Acknowledgements

The Agency for Clinical Innovation (ACI) recognises the unique position of Aboriginal people in the history and culture of NSW. The ACI would like to acknowledge the traditional owners of the lands and to acknowledge and pay respect to elders of the communities covered in this report.

The ACI would like to sincerely thank the large number of people involved in the development of the MAU Model of Care who gave willingly of their time and experience.

A special thank you to the NSW Ministry of Health for their considerable work in the developing the draft model of care as part of the NSW Medical Assessment Unit evaluation. In particular Sally Howard, Principal Policy Analyst, NSW Ministry of Health, Daniel Comerford, Senior Manager, NSW Ministry of Health.

The Agency for Clinical Innovation (ACI) is the lead agency in NSW for promoting innovation, engaging clinicians and designing and implementing new models of care. All ACI models of care are built on the needs of patients, and are underpinned by extensive research conducted in collaboration with leading researchers, universities and research institutions.

For further details on the ACI visit: www.aci.health.nsw.gov.au
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1. Glossary and Definitions

### MEANS

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<th>Description</th>
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<tr>
<td>ACI</td>
<td>NSW Agency for Clinical Innovation</td>
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<tr>
<td>ED</td>
<td>Emergency Department</td>
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<td>LHD</td>
<td>Local Health Districts</td>
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<td>SHN</td>
<td>Specialty Health Networks</td>
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<td>NSW</td>
<td>New South Wales</td>
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<td>MAU</td>
<td>Medical Assessment Unit</td>
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<tr>
<td>Person-centred medical home</td>
<td>patients, their families and carers have a continuing relationship with a particular clinician (usually a General Practitioner). This partnership is supported by other care providers in the 'medical neighborhood'. The medical home coordinates the care delivered by all members of a person's care team, which sometimes includes hospital inpatient care[1, 2]</td>
</tr>
<tr>
<td>ARRCs</td>
<td>Acute to Aged-Related Care Services</td>
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<tr>
<td>ComPacks</td>
<td>ComPacks is a non-clinical case managed program of community care (e.g. meal service, domestic assistance) available for people being transferred home from a participating NSW Public Hospital. Each package is available for up to 6 weeks from the time of the transfer home.</td>
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<td>ASET</td>
<td>Aged Care Services in ED Teams</td>
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<td>LOS</td>
<td>Length of Stay</td>
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<td>Potentially Preventable Hospitalisations</td>
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<td>Medical Assessment And Planning Units</td>
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<td>Acute Assessment Unit</td>
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<td>Acute Medical Wards</td>
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<td>Rapid Assessment Medical Units</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>AMS</td>
<td>Aboriginal Medical Service</td>
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</table>
2. Overview of Model

MODEL OF CARE (p7)

STAFFING (p11, 17)

PATIENT FLOW (p13)

GOVERNANCE (p15)

NSW PROGRAMS AND MODELS TO SUPPORT MODEL OF CARE (pp17-21)
3. Background

In NSW, the health system is complex with multiple services, providers, funding bodies and governance structures which have tended to operate as ‘silos’. At a local level, Local Health Districts (LHDs), funded by the State Government, and Medicare Locals (MLs), funded by the Commonwealth Government, are responsible for planning and delivering health care across primary, community and acute care settings in collaboration with General Practice (GP), Aboriginal Medical Services (AMS), Non-Government Organisations (NGOs), private health care professionals, and private health insurers.

Emergency Department (ED) crowding has been increasingly prevalent for over 20 years[3, 4], and acute hospitals have continued to experience a rise in the number of emergency admissions coupled with increasing hospital occupancy rates and a reduction in available inpatient beds. Growing admission rates are attributed to the increasing numbers of emergency presentations of elderly patients with multiple chronic diseases, raised expectations of care and lower thresholds for admission [5].

This growing demand for health services is in evidence in NSW: from 2005 to 2011, there was a 24% increase in ED presentations and a concurrent 10% increase in inpatient admissions. This demand is predicted to further increase by 28.2% for ED presentations and by 15% for inpatient admissions from 2005 to 2013 [6]. Additionally in NSW, hospital admissions for the over 75-year age group has grown by 25% from 2005/06 to 2011. When presenting to hospital via an ED, elderly patients may not be triaged as high urgency; their wait for assessment, diagnosis and treatment can cause delayed care for patients contributing to ED overcrowding.

In recent years, Australian health authorities and hospitals have responded to these challenges by introducing initiatives aimed at managing the increasing demand for services and reducing the impact of the fragmentation across the system. One such initiative is a model of care designed to fast-track patients with complex medical problems to the care of inpatient physicians and multidisciplinary teams who can best plan their management, care and disposition. In NSW, this model is known as a Medical Assessment Unit (MAU).

A Medical Assessment Unit is specifically designed to increase efficiency in patient management while maintaining or improving quality of care[7] and ultimately, assist with improving patient flow. The evolution of the Medical Assessment Unit (MAU) in Australia reflects current pressures on the health care system, especially the rise in medical admissions and the increased demand for inpatient beds. The MAU strategy has been designed to improve the management of inpatient beds and reduce length of stay in the ED and inpatient unit, by commencing assessment, diagnostics, treatment and preparation for earlier discharge. The MAU is designed to improve quality of care[7] while assisting with improving patient flow within a hospital and at the same time matching the demand for services to hospital capacity.

Patient flow is about ensuring that people receive the care they need, when they need it, with minimum waiting times. It is a key goal for hospitals as they aim to provide faster, safer and better care by keeping patients moving through the system and removing any blockages that impede flow[8]. A whole-of-systems approach is required to manage this patient flow and match service demand with service capacity[9]. This approach encompasses the entire patient journey extending from the Emergency Department through to the inpatient area and discharge back into the community. As such MAUs also play an important role in
coordinating the care of patients and ensuring that there are adequate links between care in
the hospital and the community.

MAUs in NSW were originally established as part of a program called Health Care for Older
People Earlier (HOPE). HOPE was designed as a model of care for medical patients that will
link the acute setting to support services in the community. As part of the Special
Commission of Inquiry: Acute Care Services in NSW Public Hospitals 2008, Commissioner
Garling commented on what is required for MAUs to be effective:

Medical Assessment Units need dedicated medical staff, including senior
physician cover, nursing, allied health and support staff. They also need effective
communication and referral systems, not only with Emergency Department triage,
but also with community services, primary care services, GPs and inpatient
services. These supporting systems need to be in place to ensure effective and
continuous care and efficient patient flow, given the patient groups identified as
appropriate for admission to Medical Assessment Units. This is because in most
cases, Medical Assessment Units are appropriate for patients who have had a
prior assessment by a doctor, be it a GP or at another hospital [10]

In his recommendations from the Inquiry, Commissioner Garling requested an increase in the
number of MAUs in place in NSW for assessment of chronic and complex patients prior to
admission. The NSW Government responded to this recommendation under Caring
Together: The Action Plan for NSW Health with a significant investment in the MAU model of
care.

MAUs have now been established in 29 hospitals across NSW since 2008. They were further
developed from the HOPE program in conjunction with the Physicians Taskforce and the
Acute Care Taskforce to deliver faster, safer, and better care for those patients with complex
and chronic conditions as an alternative to treatment in the Emergency Department.

To achieve this, the MAU is staffed by an experienced and comprehensive multidisciplinary
team, able to conduct rapid patient assessments, reach faster diagnosis and provide earlier
access to treatment. The team aims to have the patient ready within 48 hours of admission
for discharge home or transfer to another unit for ongoing care.

A total of 359 MAU beds are currently open across NSW; 329 of these are funded through
dedicated Commonwealth and State initiatives. Since the introduction of the Medical
Assessment Unit in 2008, the number of patients assessed and treated has increased by
40%. In 2008/09, the number of patients treated in a MAU was 29,049; this increased to
52,221 in 2012/13.

4. Case for change

The MAU Operational Guide was published in 2007[11]. The guide outlined the intended
structure for establishing and operating a Medical Assessment Unit in NSW. The intended
audience was general managers, service managers, clinical leaders, and clinical managers
involved in the establishment of a new MAU in their facility.

Key performance indicator reports have consistently shown that there is significant variation
in the operation of the 29 MAUs across the state. This variability in operation has the
potential to adversely impact on patients, particularly patients with chronic conditions who
have complex needs.

The evaluation report was published in 2013 and the recommendations provided an
opportunity to further develop the MAU model of care. The evaluation report found that:

For MAUs to be successful, provide quality outcomes and produce sustainable change
for patients they cannot function in isolation to the hospital as a whole.
5. Methodology

5.1 Project Initiation

In 2011 the NSW Department of Health recognised that the need to evaluate the effectiveness of the Medical Assessment Units. The NSW MAU Evaluation drew on five main sources of data to assess the impact and effectiveness of the MAU in meeting the original objectives provided in the NSW MAU Operational Guide[11]:

This evaluation culminated in a draft MAU Model of Care. This responsibility for this draft was transferred to the Agency for Clinical Innovation on the publication of the NSW Medical Assessment Unit Evaluation report in 2013:

Recommendation 1: ACI will undertake a broader consultation of the Medical Assessment Unit Model of Care 2012 to ensure the components are achievable across existing and future MAUs

5.2 Diagnostic

The diagnostic phase of this model of care was conducted by the Health Services Performance Improvement Branch of the NSW Ministry of Health. A full description of the methodology can be found in the NSW Medical Assessment Evaluation report[12].

The evaluation methodology (diagnostic) asked[12]:

a) Is the Medical Assessment Unit (MAU) model of care effective for patients with complex and chronic conditions? The main emphasis will be on patient outcomes, impact on length of stay and patient satisfaction.

b) Does the MAU model of care have a positive impact on the patient journey, access block, current emergency department key performance indicators, hospital efficiency, financial resources and quality of care?

The diagnostic included data from five sources[12]:

1. A literature scan that included a review of evidence from national and international peer reviewed journals and grey literature.

2. Quantitative data analysis of data from 28 MAUs across NSW; the recently opened unit at Hornsby Hospital was excluded from the review.

3. An electronic survey of providers at all 28 MAUs over an eight week period (N=270).

4. A survey of patients using patient experience trackers at 15 MAUs over a 6 week period (N=1184).

5. An observational study conducted through a series of site visits by an expert review team at 15 MAUs. The expert review team comprised an Acute Care Taskforce Member, a senior staff member from the Health Service Improvement Branch (NSW Health), a Finance manager and a MAU project manager.
## Table 1: MAUs included in data collection and analysis

<table>
<thead>
<tr>
<th>Local Health District / Specialty Health Network</th>
<th>MAU location</th>
<th>Quantitative analysis</th>
<th>Observational Study / Site visits</th>
<th>Provider Survey</th>
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</table>

Source: NSW Department of Health, Health Services Improvement Branch

### 6. International and Australian models

In Australia and the UK acute medical assessment units have various names including acute medical assessment unit (AMAU), medical assessment and planning units (MAPU), acute assessment unit (AAU), acute medical wards (AMW), acute planning units (APU), rapid assessment medical units (RAMU) and early assessment medical units (EMU). These are defined here as [13]:
• Having designated hospital wards specifically staffed and equipped to receive medical inpatient presenting with acute medical illness from emergency departments and/or the community
• Including expedited multidisciplinary and medical specialist assessment, care and treatment for up to a designated period (typically between 24 and 72 h) prior to discharge or transfer to medical wards
• Being supervised by consultants with an interest in acute general medicine, feature multidisciplinary teams that comprehensively assess and manage both medical illness and functional disability
• Being geographically co-located with emergency departments
• Having priority access to key diagnostic services such as pathology and radiology

Internationally, MAUs are predominantly run under General Medicine Teams [7]. It is recognised that generalists are the best to deal with the complex patient with multiple chronic conditions [14]. A systematic review of the value of Acute Medical Assessment Units demonstrated [5]:

• a significant reduction in inpatient mortality
• a significant reduction in the length of stay (1.5 and 2.5)
• a reduction in waiting times for patient transfer from emergency departments to medical beds (30%)
• no increase in 30-day readmission rates following unit commencement
• improvements in patient and staff satisfaction with care.

7. NSW Model of care

7.1 Why do we need Medical Assessment Units in NSW?

Chronic disease makes a significant contribution to the burden of morbidity and mortality in Australia[15]. The prevalence of chronic disease is strongly correlated with age and is a significant factor in older people’s utilisation of hospitals, including Emergency Department presentations. Older people are more likely to require admission and have longer lengths of stays than younger people. In 2011-12, people aged 85 years and over accounted for 7% of all hospital admissions and 13% of days spent by patients in hospital[15, 16]. In 2004–05, 20% of hospitalisations for older people were due to diseases of the circulatory system[17].

Patients with general medical problems in NSW are usually admitted under the care of a Geriatrician or other sub-speciality medical teams. This has resulted in patients being ricocheted between multiple in-patient speciality teams and referred to as ‘outliers’ on sub-specialty wards.

The health environment is slightly different in NSW, in comparison to the rest of Australia as well as internationally [18]. The speciality of General Medicine has evolved into a different model of care in NSW, due to minimal hospitals having active departments of General Medicine.

In NSW in 2011-12, there were almost 75,000 potentially preventable hospitalisations (PPHs) for chronic conditions[16]. MAUs can therefore play a role in ensuring patients, particularly those with chronic conditions, are supported in the community in order to improve their health, well-being and quality of life, prevent complications, and reduce their need for hospitalisation.
7.2 What are Medical Assessment Units?

Medical Assessment Units are inpatient short stay units that are usually close to or co-located with an Emergency Department (ED) and are typically staffed by interdisciplinary inpatient teams.

The difference between a MAU and an inpatient unit is that the MAUs always feature a dedicated interdisciplinary team led by consultants. This team should be available on a daily basis (if not twice daily) to conduct rounds with the interdisciplinary team and provide timely access to treatment and management decisions [11, 19].

MAUs provide an alternative to treatment in the ED for undifferentiated, complex, chronic, non-critical medical patients. These patients are not critically ill but have complicated conditions that take time to assess and require a range of medical expertise to diagnose and treat.

MAUs are staffed by an experienced and comprehensive interdisciplinary team, who is able to conduct rapid patient assessments, reach faster diagnosis and provide earlier treatment.

Once a patient is assessed, their condition diagnosed and treatment provided, they will be able to return to home within 48 hours with community services provided as necessary. If further treatment is required, they will be referred to an inpatient team and transferred to a specialty ward.

7.3 What are key principles of Medical Assessment Units?

MAUs across NSW vary in size and are either co-located to Emergency Departments, co-located to an existing ward or are standalone units. The types of patients assessed and treated in MAUs range from general medical to aged care, paediatric, respiratory and cardiac-specific patients.

Regardless of the size of the unit or the funding received, Medical Assessment Units aim to provide a model of care for undifferentiated, complex, chronic, non-critical medical patients. The five key principles of the MAU Model of care are to provide patients:

1. **with access to rapid care** (Right Care, Right Time, Right Place, and Right Provider) – measured as average total time for all MAU patients in the ED.
2. **with access to rapid assessment, faster diagnosis and earlier treatment** within 48 hours – measured as average length of stay in the MAU.
3. who require further inpatient care, an ongoing management plan based on their initial rapid assessment, faster diagnosis and earlier treatment -measured as average length of stay for MAU patients transferred to an inpatient unit.
4. **with safe and effective care**; – measured as MAU readmission rates.
5. **with a link to ongoing care or support through the patient’s medical home** – measured as general practitioner linked to team or medical local represented on governance group

Figure 1 MAU model of care

7.3.1 Person centred medical home

People often have more than one chronic disease with complex medical, functional and psychosocial needs that change over time. As a result, people with chronic disease require
different levels of care and access to a range of services and providers at different stages as their disease progresses. Kaiser Permanente has described this as the ‘Kaiser Triangle’, this model is based reducing hospital usage through integration of organisations and disciplines[20]. Under this approach unplanned hospital use is an indicator of system failure [21].

**Figure 2** Level of health care required for potential MAU-appropriate patients

![Figure 2](image)

Adapted from the Kaiser Permanente model[21, 22]

The principles of the Medical Assessment Unit are underpinned by the concept of the person centred medical home. The patient’s journey through hospital and post-acute period will be best served by integrating what the general practice can offer with what the hospital team can offer.

In terms of integrated and coordinated care, the concept of a medical home or having a regular provider within a healthcare team is increasingly recognised to improve population health planning and strengthen integration, coordination and continuity of care for patients[23, 24].

The person centred medical home includes a patient-chosen clinician to be responsible for a patient’s ongoing and comprehensive, whole-person medical care. This is usually a General Practitioner. In a medical home, patients, their families and carers have a continuing relationship with a particular GP; this partnership is supported by a practice team, and other clinical services in the medical neighbourhood who wrap around the patient and their families to provide care as required (Figure 3). The medical home coordinates the care delivered by all members of a person’s care team, which may sometimes include hospital inpatient care. The medical home ensures that each person experiences integrated or joined-up health care[25].
Figure 3 Patient-centred medical home

While a 2007 survey found that 96% of Australian adults surveyed have a regular doctor (or a medical home) [26], this may not be true for all patients. For example: children and young people, patients with a mental illness and patients with an intellectual disability.

It is the role of the hospital staff to communicate with a patient’s medical home once a hospital admission has commenced. Under this approach a GP Inreach program is facilitated in the hospital setting. Therefore the medical home is always informed and consulted at admission, able to access progress during admission (e.g. virtually) and informed and consulted at discharge. This approach builds on a shared care approach where care isn't handed over, but shared. Many of the problems inherent in clinical handover fall away. LHDs and SNs should consider how they work with MLs to develop a process for identifying a medical home for patients who do not have a coordinating clinician (e.g. GP), particularly for patients with complex needs.
7.4 The ideal MAU team

Figure 4 describes the ideal members of a MAU team. At a minimum for optimal operation the MAU should employ a dedicated:

- medical director, ideally a General Medical staff specialist for senior decision making
- medical staffing, ideally Monday to Sunday, 8-10pm
- Nursing Unit Manager; this is dependent on the size of unit
- supernumerary Care Coordinator
- nursing staff for direct patient care, ideally 1:4 ratio
- allied health staff, at a minimum physiotherapy, social work and occupational therapy and ideally 7 days per week

A General Practitioner should also form part of the MAU team, either under an in-reach model or via representation on the MAU Governance Committee. GP In-reach seeks to improve the input of the GP into key points in the patient’s hospital admission. Having the GPs name over the bed should help remind the hospital team to contact the GP for their input. In complex cases this should be on admission, at times of deviation from expected in-patient journey, and prior to discharge.

Any admission where frailty, chronic disease or frequent admissions are factors should be targeted for this approach, including paediatric, mental health, surgery, and medicine admissions.

More information about implementing a model for a highly functioning team can be found at page 17.

Figure 4 The ideal MAU team

- Dedicated medical director preferably a General Medical staff specialist – i.e. a senior decision maker
- Dedicated medical staffing preferably Monday to Sunday, 8-10pm to allow for direct patient admissions
- General Practitioner (e.g. In-reach model or member of Governance Group)
- Nursing Unit Manager – dedicated is optimal, dependant on size of unit
- Care Coordinator – dedicated supernumerary position to allow early patient ID, improve patient flow & reduce delays (e.g. NP/CNC/CNS2) preferably 7 days/week
- Dedicated nursing staff for direct patient care preferably 1:4 ratio
- Dedicated Allied Health staff preferably 7 days/week of physiotherapy, occupational therapy and social work
- Speech Pathology, Pharmacy and Dietitians, consideration of part time or full time basis dependant on unit requirements.
- Access to dedicated porters, cleaners and ward assistant facilitates continual patient flow
7.5 What does a typical MAU patient look like?

A typical patient suitable for management in a MAU is the undifferentiated complex non-critical medical patient generally with co-morbidities.

MAUs are also suited to the complex and chronic paediatric patient; there are specific paediatric models in NSW.

7.6 Where do MAU presentations come from?

These patients can be streamed to the MAU from:

- The community (i.e. GPs, AMS’, specialist rooms, ambulatory care or other identified community referrals) directly to the MAU through predefined pathways.
- ED triage direct to MAU – where the suitability of a patient is determined at ED triage, usually by the ED nurse or doctor or an MAU nurse or doctor.
- Within the ED after a very short period of time – the suitability of the patient is usually determined within the first hour of the ED stay by the ED nurse or doctor or a MAU nurse or doctor.
7.7 MAU ideal patient flow

Figure 5 MAU patient flow

The undifferentiated complex, chronic, non-critical medical patient may access the MAU from:
- The patient's medical home (e.g. GP, RACF)
- The community
- ED triage
- Within ED after a very short time

MAUs are staffed by an experienced and comprehensive interdisciplinary team dedicated to the ward. At a minimum this includes a dedicated medical director and dedicated senior nursing and Allied health staff.

The team works together to conduct a rapid patient assessment to reach a faster diagnosis and provide earlier treatment. The initial assessment should include:
1. Identifying the patient's medical home (usual GP)
2. Obtaining consent from the patient to contact their usual GP and share information
3. A discussion with the patient's usual GP regarding relevant medical and/or social history

MAUs feature a dedicated interdisciplinary team led by consultants who should be available on an at least daily basis to conduct a structured interdisciplinary team round; ideally this round should be at the patient bedside. This round will facilitate timely access to treatment and decisions.

Once a patient's presenting condition is diagnosed and any necessary treatment is commenced further decisions can be made. Two are possible:
1. A patient is able to return home with the appropriate support
2. Patient admitted for further inpatient care ward
7.8 What happens after the MAU?

In NSW, the MAU model of care provides two streams of care:

**Stream One** is for those patients that go home direct from the MAU. These patients have previously typically stayed in hospital for 3-5 days and can now be provided with rapid assessments, faster diagnosis and earlier treatments and sent home safely within 48 hours, with community care if needed. This patient group should account for approximately 50% of patients that are admitted to the MAU.

**Stream Two** is for those patients that are transferred to a specialty ward from the MAU. In an MAU, these patients are provided with rapid assessment, faster diagnosis and commencement of treatment within the MAU. They are then referred to an inpatient team and transferred to an inpatient ward after approximately 24-48hrs with a documented plan of care to be followed and sent home safely within 5-7 days. This patient group should account for approximately 50% of patients that are admitted to the MAU.

7.9 Ideal Patient Experience

| June is a 72 year old woman who has a history of diabetes and heart disease. She has had several presentations to hospital recently with the last admission exceeding 2 weeks. Her daughter lives nearby and visits regularly but is not coping with June’s increasingly complex health situation. June has presented to the emergency department following a fall at home. June does not have a regular GP or contact with community health but she has some regular home help provide cleaning support. On the morning round to the emergency department the MAU medical clinician identified that June would benefit from some initial fast tracked assessments from the interdisciplinary MAU team. She liaises with the ED staff to have June transferred to the MAU within 1 hour of the ED presentation. The senior medical clinician, nurse and physiotherapist conduct an initial rapid assessment. The medical clinician identified that June doesn’t currently have access to a regular GP. The MAU team contacts the local Chronic Disease Management team and they assist to identify a regular GP to continue care for June in the community. June is able to be discharged from hospital within 40 hours to the care of her new GP. |

7.10 Benefits of the MAU model of care

- Reduction in undifferentiated, complex, chronic, non-critical medical patients presenting to the ED by providing direct referral to the MAU
- Reduced length of stay in the ED for undifferentiated, complex, chronic, non-critical medical patients
- Decreased in-hospital Length of Stay (LOS) by providing rapid assessment, faster diagnosis and earlier treatment at the point of entry into a hospital
- Reduced level of intensive investigations prior to decision-making
- Reduced number of patient outliers on inpatient wards
- Reduction in readmissions due to improved coordination and early activation for community care for those patients discharged home
- Improved patient experience through a more integrated approach to providing care

7.11 Challenges to the MAU model of care

- Identification of ‘MAU-appropriate patients’ prior to or at entry into the hospital
• Medical home, community and ED staff education about patient suitability for the MAU
• ED MAUs are used as an overflow unit when the ED is busy
• MAU used as a holding bay until ward beds become available
• MAU used for acute inpatient admissions when inpatient beds are not available.

7.12 Governance requirements for the operation of the MAU

MAU are inpatient short stay units staffed by interdisciplinary inpatient teams led by consultants, to provide an alternative to treatment in the Emergency Department for undifferentiated, complex, chronic, non-critical medical patients. These patients are not critically ill but have complicated conditions that take time to assess and require a range of medical expertise to diagnose and treat.

The Hospital Executive Management Team (Figure 6 Error! Reference source not found.) at the Local Health District or Speciality Health Network is accountable for overseeing the implementation and operation of the MAU. However, each MAU should have in place a group of clinicians, managers and possibly consumers who monitor the performance of the MAU and provide advice and guidance on the operation of the MAU. Such a group is often termed the MAU Governance Committee. At a minimum this group should comprise representatives from the:

- Hospital Executive
- MAU allied health, nursing and medical staff
- Patient Flow and bed management
- Emergency Department
- Local Chronic Disease Management Program representatives
- Senior General Practitioner and/or Medicare Local representative

The nearest Medicare Local can be located using the following website: http://www.medicarelocals.gov.au/. If a GP is not known to the Medical Assessment Unit the Medicare Local may be able to assist in identifying a GP to be a representative on the MAU Governance Group.

Figure 6 Optimal governance requirements for the operation of the MAU
8. Other NSW programs and models to support MAU model of care

A well operating MAU will build around and link to other programs across the system, both within the hospital and outside the hospital. Table 2 summarises the key models that support the MAU model of care; a more detailed description of the programs is included at pages 17-21.

Table 2: Other NSW models to support the MAU model of care

<table>
<thead>
<tr>
<th>Model</th>
<th>Responsibility</th>
<th>Supports</th>
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<tr>
<td></td>
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<td>Direct admission</td>
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<td>HealthOne NSW</td>
<td>NSW Ministry of Health</td>
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<tr>
<td>Chronic Disease Management Program</td>
<td>ACI Chronic Care Network</td>
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<tr>
<td>Direct Admission - Ambulance</td>
<td>Ambulance Service of NSW</td>
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</tr>
<tr>
<td>Triage</td>
<td>Local EDs/Emergency Care Institute</td>
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<tr>
<td>ED Snr Assessment &amp; Streaming</td>
<td>ACI Emergency Care Institute</td>
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<tr>
<td>Aged Care Services in ED Teams (ASET)</td>
<td>ACI Emergency Care Institute</td>
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<tr>
<td>Rehabilitation Model of Care</td>
<td>ACI Rehab Network</td>
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<tr>
<td>In Safe Hands</td>
<td>Clinical Excellence Commission</td>
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<tr>
<td>Com Packs</td>
<td>NSW Ministry of Health</td>
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<tr>
<td>Hospital in the Home</td>
<td>NSW Ministry of Health</td>
<td></td>
</tr>
<tr>
<td>Acute to Aged-Related Care Services</td>
<td>LHDs / SHNs</td>
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</tr>
</tbody>
</table>

8.1 Effective teams – In Safe Hands

The Clinical Excellence Commission’s In Safe Hands program aims to build and sustain effective health care teams. It is designed to give health care teams the structure and tools to redesign their
units into strong, interdisciplinary teams that work together to deliver highly reliable, planned care to all patients.

Similarly themed programs launched internationally have demonstrated that effective teams have:

- reduced patient lengths of stay
- reduced unexpected deaths
- improved patient experience
- increased staff satisfaction

An ‘In Safe Hands Unit’ allows clinicians to be co-located in one physical location throughout the day, creating a cohesive team environment. All members of the health care team then share a common understanding of the care of each patient, fostering a culture of collaboration, openness and respect. In Safe Hands enables teams to address daily challenges of patient care by empowering them to make good decisions, with clarity on the full scope of a patient’s care. The result is that all members of a health care team are better placed to solve problems as they arise, transforming clinicians working in isolation into highly functioning health care teams. Four key principles enable the development of highly functioning teams:

1. Unit-based teams
2. Co-leadership model
3. Structured Interdisciplinary Bedside Rounds
4. Continuous evaluation processes

Medical Assessment Units implementing the MAU model of care are well placed to implement this complementary approach at the same time. A MAU operating under the ACI MAU Model of Care is

- already a unit based team with dedicated nursing, medical and allied health staff
- already operating a co leadership model with both senior medical and nursing leads
- well placed to take the existing multidisciplinary whiteboard round to structured interdisciplinary round at the patient bedside

Figure 7 The ideal MAU team
8.2 Direct admission – NSW Chronic Disease Management Program [27]

The NSW Chronic Disease Management Program (CDMP) is a free service for people with chronic disease who have difficulty managing their condition and who are at risk of hospitalisation.

The CDMP provides care coordination and self-management support to help people with chronic disease better manage their condition and access appropriate services in order to improve health outcomes, prevent complications and reduce the need for hospitalisation.

The target chronic diseases are Diabetes, Congestive Heart Failure, Coronary Heart Disease, Chronic Obstructive Pulmonary and Hypertension, recognising that people with these diseases often have multi-morbidities such as depression, arthritis and dementia.

It is envisaged that Chronic Disease Management Program staff could work with MAUs to identify patients who might be eligible for direct admission to MAUs for early assessment and

8.3 Direct admission – HealthOne NSW [28]

HealthOne is a NSW Health initiative that is intended to bring together general practitioners and community health professionals – and other health professionals, to achieve locally integrated and coordinated patient care. HealthOne is a system redesign model in which common objectives and principles are flexibly applied in local environments. HealthOne initiatives generally focus on those people in the local community who are at increased risk, and/or need a greater level of coordinated care.

HealthOne NSW is a sound platform to support early entry to MAUs and well-coordinated transfer of care back into the community.
8.4 Direct admission – Ambulance

Ambulance are often the initial point of call for patients who require hospital treatment. Medical treatment provided by paramedics is guided by approved protocols, pharmacology and clinical procedures guiding the provision of treatment for various clinical conditions. Using an agreed protocol MAU-appropriate patients could be identified by paramedics for early and direct entry to a MAU via triage by-passing the emergency department.

8.5 Direct admission – Triage [29]

Triage is streamlined to facilitate an efficient process that does not itself create a barrier to further assessment and clinical care. Only essential functions occur at the point of triage: the determination of patient acuity and level of urgency, basic first aid if needed, and referral to the most appropriate area for treatment. This can include models of care both within the ED and within the hospital. [29] It is envisaged that hospitals with well-developed MAUs and dedicated medical staffing utilise direct patient transfers from triage.

8.6 Early entry – ED Senior Assessment and Streaming [29, 30]

Early ED Senior Assessment and Streaming model of care focuses on the assessment and treatment process that determine an early diagnosis, clinical management plan and disposition decision for patients. This model of care improves front line processes such as triage and includes early streaming of patients by a senior decision maker to avoid queuing and delays to care.

It is envisaged that Emergency Departments utilising this model of care will stream appropriate patients direct to the MAU.

8.7 Early entry – Clinical Initiatives Nurse (CIN) [29]

The Clinical Initiatives Nurse (CIN) is a senior nursing role that provides nursing care to patients in ED waiting rooms. The three main functions of the CIN nurse are to:

1. Maintenance of an ED nursing presence in the waiting room to facilitate a safe clinical environment
2. Communication with patients and carers regarding ED processes, waiting times and provision of relevant education on their health issues
3. Assess patients following triage to Initiate diagnostics or treatment, escalate care or refer patients to suitable services which may be external to the ED.

It is envisaged that Emergency Departments who have CIN nurses will utilise them to identify and refer patients to the MAU.

8.8 Early entry – ASET (Aged Care Services in Emergency teams)

The ASET model of care is based on early identification, assessment and care planning for an older person presenting to an Emergency Department with identified aged care needs in addition to their acute care condition.

The primary goal of ASET is to improve the health outcomes of older people on presentation to the ED, minimise the requirement to remain in hospital, and prevent readmissions once patients are discharged by providing linkages to community services for support in the home environment.
In EDs that are utilising the ASET model of care, length of stay reductions of 60min have been seen in the over 70 years age group. The use of ASET also coincides with a 0.4% reduction in representations rates for the 70-74 year age group [31].

It is envisaged that Emergency Departments with ASET will utilise them to stream appropriate patients direct to the MAU.

8.9 Discharge – NSW Rehabilitation Model of Care

Under the NSW Rehabilitation Model of Care [32], rehabilitation is defined as the provision of care that aims to:

- restore functional ability for a person who has experienced an illness or injury
- enable regaining function and self-sufficiency to the level prior to that illness or injury within the constraints of the medical prognosis for improvement
- develop functional ability to compensate for deficits that cannot be medically reversed.

Any patient discharged from the MAU requiring rehabilitation has the option of being referred to many ambulatory care options. Patients can access:

- Ambulatory Care (Day Hospital) - a comprehensive rehabilitation program conducted by a multidisciplinary team in an outpatient setting
- Ambulatory Care (Outpatients) – discipline specific therapy provided in an outpatient setting
- Ambulatory Care (Home based) – rehabilitation services provided in the patients home
- Outreach rehabilitation service for rural and regional centres (hub and spoke) - rehabilitation provided outside a specialised rehabilitation unit.

8.10 Discharge – ComPacks

ComPacks – this is a non-clinical case managed program of community care available for people being transferred home from a participating New South Wales Public Hospital. It has been developed for patients who require immediate access to case management and a combination of community services to safely return home from hospital [33].

8.11 Discharge – Hospital in the Home

Hospital in the Home (HITH) services provide acute and post-acute care to children and adults residing outside hospital, as a substitution or prevention of in-hospital care. A person may receive their care at home (including Residential Aged Care Facilities) or in a hospital or community clinic setting (this may include at school or in the workplace). HITH care is short-term and preferably interdisciplinary, including doctors, nurses and allied health practitioners. It aims to provide the most appropriate care setting, avoid hospital admissions and reduce patient length of stay.

The most common conditions and treatments delivered by adult HITH services are intravenous antibiotic therapy for cellulitis, genitourinary tract, respiratory tract, postoperative/post-traumatic infections and osteomyelitis, and anticoagulant therapy for deep vein thrombosis or pulmonary embolism. For paediatric services, complex wound dressings for eczema, intravenous antibiotic therapy for cellulitis and cystic fibrosis are most common [34].

8.12 Discharge – Acute to Aged-Related Care Services (ARRCS)

The AARCS aims to provide inpatient hospital coordination for older patients with complex and chronic conditions.

It is envisaged that hospitals that have AARCS will utilise this service to assist appropriate MAU patients.
9. Implementation

9.1 Case for implementation

To assess the need to implement this model to support your hospital, consider the following:

**Patient demand for a MAU from the ED** (determining what proportion of ED presentations are undifferentiated, complex, chronic, non-critical medical patients):
- What proportion (% & number) of Emergency Department presentations are medical patients (i.e. do not need surgical intervention)?
- What proportion (% & number) of Emergency Department medical patients were admitted to an in-patient unit (i.e. medical patients that are not admitted & discharged from the ED)?
- What proportion (% & number) of Emergency Department medical patients were admitted to an in-patient unit (i.e. medical patients that are not admitted & discharged from the ED) for single organ v’s complex conditions?
- What is the age breakdown & ALOS in the ED for (i.e. are medical patients managed for > 4hrs in the ED?):
  - Medical patients admitted and discharged from the ED.
  - Medical patients admitted to an inpatient unit from the ED.
  - Medical patients admitted to an inpatient unit from the ED for single organ v’s complex conditions.
- If you have an Emergency Department Short Stay Unit OR Emergency Medical Unit what proportion (% & number) of admitted medical patients utilise this & are then transferred to another in-patient unit?

**Patient demand for a MAU from the community** (determining what proportion of community presentations are undifferentiated, complex, chronic, non-critical medical patients):
- What proportion (% & number) of separations from your hospital are medical DRGs (i.e. not surgical or procedural)?
- What proportion (% & number) of these patients were referred into the hospital (source_of_referral) from 02-community health, 03-outpatients, 06-nursing home/residential aged care facility?

**Patient outcomes to determine MAU viability** (determining what proportion of readmitted undifferentiated, complex, chronic, non-critical medical patients would have benefitted from a MAU):
- What is the readmission rate for your hospital?
- What is the readmission rate for unplanned medical patients in your hospital?
- What is the age breakdown of unplanned medical readmissions?

10. Evaluation, monitoring and data system

MAU patients are admitted to a bed type 87 (Admitted Patient Data Dictionary). There are four outcome indicators and seven process indicators.

**Table 3: NSW Ministry of Health MAU Outcome Indicators**

<table>
<thead>
<tr>
<th>Outcome Indicators</th>
<th>Description</th>
<th>Target</th>
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</thead>
<tbody>
<tr>
<td>1 Average Total Hours in ED for all MAU patients</td>
<td>≤ 4 hours</td>
<td></td>
</tr>
<tr>
<td>2 Average Length of Stay in the MAU (hours)</td>
<td>≤ 48 hours</td>
<td></td>
</tr>
<tr>
<td>3 Average Length of Stay of MAU patients transferred to the ward (days)</td>
<td>≤ 7 days</td>
<td></td>
</tr>
<tr>
<td>4 Unplanned Readmissions within 28 days of MAU</td>
<td>≤ 10%</td>
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</tbody>
</table>
Table 4: NSW Ministry of Health MAU Process Indicators

<table>
<thead>
<tr>
<th>Process Indicators</th>
<th>Description</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Separations from MAU</td>
<td>Nil</td>
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<tr>
<td>6 Average Length of Stay of MAU patients aged 65yrs +</td>
<td>≤ 48 hours</td>
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<tr>
<td>7 % patients transferred from the MAU within 48hrs</td>
<td>80% - 90% (guide only)</td>
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<tr>
<td>8 % patients discharged home from MAU</td>
<td>50%</td>
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</tr>
<tr>
<td>9 % patients discharged home from MAU within 48hrs</td>
<td>80% - 90% (guide only)</td>
<td></td>
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<tr>
<td>10 % patients transferred to inpatient ward from MAU</td>
<td>50%</td>
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<tr>
<td>11 % patient admitted directly to the MAU</td>
<td>Nil</td>
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<tr>
<td>12 Unplanned Readmissions within 28 days of MAU discharge from MAU-home</td>
<td>≤ 10%</td>
<td></td>
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</tbody>
</table>
11. References

6. NSW Health, data from NSW Health Annual Reports 01/02, 02/03, 03/04, 04/05, 05/06, 06/07, 07/08, 08/09, 09/10, 10/11 and Projected growth from Activity Based Funding Model as at 20th January 2012. 2012.
15. AIHW, Premature mortality from chronic disease, in AIHW bulletin no. 84. Cat. no. AUS 133. 2010, AIHW: Canberra.
22. NSW Agency for Clinical Innovation, *NSW Chronic Disease Management Program – Connecting Care in the Community*, in *Service Model 2013*. 2013, ACI Chronic Care team.


30. NSW Ministry of Health and Emergency Care Institute, *ED Senior Assessment and Streaming Model of Care and Implementation Toolkit*. 2012, NSW Ministry of Health,: Sydney.


### 12. MAU Model of Care Working Group

Table 5 outlines those who were involved in the development of the ACI MAU model of care.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Full Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency for Clinical Innovation</td>
<td>Cecily Barrack</td>
<td>Network Manager, Respiratory</td>
</tr>
<tr>
<td>Agency for Clinical Innovation</td>
<td>Kate Lloyd</td>
<td>Manager, Acute Care</td>
</tr>
<tr>
<td>NSW Ambulance</td>
<td>Michelle Shiel</td>
<td>Manager, Low Acuity Care</td>
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<td>Central Coast LHD</td>
<td>Ellen Hardcastle</td>
<td>District Patient Flow &amp; Access Manager</td>
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<td>Central Coast LHD</td>
<td>Natalie Irwin</td>
<td>Redesign</td>
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<td>Central Coast LHD</td>
<td>Debbie Scott</td>
<td>A/District Patient Flow &amp; Access Manager</td>
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<tr>
<td>Central Coast LHD</td>
<td>Jennie Lamb</td>
<td>CNC - Central Coast</td>
</tr>
<tr>
<td>Wollongong</td>
<td>Phil Harrison</td>
<td>CMO</td>
</tr>
<tr>
<td>Coffs Harbour</td>
<td>Sergio Diez Alvarez</td>
<td>(former) MAU, Director / Now Director, Clinical Governance</td>
</tr>
<tr>
<td>Coffs Harbour</td>
<td>Chris Mostert</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Lismore</td>
<td>Nikia Goldsmith</td>
<td>CNS2</td>
</tr>
<tr>
<td>Port Macquarie</td>
<td>Tracey Morris</td>
<td>CNS2</td>
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<tr>
<td>Nepean</td>
<td>Ann Attwood</td>
<td>Nurse Manager Aged &amp; Chronic &amp; Complex Care</td>
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<tr>
<td>Nepean</td>
<td>Drew Roberts</td>
<td>A/NUM</td>
</tr>
<tr>
<td>Nepean</td>
<td>Anita Sharma</td>
<td>Geriatrician, Director MAU</td>
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<tr>
<td>Hornsby</td>
<td>Patricia Norton</td>
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<td>Hornsby</td>
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<td>Mona Vale</td>
<td>Jane Edmond</td>
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<tr>
<td>Mona Vale</td>
<td>Majella McFarlane</td>
<td>NUM MAU</td>
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<tr>
<td>Royal North Shore</td>
<td>Paul Collett</td>
<td>Director AAU (Renal Physician)</td>
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<td>Royal North Shore</td>
<td>Ana Diaz</td>
<td>A/NUM - MAU, NUM AAU / Co-Chair</td>
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<td>Ashley McIntosh</td>
<td>Physiotherapy</td>
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<tr>
<td>Royal North Shore</td>
<td>Vanya Ripley</td>
<td>A/CNC</td>
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<tr>
<td>Prince of Wales</td>
<td>Louise Goetz</td>
<td>Cardiac MAU</td>
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<tr>
<td>Prince of Wales</td>
<td>Melissa Gole</td>
<td>Clinical Nurse Consultant - Parkes 6</td>
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<tr>
<td>St George</td>
<td>Grant Pickard</td>
<td>Director, MAU (Geriatrician) / Co-Chair</td>
</tr>
<tr>
<td>Sutherland</td>
<td>Sandra Frese</td>
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<td>Bankstown</td>
<td>Bin Ong</td>
<td>Director, MAU (Geriatrician)</td>
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<tr>
<td>Liverpool</td>
<td>Sarah Ghamraoui</td>
<td>Social Worker</td>
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<tr>
<td>Sydney LHD</td>
<td>Deb Donnelly</td>
<td>Clinical Manager Aged Care, Rehabilitation, Chronic &amp; Ambulatory Care, Endocrinology, General Medicine &amp; General Practice, Andrology &amp; Clinical Genetics</td>
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<tr>
<td>Westmead</td>
<td>Ray Cabela</td>
<td>Clinical Lead</td>
</tr>
<tr>
<td>Western Sydney Medicare Local</td>
<td>Di O'Halloran</td>
<td>General Practitioner / Medicare Local</td>
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