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Spotlight on virtual care: Royal North Shore Hospital Intensive Care Unit Patient and Family Videoconferencing Model

Northern Sydney Local Health District

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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 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.

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Introduction

The patient and family videoconferencing model in the Intensive Care Unit (ICU) at Royal North Shore Hospital (RNSH) is a simple and innovative solution implemented to connect patients and their loved ones during an ICU stay. The service uses existing technology at the patient's bedside and an approved NSW Health videoconferencing platform to facilitate family meetings and maintain family connections.

RNSH is the major hospital for Northern Sydney Local Health District (NSLHD) with many specialty services provided. The 58-bed ICU is split across four pods, providing specialist cardiothoracic, neurosurgical and general intensive care. Due to the specialist clinical services available at RNSH (including being a statewide referral centre for burn and spinal injuries), patients may have travelled or been transported in an emergency, resulting in them being geographically isolated from their family, carers and loved ones during their admission.

During the COVID-19 pandemic, hospital visitor restrictions were necessary to control the spread of the virus. Border closures and lockdowns also meant that travel to and within NSW was limited. This impacted how and when in-person visits from family to their loved ones in ICU could occur and made holding family meetings challenging.

The ICU team developed an innovative solution to address the restrictions by introducing videoconferencing to the bedside. Bedside videoconferencing uses Pexip (a NSW Health endorsed videoconferencing platform*) to address the need for both family/carer visits and family meetings. This service is offered in addition to the existing means of communication that patients may have.

Whilst visitor restrictions have eased, bedside videoconferencing has demonstrated benefits beyond the pandemic. All bed spaces in the ICU remain enabled for videoconferencing, which can be utilised by families who do not live in Sydney or are unable to travel. Going forward, the ICU team is committed to using this model to help patients stay connected with their loved ones.

Family Meetings

Family meetings are held between clinicians and families for patients with complex needs and to support end of life decisions when needed. Family meetings are attended by ICU doctors and nurses, specialty teams, social workers and the patient's family. Due to visitor restrictions, in-person family meetings were significantly limited during COVID. To address this, the ICU introduced a videoconferencing option alongside phone calls which were offered previously.

*See NSW Health videoconferencing guideline

Reported benefits of the model

Patient and family benefits

- Family can be present in the ICU even when they can't physically be there
- Isolated family members can participate in family meetings by video
- Videoconferencing provides an easy to use option that is accessible by anyone with a computer, smartphone or mobile tablet device, and internet connection
- Patients can interact with family during visitor restrictions
- Patients can connect to remote family who would not have been able to participate previously (including interstate and internationally)
- The use of NSW Health videoconferencing platforms allows patients to connect in a way which maintains privacy and confidentiality
- Enhances interpreter translator services (when compared to audio only).

Clinician benefits

- Ability to interact with family members in an enhanced manner using videoconferencing when compared to phone calls
- Ability to link interpreters into the ICU and family meetings in a streamlined manner
- The solution is easy to use and designed to be secure and simple for clinicians.
- Staff are able to offer a solution that maintains confidentiality for patients
- Opportunity for consulting clinicians to provide care virtually
- Enhances contact and communication with families overseas.

Service benefits

- Facilitates patient-centred interactions between clinical teams, patients and families
- Provides an alternative to in-person meetings for the ICU to offer to patients and families during visitor restrictions or when isolated
- Allows improved patient and family experience through connecting patients and family members for family meetings
- Establishing a videoconference has minimal impact on clinical staff's workload.

Overview of the model

Key elements of the model

Element	Detail
Patient population	<ul style="list-style-type: none"> All patients admitted to the ICU at RNSH can access videoconferencing if they choose to If patients are unable to consent, their next of kin is asked to provide consent for participation and approved participant names
Healthcare team	<ul style="list-style-type: none"> ICU Nurses ICU Social Workers ICU Specialists ICU Administration Team Interpreters
Technology	<ul style="list-style-type: none"> Bedside computers on wheels with webcams and built-in speakers are allocated to each bed space Pexip platform with a unique Virtual Meeting Room (VMR) number assigned to each bedspace Computer on wheels with enhanced camera and speaker for family meetings held in a larger meeting room RNSH ICU website* for information to family members on what videoconferencing is and how to connect.

Services

A key element of the service is the simplicity for both nursing staff and family members.

The local ICT team added unique links to the desktop of each computer. This brings the patient's bedside into the videoconference as a host with just one click.

Calls can occur at any time and can accommodate family overseas or those who may be working during designated visiting hours. To access a video call, family members contact the bedside nurse and request a call. This is arranged specifically with nursing staff on duty. Family are then provided

instructions verbally and a virtual meeting room number to connect to at the agreed time. Family are referred to simple connection instructions and further information on the RNSH ICU website.

Following this, all nursing staff need to do to start the conference is click a link and then admit each family member to the virtual room at the set time. At the end of the videoconference nursing staff will disconnect all participants.

Patients who are well enough and have their own devices can choose to use the hospital's patient Wi-Fi to connect with their families. Access to this service is optional and designed to assist patients and loved ones to connect when needed.

*See RNSH ICU website

Workflow diagram

Figure 1: Initiating a secure videoconference with family and loved ones

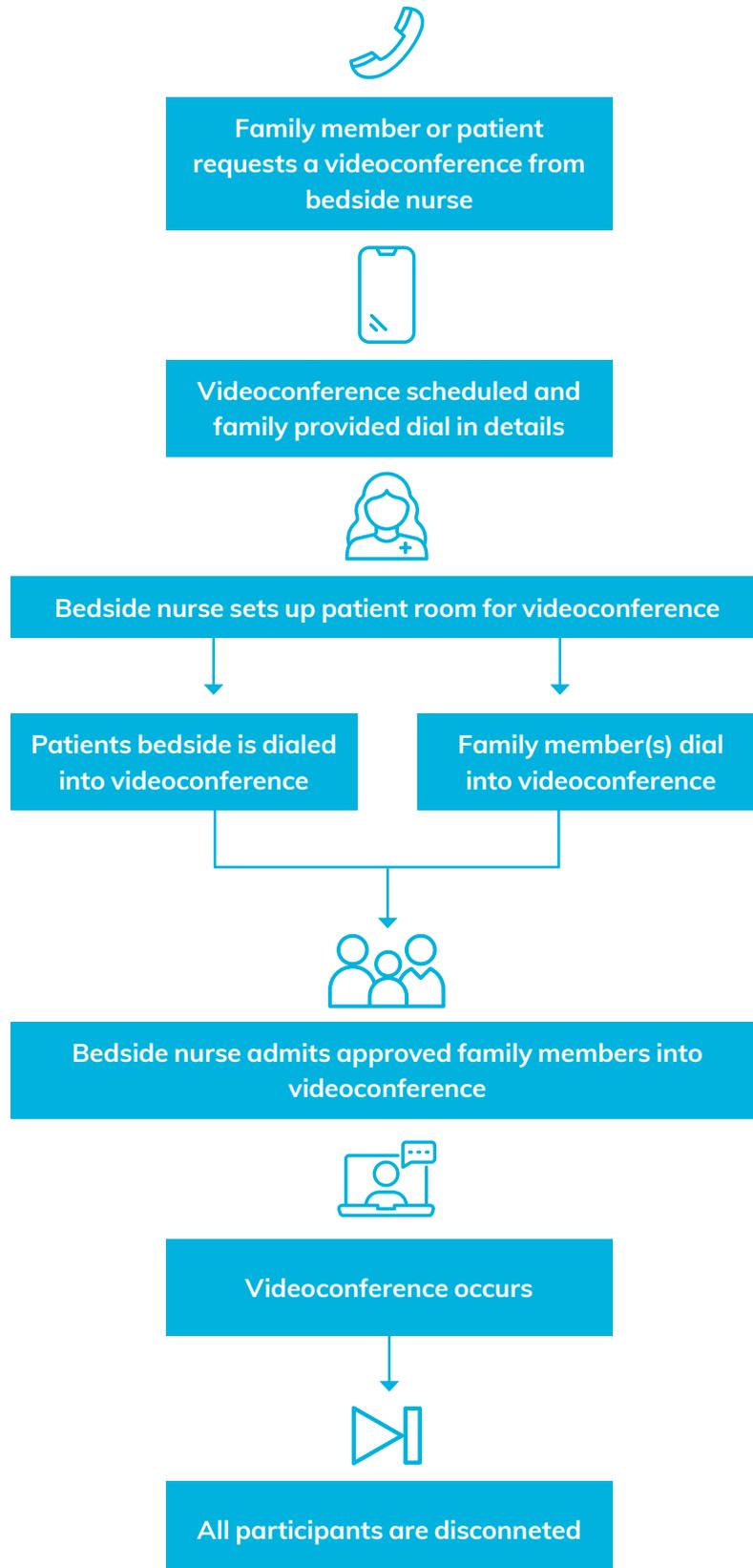
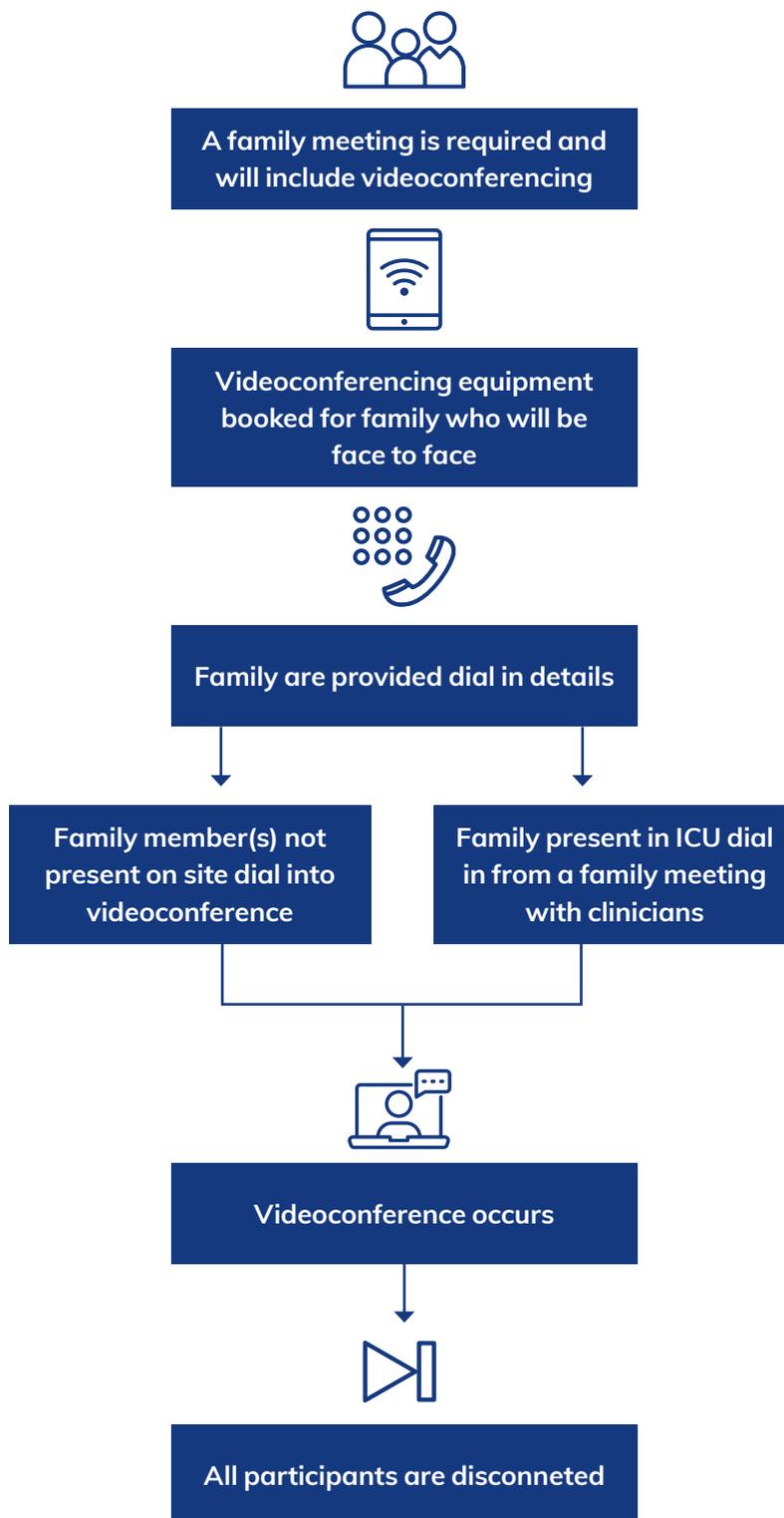
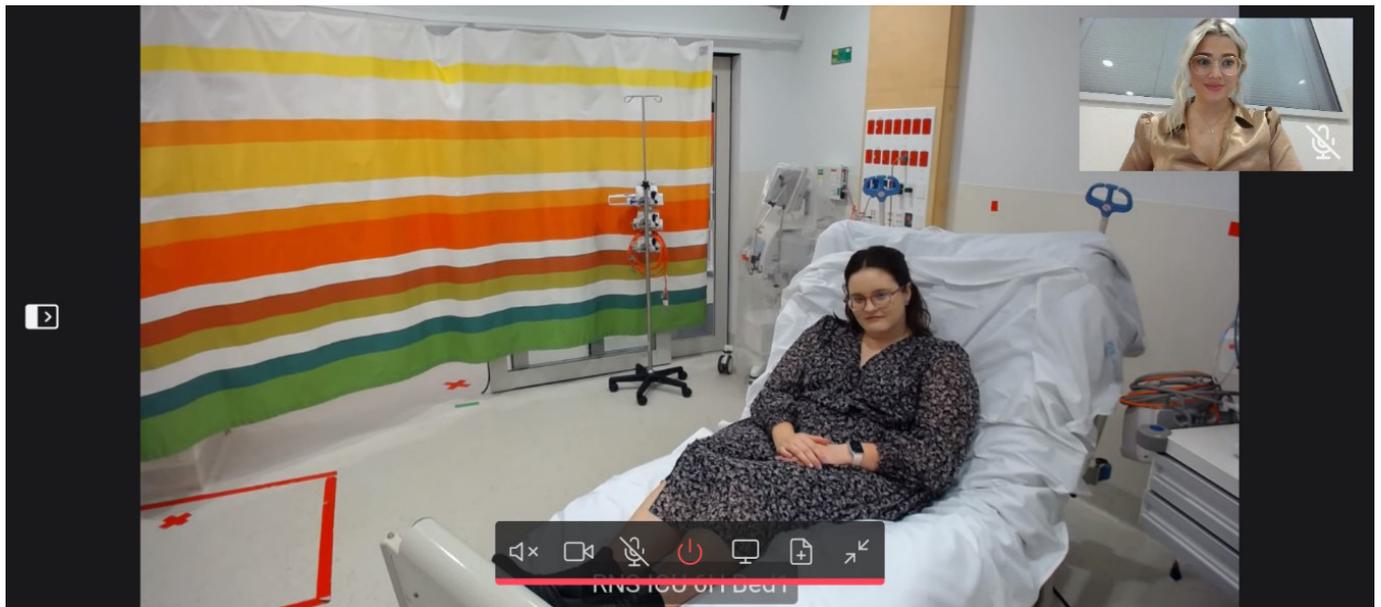


Figure 2: Initiating a family meeting with approved family members.





A demonstration of the bedside videoconferencing set up at RNSH ICU.

Family Story

Bryan* lives with his family near Byron Bay, an eight-hour drive from RNSH. Following an admission to Lismore Base Hospital for an infection, Bryan needed to be moved to RNSH for a higher level of care. Bryan spent five weeks in ICU and was not conscious for most of this time. Whilst in the ICU he underwent 10 surgical procedures.

Bryan's wife shared her experiences accessing the videoconferencing and the impact it had on their family:

'The videoconferencing was wonderful for keeping us up to date with everything – we spoke every day to the doctors and nurses. We set the TV up with the screen and the video link and it was as though we were in the same room as him. It was an emotional time, but we could do it as a family – even the dog would come in and bark at the TV. It was invaluable.'

We were introduced to two of the doctors over video link – the nurses explained what the equipment was in the video – it allowed the family to understand what was happening. We were able to put faces to those who were caring for Bryan.'

If it wasn't available, I would have had to stay long term in Sydney – there wasn't a lot of point being there when Bryan was in the coma. I would have been staying the hospital until he came out of it. With the video link the whole family could carry on with life but keep in contact. It kept everything as normal as it can be in a situation like this.'

We don't know what we would have done – we would have been a lot more worried and had a lot less sleep if we didn't have the video links.'

* Name changed to protect patient privacy and confidentiality

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

Processes

- Where appropriate and in line with public health advice, the preference is for family members to visit the patient in ICU in person. This model was developed to support family members who are unable to visit due to visitor restrictions or geographic distance from RNSH or other commitments.
- Staff are encouraged to manage a videoconference in the same way as in-person visitors. Though not present in the room, family members can still hear what is going on in the room, so background noise is minimised, and staff need to be mindful of conversations and care tasks.
- A unique VMR number is assigned to each bedspace, meaning family members have only one number to dial for the duration of their loved one's stay. If patients are moved within the ICU, a new VMR is provided to family.
- The model has also been designed to be simple for staff to implement.
 - Desktop icons on computers support quick access.
 - The ICU produced an internal document* outlining how to set up a videoconference and considerations for staff, including the patient's environment.
 - A checklist is available for nursing staff to facilitate a videoconference (see appendix).
- Social workers and nurses recognise that it can be confronting for family members to see their loved ones in the ICU. These team members work with families in a similar way to an in-person visit to ensure they are prepared for the video call and have the support they need.

Enablers for implementation

- The physical set up of the ICU with a computer at every bedside assisted with the implementation of the model.
- The model was designed to be simple and easy to use for staff and family members, which is a key enabler of its success.
- There was significant clinical sponsorship from an ICU staff specialist to enable the design, implementation and continued use of the model.
- Once it is set up, resources developed, and staff trained, very little needs to be done to sustain this model.

Barriers to implementation

- The large number of staff working across four pods in the ICU which made it challenging to train all staff in how to use the model, however resources were developed to provide simple instructions. Staff report that the technology is easy to use.
- All 58 bed spaces needed to be set up with a unique clinical locked VMR. This required significant time to request, and bookmark the link onto the computer, however once established this does not need to be done again.

*See Instructions for Facilitating Bedside Videoconferencing in RNSH ICU in Supporting documents list

Governance

- All video calls occur over Pexip as this is a secure videoconferencing platform endorsed by NSW Health.
- Consent is collected verbally from competent patients or family members and documented in Electronic Record for Intensive Care (eRIC).
- All VMRs are set up to be automatically locked to ensure security.

Key tasks in the setup of the model:

- Request an individual VMR for each bed space
- Install webcams
- Work with LHD ICT teams to install direct links to the VMR on computers
- Educate staff and develop staff and patient resources.

'We had a patient who watched Shaun the Sheep with his grandson every day at 4pm. It was important for him and his grandson to keep this tradition even though he was in hospital far away. Pexip allowed them to do this.'

SENIOR SOCIAL WORKER, RNSH ICU



A demonstration of how Dr Josh Pillemer (ICU Staff Specialist) can connect into a family meeting room using the videoconferencing equipment.

Building engagement

Key partners and stakeholders

- Patients and family members
 - This model has been developed and implemented to support patients and family members during an ICU admission.
 - Use of videoconferencing is an additional offering and remains optional for family members. Where appropriate, visiting in person remains available and is encouraged.
- Nursing staff
 - Nursing staff are a key partner in the model as they liaise with families to set up the videoconference. This includes providing dial in details to family members and connecting the patient's end.
- Social workers
 - Social workers are instrumental in communication with patients and families and support communication alongside nursing staff.
 - Social workers assist families to set up videoconferences for family groups.
- NSLHD Telehealth Project Officer
 - Supported the technical implementation of the model and liaised with eHealth to ensure the solution met the needs of families and clinicians.
 - Interfaced with local ICT teams to support the addition of hyperlinks onto each computer.
 - Assisted with procurement of webcams.

- As the ICU has over 300 nurses, it was challenging to educate the entire team. The following activities were undertaken to support rollout:
 - How to guides and checklists were developed and provided to staff through the ICU intranet.
 - Staff were offered short demonstrations to learn how to use the technology at the bedside.
 - Newsletter updates provided information on the new model.

Clinical leadership and champions

- All staff in the ICU are encouraged to offer videoconferencing to patients and their families.
- The model is supported by the clinical director of the ICU and led by an ICU staff specialist.
- Nursing staff and social workers are instrumental in the day to day use of the platforms and in promoting the service.

'The model provides a simple and secure videoconferencing solution that supports a huge variety of platforms for families, while requiring very minimal input from clinical staff.'

STAFF SPECIALIST, RNSH ICU

Staff engagement

- The implementation of videoconferencing was led by an ICU Staff Specialist from within the department and supported by social workers.
- In order to engage other staff, the model was designed to be simple and easy to use. This includes both the processes staff follow and the information that is provided to family members.

Technology and resourcing

Appropriate technology

- Pexip is used for both patient and family videoconferences and family meetings.
- Pexip is used in its standard form with no additional enhancements. Support was provided from eHealth to create links directly into the VMR. This enables the one click function for nurses described previously.
- All bed spaces in the ICU have two computers, one inside the patient room and one outside the room. This was introduced when eRIC was rolled out in the ICU and allows clinical staff to access notes either at the bedside or just outside the room. Having two computers means that one is available for nursing staff and one for the patient.
- Computers in patient rooms have a screen with built-in speakers. A Logitech C930E webcam was added to the computer inside every room.
- All webcams have a privacy shutter, which is used to provide reassurance to patients and their families that they are not being watched by the camera when not participating in a videoconference.

- For family meetings an additional computer on wheels was enhanced with a wide view Panasonic camera and Jabra 810 speakerphone. This allows a full meeting room to be seen on the video, which would not be possible using the Logitech webcams.
- The use of a computer on wheels rather than a videoconferencing machine allows mobility and the option to share the patient's information and medical record from eRIC within the conference.

Planning for technology implementation

- Each bedspace is allocated a Pexip VMR with a naming convention of RNSH ICU [Pod] [Bed Number]. This allows multiple videoconferences simultaneously.
- To ensure ease of use for nursing staff as well as security, a separate link was created for each bed space. When clicked, this link brings the bedside into the conference as a host, meaning that the conference pin is not shared widely.
- Links were added by the local ICT team to the desktop of each computer, so they remained when the computer was restarted.
- The RNSH ICU website was updated with information for family members on how to connect to Pexip.



Dr Josh Pillemer (ICU Staff Specialist) and Emily Mahony (ICU Social Worker) alongside a bedside computer used to connect patients and family members.

Benefits of the model

Results



From April 2020 to March 2021:
223 videoconferences occurred. This included:
 – 22 virtual family meetings connecting
 105 participants
 – 201 videoconferences connecting
 770 participants



134 hours
 of videoconferencing occurred



On average each call had 4 participants.
 The largest call had 39 participants



The average length of calls for all calls was 34 minutes, highlighting that families did spend extended periods with their loved ones



Participants joined from across NSW, Australia, and internationally



A [Facebook post](#) about this model on the official RNSH Facebook page received over 1100 likes



The service was included in a case study by Pexip*

Benefits

1. Family members can connect to their loved ones from anywhere.
2. This model is patient centred and allows choice and connection with family.
3. Families who can't travel to ICU are still able to connect with their families.
4. The model was designed to be simple for clinicians to implement.
5. The model was low cost to implement and is sustainable.

'The most striking aspects of the RNSH ICU videoconferencing model are the speed and cost-effectiveness of its deployment. Through small upgrades to existing hardware and use of district-supported software, we were able to rapidly convert our existing bedside computers into fully functional videoconferencing stations - providing patients in all of our 58 bed spaces with the opportunity to connect with their families.'

STAFF SPECIALIST, RNSH ICU

*See Pexip NSLHD case study

Monitoring and evaluation

Whilst there has not yet been an evaluation of the model, there are many positive patient stories associated with the use of the videoconferencing model. Due to the cohort of patients (intensive care) and family members who are utilising the technology, it is challenging to survey patients and family members on the use of the technology.

As this model has been developed to enhance the patient and family experience, any monitoring and evaluation activities should focus on how videoconferencing has supported this.

It is also important to understand staff experiences to ensure this does not create a significantly increased workload for clinical teams. Implementing ways to capture patient and clinician experience is a future opportunity for exploration.

Pexip utilisation data is available to monitor the usage of both bedside VMRs and family meeting VMRs. A significant use case has been demonstrated for this technology in facilitating communication and end of life care.

Opportunities

There are opportunities for ICUs around NSW to implement a similar model for both patient and family videoconferencing and family meetings. As this model has utilised existing infrastructure and NSW Health videoconferencing platforms, it is scalable across many ICUs.

There is an opportunity to consider the applicability of this program to other clinical settings where family meetings can occur. This may include aged care and rehabilitation.

A further opportunity for the model is to use the existing technology for consultant teams to review patients or for overnight reviews by ICU consultants.

Appendix – Videoconferencing checklist for nursing staff

Videoconferencing checklist

Obtain consent for videoconferencing:

- Patient competent – consent is implied
- Patient not competent (or under 16 years of age) – need consent from person responsible

Document details of consent in eRIC:

- Discussion with person responsible
- Names of all approved people who can join a videoconference with the patient

Discuss with relative/loved one:

- Arrange an agreed time for videoconference
- Arrange an agreed duration of videoconference
- Give them the VMR number
- Direct them to information on rns ICU.org
- Give relative a warning of what to expect

Prepare bedside computer:

- Power and network cables connected
- Computer powered on
- Webcam privacy flap opened
- Pexip videoconference started (via desktop shortcut)
- Computer/webcam positioned appropriately

Prepare patient:

- Patient covered and cares/procedures completed

At agreed time, allow relative/loved one in to videoconference

- When name appears on left side of screen, click on the green tick next to the name

Supervise videoconference as required

- Warn any staff/visitors wanting to enter bed space that videoconference is in progress
- Ensure that patient's comfort and dignity are maintained throughout
- Ensure agreed timeframes are kept

Conclude videoconference when appropriate

- Select 'Disconnect all' from menu on left of screen

References and links

[RNSH ICU Website](#)

[NSW Health Videoconferencing Platforms Guideline](#)

[Pexip case study](#)

Supporting documents

[Instructions for Facilitating Bedside Videoconferencing in RNSH ICU](#)

Acknowledgements

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Ms Emily Mahony, Senior Social Worker, ICU, RNSH

Ms Emma Cardwell, A/Nursing Unit Manager, ICU, RNSH

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

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