 related deterioration including:

- prevalence of underlying medical conditions

- people aged 65 years and older

- prevalence of weakened immune systems.

Both LHD populations also have higher than average proportions of Aboriginal and Torres Strait Islander people, communities with a lower than average socio-economic status and people living in rural communities or isolated areas. This potentially impacted the community's ability to self-isolate and placed them at an increased risk of contracting COVID-19.

N.B. These factors relate to the population risk of being impacted by COVID-19, however are not criteria for VCC admission.

These factors made it critical that both LHDs implement safe, highly responsive and equitable initiatives to protect the community. The VCC:

- monitors COVID-19 positive patients in a shared care arrangement with their GPs

- ensures timely identification of clinical deterioration and ability for rapid clinical escalation

- provides holistic care to people isolated in their homes and quarantine hotels using virtual modalities.

ISLHD, SNSWLHD and COORDINARE (South Eastern NSW PHN) had jointly commissioned the VCC in late 2019 and were planning to commence remote monitoring for chronic condition management.

The cross-LHD partnership enabled the sharing of knowledge and resources and enhanced the capabilities for each LHD to support the other during potential community transmissions of COVID-19.

The service

Upon admission to the VCC, patients' GPs are contacted to advise of admission. A further history of any preexisting conditions is gained, as well as an escalation plan for non-COVID symptoms.

Escalation of COVID related symptoms is managed by the overseeing medical officer. If the patient does not have a regular GP, a plan is established with the overseeing medical officer.

Using the VCC COVID-19 remote monitoring kits, COVID-19 positive patients record daily or twice daily observations, depending on their assigned pathway of care and VCC clinical judgment. These are transmitted securely to a dashboard monitored by VCC clinicians, either at their workstations or in their home offices (see Figure 2).

The VCC continues to monitor COVID-19 positive patients for the duration of their home isolation, with the ability to link in virtual allied health care as required. When Criteria Led Discharge (CLD) criteria have been met, the VCC liaise with the PHU to facilitate release from isolation and communication with GPs to ensure follow-up as required (see Figure 2).

VCC hours of operation are 7am to 8pm, seven days a week. Usual protocols apply outside of these hours, i.e. emergency services.

Components of the monitoring kits provided to patients.

'COVID-19 in-home remote monitoring tested two key elements of virtual care: acceptance and capability of patients and staff of virtual care modalities.'

CAROLINE LANGSTON, EXECUTIVE DIRECTOR, INTEGRATED CARE, MENTAL HEALTH, PLANNING INFORMATION & PERFORMANCE, ISLHD

Workflow diagram

Figure 2: VCC workflow diagram

PHU

PHU receives notification of COVID-19+ patients identified through community testing or GP testing.

PHU phone call to patient:
– notify patient of positive result
– confirm for self isolation requirements and location
– Complete COVID -19 NSW Case Questionnaire*

PHU refers patient to the VCC via phone call and securely forwards the Case Questionnaire to VCC.

VCC admission

VCC phone call to patient to conduct clinical and risk assessment including:

– Overview of VCC service, requirements and option to opt out**
– A-G assessment***
– Diagnosis of chronic conditions - respiratory conditions, hypertension, diabetes etc
– Cognition assessment (sight/hearing/memory)
– Literacy assessment – language and reading, health literacy and technological literacy
– Identifying presence and context of family or support people
– Identifying patients regular GP

VCC phone call to patient's GP for discussion based on above assessment to determine suitability for VCC, any underlying health conditions, co-morbidities and preferred method of regular communication.

Determine acuity pathway and equipment requirements.

LHD transport

VCC clinician arrange for the contactless delivery of required equipment to the patient. (Transport options flexible based on location and availability of LHD drivers, community nurses and other staff members).

Delivery will follow VCC COVID-19 equipment delivery and retrieval procedure.****

Kit contains educational material covering how to use the kit, which is also supplemented by a phone call between patient and VCC clinician.

* See COVID-19 NSW Case Questionnaire in Supporting documents list
** See ISLHD Virtual Care Clinic: Introduction Script and Suitability Questionnaire in Supporting documents list
*** See SNSWLHD COVID-19 Initial Health Assessment Screen in Supporting documents list
**** See VCC COVID-19 Equipment delivery and retrieval procedure in Supporting documents list
† See CDNA National Guidelines in Supporting documents list

VCC monitoring

Daily observations by patient:
– Observations either transmitted via Bluetooth (VCC kit) or manually (BYOD app)
– Patient completes daily survey on VCC interface (VCC kit or BOYD app)

Daily observations by VCC:
– VCC clinician reviews all patient observations in VCC dashboard and triages calls based on clinical judgement – ie. Observations and survey responses.
– VCC makes daily contact with patient via video or phone and covers PHU requirements for wellbeing check and isolation requirements during call.

Observations between the flags

Daily observations and VCC daily contact continue for the duration of isolation.

After the required days in isolation and symptom free days have been completed based on the CDNA National Guidelines for Release from Isolation†
VCC clinician consults over phone with GP and PHU to determine when patient is fit for discharge.

Fit for discharge

VCC/PHU/GP

VCC sends discharge summary and GP plan for follow up to GP through normal discharge process through eMR (CHOC).
– VCC sends discharge summary to patient via post (or email, if requested).
– VCC send notification of discharge and summary to PHU via email.

VCC clinician arrange for the contactless collection of equipment, following VCC COVID-19 equipment delivery and retrieval procedure. (Transport options flexible based on location and availability of LHD drivers, community nurses, other staff members or patients ability to return to VCC).

VCC escalation

Observations outside the flags

– VCC contact patient urgently
– Request repeat observations
– Notify GP and VCC MO or NP – conduct a phone call discussion if support is required to decide on recommendation for review, escalation or transfer to hospital.

VCC makes follow up contact with patient to notify of decision:
– Request repeat observations at certain time; or
– Transfer to ED (patient transport via ambulance)

Unfit for discharge

Making it happen

This section outlines the key enablers and challenges identified by those involved in implementing this initiative. 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

Processes and clinical protocols

- VCC is a protocol-driven model of care underpinned by defined processes for referral, admission, assessment, monitoring, escalation and discharge.

- Due to the nature of the pandemic, the VCC rapidly developed, defined and adopted multiple protocols and procedures parallel to operation to ensure needs of the community were met.

Local clinical governance

A robust local clinical governance structure is in place (Table 2). This defines medical responsibility for both COVID-19 related and non-COVID-19 related deterioration and underpins the duty of all team members within the VCC. This is essential to maintaining clinical safety.

	COVID-19 related deterioration	**Non-COVID-19 related deterioration**
VCC nurses	VCC nurses responsible for escalation of all deterioration	
LHD medical officers	Responsible for escalation of deterioration	If GP is not available, responsible for escalation of deterioration
GP	Informed of deterioration	If GP is available, responsible for escalation of deterioration

Table 2: Clinical escalation

'We use comprehensive assessment skills to determine if someone is really unwell… at times, due to the virtual constraint, we have to ask clarifying questions. With the continuity of a frequent contact with a clinician, patients were able to relax and disclose more information that provided a full clinical picture.'

JANE COTTER, NURSE PRACTITIONER CHRONIC CARE, SNSWLHD

This structure is enabled through governance mechanisms including:

- initial discussions with GP prior to admission to VCC

- daily huddle of VCC staff to identify concerns, new admissions and priorities for contact

- daily email to medical team, clinical assessment data and medical histories

- regular updates to medical team via secure online group chat for new referrals and advice on stable conditions

- as VCC clinical team hours of operation are 7am to 8pm seven days a week, outside of these hours patients are responsible for attending the emergency department in the case of rapid deterioration.

Cross-district partnerships

The joint approach to implementation between ISLHD and SNSWLHD extended the capability and capacity of both workforces. The benefits of the shared care model were intensified through collaboration. Enablers of the partnership model included:

- one PHN across both ISLHD and SNSWLHD

- existing joint regional planning

- overarching governance facilitated by joint board meetings

- a common agenda and goals.

The COVID-19 pandemic was recognised as an opportunity to use planning that had occurred for remote monitoring service provision to form a pandemic response and fast track the processes that were being established.

The VCC demonstrated the value add to patient and staff safety by allowing people to recover at home while facilitating collaborative care between LHD clinicians and GPs.

Building engagement

Engagement with GPs at each stage of the patient journey

- The PHN convened after hours consultation sessions with local GPs to include them in service design and planning, helping to facilitate engagement and buy-in.

- Collaborative planning with GPs was essential for successful implementation of the model and ensured continuity of care.

- GPs were engaged from the start of the patient journey and given the option to provide their clinical input in monitoring and escalation planning.

- Remote monitoring technology can allow GPs to securely access the regular observations of their patients admitted to the VCC from their own devices.

- Patients have access to Medicare rebates for GP appointments related to their monitoring including Medicare Benefits Schedule (MBS) item numbers for care planning sessions.

'I thought my patient would be stuck at home and I would be responsible for liaising with them… I was presently surprised to be contacted by the VCC… I was receiving observations daily and received plenty of information to give advice and help the patient feel confident.'

LOCAL SUPPORTING GP

Engagement with Aboriginal Community Control Health Service Sector (ACCHSs)

A memorandum of understanding (MoU) underpinned the engagement of Aboriginal Community Controlled Health Services (ACCHSs) in the VCC and ensured COVID-19 monitoring would be delivered in a culturally safe manner.

South Coast Aboriginal Medical Service (AMS), Illawarra AMS and Waminda South Coast Women's Health and Welfare Aboriginal Corporation were signatories to the MoU.

Weekly phone calls took place with signatories to the MoU, during which:

- organisations agreed on the care plan for COVID-19 positive members of the Aboriginal community
- ACCHSs were consulted during implementation, particularly on the choice of technology, to ensure vulnerable or remote communities would not be disadvantaged by the selection
- organisations resolved any issues that were identified through implementation.

LHD clinical team:

Remote team building strategies were implemented to boost clinical team morale, including:

- enhancing team connections through the use of multiple remote communication channels
- enabling information sharing through SharePoint
- sending a daily team email to update staff about COVID-19 guidelines and celebrate achievements
- VCC clinicians were trained in remote monitoring by VCC champions. These were early adopters of remote monitoring, predominantly community nursing staff, interested and willing to provide upskilling.

'There was unbelievably great and positive uptake and interest from the clinical team in VCC... The key factors that engendered this positivity were the system's ease of use and realising the benefits of remote monitoring for patients in home isolation.'

CAROLINE LANGSTON, EXECUTIVE DIRECTOR, INTEGRATED CARE, MENTAL HEALTH, PLANNING INFORMATION & PERFORMANCE, ISLHD

Workforce and resourcing

Workforce resources

- The VCC clinical teams were rapidly formed by community nursing staff and allied health staff (respiratory physiotherapist, social worker, others as required).

- Both clinical teams were supported by overseeing medical officers, from their respective LHDs, these included respiratory, infectious disease and general medicine physicians.

- The SNSWLHD VCC clinical team worked remotely across the district. Additional computer monitors and audio headsets were purchased to support workstation set up and access to the eMR through a VPN.

- The ISLHD team primarily worked from the Wollongong VCC hub.

Surge capacity

The following elements of the model of care allowed each LHD's clinical team and overseeing medical officers to support clinical care across districts. This enabled surge workforce capacity in the case of an outbreak:

- Allocation of clinical team resources being flexible based on patient numbers

- Using a group alert system to contact all medical officers rather than a traditional 'on call' system, to expedite advice from the first available

- Remote monitoring data accessible from any device

- Contingency plans to access the other LHDs eMRs.

Funding and sustainability

- Planning with the Integrated Care Strategy enabled the initial investment in VCC software and hardware.

- Ongoing leasing and support expenses are jointly funded through integrated care funding based on the number of units within each LHD.

- The joint funding arrangement for ongoing VCC costs would ideally be governed by a service agreement between the two LHDs.

- When the VCC reverts to chronic conditions monitoring, funding sustainability will be achieved through reduced presentations to ED, preventable hospitalisations and lengths of stay within the chronic conditions patient cohort. Efficiency gains will also be delivered through reduced travel time for home visiting, time spent undertaking biometric assessment and reviews.

'We utilised the existing capability within our workforce to staff the VCC, recognising the value virtual care could provide to enhance patient and clinician safety, in addition to the provision of clinical care.'

FRANCA FACCI, STREAM LEADER INTEGRATED CARE & PRIORITY POPULATIONS, ISLHD

VCC work station set up at ISLHD

Benefits

Results

Rapid clinical escalation of COVID-19 positive patients was enabled through the shared care arrangement. This comprised GPs and the LHD clinical team (including medical officers), which allowed the VCC to appropriately manage any deterioration.

The flexible makeup of the clinical team was able to expand rapidly and support workforce surges in the event of an outbreak.

As COVID-19 remote monitoring transitions to the chronic conditions VCC, clinicians will be able to see almost three times as many patients as they would normally do so with face-to-face interactions.

Benefits

1. Joint planning and implementation across the two LHDs – allowing for potential surge workforce capacity.

2. Integrated primary and secondary care planning – enhancing care continuity.

3. Remote and timely access to medical expertise – supporting a robust clinical protocol for escalating deterioration.

'Staff reported positive experiences both in developing their telehealth skills as well as feeling enabled to provide real support to people in isolation. Staff also felt validated in participating in the development of a new model of care.' EXECUTIVE SPONSOR ON CLINICAL STAFF EXPERIENCE

Patient story

Steph* received her COVID-19 positive test result and notification to self-isolate from the public health unit. At the same time, a few members of her family were also given the same instructions.

Confined to a bedroom in her family home, Steph received a call from the Virtual Care Centre and was sent monitoring equipment and instructions. Steph was not too keen on reading the instructions, but after her nurse talked her through everything over the phone she had a good understanding of what to do.

There were times when Steph felt she was not doing well mentally in isolation. She had her 21st birthday locked in her bedroom and was shut off

from her family. Her nurse observed this and set up a telehealth appointment with a psychologist. Steph found this reassuring.

'The whole team treated me like a human, made me comfortable and confident under their care.'

Steph found that consistency really helped, speaking with the same nurse at the same time every day, asking the same questions. She also loved that she could receive care direct to her bed.

Steph was lucky enough to remain relatively healthy during isolation and when she was discharged from VCC she was able to celebrate her 21st birthday with her family and friends.

* Name changed to protect patient privacy and confidentiality.

Part 3
SLHD: RPA Virtual Hospital

To form a thorough understanding of the RPA Virtual Hospital initiative it is assumed this section is considered in conjunction with the core elements in Part 1.

Overview

RPA Virtual Hospital (rpavirtual) was launched in early 2020 as an alternative, sustainable solution to increasing demand for healthcare in Sydney. It acts as a bridge between hospital specialist services and patient care in the community.

rpavirtual was initially established as a pilot for Sydney Local Health District (SLHD) with the following objectives:

- Support patient flow in SLHD acute hospitals by delivering sub-acute care in the community, including HiTH

- Reduce unnecessary ED presentations, hospital admissions and length of stay

- Enhance patient experience of healthcare

- Inform the broader adoption of virtual health across SLHD.

In March 2020, rpavirtual was able to rapidly scale up their service in response to the pandemic and provide virtual care for COVID-19 patients. As at the end of December 2020, rpavirtual had registered 1,501 COVID-19 positive patients for virtual care.

rpavirtual operates as a 24/7 service providing virtual in-home remote monitoring of stable COVID-19 positive patients in self-isolation, clinical care for COVID-19 negative patients in hotel quarantine, and a range of other non-pandemic programs.

Giving patients an opportunity to receive care in their home and not in hospital offers many benefits, such as reducing the risk of onward transmission, less travel, increased familiarity and comfort, and ensuring hospital beds are available for those in need.

While this model will focus on the COVID-19 response, the scope of rpavirtual extends far beyond this. According to the SLHD Strategic Plan 2018-2023, the SLHD population of 700,000 is projected to increase by 28% by 2036. Combined with increasing rates of chronic disease and a rapidly ageing population, an 84% increase in emergency department presentations is predicted by 2026. Analysis of population projections and service demand was a key driver in considering new, integrated and sustainable models of outpatient and community care.

In 2020, rpavirtual won the NSW Premier's Award in the category of Excellence in Digital Innovation.

'rpavirtual, as a new way of caring, is an innovative and exciting opportunity to provide enhanced medical services to our community.'

DR OWEN HUTCHINGS, CLINICAL DIRECTOR, RPA VIRTUAL HOSPITAL

The service

- rpavirtual provides a 24/7 virtual in-home remote monitoring service to patients who have tested positive to COVID-19 and are assessed as clinically appropriate for virtual care.

- When patients are first contacted, nursing staff will:
  - phone or send an SMS to initiate video conference
  - introduce themselves and the rpavirtual service
  - perform a patient ID check
  - provide their reason for calling
  - perform a COVID-19 clinical assessment as per protocol to determine patient's level of risk.

- A care plan is then prescribed depending on risk.
  - The patient is **not** informed of their level of risk.

- Following initial referral, if the patient is considered high risk the rpavirtual flying squad (a dedicated team of nurses who are PPE trained) delivers a wearable package (care kit). This includes:
  - a temperature measurement device
  - a pulse oximeter – for heart rate and oxygen saturation monitoring
  - information resources for downloading the application (app) onto the patient's own device, which is linked to wearables
  - a tailored educational video and written material.

- Data from wearables is uploaded via Bluetooth to a web-based dashboard monitored remotely by clinical staff at the virtual hospital.

- Clinicians receive vital signs from patients which are then entered directly into the eMR. Nursing staff also assess respiratory rate and general wellbeing observations using prescribed clinical questions.

- Medical officers are available to assess patients virtually if their condition deteriorates and they require escalation.

- Prior to discharge from rpavirtual, all patients must have met the COVID-19 CLD requirements. There are additional requirements if the patient is in hotel quarantine. These protocols are regularly reviewed to reflect changes at a state, national and international level.

- For all COVID-19 positive patients, the recommendation to discharge must be approved by the PHU and ultimately the SLHD Chief Executive.

- The patient's GP receives registration notification and a discharge summary via secure file transfer and the patient is advised to see their GP in seven days for a follow-up appointment. If the patient does not have a GP on discharge, a summary is provided to the patient to take to a GP. Information is also provided on how to locate a GP in their local area.

- Post discharge, all patients receive an SMS with a link to a patient experience survey which is built into a secure database.

Workflow diagram

Figure 3: RPA Virtual Care Centre eligibility decision flow tree*


```
                                    ┌─────────────────────┐
                                    │ COVID-19+ patient is│
                                    │ referred to rpavirtual│
                                    └─────────────────────┘
                                              │
                                              ▼
              ┌──────────────┐      ┌──────────────────────┐      ┌─────────────────┐
              │ Review eMR   │─────▶│ Patient is from a    │─────▶│ Refer to RACF   │
              └──────────────┘      │ Residential Aged     │      │ COVID-19        │
                     │              │ Care Facility        │      │ workflow  END   │
                     ▼              └──────────────────────┘      └─────────────────┘
         ┌─────────────────────┐      ┌──────────────────┐
         │ Patient lives in SLHD│─No─▶│ Refer back to    │
         │ or in Special Health │     │ PHU              │
         │ Accommodation        │     └──────────────────┘
         └─────────────────────┘
                   │ Yes
```

65 years and older	Under 65 years	Other
Patient has one or more of the following comorbidities – cancer, cardiovascular disease, diabetes, heart failure, immunosuppression, stroke, liver disease, renal disease and lung disease	Patient has one or more of the following comorbidities – lung disease, cardiovascular disease; renal disease (level 5 renal failure)	Patient: – is pregnant – is under 16 years of age – has hypertension.

```
             No ◀──────────────┬──────────────▶ Yes
                               
   ┌──────────────────────┐        ┌──────────────────────┐
   │ Contact patient to   │◀─ Yes ─│ Patient has been deemed│
   │ complete COVID-19    │        │ appropriate for virtual│
   │ Clinical Deterioration│       │ monitoring by ED      │
   │ Assessment and risk  │        └──────────────────────┘
   │ stratification       │                  │ No
   └──────────────────────┘                  ▼
            │                   ┌──────────────────────┐   ┌──────────────────────┐
            │                   │ Contact ED COVID-19  │──▶│ Patient needs to      │
            │                   │ line                 │   │ present to ED         │
            │                   └──────────────────────┘   └──────────────────────┘
            │                             │                          │
            ▼                             ▼                          ▼
   ┌──────────────────────┐   ┌──────────────────────┐   ┌──────────────────────┐
   │ Based on clinical    │◀──│ Patient safe – to be │   │ Telephone ambulance   │
   │ assessment, does the │   │ monitored by rpavirtual│  │ END                   │
   │ patient need to return│  └──────────────────────┘   └──────────────────────┘
   │ to ED for face-to-face│
   │ assessment?          │
   └──────────────────────┘
        │ No        │ Yes
        ▼           ▼
   ┌──────────────┐  ┌──────────────────────┐
   │ Provide      │  │ Telephone ambulance   │
   │ education and│  │ immediately  END      │
   │ advice on how│  └──────────────────────┘
   │ and when to  │
   │ escalate     │
   │ concerns     │
   └──────────────┘
        │
        ▼
   ┌──────────────────────┐
   │ Schedule next virtual│
   │ appointment (must    │
   │ occur twice per day  │
   │ every day)           │
   └──────────────────────┘
        │
        ▼
   ┌──────────────────┐
   │ Continue monitoring│
   └──────────────────┘
```

*See rpavirtual Patient Management Framework: Pandemic response cohort – COVID-19 positive in supporting documents list

Figure 4: rpavirtual workflow diagram*

rpavirtual admin	rpavirtual flying squad	rpavirtual Care Centre	Referral agency	ED/Hospital

START

Referral process

Referral from Public Health Unit

Referral from ED
Note: rpavirtual medical officer must be notified – see flowchart for more information

Referral from police hotel
Note: SHA must be notified – see flowchart for more information

Referral from SHA

Patient is registered to CP RPA Virtual EMRSP via eMR

eMR: patient is registered to CP RPAVirtual EMRSP location

Nurse contacts patient via phone to initiate videoconference

Nurse conducts COVID-19 clinical assessments as per protocol

Patient is not eligible for rpavirtual / Patient requires escalation

Eligible

Level of risk is determined using risk stratification tool
Level of risk assigned on eMR

eMR: patient is assigned a level of risk in associated groups

Registration notification sent to patient GP via secure file transfer

Notification to flying squad required

High risk patients at home or in hotel: Wearables and care kit delivered

Low/medium risk patients at home only: Care kit and PPE delivered (no wearables)

Yes

Notify rpavirtual flying squad of patient and level of risk

Patient commences virtual monitoring program

Continue monitoring

Patient reviewed as per protocol

Patient requires escalation

Patient reviewed by ED and admitted to hospital or discharged back to rpavirtual – if patient is in SHA, SHA notified at point of escalation

Patient is ready for discharge

Discharge summary sent to GP via secure file transfer

Discharge process

Follow discharge protocol for patient group

Patient discharged

eMR: patient is discharged from rpavirtual

FINISH

*See rpavirtual Patient Management Framework: Pandemic response cohort – COVID-19 positive in supporting documents list

Making it happen

This section outlines the key enablers and challenges identified by those involved in implementing this initiative. 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

Processes and clinical protocols

- rpavirtual is a multidisciplinary service with prescribed clinical and escalation protocols.

- The model uses CLD to assess a patient's readiness for discharge from the service and referral to their GP for ongoing care.

- During initial planning there was strong engagement and communication with medical leads across the LHD to identify opportunities for virtual care.

- All virtual models of care are designed in collaboration with medical specialists to ensure they are comprehensive, safe and include appropriate escalation and referral into hospital if required.

RPA Virtual Hospital

Service design and governance

- A key enabler of the model was the significant upfront investment. SLHD commenced planning for the virtual hospital in late 2019. Initial emphasis was on developing the necessary infrastructure and governance for virtual care delivery and consulting extensively to inform the initial model of care.

- A foundational principle of the rpavirtual model is that virtual care complements in-person care.

- The strong governance model ensured that the service was well supported by the SLHD executive.

- The governance structure includes clinical leads from across disciplines, executive representation, IT and health informatics, general practice and consumer representation, as well as the NSW Ministry of Health and tertiary institutions.

- A significant amount of refurbishment was required to ensure the physical space supported virtual care. This included ensuring mobile phone signal was available, there was an appropriately designed and sound-proofed space for the care pods (e.g. to maintain privacy), and other equipment could be suitably stored.

- Care pods were developed as a dedicated space for virtual consultations. They include equipment, platform and apps required for videoconferencing and monitoring, access to the eMR and clinical protocols, headsets for privacy, phone queuing and a dedicated phone line.

- The partnership between clinical and information and communication technology (ICT) supported a human centred design approach that ensures the technology facilitates the delivery of clinical care.

- The space was configured to ensure 24/7 access to technology and an uninterrupted power supply (UPS) needed to be cabled to ensure business continuity in the case of a power failure.

- Downtime procedures and 24/7 downtime viewers are in place in case of eMR disruptions and outages. This is essential for ongoing care in a virtual service delivery model.

'To deliver anything virtually, several pieces of technology need to be in place. If repurposing buildings, consider space with access to technology requirements. Capability of staff and patient needs to be identified when developing infrastructure.'

DIANNA JAGERS, DIRECTOR CLINICAL SERVICES SUPPORT & INTEGRATION, RPA VIRTUAL HOSPITAL

Care pods

A purpose-built 24/7 Virtual Care Centre was established on the Royal Prince Alfred Hospital campus and equipped with care pods that included videoconferencing technology and the ability to remotely monitor patients with wearable devices.

Workforce and resourcing

Dedicated positions

- rpavirtual utilises a dedicated staffing model. Staff were initially redeployed from other assignments or seconded from other areas. Positions have since been recruited via advertising.

- Team members include:

  – Nursing: nurse managers, nurse unit managers, care centre registered nurses, paediatric nurses, midwifery clinical nurse consultant (CNC), midwife, clinical nurse educator

  – Medical: deputy clinical director, registrars, career medical officers (CMOs) (including general practice)

  – Allied health: psychologists, social workers, physiotherapists.

- Ensuring access to psychology services is an important component when setting up COVID-19 remote monitoring services to manage the wellbeing of patients in isolation or quarantine.

'At the time of our greatest struggle and challenge, your kindness and gentle nature were the greatest gift to both of us.'

BETH, CARER

Clinical leadership and champions

- rpavirtual has several leadership roles as part of the governance model to support future planning, monitoring and evaluation, including:

  – General Manager

  – Clinical (Medical) Director

  – Director Clinical Services Support and Integration

  – Patient Experience and Service Development Manager

  – Director of Nursing

  – Research and Evaluation Officers

  – Quality and Clinical Risk Manager.

Funding and sustainability

- Initial funding for rpavirtual was allocated internally by SLHD to pilot a virtual hospital model. Funding for COVID-19 related activity is recouped via the COVID-19 stimulus funding.

- Patients are currently classified as non-admitted patients for reporting purposes.

Benefits

Results

In response to the COVID-19 pandemic, rpavirtual provided **virtual care for over 4,000 patients** in quarantine and mandatory hotel isolation in the first eleven months of operation (February – December 2020).

Patient experience data demonstrates that clinician assessment, monitoring and treatment within the hospital context **can be delivered safely in the community environment via virtual care**.

As of 7 September 2020, 375 patients have provided feedback on their experience of COVID-19 in-home monitoring:

87% rated their care as very good or good*

92% said they **felt confident** knowing their symptoms were being monitored virtually

83% said the **technologies used by rpavirtual improved their access to care.**

Benefits

1. **24/7 virtual hospital to respond to deteriorating patients** with a dedicated phone line and on-call medical officers.

2. **People felt confident at home** knowing that their symptoms were monitored daily.

3. **Local relationships** with bricks and mortar hospital specialists support safe and effective virtually enabled models of care.

4. **A robust clinical protocol that appropriately assesses patient risk** to ensure early detection of deterioration.

5. **Partnerships between clinical and ICT services** ensured technology was appropriate and an enabler of care delivery, not a barrier.

'The outstanding communication. Understanding when to call 000 and the oxygen detection device giving peace of mind. The nurses were exceptional in every interaction.'

RPA VIRTUAL HOSPITAL PATIENT

*See RPA Virtual Hospital – COVID-19 Positive Patient Reported Experience Measures – Summary Report – 31 October 2020 in supporting documents list

Monitoring and evaluation

- The University of Sydney, Menzies Centre for Health Policy was engaged in early 2019 to evaluate the pilot of rpavirtual prior to the scale up to manage COVID-19 patients.

- rpavirtual has established research and evaluation governance which includes:

  – RPA Virtual Hospital Research Steering Committee

  – RPA Virtual Hospital Evaluation Committee.

- Subgroups for monitoring and evaluation have also been established to review:

  – clinical studies

  – models of care

  – costing study

  – patient experience

  – workforce experience.

- In 2020, rpavirtual reviewed 33 research proposals and approved 23, the majority being COVID-19 related clinical studies.

Patient story

Mr D* is a 35-year-old man who arrived in Australia on a cruise ship. He was initially diagnosed with COVID-19 and later with community acquired pneumonia and tuberculosis. Due to his condition, Mr D was in health hotel quarantine for 67 days under the care of rpavirtual.

After 10 days in ICU, Mr D was referred to rpavirtual for remote monitoring. He received twice daily video consults with a nurse, which included an overall assessment and observations of his heart rate, temperature and oxygen saturation, any laboured breathing or psychosocial issues. The rpavirtual Care Centre was available to Mr D 24 hours a day, seven days a week.

During his quarantine, Mr D had four hospital admissions. The rpavirtual clinical protocol enabled early identification of deterioration and appropriate escalation of his care. Upon his return home, Mr D sent the following email to rpavirtual:

'Dear RPA Virtual Team,

Good day! …We would like to extend our appreciation to all the staff nurses for monitoring us in the morning and evening, providing our meals and assisting our other requests. To the nurses who had joined the zoom meeting with us every day - we appreciate you for listening, answering our questions and being friendly. Because of your effort our condition improved and we recovered.

We are all with our family now. Yehey!!! Again, we are so grateful and overwhelmed for everything. Keep safe and God bless you all.'

* Name changed to protect patient privacy and confidentiality.

Part 4
SVHN Virtual Care Unit

To form a thorough understanding of the St Vincent's Virtual Care Unit (VCU) it is assumed this section is considered in conjunction with core elements in Part 1.

Overview

The St Vincent's Integrated Healthcare Campus have committed to using technology to deliver virtual specialist care and remote monitoring so that patients, including those from NSW rural and remote communities, can be managed at home or in a facility closer to home.

The VCU was developed in response to the current COVID-19 pandemic. The VCU functions as a Virtual Hospital in the Home (V-HiTH), providing a framework for safe, effective and patient-focused care for people with COVID-19 in the community. A virtual care unit framework has been developed for staff to follow whilst it is a V-HiTH model.

The VCU is a multi-disciplinary team model of care that addresses the health needs of vulnerable populations within their homes. The model provides safe and effective care and has been developed to support care in the home and early discharge strategies. Existing governance structures and resources are used to ensure the model can continue to operate as required to support the pandemic response.

The service

The VCU uses a a consistent protocol for the provision of specialist healthcare and short-term care coordination of people with COVID-19.

The system includes the following elements:

- Patient referral, including inclusion criteria and referral pathway.

- Admitting medical officer: patients admitted as an inpatient under V-HiTH are under the care of the infectious diseases medical team.

- Individualised support for mental wellbeing and vulnerable populations.

- Discharge and transfer of care:

  – At day 10, when isolation is complete, all patients are emailed a clearance letter to support them back into the community

  – People returning to a higher risk setting must meet higher discharge criteria before clearance, for example, aged care facilities, childcare centres and workplaces where social distancing cannot be readily practised

  – A discharge letter with admission details is sent to the person's GP or provided to the patient if they do not have a regular GP.

- Education

  – Patient and carer education resources have been developed and are emailed to the patient prior to their first appointment.

- Documentation

  – The VCU documents all activities pertaining to service delivery as per [PD/2017/95224 Health Care Records – Documentation and Management Policy](#)

  – Documentation is audited regularly by the nurse manager.

- Compliance – is reported by the HiTH Line Manager and demonstrated through reporting including:

  – monthly reporting and evaluation of virtual episodes of care

  – monitoring of patient experience

  – reporting of clinical incidents.

The VCU operates seven days a week from 8am to 4.30pm and is staffed by registered nurses under the direction of the nurse unit manager (NUM) of outpatients. Referrals received out of hours are reviewed the next day. If a person requires urgent medical attention, they are requested to attend their local ED.

'[The service] allowed me to access medical help during lockdown.'

VCU PATIENT

Service model

Clear escalation pathways have been established to ensure early detection and to trigger further review.

Provision of care includes:

- diagnosis with admitting consultant

- estimated date of discharge

- admission treatment plan

- consent to treatment

- handover on each shift

- care interventions as directed by the COVID-19 pathways

- mental wellbeing screening is undertaken when conducting the initial assessment

  – risk factors are identified, and the patient may be referred to their GP, Crufad This Way Up Online Mental health program, or contacting SVHN.

- Homeless Health, Drug and Alcohol and/or Mental Health Services may need to be contacted by the VCU nurse at any point throughout the remote monitoring process.

'Virtual care needs to be integrated into everyday practice. With it comes a new set of skills for clinicians such as virtual empathy.'

CHRIS ROBINSON, DIRECTOR OF INNOVATION AND IMPROVEMENT, SVHN

Workflow diagram

Figure 5: SVHN VCU identification and assessment*

| COVID+ patients identified through community testing and PHU referral | COVID+ patients discharged from SHVS ED, well enough for home management | COVID+ patients discharged from SVHS inpatient care requiring follow up | Other GP referrals deemed appropriate to be admitted to V-HiTH |

Commence interaction with Virtual Hospital in The Home (V-HiTH)

Prerequisites for referral (assessed by referrer over the phone or in person):
– Adequate health literacy
– Adequate communication/language skills
– Access to technology.

Mental health COVID-19 patients known to the SVHS MH team are jointly screened for appropriateness by the MH team and VCU

Infectious disease specialist team notified of COVID-19 patient by SydPath

Allied health team consulted as required

Initial assessment:
Takes place at first point of contact either with medical officer and/or VCU nurse via telehealth
– Virtual Care Unit referral and assessment form completed
– A-G Assessment
– Mental health screening undertaken

Notification/feedback to patient including:
– confirm COVID-19 diagnosis
– isolation requirements (patient provided with education information)
– PHU will be in contact
– clearance requirements
– deterioration plan
– contact details for VCU

*See St Vincent's Virtual Care Unit - Model of Care in supporting documents list

Figure 6: SVHN VCU admission, monitoring and discharge

Admission to V-HiTH – monitoring equipment issued as per guide

Low risk (Group 1):
Minimally symptomatic/
asymptomatic individuals
without significant comorbidities

Monitoring:
Daily respiratory observation
and VCC contact day one,
two and three
Repeat phone call at day
seven – check symptoms
and isolation

Moderate risk (Group 2):
Mild symptoms but
significant risk factors
Monitoring:
Thrice daily observations
– respiratory rate
– SpO2
– heart rate
– temperature
VCC contact daily
(first three days, then
based on symptoms)

Moderate risk (Group 3):
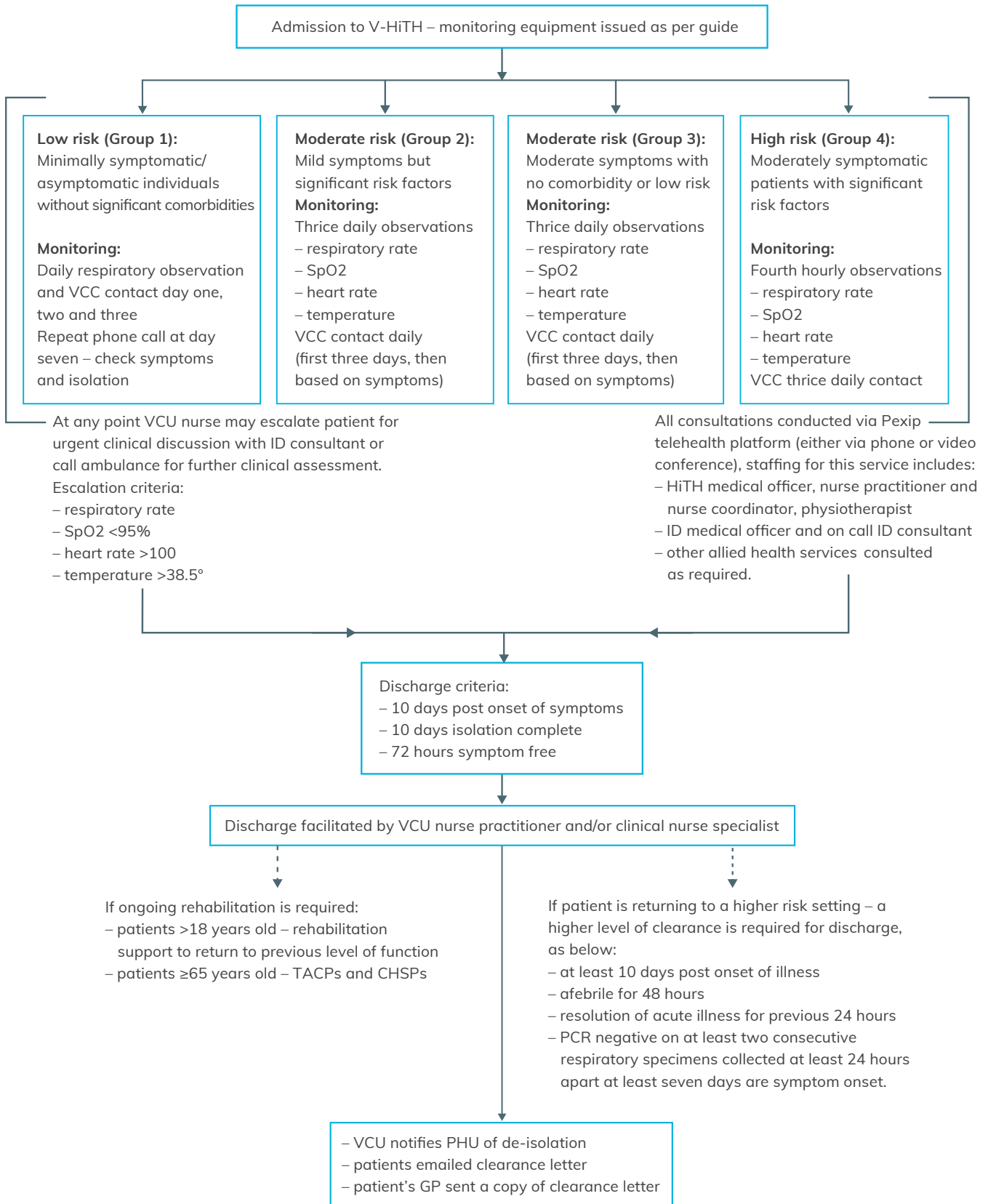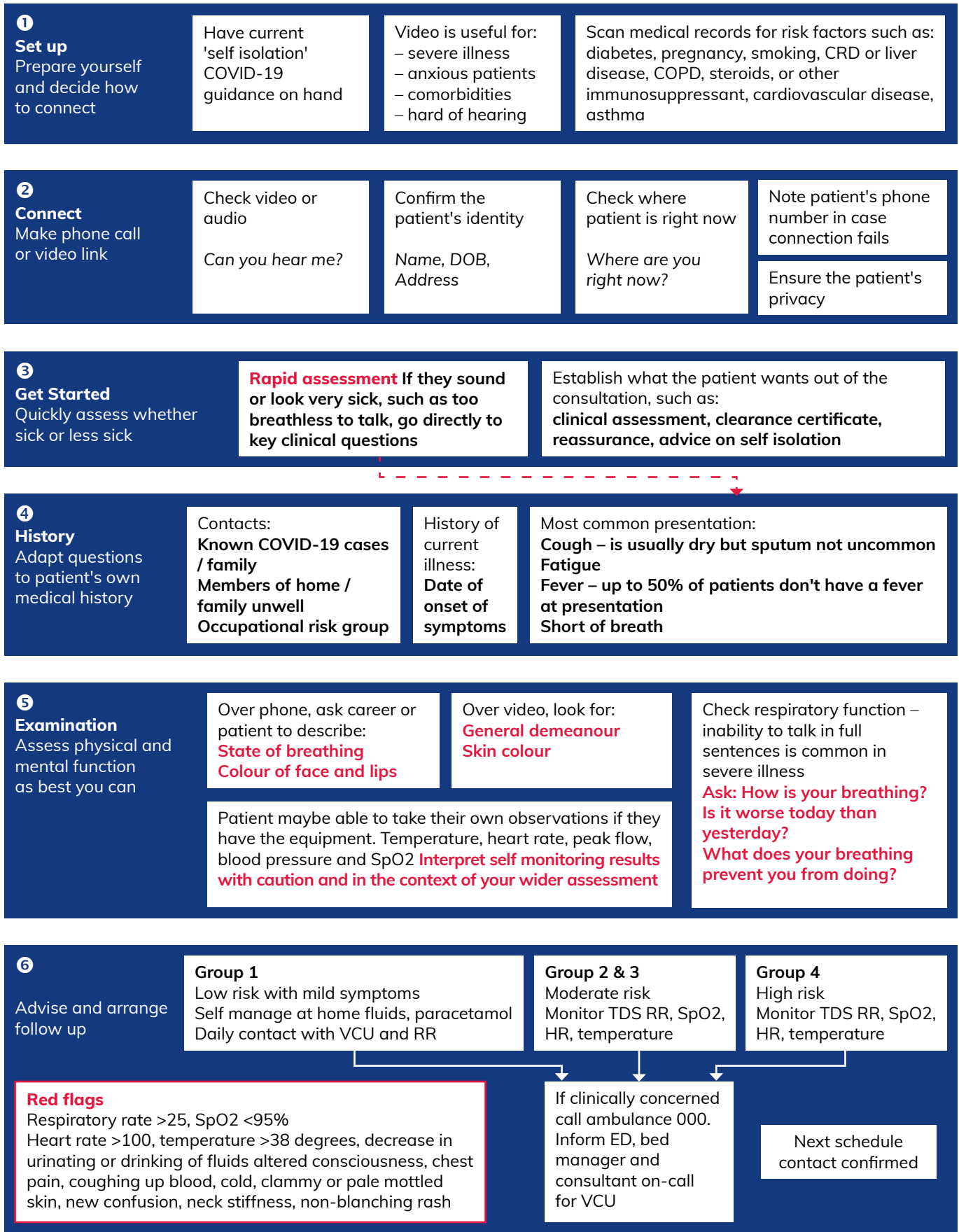Moderate symptoms with
no comorbidity or low risk
Monitoring:
Thrice daily observations
– respiratory rate
– SpO2
– heart rate
– temperature
VCC contact daily
(first three days, then
based on symptoms)

High risk (Group 4):
Moderately symptomatic
patients with significant
risk factors

Monitoring:
Fourth hourly observations
– respiratory rate
– SpO2
– heart rate
– temperature
VCC thrice daily contact

At any point VCU nurse may escalate patient for
urgent clinical discussion with ID consultant or
call ambulance for further clinical assessment.
Escalation criteria:
– respiratory rate
– SpO2 <95%
– heart rate >100
– temperature >38.5°

All consultations conducted via Pexip
telehealth platform (either via phone or video
conference), staffing for this service includes:
– HiTH medical officer, nurse practitioner and
   nurse coordinator, physiotherapist
– ID medical officer and on call ID consultant
– other allied health services consulted
   as required.

Discharge criteria:
– 10 days post onset of symptoms
– 10 days isolation complete
– 72 hours symptom free

Discharge facilitated by VCU nurse practitioner and/or clinical nurse specialist

If ongoing rehabilitation is required:
– patients >18 years old – rehabilitation
   support to return to previous level of function
– patients ≥65 years old – TACPs and CHSPs

If patient is returning to a higher risk setting – a
higher level of clearance is required for discharge,
as below:
– at least 10 days post onset of illness
– afebrile for 48 hours
– resolution of acute illness for previous 24 hours
– PCR negative on at least two consecutive
   respiratory specimens collected at least 24 hours
   apart at least seven days are symptom onset.

– VCU notifies PHU of de-isolation
– patients emailed clearance letter
– patient's GP sent a copy of clearance letter

Figure 7: Clinician quick reference guide for remote in-home monitoring consults*

❶ Set up
Prepare yourself and decide how to connect

Have current 'self isolation' COVID-19 guidance on hand	Video is useful for: – severe illness – anxious patients – comorbidities – hard of hearing	Scan medical records for risk factors such as: diabetes, pregnancy, smoking, CRD or liver disease, COPD, steroids, or other immunosuppressant, cardiovascular disease, asthma

❷ Connect
Make phone call or video link

Check video or audio

Can you hear me?

Confirm the patient's identity

Name, DOB, Address

Check where patient is right now

Where are you right now?

Note patient's phone number in case connection fails

Ensure the patient's privacy

❸ Get Started
Quickly assess whether sick or less sick

Rapid assessment If they sound or look very sick, such as too breathless to talk, go directly to key clinical questions

Establish what the patient wants out of the consultation, such as: **clinical assessment, clearance certificate, reassurance, advice on self isolation**

❹ History
Adapt questions to patient's own medical history

Contacts: **Known COVID-19 cases / family Members of home / family unwell Occupational risk group**

History of current illness: **Date of onset of symptoms**

Most common presentation: **Cough – is usually dry but sputum not uncommon Fatigue Fever – up to 50% of patients don't have a fever at presentation Short of breath**

❺ Examination
Assess physical and mental function as best you can

Over phone, ask career or patient to describe: **State of breathing Colour of face and lips**

Over video, look for: **General demeanour Skin colour**

Check respiratory function – inability to talk in full sentences is common in severe illness **Ask: How is your breathing? Is it worse today than yesterday? What does your breathing prevent you from doing?**

Patient maybe able to take their own observations if they have the equipment. Temperature, heart rate, peak flow, blood pressure and SpO2 **Interpret self monitoring results with caution and in the context of your wider assessment**

❻
Advise and arrange follow up

Group 1
Low risk with mild symptoms
Self manage at home fluids, paracetamol
Daily contact with VCU and RR

Group 2 & 3
Moderate risk
Monitor TDS RR, SpO2, HR, temperature

Group 4
High risk
Monitor TDS RR, SpO2, HR, temperature

Red flags
Respiratory rate >25, SpO2 <95%
Heart rate >100, temperature >38 degrees, decrease in urinating or drinking of fluids altered consciousness, chest pain, coughing up blood, cold, clammy or pale mottled skin, new confusion, neck stiffness, non-blanching rash

If clinically concerned call ambulance 000. Inform ED, bed manager and consultant on-call for VCU

Next schedule contact confirmed

Adapted from Greenhalg, T et al (2020) Covid-19: remote consultation flow chart

*See St Vincent's Virtual Care Unit - Model of Care in supporting documents list

Making it happen

This section outlines the key enablers and challenges identified by those involved in implementing this initiative. 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.

Figure 8: Virtual Care Unit timeline 2020

Commenced management of COVID+ patients in community

'Go Live' V1 Patients admitted to VCU

Planning for Hybrid HiTH model

'Go Live' V2 COVID+ Patients admitted under Hybrid HiTH model

HiTH service expansion planning commenced

'This way up' online mental health program incorporated into MOC

| March | April | May | June | July | Aug | Sept | Oct | Nov |

Established VCU Steer Co

MOH funding stimulus for virtual

Commencement of Virtual Hospital Planning Workshops

Virtual Hospital Proof of Concept (PoC) Planning

MOC development including rapid consultation/testing

Telehealth Lookbook and review of current VCU processes

Commencement of Virtual Hospital Vendor Workshops

Virtual Hospital Proof of Concept Business Case and Finalisation of Pilot Testing

Local planning, service design and governance

Processes, clinical protocol and resources

- The VCU rapidly developed many resources during the COVID-19 pandemic to ensure the safe delivery of services, including:

  – request for admission

  – VCU quick guide admission*

  – VCU quick guide discharge**

  – VCU clearance letter

  – VCU patient information

  – VCU quick guide monitoring equipment***.

- The executive team held consultations with clinicians, managers and IT to support development of a remote in-home monitoring service.

- If face-to-face assessment was required, patients were picked up by VCU patient transport and taken to the outpatient department for physical assessment.

Local community needs

- The local community includes people of diverse backgrounds and needs. These were considered in the program design.

- Services to support vulnerable groups have been incorporated in the model, for example, support for people who are homeless, people with mental illness, and people with addiction.

- Homeless people who are unknown to SVHN are referred to the Homeless Assertive Response Team (HART) via Homeless Health.

- There are plans underway to place a mobile van into the community for the monitoring of people in vulnerable groups.

*See COVID-19 QUICK GUIDE - VCU - Admission in supporting documents list
**See COVID-19 QUICK GUIDE - VCU - Discharge in supporting documents list
***See COVID-19 QUICK GUIDE - VCU - Monitoring Equipment in supporting documents list

Building engagement

Key partners and stakeholders

- The successful delivery of the VCU is based on the relationships built between the SVHN Executive, SVHN clinical staff from multiple departments and SVHN ICT. These groups identified a shared goal which supported buy-in from each group and the successful delivery of the service.

- SVHN has developed StVincent's@home, an overarching service where virtual care will sit in the future. A project plan has been developed with an approximate two-year timeframe to implement virtual care opportunities for SVHN.

Patient engagement

- The VCU developed a COVID-19 virtual care patient information package, which included information such as:

  - when contact would be made

  - contact details for the virtual care team

  - a health and wellbeing guide, including guidance on isolation, infection control practices and relaxation and mindfulness tips.

- COVID-19 positive patients are provided a care kit, which contains self-monitoring equipment, according to the Risk Stratification Management Flowchart.

- Patients were educated on how to use equipment either prior to discharge from the hospital or over the phone after SVH transport delivered the equipment to patient's home. This included correct use of monitoring equipment, for example, 'place oxygen saturation probe following the marked arrow'.

- Interpreters were readily accessible if required.

'It was almost comforting, having a professional from the unit call you every day, on a first name basis, it was a comfort and reassurance.'

VCU PATIENT

Workforce and resourcing

Staffing model

- The VCU uses existing services and resources to provide safe and high-quality care to patients in their homes. As such, it is a cost-neutral model enabling longer term sustainability.

- Staffing included:

  - existing HiTH staffing: HiTH medical officer, nurse practitioner and nurse coordinator, physiotherapist

  - infectious diseases MO and an on-call infectious diseases consultant

  - nursing staff rostering was provided by existing HiTH staff and community staff.

'Consistency of the staff that would deal with you, you know when they would call and get good information.'

VCU PATIENT

Virtual Care Unit videoconference

Benefits

Results

Early feedback suggests that people in isolation feel **connected and supported** through accessing the VCU.

Clinician capacity to deliver care virtually has been **strengthened** through training and education.

The VCU is testing a service model and **continuing to improve** the service to meet community needs.

Patient feedback –

51% **rated the service excellent**.

38% **rated it good**. Positive key themes from patients - accessible, efficient, punctual, same high quality care.

Clinician feedback –

3.69 / 5.00 **average rating**. Positive key themes time efficiency, reduced readmission, training and education, rural and regional outreach.

Benefits

1. **The VCU empowers patients to drive their clinical journey** through seamless integration of technology

2. **Improves patient experience** and delivers care close to home.

3. **Bridges the healthcare gap for vulnerable populations** with technology.

4. **Enhances partnerships** with key stakeholders across the LHD.

'Useful when having three-way conversations – allowing families to attend even though they are not able to be there physically.'

VCU PATIENT

Monitoring and evaluation

The VCU will act as a pilot to support the expansion of virtual hospital models at SVHN. The model will continue to use agnostic platforms to ensure scalability and ease of use.

Monitoring

Mechanisms to monitor the model and collect information for improvement include:

- monthly reporting and evaluation on virtual episodes of care to Integrated Care Governance Meeting by the HiTH NUM

- providing access and training for myVirtualCare. The HiTH NUM is accountable for staff record

- documentation audit as per Health Information Services Clinical Documentation Procedure, including length of stay, patient closure, report completion (including discharge summaries)

- reporting of clinical incidents as per the NSW Health **Incident Management Policy**.

Consumer feedback

- NPS review to measure consumer experience has been embedded into the virtual care model. This feedback will be utilised to continuously improve the model and reported monthly to the Integrated Care Stream.

- Operational measures are monitored by HiTH NUM including monitoring demand, capacity, appropriate staff ratios.

- Ongoing monitoring of complaints and compliments, and presentation of these results in patient conferences and team meetings as appropriate.

'9/10. Their phone calls made me feel a lot better about my isolation.'

VCU PATIENT

'I was in isolation at home and I received phone calls every day to monitor symptoms and to offer suggestions on how to relieve them.'

VCU PATIENT

Clinician feedback

- Preliminary clinician feedback has been captured and will be used to review and strengthen the model of care. Themes include:
  - improved service efficiency and convenience
  - reduced readmission
  - training and education to strengthen skills to deliver care virtually
  - ability to provide rural and regional outreach
  - positive patient experience.

Opportunities

The St Vincent's Curran Foundation has supported further service development, including:

- digital appointments with patients able to book appointments on their mobile devices

- system design and integration of new services to streamline solutions and improve efficiency:

  – Changing the referral/discharge regarding pre and post op so patients can flow into digital model

  – Opportunity to enhance current HiTH from 10 beds to 30 beds which will operate 24/7.

Patient story

Betty* was requested to self-isolate at home after being informed she had tested positive for COVID-19. The VCU was notified and a staff member attended her home and delivered wearables and talked to her about the remote in-home monitoring program.

Betty said she felt all the phone calls and contact with staff were really reassuring. Calls came at an agreed time which was more convenient. She felt it was comforting having a professional call her from the unit every day and because staff were familiar they were on a first name basis. Betty said communication was always very clear and never felt rushed.

* Name changed to protect patient privacy and confidentiality.

References and links

Australian guidelines for the clinical care of people with COVID-19

Coronavirus Disease 2019 (COVID-19). CDNA National Guidelines for Public Health Unit

Greenhalgh T.,Koh GCH., Car J. COVID-19: a remote assessment in primary care, BMJ,368, 1-5. doi:10.1136/BMJ.m1182

Supporting documents

ISLHD & SNSWLHD

COVID-19 NSW Case Questionnaire

CDNA Release from Isolation National Guidelines

VCC COVID-19 Equipment delivery and retrieval procedure

Script for daily COVID-19 survey

VCC A-G Assessment

ISLHD Virtual Care Clinic: Introduction Script & Suitability Questionnaire

SNSWLHD COVID-19 Initial Health Assessment Screening

SVHN

St Vincent's Virtual Care Unit - Model of Care

COVID-19 QUICK GUIDE - VCU - Admissions

COVID-19 QUICK GUIDE - VCU - Discharge

COVID-19 QUICK GUIDE - VCU - Monitoring Equipment

SLHD

RPA Virtual Hospital – COVID-19 Positive Patient Reported Experience Measures – Summary Report – 31 October 2020

Deeble perspectives Brief No.14 rpavirtual: a new way of caring

rpavirtual Patient Management Framework: Pandemic response cohort – COVID-19 positive

rpavirtual presentation pack – NSW ACI Redesign and Innovation Leaders Network

Hutchings et al, 'Virtual Health Care for Community Management of Patients with COVID-19 in Australia: Observational Cohort Study' J Med Internet Res 2021; 23(3):e21064

Raffan et al, 'The virtual care experience of patients diagnosed with COVID-19', Journal of Patient Experience; Volume 8: Article first published online: April 18, 2021; Issue published January 1, 2021

Acknowledgements

We would like to acknowledge the following districts and network for their involvement in documenting these models of care, along with all staff involved in their development and ongoing delivery.

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.