Innovation in Applied Nursing Informatics
G. Strudwick et al. (Eds.)

doi:10.3233/SHTI240185

Hospital in the Home: Nurse-Led Models of Care and Pathways

Lucy A. WESTBROOKE[1]
Te Whatu Ora – Health New Zealand, Auckland, New Zealand

Abstract. Hospital in the Home (HITH) model of care was developed to support the COVID-19 response and the need to deliver care in new ways to ensure secondary care services were free to deliver care to the sickest patients and not be overwhelmed by the COVID-19 patients needing hospital-level care. Intermediate Care Services, led by nursing and allied health stepped up to the challenge and collaborated on the development of the HITH model of care with defined pathways. This provided hospital-level acute health services in the home that was a clinically safe alternative option to inpatient care. The establishment of HITH released bed capacity and resources and therefore prevented the need for expanding hospital inpatient capacity at a time where resources and staff were constrained. Care delivery was achieved by utilising both in-person visits and telehealth. Technology supported the care delivery which allowed patients, whanau (family) and clinicians to be connected.

Keywords. Hospital in the Home, HITH, Models of care, Pathways development, Nurse-led services, COVID-19, Intermediate Care

1. Introduction

COVID-19 was the catalyst for embedding the "Hospital in the Home" (HITH) model of care, combining secondary care medical oversight with nursing and allied health safe, community-based care, close monitoring, and on-going care for patients in their own homes in Aotearoa New Zealand (New Zealand). This service was established during the COVID-19 pandemic, in November 2021, even as the health reforms were underway to create one nationwide health entity, Te Whatu Ora – Health Zealand. This came into effect with the passing of the, Pae Ora (Healthy Futures) Act 2022 legislation [1].

New Zealand healthcare services are primarily delivered under a publicly funded model where there is an expectation that care is free in the secondary sector and only a small co-payment is made for primary healthcare. New Zealand, as with other developed countries, faces issues of providing equitable health care with limited resources, including financial and work-force resources. The healthcare reforms have merged twenty districts and support agencies to create one entity, Te Whatu Ora – Health Zealand, who from 1 July 2022, became responsible for delivery of healthcare services and is currently consolidating and standardising healthcare delivery.

[1] Corresponding Author: Lucy A. Westbrooke, Clinical Informatics, Data and Digital, Health New Zealand | Te Whatu Ora, PO Box 28-127, Remuera, Auckland 1541, New Zealand. Email: Lucyw@adhb.govt.nz

This case study outlines the work to establish the HITH service in one of the districts in the northern region, Te Toka Tumai – Auckland. Te Toka Tumai worked collaboratively and with the adjacent Auckland Metro districts of Waitematā and Counties Manukau in the Auckland metropolitan region on development of HITH.

2. Background

COVID-19 had a major impact on both New Zealand and the healthcare services. As the pandemic rapidly spread with major impacts on populations and healthcare services worldwide, it was recognised that the New Zealand healthcare system would not be able to cope if COVID-19 became prevalent in New Zealand before vaccinations could be developed and rolled out. For the first time New Zealand closed the borders to all non-citizens/residents and introduced managed isolation facilities in an attempt to limit and delay the entry and spread of COVID-19. Lockdowns were imposed to control any COVID-19 detected and plans were developed for how to adapt healthcare delivery when COVID-19 was no longer able to be controlled.

The COVID-19 response was led from the Northern Region Healthcare Co-ordination Care (NRHCC) which developed processes and systems for border control and managed isolation in the community, while the hospital services developed systems and processes for hospital admissions.

The Intermediate Care Services was already established using a multidisciplinary approach. This service bridged the gap between hospital and locality services for low acuity adult patients with reversible healthcare needs who no longer needed hospital level care. It aims to provide early and more intensive nursing and therapy interventions in community settings. In response to COVID-19 the service developed a risk-base model for COVID-19 positive patients, combining essential elements of inpatient (secondary level) hospital care with care in the home by utilising the current infrastructure and staff and adding in physician oversight in a truly multidisciplinary care model. It supported timely discharge for medically stable patients who no longer required inpatient clinical investigations or treatment but who were not yet medically cleared for discharge from secondary to primary care.

The establishment of HITH released bed capacity and resources and therefore prevented the need for expanding hospital inpatient capacity at a time where resources and staff were constrained. With the borders closed the usual migration of healthcare workers all but ceased and new models of care were essential to utilise the available workforce.

3. Intermediate Care Services and Development of Care Pathways

Intermediate Care Services is a multidisciplinary team of nursing and allied health. This team manages both Rapid Community Assessment and Treatment (RCAT) and the Interim Care Programme (ICP). RCAT provided rapid and intensive nursing or therapy input to patients aged over16 years in their homes. The ICP provided expertise, advice, and oversight to patients in community-based hospitals and residential care facilities. The COVID-19 response had nurses at the forefront in all arenas and the Intermediate Care Services was well placed to extend its service to deliver HITH.

Steering and working groups were established and led by senior nurses. The COVID-19 pathways development was led by nurse specialists and nurse consultants with input from all members of the multidisciplinary team. The main patient groups considered for management on a COVID-19 pathway were:

- All adults (16 years and over) who presented for hospital assessment within the first 28 days of COVID-19 illness
- Patients being discharged from hospital after a period of inpatient treatment on a ward
- Patients with COVID-19 who required closer monitoring for non-COVID-19 related conditions
- HITH pathway to support admission avoidance and early supported discharge for non-COVID patients
- Patients who met HITH adult COVID-19 criteria and required Paxlovid or IV Remdesivir administration and monitoring with a clear care plan documented on discharge summary.

The COVID-19 pathways developed documented the eligibility criteria, exclusion criteria, steps for enrollment into HITH, monitoring while under HITH care, escalation pathway for deteriorating patients, steps for transfer to hospital, and discharge from HITH criteria. The pathways implemented were:

- Adult COVID-19 pathway
- Oncology/Haematology/Immunocompromised COVID-19 pathway
- Obstetric COVID-19 pathway
- IV Remdesivir pathway
- Ngāti Whātua Ōrakei (for Māori, the indigenous people of New Zealand) COVID-19 pathway.

Central to the success of this service delivery model was the Te Ao Māori value of whakawhanaungatanga, which is about relationships and connections. To achieve equitable outcomes, the team needed to have the ability to respond to acute changes in health or functional status of patients. Early comprehensive assessments, effective interventions that avoided the need for unnecessary hospitalisation and early recognition/re-assessment in hospital for deteriorating patients. This was achieved through the concept of whanaungatanga when successful engagement between the patients, whānau/family, clinicians, and service occurred. Ngāti Whātua Ōrakei was the Māori iwi who collaborated and provided nurses to deliver HITH services direct to Māori patients in a culturally safe way.

The success of HITH in the adult COVID-19 pathways was reflected in two key areas: the support of patients and whānau through their care journey in a holistic way and releasing capacity within the hospital through earlier discharge. The development of HITH provided a safe alternative option to hospital care and increased capacity without requiring a new wards or facility builds or significant capital investment to refurbish existing facilities.

4. Hospital in the Home Care Delivery Model

The clinical record for the patients, including assessments and care plans, was recorded electronically in the national Border Control Management System (BCMS) which was later renamed to the COVID Community Care Module (CCCM). This system allowed

access to the clinical record for COVID-19 for all healthcare providers across the continuum of care. The system was connected to the national results reporting repository where positive cases for COVID-19 would trigger enrolment into the BCMS system. The information collected in the national systems not only provided clinical information for direct care delivery, but allowed for anonymised data to inform wider decision making on COVID-19 prevalence, care requirements and where care was being delivered.

A new virtual ward for HITH was configured in the hospital patient administration system as there was already virtual wards established for RCAT and ICP. These wards had "whiteboards" to display an "at a glance" list of patients and all the key fields. Twice daily "rapid rounds", utilising the HITH ward whiteboard, with medical, nursing, allied health and midwifery staff ensured smooth communication between team members and rapid updating of data.

Care was accomplished by utilising both in-person visits and telehealth modes of delivery. Telehealth as a care delivery model already existed when COVID-19 arrived so this was extended and rolled out throughout the organisation including Intermediate Care Services. Telehealth technology and remote patient monitoring supported care delivery which allowed patients, whanau/family and clinicians to be connected even when residing in different locations. The remote patient monitoring was in its infancy as platforms for automatically acquiring data were not prevalent. There was a reliance on supplying biometric monitoring equipment such as pulse oximeters, sphygmomanometers, weight scales etc. to patients who entered HITH and then utilising telehealth or in-person visits to review data and make decisions.

Patients with COVID-19 also had access to support from the "Manaaki" support services who could provide food and other supplies for patients who were isolating but lacked access to support systems.

Patients and whanau where given instructions of what actions to take if they had concerns or were deteriorating. There was urgent care coverage by Intermediate Care Services from 07:00 until 22:00 hours. Overnight the on-call Medical Registrar or Emergency Department responded to patients who needed care. Electronic ordering of medications and laboratory tests were supported by community pharmacy dispensing and delivery and community laboratory staff visiting patients in their home. Patients whose condition was deteriorating were either visited by the HITH community nurses or ambulances were dispatched for paramedic on site assessment and if necessary, transport back to the hospital.

Visualisation of the Intermediate Care Services for senior management and the Integrated Operations Centre (IOC) was achieved with the use of Power BI dashboards. These dashboards provided "at a glance" information on the patients in the various Intermediate Care Services, including HITH, and the resources available to provide care. The IOC had an immediate idea of capacity inside the hospital and in the community. If decompression of the inpatient services was required, they would know how much capacity there was to send patients home under HITH or RCAT care.

5. Expansion of HITH

Patients discharged to primary care under the RCAT care with General Practitioner (GP) medical oversight were incorporated into HITH so there was a mixed model of medical oversight for HITH patients. The HITH service has now expanded pathways

from COVID-19, immunocompromised, oncology, obstetric patients, into pathways for respiratory conditions, heart failure and cellulitis, and in addition, RCAT has become one of the pathways. Work is underway to develop additional pathways to support general care pathways for adults and specific pathways for diabetes, surgical, palliative and frailty. This will expand the range of services Intermediate Care can support.

The core principles of HITH that have been met are:

- Ensure a "culturally safe" approach throughout all aspects of the HITH model.
- Any solutions proactively work to accelerate equitable outcomes.
- Ensure active partnerships with Māori to have oversight and shared decision making so that Māori knowledge informs and drives the work.
- Regional collaboration and alignment of key clinical pathways provide the ability to flex within the region to support capacity and demand management.
- Patient care is holistic and tailored to individual need.
- Engagement in care 'closer to home' and support people in the community with acute needs to prevent further deterioration in their condition.
- Broad definition of "home", to where they reside which can include Aged Residential Care (ARC), a Retirement Village, or their own residence.
- Acute demand management support.
- Support better integration of community care models.

6. Conclusion

The implementation of HITH imposed as a response to COVID-19 has been extremely successful and is now embedded. Work is underway with the four northern region districts to align and develop a standardised HITH service.

Te Pae Tata – The New Zealand Health Plan [2] lists six priority actions. The fifth action is to "Develop greater use of digital services to provide more care in homes and communities". This provides a mandate to continue the development of the HITH services. Te Toka Tumai's Intermediate Care Services will be able to leverage the work of other districts who have been trialing remote monitoring devices for HITH patients.

The rapid establishment and the ongoing evolution of the HITH service is developing a trajectory toward the Virtual Hospitals of the future. Already Te Whatu Ora has commenced work on "Virtual Care" with a horizon scan. The advances in technologies supporting people in their homes are rapidly growing and we have great opportunities with the health reforms to leverage this to design new ways of working where we are not limited or restricted by physical institutions. Nurses have a major part to play in this new era and are embracing and leading it.

References

[1] New Zealand Government: Pae Ora (Healthy Futures) Act 2022. Available: https://www.legislation.govt.nz/act/public/2022/0030/latest/LMS575405.html.
[2] New Zealand Government: Te Pae Tata Interim New Zealand Health Plan 2022. Available: https://www.tewhatuora.govt.nz/whats-happening/what-to-expect/nz-health-plan/