Critical Intelligence Unit

In brief

Alternate models of providing health care

15 August 2023

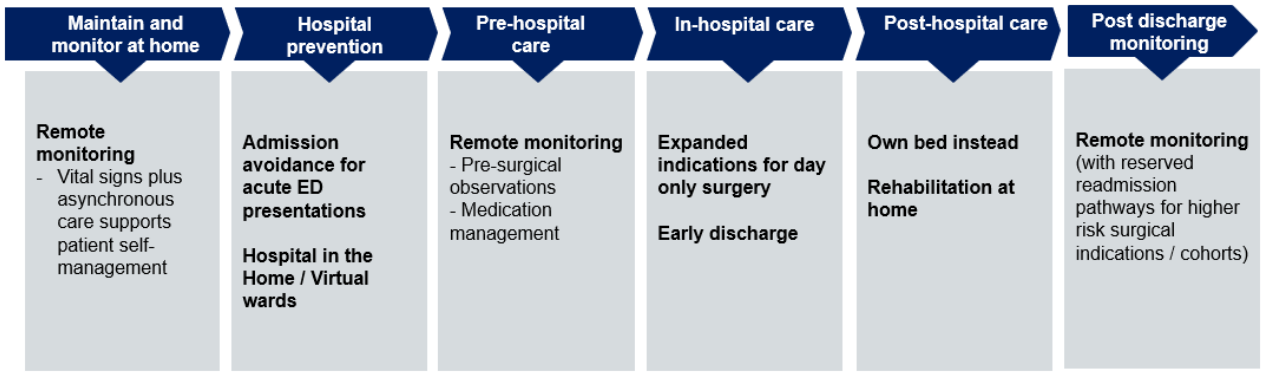
Summary

NSW Health is seeking to identify and implement alternate ways of providing health care with a view to enhance delivery models and address current resource challenges.

There are a range of evidence-based initiatives that have been shown to be non-inferior to, or better than standard care (that is, no worse in terms of patient safety and outcomes).

This In Brief provides details about seven specific alternate models of care which can be applied at different points along the patient journey (Figure 1). A short case study describes each of these models – describing the model, outlining the peer reviewed and grey literature and significant clinical applications.

Figure 1: Alternate care models – a patient journey perspective



Alternate models can drive significant changes in the use of hospital beds, resulting in:

- No hospital admission
- Admission ‘at home’
- Shorter hospital admission

Implementation of alternate models will rely on reviews of staffing and costing frameworks. For example, the adoption of revised nurse:patient ratios for virtual care; district funding streams for alternate models.

Eleven clinician members of the NSW Health System Advisory Council (HSAC) and the Clinical Expert Advisory Group (CEAG) provided examples of clinical cohorts and procedures that are appropriate for adoption of each alternate model. Their responses populate the boxes at the base of each of the case studies.

NSW GOVERNMENT

Maintain and monitor at home

Case study 1 – Remote monitoring

What is it?

Remote monitoring enables patients to stay connected with health professionals outside of formal care delivery settings (such as hospitals and GP clinics). Remote patient monitoring has potential value in a wide range of alternate models of care – maintain and monitor at home (self management), pre-hospital, and post discharge care.

Peer reviewed literature

Studies have shown that remote monitoring programs are not significantly different to usual care in terms of mortality or rehospitalisation for heart failure, chronic disease, COPD [1-11]

Remote patient monitoring is associated with:

- A reduction in patient associated costs and healthcare presentations for heart failure, chronic disease [8]
- Improved clinical outcomes such as decrease in glycated haemoglobin for diabetes monitoring and higher rate of detection of atrial arrhythmia in stroke [12, 13]

Grey literature

- In 2016, the CSIRO published an evaluation of a remote monitoring approach and reported a 53% decrease in hospital admission, a 76% reduction in length of stay if admitted to hospital and >40% lower mortality. Most patients (88%) reported that they were satisfied with the telemonitoring service.[14]
- In the UK - remote monitoring is a key element of central policy – England's NHS @home approach, and Scotland's Digital Health and Care Strategy delivery plan. [15-17]
- A University of Queensland study outlines successful remote monitoring programs, including the connected health home care program in Australia which reported a 44% decrease in emergency admissions and a 59% decrease in the cost of care.[18]

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Diabetes, including gestational diabetes
- Asthma
- COPD
- Congestive cardiac failure (CCF)
- Wound care
- Acute venous thromboembolic disease
- Mental health conditions such as anxiety, mood, personality disorders; psychological aspects of pain

Other comments:

- Non-life-threatening infection is ideal (as infection protocols are much harder in hospital than at home)
- Most diagnoses where there is either:

  - A capability of a clinical team to response any time of day/night to abnormal observations or
  - An acceptance that remote observations will only be taken when a clinical team is available.
  - Patient is medically stable enough to stay at home and doesn't require services only available in hospital (such as needing surgical intervention, high flow oxygen, specialised equipment etc etc).
- Most of the conditions already managed by HITHs are amenable to remote monitoring
- Conditions that are suitable for maintain and monitor; chronic conditions; or patients that have a diagnosis and are at a stage of clinical stability requiring specific monitoring with a nimble care plan to admit if certain criteria are reached
- Patients having regular planned treatment e.g. dialysis, infusions
- Pre-hospital care- pre-surgery optimisation or rehabilitation
- Post hospital - early discharge post procedures, potential for discharge with remote monitoring option e.g. falls monitoring, heart rate or BP monitoring, respiration / oxygen saturation monitoring, similar to during pandemic

Hospital prevention

Case study 2 – Admission avoidance for acute ED presentations

What is it?

Alternate models to avoid presentation to the emergency department among patients with acute medical conditions include outpatient care models, quick diagnostic units, observation units and general practitioners or specialists in the emergency department.[19]

Peer reviewed evidence

- Overall, alternative models of care are promising in terms of reducing presentations to the emergency department and subsequent admissions, especially for younger and otherwise healthy individuals without comorbidities.[19]

Grey literature

- NSW Health has partnered with the Commonwealth (Healthdirect) to build the Community Single front door initiative to help patients navigate their care to the right place in the right time with the aim to build a national 222 service that direct non-emergent care to the right care settings closer to home.[20, 21]
- The single front door will provide facilitated access to all non-emergent healthcare services (not just NSW Health) in NSW.

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Transient ischemic attack (TIA)
- Infectious diseases, i.e., lower acuity respiratory infections (mild/moderate CAP)
- Orthopaedic injuries
- GI bleeds
- Heart failure
- Pneumonia
- Delirium
- Falls
- Diverticulitis
- Stable DVT/ PE
- Skin infections such as cellulitis
- Hyperglycaemia (without DKA or HHS)
- Hyper or hypothyroidism without acute decompensation
- Dental without airway compromise
- UTI
- Asthma
- Cystic fibrosis
- Wound care

- Minor trauma
- Mental health
- Hyperemesis Gravidarum and threatened miscarriage - requires early link into Midwifery/GP/Obstetric models

Other comments:

- Conditions requiring IV antibiotics
- Most medical conditions are amenable to being treated at home providing an adequately resourced team is able to see the patient instead.
- Known diagnosis with treatment pathway not requiring acute intervention from the ED
- Conditions that overlap with HITH
- Chronic conditions with pre-existing management plan
- Rapid assessment by an experienced clinician, a clear plan for home treatment with safety netting for review as needed
- Any condition that would normally be sent to ED Fast Track
- Personality vulnerabilities leading to situational crisis or thoughts of self-harm
- Disability support outreach: Where people with complex disability show significant elevation in behaviours of concern that need assessment to determine whether they indicate a change in health status. (Similar to Geriatric Outreach Models.)

The Complex and RestorativE (CARE) Centre is a six-bed unit staffed by a multidisciplinary geriatric team. Patients are transported directly to CARE after calling for an ambulance and being triaged by a paramedic. Adelaide SA https://emj.bmj.com/content/40/9/641.long

Case study 3 – Hospital in the home / virtual wards

What is it?

Hospital in the home is a service that provides active treatment by healthcare professionals in the patient's home for a condition that otherwise would require acute hospital inpatient care.[22]

Virtual wards are the systems and staffing of a hospital ward while enabling the patient to get the care they need where they live, safely and conveniently, rather than being in hospital. [23]

Peer reviewed evidence

- Patient outcomes for hospital in the home are comparable to usual care models.[24]
- Hospital in the home can reduce presentations to emergency departments and hospital admissions, create cost savings, and are safe and effective at reducing length of stay.[22, 25]
- Contraindications to hospital in the home include patients with multiple medical conditions and in acute stroke management.[22, 25]

Grey literature

- NICE recommends provision of multidisciplinary intermediate care as an alternative to hospital care to prevent admission and promote earlier discharge.[26]
- NSW Health guidelines on hospital in the home.
- Successful virtual wards in the UK have used co-design, created confidence among patients and clinicians.[23]

- An evaluation of England's Croydon model (2021) estimated that the cost saving per virtual ward patient of £742.44 compared to a rapid responses control group.

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Selected infections requiring IV treatment
- Wound care
- Tracheostomy care and support
- Total parenteral nutrition administration
- Chronic respiratory conditions
- COPD
- Chronic heart failure
- Diabetes
- Hyperemesis Gravidarum - - maintenance, medication and appropriate follow-up from Hyperemesis Pathway.
- BP monitoring for women with Preeclamptic risk factors and escalating hypertension medication management
- Fracture
- Trauma follow-up (especially psychological care)
- Palliative care
- Cancer care follow-up (psychological)
- Minor trauma
- Falls
- Uncomplicated catheter changes
- Crossover with above

Other comments

- Cases where IV antibiotics, anticoagulation, family support required
- Acute infections requiring IV treatment but stable/ relatively stable observations. Site of infection may be less relevant.
- Ongoing management of chronic conditions
- Traditionally HITH has concentrated on very straightforward conditions like cellulitis and more recently has broadened scope to include older patients with complex comorbidities.
- HITH needs to broaden even further, and look at younger patients who are currently admitted but could be treated at home.
- Post-surgery care: pain, physiotherapy, rehab can all be done virtually

In-hospital care

Case study 4 – Expanded indications for day-only surgery

What is it?

Day only surgery is defined as specified surgical treatments which require admission for up to 24 hours for elective procedures.[27]

In NSW, up to 80% of all surgical patients could be treated as Day Only (24 hours) or extended day admissions.[27] The Ministry of Health and Agency for Clinical Innovation have worked together to identify targets for a tranche of surgery which can be performed as true day stay surgery. These targets have been endorsed by the surgical care governance taskforce.

In the UK, according to the *Getting it Right First Time* (GIRFT) initiative:

- All surgical hubs should adopt day case as their default option for the high volume and low complexity work.[28]
- 85% of all elective surgery (with minimal exceptions e.g. arthroplasty) should default to a day surgery pathway.[29]
- The British Association of Day Surgery (BADS) Directory of Procedures and National Dataset provides recommended benchmarking day case rates and national day surgery performance.[30]

Key features of high-volume short stay surgical centres include strict patient inclusion and admission criteria, criteria for safe discharge and dedicated resourcing (e.g. operating theatres and staff).

Peer reviewed evidence

- In preparation for a day surgery admission, prehospital remote care supports short stays for people undergoing surgery.[31]
- Post-surgery remote monitoring supports day only admissions with non-inferior outcomes compared to standard care and is well accepted by patients.[32]
- Appropriate pathways for counselling, follow-up and escalations for higher risk surgical indications/cohorts.[33, 34]
- Postoperative overnight high-acuity care in medium-risk patients undergoing elective and unplanned noncardiac surgery was associated with reduced major postoperative complications and increased days at home compared with usual care.[35]

Grey literature

- In NSW, there is a long-standing Extended Day Only model. It covers key principles, selection of procedures, key performance indicators and an implementation checklist.[27]
- Safer Care Victoria published key principles for safe introduction and expansion of day surgery models. It includes optimisation prior to surgery, as well as follow up options which include virtual care, pre-arranged GP or outpatient appointment or hospital in the home.[36]

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Joint replacement
- Terminations of pregnancy
- Dilation and curettage (D&C)
- Mastectomy

- Laparoscopic cholecystectomy
- Hernia
- Ureteroscopy/ stents
- knee reconstruction (I29Z) including multi ligament
- Septoplasty
- Functional endoscopic sinus surgery (FESS)
- Endometrial ablation
- Hysteroscopy
- Bunion and minor feet surgery
- Microdiscectomy
- Carpal tunnel

Other comments

- A greater consideration to the non-planned conditions suitable for day surgery
- One-stop-shop health assessment for people with complex disabilities (particularly where sedation and monitoring may be needed).

Case study 5 – Early discharge programs

What is it?

Early discharge programs link acute and community care. Inpatients return home and continue to receive necessary input from healthcare professionals or remote monitoring with options for rapid readmission.[37, 38]

One enabler of early discharge programs is nurse-initiated discharge. This involves nurse-led assessment of patients' discharge readiness and planning for earliest and safest time for discharge. It is usually protocol or criteria driven.

Peer review evidence

- There is high quality evidence that early discharge to 'hospital in the home' services is safe and effective at reducing length of stay. [37, 39]
- Early discharge programs are effective for patients in 'real-life' contexts[40] but are less appropriate for complex patients with multiple co-morbidities.
- There is evidence that nurse-initiated discharge represents a viable (non-inferior) alternate model in:
  - Stroke [35]
  - Paediatric services s[41, 42]
  - Emergency Department[43]
  - Medical inpatient services[43]
  - Post-surgical care[43, 44 43]

Grey literature

- Early supported discharge for stroke is endorsed by NICE in the UK and the Heart and Stroke Foundation in Canada.[45, 46]
- Retrospective data analysis from Queensland suggests that even 1 hour earlier discharge can significantly reduce overcrowding in the Emergency Department.[47]

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Diabetes
- Heart failure
- Pneumonia
- Orthopaedics
- Mandibular jaw fracture
- Fractures
- Some mental health conditions
- Vaginal hysterectomy
- Laminectomy (2 level)
- Transurethral resection of the prostate (TURP)
- Trans urethral resection of bladder tumour (TURBT)
- Some dressing management,
- Bowel resection
- General abdominal surgery

Other comments

- Well women postnatal period - early discharge home with well baby. Need to ensure appropriate follow up midwifery support in the community/home.
- Medication management
- One major issue that delays discharge, especially for older people, is rapid availability of community services. A temporary, readily available service providing that might allow for additional early discharges for a range of conditions.
- If there are limited funds and resources, they should be preferentially directed at hospital avoidance systems rather than early discharge programs.
- Criteria lead and team lead (rather than individual clinician lead) discharge.
- Requires good education of candidate patients/carers on what to expect regarding their condition and who to contact for advice if concerned while at home.
- Home carer needed and nimble support measures available 24 hours per day with telehealth, remote monitoring and with clear safety nets.
- Many ambulance presentations post hospital discharge occur because patients or carers haven't fully understood the advice that has been given on discharge.

Post-hospital care

Case study 6 – Own Bed Instead

What is it?

Patients who do not require an acute bed but may still require care services, are supported to return to their home or a community setting. Specialist follow up tests or procedures are provided via day visits to hospital. Assessments for longer-term care are undertaken in the most appropriate setting and at the right time for the person.[48]

Peer review evidence

These types of services have been used in:

- The NHS, via the *Discharge to Assess* program where the emphasis is on preventing patients becoming deconditioned while awaiting transfers out of acute care.[49]
- The UK, for COVID-19 patients, with a planned follow-up assessment schedule.[50]
- The US, for COVID-19 patients with a broad multi-disciplinary managing team.[51]

Grey literature

NHS patients in the "Own Bed Instead" program are discharged as soon as possible and supported at home. Its aims are:

- to provide rehabilitation in the community following illness/injury – day rehabilitation
- to support the management of long term conditions and disability. [52]

The service starts within 48hrs of discharge home from hospital, with an intensive 4-6 week rehabilitation programme.[52]

It utilises remote monitoring systems, where patients use a wearable devised which record information and transmits this back to the hospital for review.[53]

In Germany, hospitals can offer admitted patients the possibility to leave the hospital overnight if:

- they are acceptable from a medical point of view (decided on a case-by-case basis by the hospital/attending physician)
- the inpatient treatment during the day is of at least six hours
- the patient approves[54]

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Similar to HITH
- Chronic heart failure
- Chronic respiratory conditions
- Diabetes management
- Diverticulitis,
- Minor abscesses after drainage,
- Acute retention,
- Uncomplicated ureteric stones

Other comments

- Most hospitalised patients who are ambulant, cognitively intact, have stable vital signs, and do not require IV medications/fluids/drains or continuous monitoring overnight would be suitable.
- Ongoing monitoring for PET risk factors
- Day rehabilitation or home-based rehabilitation
- Medication management
- Lengthy infusions/medication administration with monitoring
- BP surveillance in pregnancy
- Patients who live alone should probably be excluded and remain in hospital until discharge.
- Residents of Aged care facilities that require a GP/RN review - non urgent but has limited experience within the nursing home.
- Requires good education of candidate patients/carers on what to expect regarding their condition and who to contact for advice if concerned while at home. Requires adequate advice to be available while at all times while patient is out of hospital.

Case study 7 – Home based post-acute rehabilitation program

What is it?

- A service that provides rehabilitation in a person's home for a condition that otherwise would require acute hospital inpatient care.
- Rehabilitation in the home has the potential to offer a cost-effective and high-quality alternative to inpatient care.[55]

Peer reviewed literature

Recently published (2020-2023) systematic reviews have found:

- Home-based rehabilitation is as effective centre-based programs after stroke, hip fracture and for pulmonary rehabilitation.[56-60]
- Improvements in forced expiratory volume in 1 second, forced vital capacity and quality of life for children or adults with cystic fibrosis when compared to conventional rehabilitation programs.[61]
- Home-based cardiac rehabilitation options are safe and cost-effective.[62, 63]

Grey literature

- A case study from Victoria, Australia noted benefits of home-based rehabilitation such as the applicability of therapy, involving the carer and other family members and the facilitation of the transition from hospital to home.[64]

Suggestions for appropriate clinical areas in NSW, from HSAC and CEAG

- Orthopaedic – including total knee replacement and total hip replacement
- Stroke post-acute
- Hip/knee replacements

- Fractures
- Hospital acquired deconditioning
- Trauma follow-up and care
- Abdominal surgery,
- Spinal surgery,
- Vascular surgery,
- Foot and ankle

Other comments

- Consideration to regional / rural options with virtual / at home supervision options.
- All that have home support, once again depends on systems to be in place.

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