

# My Health Record in Emergency Departments

## Final report and adoption model

December 2021





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# Contents

<b>Preface</b>	<b>v</b>
<b>Definitions and acronyms</b>	<b>vi</b>
<b>Glossary of My Health Record system terms</b>	<b>vii</b>
<b>Executive Summary</b>	<b>ix</b>
<b>1 Introduction</b>	<b>1</b>
Assessing My Health Record system use in EDs	1
Using electronic healthcare records in emergency medicine	2
<b>2 Method</b>	<b>5</b>
Project aim	5
Project methodology	5
Governance	7
Ethics	7
Phase I – opt-out trial sites and targeted interviews	8
Phase II – pilot sites	10
<b>3 My Health Record system viewing platforms</b>	<b>21</b>
Viewing platforms	22
Functionality	25
<b>4 Pilot site findings</b>	<b>29</b>
Staff surveys	29
Use-cases	29
Low staff awareness of the My Health Record system	31
Opportunistic training by clinical champions	33
Volume and variety of My Health Record system content	35
Realised and missed opportunities for use	45
Usability and user experience	52
<b>5 Clinical champions workshop findings</b>	<b>61</b>
Experiences from pilot sites	61
Synthesis and analysis of key themes	61
Summary of observations	61

<b>6 Recommendations</b>	<b>67</b>
Increasing awareness of the My Health Record system through clinical champions	67
Promoting high-value My Health Record system content to ED clinicians	70
Integrating the My Health Record system into ED clinical workflows	73
Enhancing existing and new My Health Record system content	77
Optimising My Health Record system viewing platforms to support ED clinicians	83
<b>7 Implications</b>	<b>87</b>
For the Australian Digital Health Agency	87
For health system operators	89
For hospitals and clinicians	91
For software vendors	93
Limitations of the project	93
Opportunities for future work programs	97
Conclusion	100
<b>Appendix 1: Stakeholder interviews and clinical champions</b>	<b>101</b>
<b>Appendix 2: Comparison of My Health Record viewing platforms</b>	<b>103</b>
<b>Appendix 3: Adoption model</b>	<b>107</b>
<b>Appendix 4: Findings and recommendations</b>	<b>113</b>
<b>References</b>	<b>117</b>

# Preface

A central tenet to the practice of good clinical medicine is access to precise, contemporary information. Efficient access to a patient's health information is crucial for clinicians when making timely diagnostic and management decisions. In an acute, time-sensitive setting, such as an emergency department (ED), the availability of such information can improve patient outcomes and reduce treatment times.

The more known about a patient's presenting condition, the better the decision-making about their care can be. This can be the difference between a patient being admitted or discharged home from the ED. It may negate the need for a patient to undergo unnecessary investigations, which can increase the risk of iatrogenic complications.

Communication between Australia's health service organisations is challenged by disparate clinical information record systems across a number of disconnected imaging, pathology, medication and documentation data delivery structures. This complexity results in obstructions to the free flow of clinical information, which routinely frustrates clinicians.

My Health Record has the capacity to revolutionise health care, by removing these communication barriers. Additionally, it can help assist patients and their families when telling their 'health story' to healthcare providers.

This project is the largest study of My Health Record use undertaken, covering almost 130,000 patients across four states and involving more than 1,000 ED staff. The data collected and analysed provides insight and context around the barriers and enablers of My Health Record use by ED clinicians. It has also shown where future efforts should be concentrated.

An extended time was required to determine project data, in liaison with the Australian Digital Health Agency and the National Infrastructure Operator. The development of bespoke project datasets and reports has effectively described a 'data blueprint' that strengthens transparent reporting capabilities.

While it found that the My Health Record system requires more clinical content to address current underuse by clinicians, the project also captured case studies of system use that influenced clinicians' decision-making. These practices, if scaled nationally and applied to more than 8 million patients seen in Australian EDs each year, have the potential for realising system-wide patient benefits.

We would like to extend our gratitude to everyone who participated in this project – particularly the participating ED staff. We hope our findings have accurately conveyed your feedback on how the My Health Record system can help with providing better patient care and informing the Australian digital health agenda.

Dr Andrew Hugman FACEM FRCEM

Dr Paul Miles DBA

# Definitions and acronyms

Term	Definition
(the) Agency	Australian Digital Health Agency
CIS (clinical information system)	Software solutions that store and manage information collected directly from equipment and clinician inputs. Examples include patient administration systems, laboratory information systems, picture archive and communication systems, electronic medical records and electronic healthcare records.
(the) Commission	Australian Commission on Safety and Quality in Health Care
DVA	Australian Government Department of Veterans' Affairs
ECG	electrocardiogram
ED	emergency department
EHR (electronic healthcare record)	An online electronic application or repository that contains a consumer's health information, which is often sourced from multiple healthcare organisations. Consumers can access, manage and share their health information through their EHR, and that of others for whom they are authorised, in a private and secure environment. For the purposes of this project report, the My Health Record system is considered an EHR.
EMR (electronic medical record)	A clinical information system, internal to a health service organisation, which stores a patient's clinical information and that only a clinician can access.
GP	general practitioner
Health service organisation	A service that implements clinical governance, administration and financial management of a service unit or service units providing health care. Examples of different health service organisation provider types that are typically registered with the My Health Record system include hospitals, primary healthcare clinics, pharmacies, specialists' rooms, outpatient facilities and aged care settings.
HIPS-UI	Health Identifier and Personally Controlled Electronic Health Record System user interface
IHI	Individual Healthcare Identifier
MBS	Medicare Benefits Schedule
My Health Record system	Australia's national EHR, which is a summary of a consumer's health information that is sourced from a variety of providers across the healthcare system, which consumers and clinicians can access. An individual patient's record is referred to as their My Health Record.
NIO	National Infrastructure Operator
PBS	Pharmaceutical Benefits Scheme
PHN	Primary Health Network
State- or territory-based portal	An online portal that enables access to clinical documents from across public hospitals within a state or territory.
Use-case	A case study of actual My Health Record use by ED clinicians.
User experience	What influences a person's perception towards every aspect of the My Health Record system when they use it.
User interface	How the series of screens, pages and visual elements (e.g. icons and buttons) enable users to interact with the My Health Record system, which contributes to the overall user experience.
Viewing platform	Software used to present the My Health Record system to users; typically interfaces with the local CIS.
Workflow	The steps a clinician takes to provide clinical care to a patient.



# Glossary of My Health Record system terms

Term	Definition
Advanced access controls	The access controls that enable an individual to set controls on healthcare providers' access to their My Health Record. This includes controls such as the limited document access code (LDAC) and record access code (RAC).
Consumer entered health summary	A document created by the individual that can include medications, allergies and adverse reactions. This document is accessible by healthcare providers. This is also referred to as a personal health summary.
Diagnostic imaging report	A diagnostic imaging (or radiology) report is primarily a written communication between the radiologist interpreting the imaging study (e.g. X-ray) and the clinician who requested the examination.
Discharge summary	Captures details of a patient's hospital stay in a structured format, including any follow-up treatment required.
eReferral	An eReferral supports the exchange of significant patient information from one treating healthcare provider to another.
Event summary	A clinical document that summarises one or more episodes of care, entered by the healthcare provider who was involved in the patient's care to inform other treating healthcare providers.
Health (record) overview	View that provides a summary of an individual's My Health Record and is intended to serve as the 'home screen' displayed when an individual's record is first opened.
Limited document access code	A code (4–8 alphanumeric characters) that an individual can provide to healthcare providers so that they can access documents marked as restricted in their My Health Record.
Medicare documents	Medicare information that is collected by Services Australia and/or the Australian Government Department of Veterans' Affairs and is available on the My Health Record system. This includes Medicare documents, Australian Immunisation Register, Australian Organ Donor Register, Medicare/DVA benefits report, and Pharmaceutical Benefits Report.
Medicines view	The consolidated view that quickly sorts and displays the most recent and available medicines information and documents in the individual's My Health Record; also known as the medicines information view.
Pathology report	A pathology report contains the findings of test results on samples of body fluid/waste or tissue material.
Pharmaceutical Benefits Report	Records information about pharmaceutical items prescribed and dispensed to an individual that were partially or fully funded under the Pharmaceutical Benefits Scheme (PBS) or the Repatriation Pharmaceutical Benefits Scheme (RPBS).
Pharmacist Shared Medicines List (PSML)	A list that may include prescription medicines, non-prescription medicines including over-the-counter medicines, or complementary medicines (such as vitamins or herbal medicines).
Prescription and dispense records	Records that incorporate prescription and dispense information to provide a consolidated record of medications.
Record access code	A code that can be used to restrict access to an individual's My Health Record. The code is provided to a healthcare provider to gain access to the individual's My Health Record.

<b>Term</b>	<b>Definition</b>
Shared health summary	A clinical document summarising an individual's health status; includes important information such as allergies/adverse reactions, medicines, medical history and immunisations. Only a nominated healthcare provider can create or update the shared health summary.
Specialist letter	The document used by a treating specialist to respond to a GP about a referred patient.

Source: Australian Digital Health Agency<sup>1</sup>

# Executive Summary

The use of the My Health Record system can help people with complex healthcare needs.

This report describes findings from the My Health Record in emergency departments (EDs) project, which is the largest study of My Health Record use undertaken, covering almost 130,000 patients across four jurisdictions and involving more than 1,000 ED staff. The project's aim was to establish enablers to regular use of the My Health Record system by ED clinicians.

A national My Health Record adoption model (and hospital checklist) for the ED setting emerged from project findings, which were categorised within five themes:

- Viewing: ongoing improvements to the usability of My Health Record viewing platforms
- Value: better clinician awareness of how and when to use My Health Record
- Volume: continued efforts to increase the content in My Health Record
- Variety: expanding the document types of My Health Record
- Vicarious: My Health Record training using case-studies, led by clinical champions.

The project found that the My Health Record system is a vital tool that can improve the quality of decision-making by ED clinicians and support safer patient care. Of those that accessed the system, more than a third of ED clinicians stated that their clinical decision-making had been influenced by My Health Record content. With 8.4 million ED presentations across Australia annually<sup>2</sup>, the My Health Record system presents an opportunity for better-informed decision-making. Other project findings include:

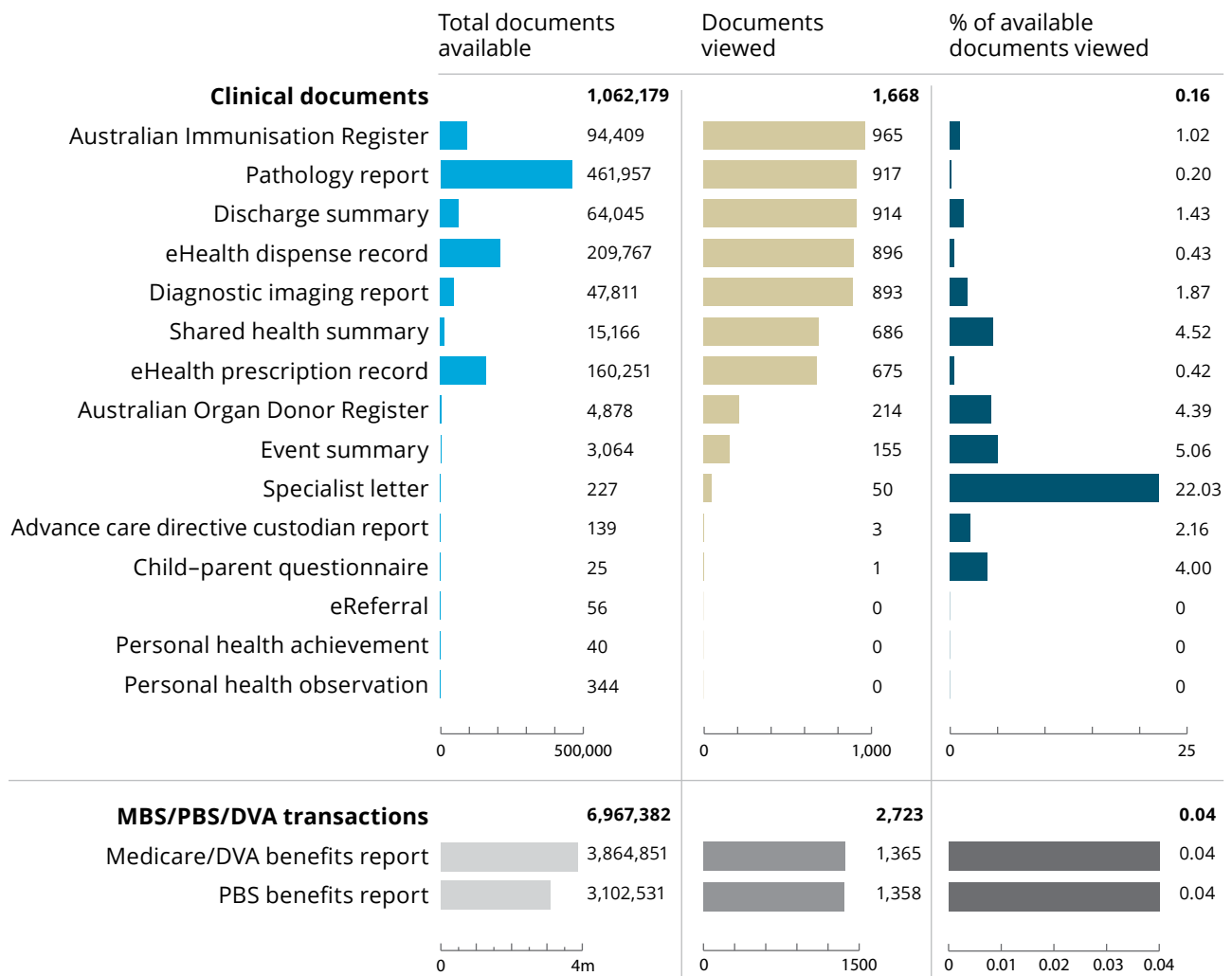
- Patients with the most complex healthcare needs often had the most populated My Health Records.
- Patients who presented to ED with content in their My Health Record had an average of 8 clinical documents in their record. Patients who were admitted had more content in their

My Health Record compared with those that were discharged directly from ED (10 and 6 clinical documents, respectively).

- There were 1,051 ED presentations (<1% of total ED presentations) during the study where a My Health Record with content was viewed by an ED clinician. Project findings detail how the Agency and health service organisations can work collaboratively to maximise use of the My Health Record system.
- ED clinicians considered medication-related documents and diagnostics tests results as high-value content during the study. ED clinicians wished to see electrocardiograms, advance care plans and specialist (or outpatient) letters made available in the My Health Record system.
- My Health Record system viewing platforms can have multiple pathways to the same content, which ED clinicians found time-consuming and low-value. Improved and intuitive viewing platforms that enhance usability and on-screen presentation of content, guided by real-life case-studies from health service organisations, would improve ED clinicians' user experience.
- The project's research methodology is foundational to future evaluative studies of a My Health Record system viewing platform or state- and territory-based portal.

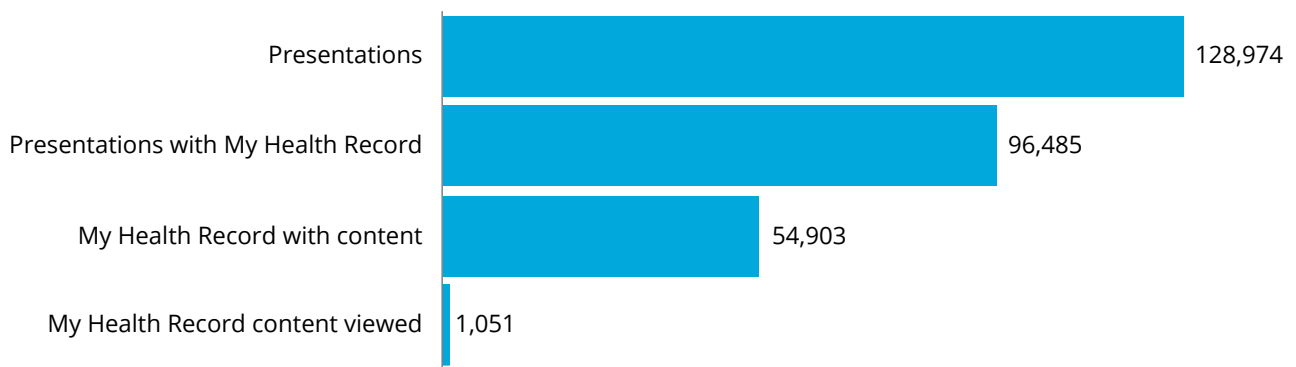
Additional work is required to encourage ED clinicians to view My Health Record system content during their clinical workflows. This was evidenced by 0.16% of the clinical documents available within My Health Records being viewed during the study (Figure 1). Opportunities to increase this view rate include peer-led advocacy by clinical champions. Project findings show that the most sought-after clinical documents – specialist letters, event summaries and shared health summaries – were low in quantity (and hence, availability) compared with other document types, such as discharge summaries. This sought-after content is not typically available in a hospital's electronic

**Figure 1: Summary of My Health Record clinical documents available and viewed, by document type, during Phase II of the project**



DVA = Department of Veterans' Affairs; MBS = Medicare Benefits Schedule; PBS = Pharmaceutical Benefits Scheme

**Figure 2: Summary of emergency department presentations, by cohort, during Phase II of the project**



medical record (EMR) or state- or territory-based portal. If health service organisations encouraged the uploading of these documents, particularly outside the acute environment, this would incentivise more frequent use of the My Health Record system by ED clinicians.

The availability of My Health Record system content is expected to increase as connected health service organisations continue uploading data to the system. Content regarded as 'high value' by ED clinicians – including medication-related documents, diagnostic imaging and pathology test results, and specialist letters – is crucial for inclusion to encourage ED clinician use. Activities to maximise the availability of this content in patients' My Health Records should be accelerated.

## Project overview and objectives

This report describes findings from a multiyear project that aimed to establish what would be required for ED clinicians to use the My Health Record system more frequently in their practice. The project comprised two phases:

- Phase I – opt-out trial sites and targeted interviews
- Phase II – pilot sites.

This project was undertaken by the Australian Digital Health Agency in partnership with the Australian Commission on Safety and Quality in Health Care.

Project findings informed the development of a national adoption model to support ED clinicians' regular use of the My Health Record system.

The ED presentations that attended the pilot sites during Phase II of the project were stratified into cohorts. Firstly, ED presentations were grouped according to whether they were matched to their My Health Record, making it accessible for the ED clinician. This cohort was further grouped according to whether their My Health Record contained content or not. Subsequently, the cohort with content in their My Health Record was further stratified according to whether this content was viewed by an ED clinician during the ED presentation. It is this cohort that was

the focus of the pilot, to determine if a content populated My Health Record influenced clinical decision-making (Figure 2).

## Principles informing the adoption of the My Health Record system in EDs

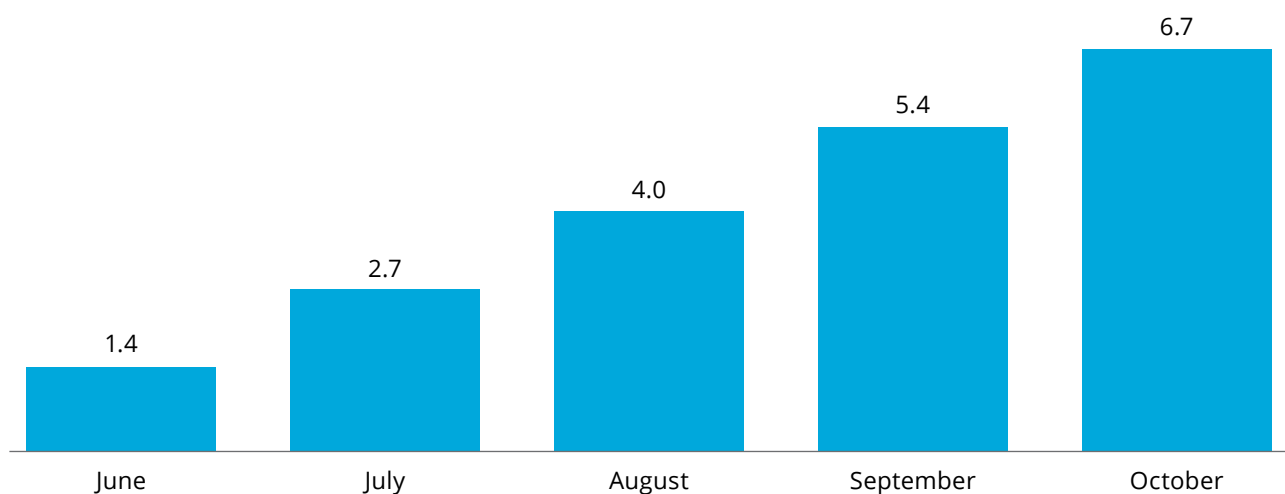
For the My Health Record system to influence clinical practice in EDs, clinicians require:

- Continued increase in the volume of clinical documents within the My Health Record system
- Better awareness of how and when to use the My Health Record system in their workflows
- Greater visibility of what information is available within the My Health Record system
- Improved presentation and organisation of My Health Record system content.

These principles, although focused on the ED setting, are transferable and scalable to other clinical settings within the broader hospital environment. The principles are based on:

- Technology factors
  - navigation
  - presentation of content
  - usability enhancements
- Process factors
  - governance
  - workflow integration
- Human factors
  - education
  - workforce.

**Figure 3:** Average number of documents viewed, all pilot sites, each month of the pilot study (Phase II)



## Recommended enablers to regular use of the My Health Record system by ED clinicians

### The My Health Record system benefits patients who have the highest healthcare needs

The more encounters people have with the healthcare system, the more likely they will have clinical information from multiple clinicians and organisations will have documents uploaded to their My Health Record. Patients who presented to the ED and needed hospital admission had an average of 10 documents in their My Health Record, compared with an average of six documents in the My Health Record of patients who were discharged directly from the ED.

Such complexity can reflect the history of a patient with a single chronic disease and an extensive history of medical interactions, or a patient with multiple conditions of lower acuity that are managed by multiple clinicians within acute and community settings. ED clinicians often do not have access to a patient's complete history.

The My Health Record system provides a mechanism for consolidating healthcare information from multiple sources and will

become increasingly important as content and awareness evolve.

### Increased My Health Record utility depends on high-value content

The My Health Record system provides a way to provide the required information in a more timely and efficient way than communicating with other clinicians, sorting through paper records or faxing clinical results.

ED clinicians are adept at seeking information to help provide the most relevant care for their patients. This is reflected in data collected throughout the project. My Health Record use is highest when patients are admitted from the ED to inpatient wards in a hospital, compared with patients discharged directly from the ED.

The project found that, by the end of the study in October 2019, the average number of My Health Record documents available had increased across the four ED pilot sites. This finding supports the view that My Health Record content will continue to increase over time as clinicians become familiar with its availability. Additionally, Figure 3 shows that the average number of My Health Record documents viewed had increased across the four ED pilot sites. This suggests that greater My Health Record system awareness,

facilitated by the clinical champions, translated to increased use.

### **On-screen design and usability of clinical information systems affect clinicians' use of the My Health Record system**

The project has provided insight into the usability of various viewing platforms used to access the My Health Record system. Survey and workshop findings confirmed anecdotal observations that poorly designed viewing platforms increased cognitive load and deterred clinicians from using the My Health Record system. Clinicians felt that there was room for improvement on usability burdens such as:

- Number of mouse clicks
- Number of screens
- Amount of scrolling required
- Links to content needing to be displayed more prominently.

### **Project findings are applicable beyond the ED to the wider hospital setting**

While the circumstances around assessment and management of patients are different in an ED to other areas of a hospital, the general concept is the same for all clinical specialties – better informed clinicians make better clinical decisions. As such, the findings in this report are applicable to the broader public and private hospital systems. All clinicians will benefit from a content-rich and easy-to-use My Health Record system. Inevitably, enhancements to viewing platform systems required to support user-friendly access to the My Health Record system will take time. However, clinical champions can help achieve immediate benefits, by raising awareness and helping to integrate the My Health Record system into clinical workflows.

### **Expand access to the My Health Record system across all clinical staff**

Some ED nursing staff did not have access to the hospital's EMR, which served as a gateway to

the My Health Record system. Access to the EMR or similar hospital-based systems is critical to enabling access to the My Health Record data.

### **Further education and training to promote use of the My Health Record system**

ED clinicians sought further education and training to support their use of the My Health Record system. Survey findings showed that only 15% of ED clinicians felt they had received enough My Health Record system training. Approximately 40% of ED clinicians understood what clinical information was available in the system. This presents an opportunity for state and territory health departments to provide further education and training to clinicians, particularly on what content is available in the My Health Record system and, if available, the state- or territory-based portal.

### **My Health Record system clinical champions can make an immediate impact**

The main function of the clinical champions was to collect survey data from their colleagues and ED patients about their experience with using the My Health Record system. There appeared to be a correlation between the ED's collective use of the My Health Record system and the degree of engagement and availability of the My Health Record clinical champions. This reinforced how digital health initiatives can benefit from similar peer-led advocacy.

The patient safety benefits associated with using the My Health Record system can be improved immediately if clinical champions help their colleagues integrate My Health Record system use into their clinical workflows.





# 1 Introduction

Providing patient-centred clinical information to all clinicians, particularly those in a time-critical environment such as the emergency department (ED), was one of the main rationales for developing a national electronic healthcare record (EHR). EHRs are online electronic applications or repositories through which individuals can access, manage and share their health information in a private and secure environment.<sup>3</sup> EHRs can be accessed by all treating clinicians, providing one avenue for improving timely access to current and clinically relevant information. In Australia, this is the My Health Record system.

EHRs are different to an electronic medical record (EMR), which is exclusively used by healthcare providers for the purposes of providing health care in the setting in which they practise. EMRs are typically used in hospitals, including the ED, to electronically document a patient's clinical information and treatment. Both EMRs and EHRs are examples of clinical information systems (CISs), which are characterised by the storage of clinician or healthcare equipment inputs.

Studies have shown that ED clinicians' interactions with an EHR system are motivated by the availability of summary information, and by accessibility through integration with in-house CISs.<sup>4,5</sup> Research has noted that clinicians find this particularly useful for complex patients with comorbidities.<sup>6</sup> Information about a patient's previous encounters, dispensed medicines, and pathology and imaging results is closely associated with an ED clinician's decision to admit or discharge a patient.<sup>7</sup>

Hospitalisations and readmissions are less likely if an ED clinician uses an EHR during examination and treatment.<sup>6</sup>

ED clinicians often require information external to their hospital EMR and healthcare records. The My Health Record system can provide ED clinicians with supplementary information that

may be used to improve patient care. Expected benefits include:

- Improved decision-making and access to critical information in an emergency
- Improved treatment plans
- Improved communication
- Reduced duplication of diagnostic imaging and pathology
- Reduced adverse drug reactions
- Reduced inappropriate admissions.

## Assessing My Health Record system use in EDs

The project extends on work undertaken through the *Seventh Clinical Safety Review of the My Health Record System – Review 7.1: Assessing the impact and safety of the use of the My Health Record system in emergency departments* by the Australian Commission on Safety and Quality in Health Care (the Commission).<sup>8</sup> This review focused on My Health Record system use within several hospital EDs. The review analysed the extent to which ED clinicians used the My Health Record system, and the impact and implications of clinician use.

Review 7.1 provided nine findings and 14 recommendations. The review found that, at the time, ED clinicians had low use and awareness of the My Health Record system. Additionally, there was little evidence regarding how the My Health Record system integrates with clinical workflows, to provide maximum benefit for clinicians and patient care. Public and private hospital EDs are connected to the My Health Record system, but this had not translated into clinicians regularly using it.

Given the time-critical nature of the ED, clinicians consulted as part of Review 7.1 spoke of their preference for 'a single [IT] home' where they can access and maintain up-to-date patient information. They stated that, currently, the

information required to assess and manage patients presenting to the ED is 'hard to find'. Searching for this information requires 'complex navigation' through systems, which can have a negative effect on patient outcomes and the ED workflow.

The review concluded that, after recent significant investment, states and territories had progressed in building the technical capability to upload and view information held in the My Health Record system in the ED. However, use of this capability in ED settings was low. This was partly attributed to low patient uptake of the My Health Record system.

The findings were categorised under two main themes:

- Even in hospitals that were identified as actively viewing the My Health Record system, most ED clinicians had little exposure to it
- Although hospitals are required, under the legislation governing the system, to have policies for access and use of the My Health Record system, these policies do not appear to have helped promote overall awareness of system functions and potential uses of the system to ED clinicians.

Given the benefits of ED clinicians using the My Health Record system, and the identified barriers to this, the Commission proposed to the Australian Digital Health Agency a project to develop and pilot an adoption model to increase use of the My Health Record system in EDs.

## Using electronic healthcare records in emergency medicine

A literature review and environmental scan (*Implementation Method and Clinical Benefits of Using National Electronic Health Records in Australian Emergency Departments*<sup>9</sup>) established a contemporary evidence base for EHR use in EDs.

The following research questions guided the literature review:

1. What are the benefits of using EHRs in hospital EDs?
2. What barriers and enablers affect the regular use of EHRs by clinicians in hospital EDs?

The search strategy was designed to explore the following areas of the EHR literature:

- Integration of EHRs and ED patient administration systems
- Best practice of EHR use within the ED
- Barriers to EHR clinical use – particularly safety and quality risks, and impacts on workflow
- Implications for education, training and implementation support requirements.

Findings from the literature review and environmental scan were published in the *Medical Journal of Australia*.<sup>10</sup>

### Literature review

The literature review identified the barriers and enablers to national EHR use within hospital EDs (Table 1).

The usability of EHRs within the ED setting depends on components of the EHR user interface, such as access to content and navigability of content. Increased clinical content requires the user to depend more on search and filter functions, which can minimise the cognitive loads of unnecessary keystrokes and mouse clicks. ED clinicians have a low tolerance of access delays to EHR content, and are generally willing to wait no more than three seconds.<sup>11</sup> Findings from the literature review, particularly how impediments to EHR use are due to poor usability, were tested with ED clinicians in Phase I of the project.

Lessons learned from the international literature indicate that adapting the workforce and changing culture must receive the same due diligence as technical changes to CISs. The former point highlights that users should be supported in adjustments to their work processes, which will assist in embedding and optimising regular EHR use. Clinical champions providing ongoing support are the preferred approach for educating the workforce on EHR use.

**Table 1:** Literature review summary

Barriers to use	Benefits to the ED workforce	Patient outcomes
<ul style="list-style-type: none"><li>• Poor training and awareness</li><li>• Poor system interface between EHRs and hospital EMRs</li><li>• Lack of trust in content</li><li>• Poor accessibility</li><li>• Poor integration with clinical workflows</li><li>• Poor usability and navigation of content</li><li>• Lack of overall content</li></ul>	<ul style="list-style-type: none"><li>• Access to critical information in an emergency</li><li>• Reduced duplication of diagnostic imaging</li><li>• Reduced duplication of pathology</li><li>• Improved and timely access to information for complex patients with multiple comorbidities</li><li>• Improved decision-making</li><li>• Improved workflow</li><li>• Improved sourcing and documenting of a patient's history</li></ul>	<ul style="list-style-type: none"><li>• Reduced inappropriate admissions</li><li>• Reduced adverse drug reactions</li><li>• Reduced radiation exposure</li><li>• Reduced readmissions to ED</li><li>• Reduced invasive treatment</li><li>• Increased patient satisfaction</li></ul>

ED = emergency department; EHR = electronic healthcare record; EMR = electronic medical record

When clinicians can access information regarding a patient's medicines, diagnostic tests, and encounters with primary and acute care health services, the timeliness and quality of care provided in EDs are likely to improve. ED clinicians are particularly motivated to use EHRs when they have repeat and complex patient presentations.



## 2 Method

This chapter describes the project's methodology, design and activities.

The collective term 'ED clinicians' is used to describe the study population throughout the remainder of this document. ED clinicians refer to the group of clinical staff that predominantly perform patient care tasks in the emergency department (ED) setting and comprise doctors, nurses, allied health professionals and pharmacists.

### Project aim

The project aimed to develop an adoption model that will establish the enablers to regular use of the My Health Record system in Australian hospital EDs.

The study focused on two research questions:

1. What do ED clinicians need to support their use of the My Health Record system?
2. How can ED clinicians apply My Health Record system content to their decision-making?

### Project methodology

The project featured two phases aligned with the national expansion of the My Health Record system across Australia.<sup>12</sup>

Phase I focused on the experiences of ED clinicians at the My Health Record opt-out trial sites; the rationale was to examine how approximately 98% of the local patient population having a My Health Record affected ED clinicians' practice.<sup>13</sup> Subject matter experts were interviewed to further explore the barriers and enablers to electronic health record (EHR) use, which were identified from the literature review and environmental scan.

Phase II tested how the My Health Record system was being used in four participating hospital EDs, whose selection and characteristics are detailed later in this chapter. ED clinicians from these hospitals were supported by clinical champions, a key finding from Phase I. Workforce surveys and ED data from the participating hospital EDs were collected. The latter was aligned with My Health Record system data, supplied by the National Infrastructure Operator (NIO), to examine My Health Record system use. An adoption model of the My Health Record system in hospital EDs emerged from Phase II findings for use by public and private hospitals across Australia.

The overarching methodology for this project was program evaluation. A range of longitudinal observational methodological approaches were used to evaluate the impact of the project, which included use-cases (or case studies) and concurrent cohort studies.

### Case series

ED clinicians, grouped by pilot site, were observed as they used the My Health Record system in their ED. The nature and frequency of My Health Record system use were evaluated using the Australian Digital Health Agency's (the Agency's) My Health Record system data and the pilot sites' de-identified patient records. The former was reviewed to determine the presence of My Health Record system content, by document type and volume, and how this may influence ED clinicians' viewing behaviour and application of such content. ED clinicians' attitudes towards the My Health Record system were collected through de-identified surveys and use-cases. Patients and carers who presented to one of the participating ED pilot sites to receive care were invited to provide their opinion on My Health Record, through a short questionnaire.

## Concurrent cohort studies

Patients who attended a pilot site's ED during the study were stratified into three cohorts (Figure 4):

1. Patients with a My Health Record, with content, including Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) content
2. Patients with a My Health Record and no content
3. Patients where a My Health Record was not identified.

The focus of the project was patients with content in their My Health Record that was viewed by an ED clinician. This cohort represented a high opportunity to realise benefits towards patient care. All other patient cohorts were considered a missed opportunity. These included:

- A My Health Record was not identified due to the patient choosing to opt out from having a record
- A My Health Record was not identified due to incorrect or missing identifiers that are used to retrieve a record
- A My Health Record without any content

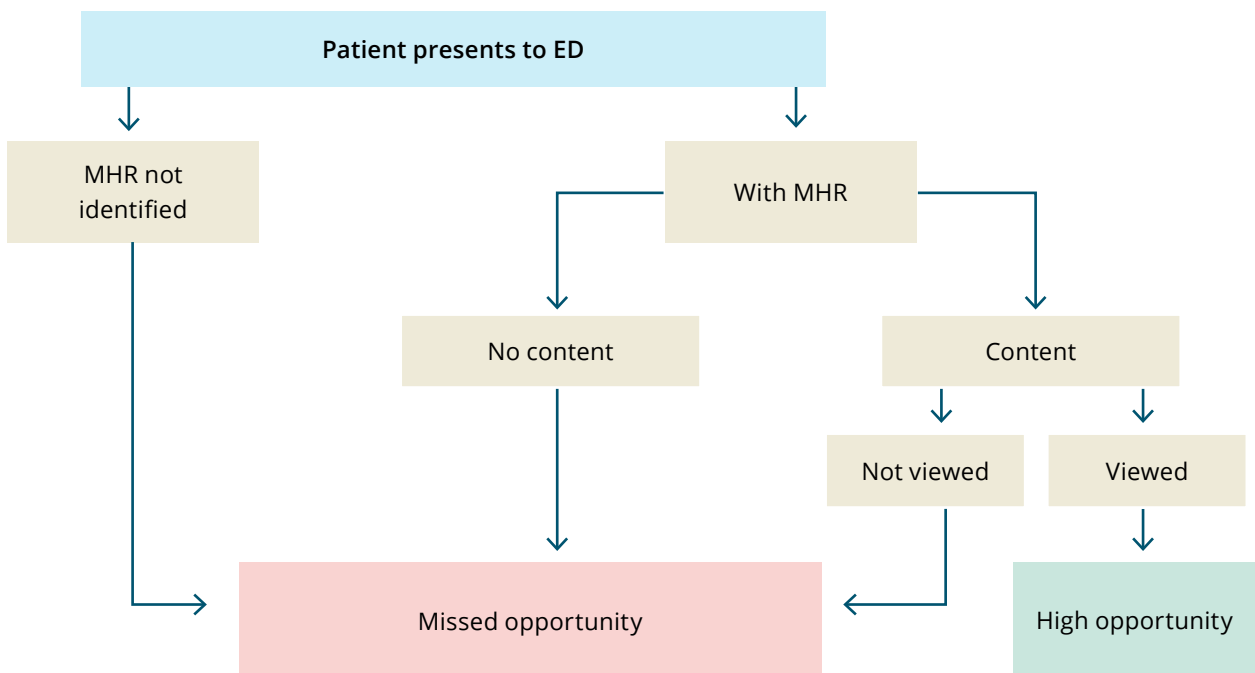
- A My Health Record with content was not viewed by an ED clinician.

ED operational measures, such as length of stay and disposition, were compared between patients who had a My Health Record and those patients who did not (analysed site by site, cohort by cohort and in aggregate). Furthermore, the project team evaluated the impact of My Health Record being used or not on ED operational metrics. The immediate impact of the project allowed for the effects of normal operational activity that limit both time and resources available within already busy, live EDs.

MBS and PBS content was considered to be of low use for clinical decision-making, as these transactional data largely contain administrative information.<sup>14</sup> This is consistent with feedback from ED clinicians in the opt-out trial sites. In contrast, a populated My Health Record with a variety of document types was considered high utility.

Patient cohorts were reviewed to determine whether demographic characteristics (e.g. age, sex) or clinical characteristics (e.g. complexity – SNOMED or International Statistical Classification

**Figure 4:** Stratification of emergency department patient presentations during the study



ED = emergency department; MHR = My Health Record

of Diseases code, triage category) correlated with ED clinicians using the My Health Record system more.

Aside from recommendations that stem from the core objectives of the project, additional recommendations were made to assist future follow-up studies of the ongoing rollout and impact of the My Health Record system in hospital EDs.

The sites included in this project and the range of ED operational metrics examined reflected different EDs and the range of ways they may or may not use the My Health Record system. The ED operational metrics and the My Health Record system data fall into two broad groups: those that reflect some aspect of use, and those that reflect some aspect of immediate impact. Both datasets were contextualised by qualitative responses from ED clinicians.

All ED clinicians at the opt-out trial sites (Phase I) and pilot sites (Phase II) were invited to participate from their ED and during their respective phase of the project. Eligibility was all ED clinicians regardless of employment type – for example, permanent full time, permanent part time, casual and visiting medical officers. Patient consent was sought before the patient questionnaire was administered.

Clinicians based outside the ED, who may attend the ED as part of their work tasks, were not invited to participate.

## Governance

The Commission appointed a dedicated project team, with a senior emergency and retrieval physician as the clinical lead.

The project was governed by an oversight committee, which included membership from the Agency, the Australasian College for Emergency Medicine, the Royal Australian College of General Practitioners, the Consumers Health Forum of Australia, Primary Health Networks (PHNs), and representatives from state and territory health departments.

The oversight committee's role was to provide expert advice on the project generally, in the context of current and future use of the My Health Record system in hospital EDs and how such use interfaces with the broader health system.

## Ethics

Two separate Human Research Ethics Applications (HREAs) were prepared for the two phases of the project. The HREAs were approved by the Nepean Blue Mountains Local Health District Human Research Ethics Committee (EC00151) and recognised at participating sites under the National Health and Medical Research Council's National Mutual Acceptance scheme. The project was considered a Low and Negligible Risk study and was exempt from a full ethical review.

A site-specific assessment was prepared for all participating sites and submitted to the respective local research governance officer. Project activities started after local site approvals were received.

A waiver of consent was sought from ED staff in the Phase II pilot sites. This recruitment method was based on the risk from stratifying ED staff participants according to their consent, which could result in multiple workflows operating simultaneously in the ED and would likely impede communication and overall workflow efficiency. This waiver of the requirement for consent was applicable only to the concurrent cohort and observational components of the pilot study.

An information sheet was distributed to all participants to inform them of the project. This included information on the different components of the pilot study. The staff survey allowed for a consent form to be appended.

## Sample size

There were 1,004 eligible ED staff across the four pilot sites (average of 250 participants per pilot site) for Phase II of the project. This was similar to the ED staff numbers from the My Health Record

system opt-out trial sites, during Phase I.\* A sample size<sup>†</sup> of 278 staff across the four pilot sites was required to achieve a 95% confidence level and a confidence interval of 5. This sample size guided the number of completed staff surveys required.

## Phase I – opt-out trial sites and targeted interviews

Development of the national adoption model was based on findings from Phase I of the project. This involved two discrete parts – targeted interviews with key ED clinical leaders and health IT experts, and lessons learned from the 2016 My Health Record opt-out trial.

### Targeted interviews with health IT experts and ED clinical leaders

Telephone interviews were conducted from November to December 2017 with stakeholders, who included ED clinical leaders and health IT experts (see [Appendix 1](#) for detailed list). The geographic location and experiences of these stakeholders were spread across all Australian states and territories, and international locations such as the United Kingdom, Israel and Denmark. The stakeholders were identified through existing networks with the Commission and the Agency. The project team also contacted authors of seminal literature about using EHRs in hospital EDs.

An interview guide was used for the targeted interviews. The questions covered the stakeholders' experience working with EHRs generally, and the My Health Record system specifically. Other themes included implementation, education and integration with clinical workflows.

\* ED staff profile information was gathered across the five hospitals that were part of the My Health Record system opt-out trial sites.

† Sample size calculator ([www.surveysystem.com/sscalc.htm](http://www.surveysystem.com/sscalc.htm))

## Lessons learned from the 2016 My Health Record opt-out trial

The My Health Record system participation (opt-out) trial was conducted from March to October 2016 in New South Wales and Queensland in the PHNs of Nepean Blue Mountains and Northern Queensland.<sup>15</sup> In these areas, approximately 98% of the population had a My Health Record created for them. As such, within these PHNs, it was expected that there would be more content within consumers' My Health Record and more My Health Record awareness among clinicians. The project team conducted workshops and staff surveys to gather the ED clinicians' opinions of My Health Record and their suggested improvements. The EDs involved were at Townsville Hospital, Cairns Hospital, Mackay Hospital, Thursday Island Hospital and Nepean Hospital.

### Case-based training by clinical champions

At the time of the interviews, stakeholders considered that awareness of the My Health Record system among ED clinicians was low. Stakeholders suggested that a case-based approach to My Health Record system training would be most effective for ED clinicians. This type of training could showcase how the My Health Record system could be used in specific clinical cases, and led by peers who were clinical champions.

Some stakeholders indicated their preference for specific My Health Record system training to be aligned with their ED clinical group (e.g. medical, nursing, allied health, pharmacy), due to the different roles and functions.

### Out-of-area patients

Stakeholders acknowledged that sourcing information from patients and their carer(s) in the ED setting was 'patchy'. Such information-gathering proved challenging if the patient was external to the geographical boundaries of the hospital ED's Local Health Network or Local Health District. Stakeholders agreed that information outside their hospital electronic medical record (EMR) – which could be in the My



Health Record system – could supplement patient information gaps.

### Measuring use

Practising clinicians highlighted the importance of measuring My Health Record system use to understand viewing behaviours. For example, hospital pharmacists suggested that they would be encouraged to use the My Health Record system if they received regular quantitative reports that showed the most viewed document types and patterns of use, such as time of day or day of week.

### Workshops

Workshops were held in December 2017 with ED clinicians from Townsville, Cairns and Nepean hospitals, which were part of the opt-out trial. An external facilitator ran these workshops, and ED clinicians reviewed a discussion paper before the workshop. Extending on the themes from the stakeholder interviews, the workshops covered:

- Usability
- Training and awareness
- Integration with ED workflows
- Stakeholder engagement
- Governance and optimisation.

Workshop participants were generally aware of the My Health Record system; however, few had used it in their clinical practice. This general awareness came largely from the media and colleagues. ED clinicians were unaware, and did not receive training on, how to access and use the My Health Record system, resulting in poor integration with ED workflows.

### High-value content

High-value content in a patient's My Health Record was considered to be information that is not typically available in the hospital's EMR and is therefore externally sourced. Participants suggested that private pathology and diagnostic imaging reports would support provision of care to patients, particularly those with chronic and complex conditions.



**It hasn't been much help as yet, though with more uptake and access to a greater number of documents/results I can see it will be of benefit in the ED setting. – doctor**

Clinical pharmacists based in the hospital's ED indicated that they regularly used the My Health Record system. This supported a view that pharmacists could promote the My Health Record system to their ED clinical colleagues.

### State- or territory-based portals

A state- or territory-based portal centralises information from other public hospitals within a state or territory. The viewing platform for the state- or territory-based portal is the same platform used to access the My Health Record system.

The workshop revealed that ED clinicians did not differentiate between the My Health Record system and their state- or territory-based portal – the latter being The Viewer in Queensland and HealtheNet in New South Wales. Further information on these portals is detailed in [Chapter 3](#). In most cases, workshop participants viewed the My Health Record system and the state- or territory-based portal as the same system, which caused frustration among ED clinicians when encountering duplicate patient information across both systems.

Nurses in the workshop indicated that they had either limited or no access to their state- or territory-based portal. This impeded their access to the My Health Record system, since the state- or territory-based portal was the only way to view the My Health Record system.

### Integration

Participants suggested that the ideal solution would be a viewing platform that encompasses content from their hospital EMR, the state- or territory-based portal and the My Health Record system. Access to this viewing platform using a 'single sign-on' would reduce the burden on ED

clinicians having to recall several different sign-on credentials. The viewing platform should highlight if a patient has a My Health Record and whether it is populated with content.

## Staff survey

A survey was developed based on feedback from the stakeholder interviews and workshop participants. This survey was made available from May to July 2018 to ED clinicians across the five public hospitals included in the opt-out trials.

The survey captured the views of ED clinicians who were unable to attend the workshops. The survey could be completed via SurveyMonkey or on paper (the latter was a request from a participating hospital). ED clinicians were given two months to complete the survey. A reminder to complete the survey was issued two weeks following survey launch and two weeks before the survey closed.

The survey design used a combination of response options, including radio buttons, a five-point Likert scale and free text for comments. The survey included 18 questions and 43 sub-questions, and took approximately six minutes to complete.

The survey captured demographic information such as state or territory, profession and experience. Questions were grouped according to themes – consistent with the stakeholder interviews and workshop – which were awareness, training, use, application of My Health Record system content, and experience with the My Health Record system. Oversight committee members provided input to refine the survey design.

The project team received 131 responses; most respondents were from Queensland with a medical background.

## Education and training

Approximately 70% of respondents indicated that they had never used the My Health Record system during their previous 10 ED shifts. Comments from this group demonstrated low awareness of, and access to, the My Health Record system. Respondents welcomed My Health Record system education and training, with a focus on what type of clinical content is available.

Respondents supported a collegiate approach to My Health Record system training, led by fellow ED clinicians known as clinical champions. It was suggested that the clinical champions could provide support ‘on the floor’ during a clinical shift. The local knowledge of clinical champions could better resolve any problems experienced with My Health Record system use in the local ED setting than external trainers could.



**The clinical champions cannot be from other professions as was done in our workplace. They need to work in the area and understand the workflow fully and hence deliver the material with perspective.** – doctor

## Phase II – pilot sites

The experiences of ED clinicians at the opt-out trial sites revealed several critical success factors that could support My Health Record system use in hospital EDs (Box 1). These factors informed a pilot study research framework for testing in live hospital EDs outside the opt-out trial regions.

### Box 1: Critical success factors from the opt-out trial sites

- Educating clinicians about the My Health Record system, focusing on content and application, to be led by clinical champions.
- Using case studies to enhance ED clinician awareness of the My Health Record system.
- Integrating the My Health Record system in the ED's clinical information systems and workflows.
- Increasing clinical content in the My Health Record system.

Feedback from ED clinicians interviewed in Phase I highlighted that a major barrier to using the My Health Record system was the low number of My Health Record-registered patients. Therefore, Phase II was aligned with the My Health Record system national expansion program (the national opt-out).<sup>12</sup> This Agency-led program resulted in Australians having a My Health Record automatically created for them if they did not opt out. This maximised the likelihood that patients presenting to an ED will have a My Health Record and thus encourage clinicians to use it.

The opt-out period was originally scheduled from July to October 2018; however, it was extended to 31 January 2019. Timelines for Phase II of the project were adjusted accordingly.

Approximately 9.9% of Australians opted out of having a My Health Record automatically created for them. In contrast, a 90% participation rate was achieved, and approximately 23 million records were created in February 2019.<sup>16</sup>

The method for the Phase II pilot site study was noted by the Agency's Board in December 2018.

## Pilot sites

Pilot sites were selected based on criteria developed and agreed to by the project team, the Agency and the oversight committee (Box 2). A balance was sought to reflect the diversity of states and territories, ED and hospital size (e.g. principal referral), geographic location (e.g. metropolitan, rural), hospital EMR and My Health Record system viewing platform. Such diversity was considered when selecting pilot sites to achieve a broad representation of an emergency clinical setting and to maximise the generalisability of the project's findings to other EDs across Australia. The project team examined the different attributes of these viewing platforms and the effect on ED clinicians' My Health Record system use.

Four pilot sites were selected to ensure appropriate resource allocation and logistics management (Table 2).

A contract was established between the Commission and each pilot site, which enabled

### Box 2: Selection criteria for pilot sites

- The pilot site must have a clinical information system or electronic medical record in the hospital ED that can access the My Health Record system and view content.
- The pilot site ED workforce profile should have generalisability across clinical professions.
- The pilot site must not have a local IT upgrade or major implementation project planned during the project.

sites to receive project funds for recruiting dedicated local ED clinical champions to support project activities, including survey administration and data collection.

The pilot sites ranged in size, volume and complexity (Table 3). Metropolitan sites were located within 5 kilometres of the respective capital city's central business district. Tamworth Hospital is in the Hunter New England region of New South Wales, which is approximately 400 kilometres north of Sydney.

Pilot sites provided advice on their ED workforce, including a breakdown by professional group. This included allied health professionals and pharmacy who were exclusively rostered to ED clinical duties on a rotational basis. Administration staff were included because they support clinicians in using the My Health Record system, such as processing 'do not upload' requests.

Some pilot sites' workforce profile was exclusive to the nursing and medical professions. Nonetheless, communication regarding the project was distributed to the ED workforce. This resulted in responses for some professional groups where the pilot site had recorded zero staff. For example, Royal Perth Hospital was the only pilot site to record administration staff in its ED profile; however, staff survey responses were received from administration staff in other pilot sites (Table 4).

**Table 2: Pilot sites**

Pilot site	State	Beds (n)	Patient type	Hospital EMR	Viewing platform
Princess Alexandra Hospital	Queensland (metropolitan)	780	Adult	Cerner FirstNet	The Viewer
Royal Children's Hospital Melbourne	Victoria (metropolitan)	340	Paediatric	Epic	Epic
Royal Perth Hospital*	Western Australia (metropolitan)	450	Adult	iSoft Clinical Manager	HIPS-UI
Tamworth Hospital	New South Wales (rural)	288	Adult and paediatric	Orion CAP†	HealtheNet

EMR = electronic medical record; HIPS-UI = Health Identifier and PCEHR System user interface

\* Royal Perth Hospital and Tamworth Hospital used a hybrid of an EMR and paper-based documentation

† Orion CAP is unique to Tamworth Hospital and its Local Health District. All other Local Health Districts across NSW Health use Cerner as their platform.

**Table 3: Emergency department profile of pilot sites**

Measure	PAH	RCH	RPH	TH
ED presentations (n)	65,840	81,173	73,179	42,778
Patients who left ED within four hours of arrival (%)	63	77	67	69
Time until most (90%) patients left ED	9 h 23 m	3 h 00 m	6 h 26 m	6 h 42 m
Median time (50%) patients left ED	3 h 38 m	2 h 40 m	3 h 18 m	3 h 02 m

ED = emergency department; PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital;

TH = Tamworth Hospital

Source: AIHW<sup>17</sup>

**Table 4: Participating emergency department staff, by profession and pilot site**

Profession	Total		PAH		RCH		RPH		TH	
	n	%	n	%	n	%	n	%	n	%
Nursing	579	58	181	60	151	67	152	48	95	61
Medical	337	34	108	36	74	33	104	33	51	32
Administration	46	5	0	0	0	0	46	14	0	0
Allied health	40	4	13	4	0	0	16	5	10	6
Pharmacy	2	>1	1	>1	0	0	1	1	1	1
<b>Total</b>	<b>1,004</b>	<b>100</b>	<b>303</b>	<b>100</b>	<b>225</b>	<b>100</b>	<b>319</b>	<b>100</b>	<b>157</b>	<b>100</b>

PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

## Clinical champions

Clinical champions, sometimes called super users, have been shown to contribute to successful implementations, with these users being doctors or nurses who had no patient care responsibilities and functioned only to support clinicians in using an EHR system (see Box 3).<sup>18</sup>

Clinical champions were established at each pilot site using a medical and nursing hybrid model. The ED director and nurse manager of each pilot site recruited the clinical champions. All staff from the existing ED staff profile of each pilot site were invited to apply; therefore, collegiate relationships were already established. The clinical champions were recruited due to their clinical seniority (i.e. minimum five years clinical experience in emergency or acute care) – clinical nurse educator or equivalent for nursing and emergency physician for medicine (i.e. Fellow of the Australasian College for Emergency Medicine). This was to ensure the necessary skills and discernment to minimise interruptions to clinical workflows and to credibly interpret any effect the My Health Record system may have had on work tasks.

In most pilot sites, the numbers of clinical champions were equivalent to a 1.0 full-time-equivalent nurse and a 0.25 full-time-equivalent doctor. The clinical champions interacted with ED staff across morning, afternoon and night shifts, with the aim of determining any differences in My Health Record system viewing behaviours according to the time of day and to avoid any roster bias. Similarly, on occasion, clinical champions' duty hours included weekends and public holidays to explore My Health Record system use when most community-based health services (e.g. general practitioners, and private diagnostic imaging and pathology laboratories) were closed.

Clinical champions guided their ED colleagues throughout the study. The clinical champions indicated that ED staff would approach them with questions related to the My Health Record system. This typically led to an impromptu My Health Record system education session, with lessons learned being directly applied to practice.

### Box 3: Clinical champion duties and responsibilities

- Raise project awareness with ED staff and provide guidance on access to, and use of, the My Health Record system from the local ED clinical information system.
- Facilitate local pilot site data collection by liaising with the relevant data custodian(s) (e.g. ED/hospital data manager or delegate).
- Observe ED staff interacting with the My Health Record system, discuss My Health Record system experiences with ED staff, and document My Health Record system use-cases from local ED workflows.
- Coordinate administration of staff and patient surveys.
- Participate in, and present feedback at, clinical champion project meetings.
- Coordinate project briefings with ED staff.
- Liaise with the local human research ethics committee or research governance officer about any ethics-related project matters.

Clinical champions developed resource guides in response to frequently asked questions they received from ED staff, with a particular focus on how to access the My Health Record system from the hospital's EMR and what content is typically available.

Junior medical officers based in pilot site EDs at the start of the study left their ED in August 2019 for their next rotation. Therefore, it was unavoidable that the junior medical officer workforce was not consistent throughout the study. Clinical champions met with the new intake of junior medical officers and provided My Health Record system education during their ED rotation.

## Instruments

### Staff surveys

The project team distributed a staff survey at the start and end of the study period, in June 2019 and October 2019, respectively. Paper-based surveys were not available. Clinical champions confirmed that all ED staff had a work email address to receive the survey link. Both surveys were made available for five weeks and were promoted to ED staff by each pilot site's clinical champions. Survey design was based on the survey used in Phase I, with minor refinements to the follow-up survey following feedback from clinical champions and respondents to the initial survey.

Each survey explored the staff member's attitudes and perceptions towards the My Health Record system, with a focus on:

- Initial survey – awareness and training
- Follow-up survey – awareness and training, access and usability, content, application and experience.

Both surveys used a combination of response options, including radio buttons, five-point Likert scale and free text for comments. The initial survey included 17 questions and 44 sub-questions, and took approximately eight minutes to complete. The follow-up survey included 24 questions and 59 sub-questions, and took approximately 10 minutes to complete. Partially completed surveys were accepted; there was a completion rate of 92% for the initial survey and 83% for the follow-up survey.

The surveys captured demographic information such as state or territory, profession and experience. Professions listed were:

- Medical
- Nursing
- Nurse practitioner
- Pharmacy
- Allied health
- Administration
- Other (please specify).

The nurse practitioner profession was grouped with nursing for data analysis. The 'other'

profession was a free-text field, which was allocated to a specific profession based on the response (e.g. mental health nurse was allocated to the nursing group). Each pilot site was unique to the state; therefore, cohorts by state were considered to be an appropriate substitute for the respective pilot site. Additionally, each pilot site had a unique survey link that was sent to ED staff, which stratified responses accordingly.

The initial survey's themes focused on awareness and training, to establish the baseline knowledge for each pilot site at the start of the study. Questions examined the individual participant's knowledge of the My Health Record system, training received and application to ED work tasks. The follow-up survey explored if My Health Record system use had become habitual, and what attributes of the respondent's My Health Record system experiences (including appraisal of their hospital EMR and My Health Record system viewing platform) improved their My Health Record system understanding.

The follow-up survey used logic sequencing, which opened a series of unique questions that related to the respondent's state. This approach was used to elicit responses on the viewing platform that the respondent was familiar with. Screenshots of mock-up My Health Record system content were included, alongside some survey questions as a reference.

### Workforce use-cases

Clinical champions at each pilot site gathered data regarding interactions between ED clinicians and the My Health Record system. These are referred to as case studies or use-cases of the My Health Record system, which aimed to show practical use in the ED. These use-cases captured anecdotal feedback from ED staff during their clinical shift based on their experience with the My Health Record system. Use-cases were collected when ED clinicians proactively approached the clinical champion or if the latter prompted the ED clinician during their shift. A dialogue between the ED clinician and the clinical champion provided the necessary context to My Health Record system use and served as a method of avoiding any observational bias that might have occurred

had the clinical champion simply observed the ED clinician interacting with the system.

Use-cases typically referred to how a patient's entire My Health Record was used during their ED presentation, rather than individual documents or certain content present in the patient's My Health Record. Experiences ranged from access impediments to exemplar cases when My Health Record system content was applied to patient care; in some cases, this showed improved care and realisation of the benefits from using the My Health Record system.

Use-cases were documented by the clinical champions using an electronic device (e.g. tablet, smartphone). A short questionnaire was prepared in SurveyMonkey. Logic sequencing was used that prompted the clinical champion to ask specific questions based on the respondent's answers.

Staff were asked two baseline questions: whether they asked the patient about their My Health Record or if the patient disclosed that they had a My Health Record, and whether they had used the My Health Record in their current clinical shift. Depending on the response (i.e. 'yes' or 'no'), staff were asked to say whether they found it useful and if clinical decision-making was affected, or to explain why they did not use the My Health Record.

These questions were designed to elicit direct user experiences with the My Health Record system, as it applies to real-life patient care in a live ED. ED staff were asked these questions after clinical champions observed their interaction with their My Health Record system viewing platform. The number of times these questions were asked was evenly distributed across the study, to ensure that responses were not biased towards a specific time period when My Health Record system awareness may have been particularly low or high. Questions were only asked when ED staff were not attending to ED patient care. Staff were encouraged to volunteer their My Health Record system experiences to the clinical champions. Use-cases were not exclusively recorded in real time; retrospective use-cases were accepted, which supported predominantly night shift (e.g. 11 pm to 7 am) staff when clinical champions

were not typically present. Exemplar My Health Record system use-cases were promoted among ED staff to encourage use and vicarious learning.

It is acknowledged that attempts by clinical champions to elicit use-cases from ED staff could be considered as an intervention. The clinical champions' enquiry regarding use-cases often transitioned to 'on the ground' support to ED staff regarding My Health Record access and use. Feedback from clinical champions suggested that most of these impromptu education sessions occurred when the study started, which was when My Health Record system awareness was lower than later in the study.

Clinical champions received monthly use-case statistics for their respective pilot site. These showed where the collection of use-cases may have been concentrated (e.g. weekdays), or if use-cases were predominantly sourced from a particular professional group. In response, clinical champions focused on collecting use-cases across other times of the day or days of the week to prevent any roster bias, or from other ED staff groups to prevent any bias towards a particular profession.

It is acknowledged that ED staff may have been repeatedly approached by the clinical champions regarding their My Health Record system experience throughout the five-month study. This forms part of the study design, as it was envisaged that the experiences of ED staff would change over the course of the study. Different My Health Record system experiences were attributed to:

- Increased familiarity with the My Health Record system
- Additional My Health Record system content from other health service organisations
- My Health Record system training
- Vicarious learning experiences from their ED colleagues or clinical champions.

Staff use-cases were stratified according to the response regarding whether the My Health Record system was used ('Did you use the My Health Record?'). Respondents who answered 'yes' were grouped to explore whether My Health Record system use was considered useful ('Was

the My Health Record useful?') and whether it influenced the ED staff member's clinical decision-making ('Did the My Health Record influence your clinical decision-making?'). In contrast, respondents who answered 'no' to My Health Record system use were asked why this was the case ('If no, why did you not use the My Health Record?') to understand what factors prevented use. Free-text comments were recorded against each question if the respondent chose to elaborate on their 'yes/no' response. Both groups were asked about their experience with the My Health Record system in the ED ('Any My Health Record in ED use-cases?') and general observations or comments ('Any other observations or comments?').

### **Patient use-cases**

Clinical champions administered a questionnaire to ED patients (or carers) to explore the level of awareness and engagement with the My Health Record system – an approach suggested by the consumer representative from the project's oversight committee. A questionnaire was used that recognised that patients, especially those with chronic care conditions, have a high level of engagement with their clinicians and treatment. Findings from the literature review suggest that these patients are likely to have a thorough understanding of their My Health Record and can advocate for its use by ED staff when presenting to a pilot site's ED.

The clinical champion asked a patient (with their consent) about:

- Their awareness of the My Health Record system ('Do you have a My Health Record?')
- Whether the patient discussed their My Health Record with a staff member ('Have you told ED staff that you have a My Health Record?')
- The patient's own My Health Record use ('Do you find your My Health Record useful?').

These questions aimed to test if a patient's prompting to their treating ED clinician can encourage the clinician to use the My Health Record system. Patient use-cases received earlier in the study suggested that most patients assumed that ED staff were aware that they have a My Health Record.

Figure 5 outlines the use-case collection for ED staff and patients (or carers).

### **Data collection**

Qualitative data were gathered using surveys and use-cases; the latter were based on a short semi-structured script administered by the clinical champions.

Quantitative data were retrieved from existing ED performance datasets from each pilot site and My Health Record system datasets from the Agency and the NIO.

Individual variables, as part of operational data, are already captured according to routine data collection and reporting practices of pilot sites and the Agency. These data were used to group ED pilot site patients into three cohorts:

- Patients who had a My Health Record (e.g. evidenced by a successful retrieval of the patient's My Health Record from the Healthcare Identifiers Service)
- If ED staff reviewed the patient's My Health Record
- If the patient's My Health Record contained clinical content.

The stratification process was conducted retrospectively using existing data fields in the My Health Record system dataset ('yes/no' queries related to the above three patient cohorts).

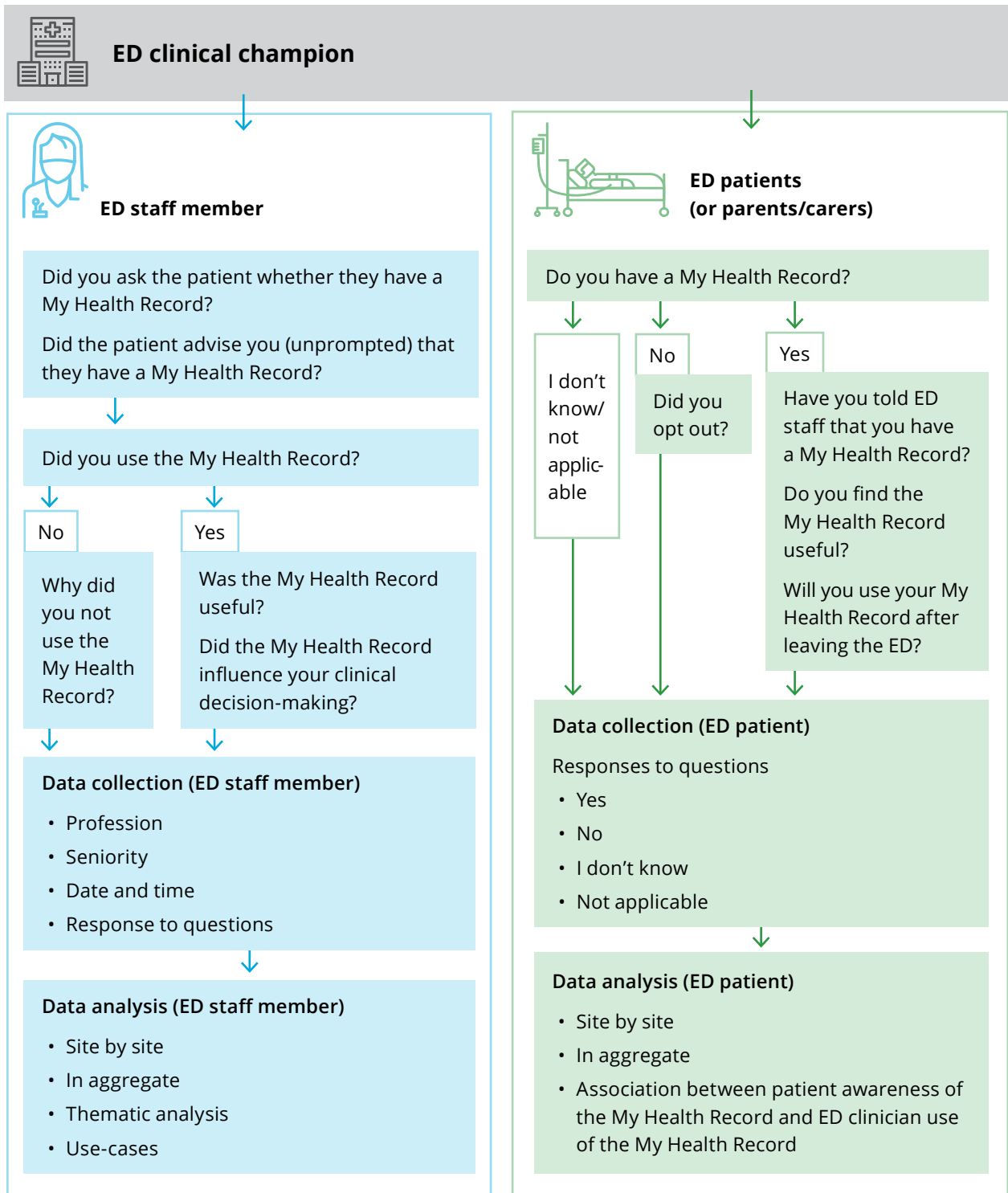
### **Pilot site ED operational data**

Operational data were collected from each pilot site's clinical information systems (CISs) and ED performance datasets. The variables collected for the project were aligned with existing ED data collected by the pilot sites and the respective state or territory health department, including:

- Patient arrival date and time
- Patient departure date and time
- Representation (within 72 hours of initial presentation)
- Readmission (within 28 days of initial admission)
- Triage category
- Description of reason for patient presenting to ED



**Figure 5:** Use-case collection process for emergency department staff and patients/carers



- Disposition (e.g. admitted or discharged)
- Initial medical officer review date and time
- Diagnosis and diagnosis code (e.g. International Statistical Classification of Diseases<sup>19</sup> or SNOMED CT-AU code<sup>20</sup>, if used)
- Seniority of treating clinician (e.g. junior medical officer, physician).

These data were used to explore any relationship between My Health Record system use and any effects on typical ED measures, such as average length of stay, admission rate, and number of pathology and diagnostic imaging orders.

The data requirements of the project referred to ED datasets and dictionaries, such as the National Non-Admitted Patient Emergency Department Care specifications<sup>21</sup>, and state or territory ED data collections or equivalent.<sup>22-25</sup>

Limited patient data were collected from the pilot sites' CIs, which related to demographic information (e.g. age at presentation, gender, postcode). These data were used to identify patient profiles and explore the relationships between patient characteristics and My Health Record system use by ED staff. No identifying information was collected (e.g. date of birth, address).

### Individual Healthcare Identifiers

The Individual Healthcare Identifiers (IHIs) of patients presenting to pilot site EDs were collected to confirm if the patient had a My Health Record and what content was accessed during their ED presentation. The IHIs were prepared by either the pilot site's parent entity (e.g. a Local Health District) or the state health department, and were supplied separately to the ED operational data. The project team cross-referenced the IHIs with the ED operational data using the corresponding pilot site identifier, such as the unique record number or medical record number. The project team prepared a dataset, which comprised four variables:

- IHI of patient presenting to pilot site ED
- Healthcare Provider Identifier – Organisation of the pilot site
- Patient arrival date at pilot site ED
- Patient departure date from pilot site ED.

This information was provided to the Agency and the NIO, which retrieved the My Health Record system information to the individual patient level.

### My Health Record system data

Data were used to examine the behaviours of pilot site ED staff with the My Health Record system. For example, My Health Record system data were reviewed to determine whether there was a concentration of My Health Record system use during a specific time period (e.g. business hours compared with after hours), whether there was a specific document type accessed more than others, and frequency of views. My Health Record system data were used to gain insight into ED clinicians' behaviours to enhance clinical usability and utility of the system.

Using the information provided by the project team, the NIO developed a dataset that included:

- Break-glass used – yes or no (e.g. whether the emergency access function was asserted)
- Total document count, by document type (e.g. number of shared health summaries and discharge summaries)
- View type
  - Not accessed (e.g. no document viewed)
  - getDocument (e.g. document was viewed)
  - getChangeHistoryView (e.g. when a document's change log is viewed)
  - getDiagnosticImagingReportView (e.g. when the 'Diagnostic imaging report view' is retrieved)
  - getIndividualDetailsView (e.g. when a document that contains the patient demographic information is viewed and details of the document)
  - getHealthOverview (e.g. when a patient's Health Overview is retrieved)
  - getMedicareOverview (e.g. when an overview of Medicare items, such as a summary list of MBS and PBS items, is retrieved)
- Document type (e.g. what type of document was viewed)
- Document ID
- View date
- View time.

The 'getDocument' view type was the primary method for determining whether ED staff viewed content from a patient's My Health Record. The NIO confirmed that any view type related to MBS ('Medicare/DVA Benefits Report') and PBS ('Pharmaceutical Benefits Report') content, particularly the 'getMedicareOverview' view type, would retrieve the total document count related to these document types. Therefore, the view count of MBS and PBS content was not assumed to have been viewed by ED staff due to the automatic retrieval of all MBS and PBS content.

The 'getHealthOverview' view type is related to when the Health Overview is retrieved in a patient's My Health Record. A summary of clinical documents in the record is displayed. During the pilot study, the Health Overview was available in the Health Identifier and PCEHR System user interface (HIPS-UI) viewing platform; thus, access to the Health Overview was exclusive to Royal Perth Hospital, as it was the only pilot site using HIPS-UI as the viewing platform. Analysis of the 'getHealthOverview' view type showed that a view was recorded for each document available in a patient's My Health Record, which is similar to the 'getMedicareOverview' view type. This had implications for interpreting document view count at Royal Perth Hospital. This is described in further detail under 'Limitations of the project', in [Chapter 7](#).

To supplement My Health Record information from NIO, the Agency provided aggregated My Health Record system upload and view statistics for public hospitals across Australia. These showed the monthly view count for two pilot sites: Royal Perth Hospital and the Royal Children's Hospital Melbourne. The aggregated view count for the other two pilot sites – Princess Alexandra Hospital and Tamworth Hospital – could not be viewed, due to the respective state view data being reported at the central agency office (e.g. department of health) or 'parent level'. It is acknowledged that some other states and territories also report at the parent level, which prevents data being viewed at the hospital level.

## Project dataset

The project team, using the ED operational data and My Health Record system data, assembled a project dataset in Microsoft Access. The ED operational data and My Health Record system data combined 107 files (most of which had different file structures). The ED operational data were normalised across the four pilot sites based on expert advice by the project's clinical lead. Duplicate entries were removed from the project dataset and placed into a separate file.

The project dataset included 535,200 ED presentations across 57 variables, which created a dataset of 30,506,400 data fields; however, some data fields were not populated. The My Health Record system data from the NIO contained 1,089,581 My Health Record system instances across 39 variables, or 42,493,659 data fields (some not populated). Hence, these two data sources contained more than 73,000,000 data fields.

## Data analysis

Qualitative data, predominantly from surveys and use-cases, were analysed, by theme, to synthesise barriers and enablers to My Health Record system use. Quantitative data, such as ED operational data and My Health Record system data, were analysed and visualised using Microsoft Power BI Desktop. Quantitative data, from the project dataset and some survey data, underwent univariate and bivariate analyses. The project used two distinct data analysis methods: descriptive and relational.

### Descriptive

Several descriptive results were detailed, to characterise the degree of utilisation and impact of My Health Record system use. The most common approach used proportions, typically expressed as percentages in terms of groups and outcomes. The remainder of any descriptive results were presented (where appropriate) as averages, frequency counts and ranges.

### Relational

Survey results and staff experiences regarding education, ED CISs and interface platforms

were used to understand relationships with My Health Record view rates and effects on ED workflows. Statistical analyses were used to examine possible associations between various operational variables and immediate outcome data, which may support clinician use of the My Health Record system.

# 3 My Health Record system viewing platforms

The method by which emergency department (ED) clinicians viewed the My Health Record system was unique to each pilot site due to differences in their digital environments. These differences extended to the interface, or viewing platform, used to display My Health Record system content (see Table 5). The viewing platforms in use were either an extension of the electronic medical record (EMR; e.g. EpicCare) or developed by either the respective state (e.g. HealtheNet, The Viewer) or the Australian Digital Health Agency (the Agency; e.g. Health Identifier and PCEHR System user interface – HIPS-UI). Reference to the My Health Record system was mixed, with some viewing platforms’ access pathways not naming the My Health Record system at all. Most viewing platforms do not replicate the appearance of the Agency’s My Health Record National Provider Portal<sup>26</sup>, which serves as a ‘gateway’ to the My Health Record system for clinicians who do not have a My Health Record viewing platform. The differences regarding access to, and experience of, My Health Record demonstrated how the viewing platform in use largely influences ED clinicians’ perceptions of the My Health Record system.

State- and territory-based portals contain clinical documents from across public hospitals within a particular state or territory. These portals

can also serve as the My Health Record system viewing platform, which, when in use, is the only method for public hospital clinicians to access the system. The main difference between state- and territory-based portals and the My Health Record system is that the former are not visible to patients, and patients cannot control their content. In contrast, patients can delete or restrict content in their My Health Record. This patient-controlled tenet of the My Health Record system has attracted some criticism from clinicians that a patient’s My Health Record may not contain their complete health information. Hence, clinicians may rely on state- and territory-based portals in the first instance, which can be supplemented by the My Health Record system.

Such portals were available in two pilot sites – Tamworth Hospital in New South Wales (NSW) and Princess Alexandra Hospital in Queensland – which were ‘HealtheNet’ and ‘The Viewer’, respectively. Several clinical documents, such as public hospital discharge summaries, were available in both the state-based portal and the My Health Record system. Therefore, ED clinicians may observe the same clinical document in duplicate across these two systems, or in triplicate if the same clinical document was available in their hospital EMR. This can potentially lead to confusion among ED clinicians who may be

**Table 5: My Health Record viewing platforms at each pilot site**

Pilot site	EMR	Viewing platform	My Health Record reference	Method of access
PAH	Cerner FirstNet	The Viewer*	‘The Viewer / My Health Record’	Within the EMR
RCH	EpicCare	EpicCare	‘Care Everywhere Outside Records’	Within the EMR
RPH	iSoft Clinical Manager	HIPS-UI	‘My Health Record’	Web browser
TH	Orion CAP	HealtheNet*	‘e-Health’	Web browser

EMR = electronic medical record; HIPS-UI = Health Identifier and PCEHR System user interface; PAH = Princess Alexandra Hospital; RCH = Royal Children’s Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

\* These viewing platforms also serve as a state-based portal.

unaware of the differences in content across the EMR, the state- or territory-based portal, and the My Health Record system. Further confusion can arise if documents are named the same across these multiple systems. Staff survey results showed that almost 4 out of 10 ED clinicians, from NSW and Queensland, did not know what clinical documents were exclusive to each system.



**I found a discharge summary that was extremely detailed and useful in caring for this patient. I check My Health Record before I check other systems, so incidentally I found the same discharge summary on our regular hospital system later in my assessment, so really this information was easily accessible to me via multiple different programs but either way it was useful.**

– resident medical officer

Access to the My Health Record system was embedded in the EMR. This method leveraged use of the ED clinician's hospital sign-on credentials, which enabled a single sign-on to the My Health Record system. The result is that an ED clinician signs in once to the EMR and navigates through the EMR, state- or territory-based portal (if available) and My Health Record system for a single patient without having to authenticate their sign-on details or search for each patient in each system. Single sign-on access is considered necessary to make it easier to access and support ED clinicians' regular use of the My Health Record system.<sup>27</sup>

## Viewing platforms

Information about the viewing platform used at the pilot sites is provided below. A comparison of these platforms is given in Appendix 2.

## The Viewer

Queensland Health's The Viewer is a state-based portal and My Health Record system viewing platform used across Queensland public hospitals. The Viewer is accessible via Queensland Health's statewide integrated EMR, based on Cerner's Millennium software. Cerner's emergency care Millennium module, FirstNet, is used in the ED setting.

The Viewer's capabilities allow patient information to be shared across Queensland's public hospitals. This supports Queensland residents' transient healthcare needs across the state. The Viewer has achieved deeper integration by securing connections with primary healthcare providers<sup>28</sup> and some private community-based diagnostic test providers. The Viewer has a range of functions such as tabs, filters and document counts. The Viewer also includes the ability to toggle between hiding and showing Queensland Health-produced documents. These documents are marked with a distinctive 'QH' symbol.

Clinicians accessing the My Health Record system via The Viewer must acknowledge they have received training or watched a training video, and a link to the video is contained within this acknowledgement message. This follows a similar requirement upon each access of the My Health Record system, where ED clinicians must declare that they are 'delivering care to (the) patient'. Clinicians are required to tick a check box to be granted access to a patient's My Health Record. No clinical documents will initially be displayed in the patient's My Health Record, as the clinician must first select a date range for documents to be displayed. While this may support more specific search and filter functionality, particularly if a patient has a vast amount of content, it may not be intuitive for some ED clinicians. This was evidenced by feedback from the follow-up survey.

A message will be displayed to advise if a patient does not have a My Health Record, or a match (using the patient's unique identifiers) cannot be made to retrieve the patient's My Health Record.

It takes the ED clinician eight mouse clicks across five different screens to access a list of content in a patient's My Health Record (Figure 6).

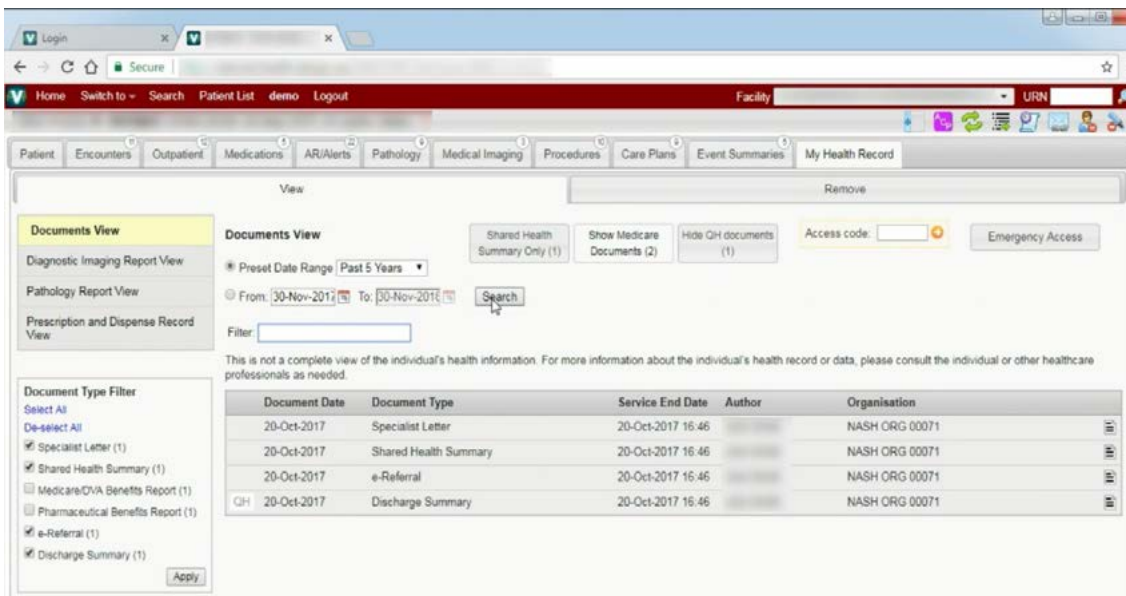
## EpicCare

The Royal Children's Hospital Melbourne was the first hospital in Australia to roll out the EpicCare EMR. EpicCare's 'footprint' has been extended across Melbourne's Parkville precinct, which encompasses the Royal Melbourne and Royal Women's hospitals, and the Peter MacCallum Cancer Centre.<sup>29</sup> The expansion of EpicCare into the public hospital digital landscape is evident with the July 2020 announcement by the Australian Capital Territory Government that EpicCare will be deployed to Canberra's public health system.<sup>30</sup>

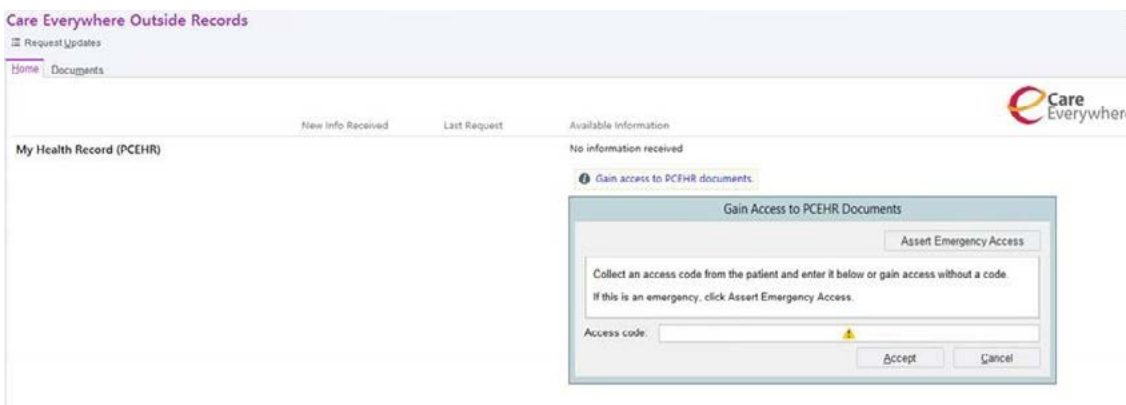
EpicCare uses an in-built function called 'Care Everywhere' to access the My Health Record system (Figure 7). The Care Everywhere function serves as a gateway to any external data source, which may include a state- or territory-based portal, or another hospital's EMR. The My Health Record system is displayed within the EpicCare EMR, which provides a more seamless user experience, compared with launching a new web browser window.

The ED clinician must 'pull' My Health Record system content by clicking 'request updates', similar to the date range search in The Viewer. Failure to do this will give the appearance that

**Figure 6:** The Viewer My Health Record viewing platform



**Figure 7:** EpicCare My Health Record viewing platform



a patient's My Health Record is empty, or only previously downloaded documents will be displayed. A 'documents' button becomes active if content is available within the patient's My Health Record. The 'request updates' button must be selected for any subsequent ED presentations of the same patient, to retrieve any new content since the previous ED presentation.

## HIPS-UI

HIPS is an acronym based on the My Health Record system's predecessor – the Patient Controlled Electronic Health Care Record. The Agency manages HIPS-UI.<sup>31</sup>

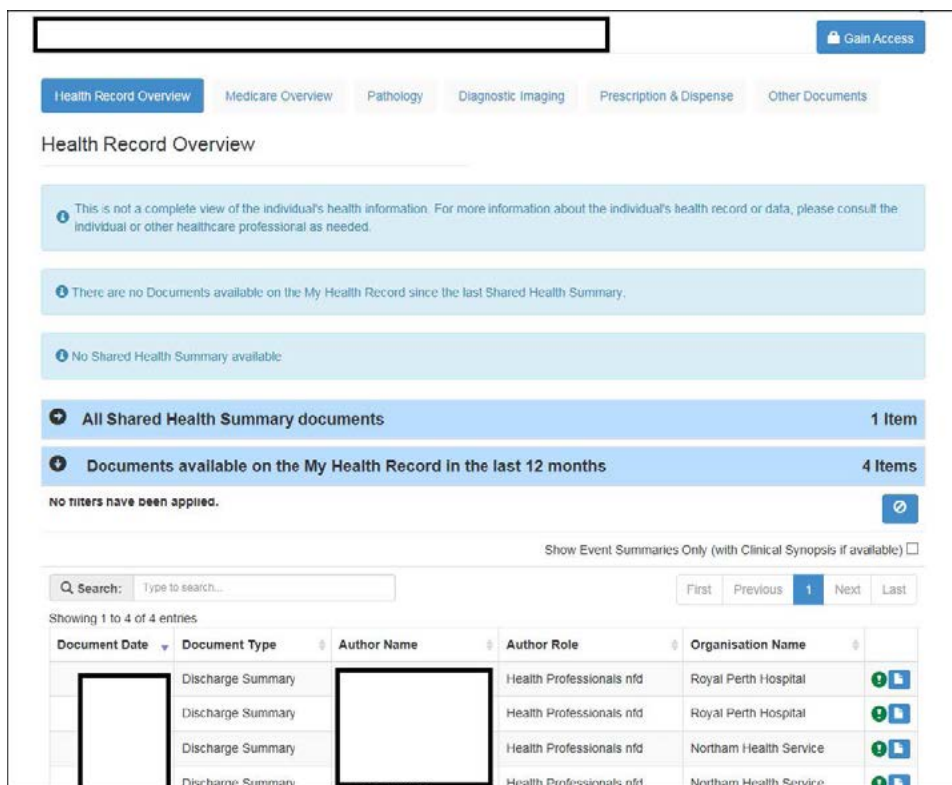
HIPS-UI is web based and is capable of interfacing with any EMR, regardless of software vendor (Figure 8). HIPS-UI has widespread use across Australia<sup>26</sup> as a My Health Record system viewing platform. HIPS-UI can be integrated with an ED tracking system. This enables a 'bulk' display of all patients within an ED that have a My Health Record, which eliminates the need to check

whether a patient has a My Health Record on a case-by-case basis.

## HealthNet

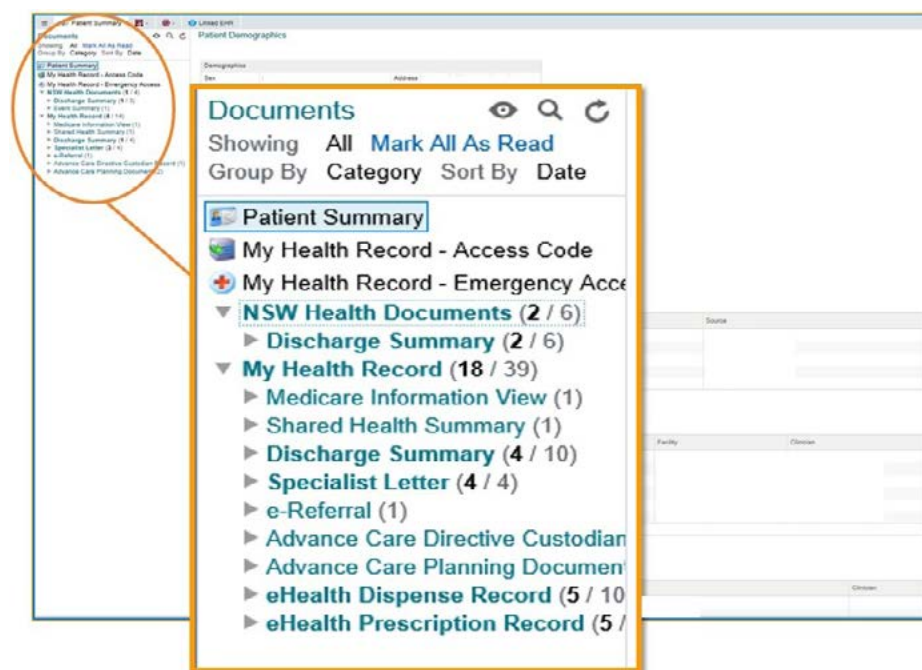
Similar to The Viewer, HealthNet is designed and maintained by eHealth NSW and is integrated into all NSW public hospitals (Figure 9). HealthNet displays clinical documents from a patient's My Health Record, if available. HealthNet includes information that is not available in the My Health Record system, such as alerts, sensitive diagnostic tests and identifying information of vulnerable persons.

**Figure 8:** HIPS-UI My Health Record viewing platform





**Figure 9:** HealthNet My Health Record viewing platform



## Functionality

### Identifiers used to retrieve a patient's My Health Record

ED clinician access to the My Health Record system was exclusively through the hospital's EMR and respective viewing platform. Some functionality available in the Agency's National Provider Portal was not replicated in the viewing platform used by pilot sites. For example, the National Provider Portal allows a clinician to search the My Health Record system for any patient if they have the required identifiers:

- Family name
- Date of birth
- Sex
- One of
  - Medicare number
  - Department of Veterans' Affairs number
  - Individual Healthcare Identifier.

The impact this has on practical application is that the patient's ED presentation must have been

previously registered on the EMR to retrieve their My Health Record. For example, in NSW, a patient must have been registered at the hospital or Local Health District for their My Health Record to be accessible via HealthNet. An unregistered patient could limit any prospective review of their My Health Record as they are en route to the ED.

### Emergency access ('break-glass') function

ED clinicians can override any access controls applied to a patient's My Health Record by asserting the emergency access, or 'break-glass', function. Examples of these access controls include a restricted access code, which restricts all content within the record, and restricted access that has been applied to content in a patient's My Health Record on a document-by-document basis. Assertion of the emergency access function must be in accordance with the *My Health Records Act 2012*, which sets out the circumstances when this function can be used:

- To lessen or prevent a serious threat to an individual's health, life or safety, and it is

unreasonable or impracticable to obtain the healthcare recipient's consent, or

- To lessen or prevent a serious threat to public health and safety.

Each viewing platform has variations on how ED clinicians use the emergency access function. This includes prominently displaying the emergency access button on the screen and reference to the function itself (e.g. 'emergency access', 'assert emergency access' and 'gain access'). HIPS-UI was the only viewing platform to indicate that emergency access is active for five days. These differences demonstrate an opportunity to harmonise the description of emergency access, the appearance of the emergency access button and the documentation process for recording the reason why such access was used. This can assist ED clinicians' knowledge and application of the emergency access function; in particular, the word 'emergency' was mistakenly interpreted as the method of access specifically for ED clinicians.



**The break-glass function isn't very clear to access. If this could be more visually alerting this would be helpful as no-one in the treating team really knew how it was accessed or where to access this function on the viewing platform.** – registrar

ED clinicians can assert the emergency access function even if a patient does not have any access controls applied to their My Health Record. All viewing platforms have a two-step process (e.g. 'Are you sure?'), which can mitigate any accidental use of the emergency access function. The Viewer requires clinicians to select one of the circumstances listed above and has a dialogue box for the clinician to enter a reason for using the emergency access function.

## Navigation to My Health Record system content

My Health Record system content can be divided into clinical documents and views. Clinicians author clinical documents of different types (e.g. discharge summary, prescription record). The My Health Record system 'views' – developed by the Agency – are a summary or amalgam of content extracted from clinical documents. Examples of these views include the 'Medicines View', the 'Pathology View' and the 'Diagnostic Imaging View'.

While the appearance of My Health Record system content is consistent across all viewing platforms, the pathway the ED clinician navigates to such content can be different. My Health Record system viewing platforms can have multiple pathways to the same content.



**... sometimes different links take you to the same info.**  
– nurse practitioner

Feedback from the staff surveys indicated that there were too many tabs for the same information, which could be consolidated for a better user experience.



**Took eight steps to get to the list of medications.** – ED physician

There were different requirements across the viewing platforms to determine whether a patient had a My Health Record. Royal Perth Hospital had an 'App Links' tab within its EMR that displayed a My Health Record logo if the patient had a My Health Record. The Royal Children's Hospital Melbourne displayed a link to a patient's My Health Record from EpicCare's 'Care Everywhere' function if the patient had a My Health Record. Such logos or links were not visible if the patient did not have a My Health Record (or if a My Health Record could not be matched to the patient). Conversely, both

Tamworth Hospital and Princess Alexandra Hospital displayed links to their respective state-based portal. A My Health Record link was available in these systems, regardless of whether a patient had a My Health Record or not. The latter was confirmed after the ED clinician clicked on the My Health Record link and a message was displayed indicating that no My Health Record was found for the patient.

A reduced cognitive load can be achieved by using visual cues or prompts if the patient has a My Health Record, rather than requiring the ED clinician to navigate through the viewing platform to receive a message stating that no My Health Record was found. Such a visual cue or prompt could be further strengthened if the volume and variety of content were notified to the ED clinician before accessing the patient's My Health Record. This could avoid any discouragement or fatigue when an ED clinician attempts to access a patient's My Health Record and they do not have one.



**I routinely look up My Health Record for every patient I treat. My observations from using My Health Record so far have shown the majority of patients do not have any information uploaded, even complex patients that have been to hospital many times since the program went live. This can be frustrating but I continue to look because I am sure over time I will start to find more information.**

– junior medical officer

clinical information during EMR downtime. My Health Record system access will not be possible during EMR downtime if the My Health Record is only available through the EMR, unless alternative access is made available to My Health Record. Such downtime redundancies were not observed during the study. As ED and hospital clinicians use the My Health Record system more regularly, it is anticipated that a commensurate need will emerge for states and territories to establish downtime procedures for My Health Record system access.

## Governance and change management

Governance and oversight across pilot sites' viewing platforms were different. HealthNet and The Viewer are state-based portals and are under the auspices of the respective state or territory health department. The Agency governs and maintains the HIPS-UI viewing platform at Royal Perth Hospital. This contrasts with the EpicCare EMR and viewing platform at the Royal Children's Hospital Melbourne. EpicCare's parent company in the United States is responsible for any My Health Record-related change management. As a result, any adjustments to the viewing platform may result in extensive change and adoption lead-times. This was shown to be the case with the introduction of the 'Medicines View' in April 2020, which was after the study period ended.

## Downtime

It is inevitable that all digital systems will experience downtime. My Health Record system access can be particularly valuable in the event of EMR downtime – particularly for digitally mature, paperless sites. Separate My Health Record system access could be the sole source of online



# 4 Pilot site findings

The findings, drawing on all data sources, are grouped into sections throughout this chapter:

- Low staff awareness of the My Health Record system
- Opportunistic training by clinical champions
- Volume and variety of My Health Record system content
- Realised and missed opportunities for use
- Usability and user experience.

Project activities enabled the collection of quantitative and qualitative data from several sources. The data were used to explore emergency department (ED) clinicians' perceptions of My Health Record system content that was available at their pilot site during the five-month study (June to October 2019).

## Staff surveys

The response rates for the initial and follow-up surveys were 56% and 49%, respectively (Table 6). A target rate of 30% was applied to each pilot site, which is recognised in the literature as a high response rate.<sup>32</sup> All pilot sites for both surveys achieved this target rate. A higher response rate from Royal Perth Hospital over-represented the overall proportion of responses. Also, this high response rate is partially attributed to the clinical champions relieving staff from their clinical duties,

to allow staff uninterrupted time to complete the survey during their shift.

The nursing workforce represented the highest number of participants. Pharmacists and allied health were grouped separately, due to the unique workflows and uses of the My Health Record system for the former. There was an over-representation in this group due to more pharmacists participating in the survey than the baseline staff profile. Responses from clinicians across both surveys achieved the target rate of 30% (Table 7).

## Use-cases

The project team received 1,060 use-cases from staff and 919 from patients (Table 8). There were no targets set for collecting a certain number of use-cases or a certain proportion based on headcount. Collection of use-cases was encouraged based on ED staff and patient willingness to contribute.

The numbers of staff use-cases, stratified according to My Health Record system use or no use, were 374 (35%) and 687 (65%), respectively (Figure 10).

The numbers of patient use-cases, stratified according to whether they had a My Health Record or not, were 276 (30%) and 176 (19%),

**Table 6:** Staff survey response rate, by pilot site

Pilot site	Total staff		Initial survey		Follow-up survey	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
PAH	303	30	115	38	142	47
RCH	225	22	106	47	76	34
RPH	319	32	260	82	214	67
TH	157	16	79	50	58	37
<b>Total</b>	<b>1,004</b>	<b>100</b>	<b>560</b>	<b>56</b>	<b>490</b>	<b>49</b>

PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

**Table 7:** Staff survey response rate, by profession

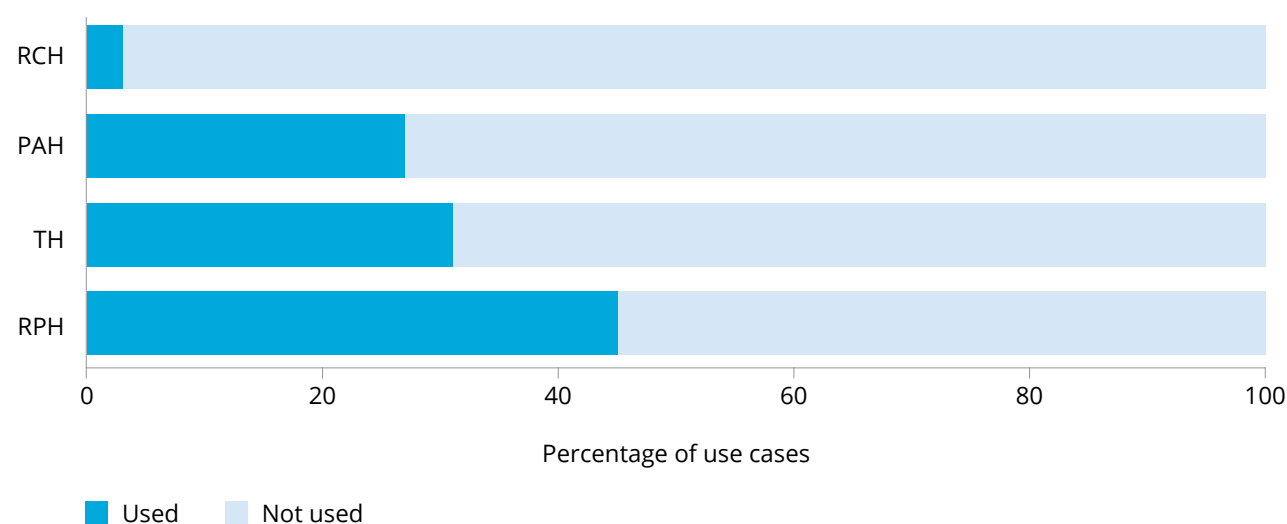
Profession	Total staff		Initial survey		Follow-up survey	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Nursing	579	58	301	52	279	48
Medical	337	34	212	63	188	56
Administration	46	5	28	61	11	24
Allied health	40	4	13	33	7	18
Pharmacy	2	>1	6	100	5	100
<b>All professions</b>	<b>1,004</b>	<b>100</b>	<b>560</b>	<b>56</b>	<b>490</b>	<b>49</b>

**Table 8:** Summary of staff and patient use-cases collected

Pilot site	Staff use-cases		Patient use-cases	
	<i>n</i>	%	<i>n</i>	%
PAH	205	19	119	13
RCH	89	8	123	13
RPH	536	51	643	70
TH	230	22	34	34
<b>Total</b>	<b>1,060</b>	<b>100</b>	<b>919</b>	<b>100</b>

PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

**Figure 10:** Staff use-cases, stratified according to My Health Record system use



PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

respectively. Additionally, there were 412 patients (45%) who did not know if they had a My Health Record and 55 patients (6%) who were categorised as 'not applicable'. The latter was assigned for patients who were ineligible for a My Health Record, such as international travellers, or if the patient was from a non-English-speaking background. Interpreter services were not engaged to assist clinical champions in this instance due to the impact it would have on direct patient care resources.

## Low staff awareness of the My Health Record system

Overall, there was low staff awareness of the My Health Record system, mainly due to training opportunities.

### Existing My Health Record training arrangements

Before the project started, all pilot site EDs had been made aware of the My Health Record system through face-to-face training or promotional material. This was in preparation for the My Health Record national expansion program in early 2019.<sup>12</sup> Trainers from the state or territory health department usually conducted the My Health Record system training programs. While these trainers had extensive knowledge of the My Health Record system, staff surveys indicated a poor understanding of how the My Health Record system could be used in the local ED setting. The Royal Children's Hospital Melbourne had local subject matter experts to support staff in using EpicCare. My Health Record system training opportunities were limited given the expansion of EpicCare across the Parkville precinct. The respective state or territory health department and the Australian Digital Health Agency (the Agency) offered additional My Health Record system training sessions to pilot sites. The Commission and the Agency delivered awareness roadshows<sup>33</sup> to Royal Perth Hospital and the Royal Children's Hospital Melbourne in the later stages of the study.

Feedback from pilot sites showed that not all nursing staff had access to the electronic medical record (EMR) and, thus, the My Health Record system. This contributed to the perception among the nursing workforce that the My Health Record system was a clinical tool for medical staff only. The process to gain access to the EMR and the My Health Record system was promoted to ED clinicians, along with project material such as information sheets and flyers, when the study commenced.

### More My Health Record training

Across all pilot sites, 86% of staff were aware of the My Health Record system. Despite this, 77% of respondents to the initial staff survey admitted to not recently using the My Health Record system in their clinical practice. Only 39% had been involved in workplace discussions about the My Health Record system, and 15% felt that they had received enough My Health Record system training.

At the time of the initial survey, 38% knew what clinical information was available in the My Health Record system. Only 23% felt confident about how to access the My Health Record system at that time. Of these, significantly more medical staff and fewer nurses felt that they knew how to access My Health Record than expected when considering the proportions of each group surveyed.

ED clinicians felt that the best forms of My Health Record system training would be online and through clinical champions. Advantages of the latter were positive experiences with peer support models and efficiency, given the time-poor nature of the ED setting. Some ED clinicians suggested that they had not received any 'formal' My Health Record system training.

Almost half (47%) of staff cited a lack of awareness and training for not using the My Health Record system. Contributing to this result was a change in the clinical teaching term at the study's midpoint. The follow-up staff survey captured such feedback, which showed that junior medical officers, who had recently started their ED clinical rotation, were unaware that the My Health Record

system was available. This highlights the need for ongoing My Health Record system training due to the transient ED workforce.

## Navigating records with restricted access

Any person with a My Health Record can apply an access code to their record or a specific document contained within their record. A restricted access code (RAC) and a limited document access code (LDAC) can be provided by the individual to a clinician, which would grant access to the restricted record or document, respectively.

There were 0.05% ( $n = 68$  records out of 128,974 ED presentations) of ED presentations during the pilot study that had a RAC applied. Similarly, 0.004% ( $n = 356$  out of 8,032,067 documents) of all documents available, across all ED presentations during the pilot study, were restricted. Discharge summaries and diagnostic tests represented most document types when an access control was applied. Both examples represented less than 1% of pilot study ED presentations, which is commensurate with the amount of access controls applied to the broader Australian population with a My Health Record.<sup>34</sup> Therefore, it is rare for an ED clinician to encounter a patient's My Health Record that has an access control applied to it.

**Of all ED presentations, the restricted access code was used 1 in 2,000 times, the limited document access code was used 1 in 25,000 times and the emergency access function was used 1 in 5,000 times.**

ED clinicians were concerned about using the emergency access function. Feedback showed that staff avoided the emergency access function due to fears of liability and penalties if use was deemed to be improper. This lack of awareness, and avoidance, regarding the emergency access function can result in ED clinicians not considering the entire contents of a patient's My Health Record (if appropriate).

Another explanation is that ED clinicians were reluctant to use the emergency access function because they did not know if the patient had hidden content or not – some use-cases showed that no additional content was retrieved when the emergency access was asserted, which led to frustration among these ED clinicians. More than half of respondents (54%) preferred to know what content was hidden in a patient's My Health Record before using the emergency access function.

There was 0.02% ( $n = 25$ ) of ED presentations during the pilot study that had the emergency access function asserted. It is inconclusive from the data whether the assertion of the emergency access function enabled ED clinicians to view restricted content in a patient's My Health Record. The low use of the emergency access function likely reflects the limited number of records that had an access control applied and the low awareness of how to assert this function.

## Improved awareness throughout the study

Results from the follow-up staff survey showed that the proportion of respondents who knew what clinical information was available in the My Health Record system increased from 38% to 67%. Further, 28% of ED staff felt that the My Health Record system was not relevant to their role in patient care. This related to discrete functional areas in the ED that typically had lower-acuity patients (e.g. fast-track, rapid assessment).

The follow-up survey showed that 34% of respondents were still unaware of what circumstances to use the emergency access function under. Almost half of respondents (49%) did not know how to use the emergency access function.

There is room for further training, given that only half of the ED workforce (50%) felt they had enough training to fully use the My Health Record system, although this figure marked a significant improvement compared with the results from the initial staff survey (15%).

Several other factors improved significantly from the initial staff survey to the follow-up staff



survey. A comparison of responses between these surveys is summarised in Table 9.

Overall, the follow-up staff survey showed that ED clinicians had a greater understanding of the My Health Record system, which was attributed to the training and support efforts led by the clinical champions.

## Opportunistic training by clinical champions

The presence of engaged ED clinicians, who had dedicated time to give to the project, proved to be an invaluable support to their colleagues on how to use the My Health Record system. Clinical champions led their peers during ‘at-the-elbow’ My Health Record system awareness sessions, and encouraged them to complete the staff surveys and use-cases. Clinical champions encouraged their colleagues to use the My Health Record system as a part of regular ED clinical governance functions, such as morbidity and mortality meetings, and educational ‘in-services’.

The effect of clinical champions on their peers’ My Health Record system knowledge and ability to

navigate the My Health Record system during the study was shown by:

- My Health Record system access more than doubling from the initial survey to the follow-up survey, from 24% to 64%
- Staff awareness of My Health Record system content increasing from 39% to 67%.

The impact of the clinical champions confirmed the literature finding that health IT initiatives achieve success with peer-led support from ‘super users’ during quarantined clinical support time.<sup>18</sup> Despite the support of clinical champions, 31% of ED clinicians still sought further My Health Record system training, which emphasises the need for ongoing support.

## Establishing the clinical champion role

Appointing the clinical champions used an internal expression-of-interest process, overseen by the ED director and nurse manager of each pilot site. Royal Perth Hospital appointed a full complement to the medical and nursing clinical champion roles. Other pilot sites achieved the same for the medical role. Fulfilment of the nursing role was challenging due to resource constraints unique to each pilot site. This resulted in some nursing clinical champions starting later in the study.

**Table 9:** Comparison between initial and follow-up staff surveys regarding My Health Record system awareness and training

Question	Agreed or strongly agree (survey 1, %)	Agreed or strongly agreed (survey 2, %)	Increase in second survey (%)
I am aware of the My Health Record	88.2	88.6	0.5
I know what clinical information is available in the My Health Record	38.7	67.2	42.4
I know how to access the My Health Record in my ED	37.7	71.4	47.2
I am confident I know enough to apply My Health Record content to my ED clinical duties	22.9	58.4	60.8
I feel I have received enough My Health Record training	14.8	49.5	70.1

ED = emergency department; N = neutral; SA/A = strongly agree/agree; SD/D = strongly disagree/disagree  
 Note: Not applicable responses were omitted.

Clinical champions were encouraged to raise My Health Record system awareness according to the needs of their ED colleagues and setting. This led to the development of My Health Record system resource material and information sessions. One pilot site developed a quick reference guide on how to access the My Health Record system from their EMR, and placed this at every computer terminal within the ED. As ED clinicians became familiar with the My Health Record system, the clinical champions were being approached with use-cases and troubleshooting enquiries. Anecdotally, ED clinicians felt more comfortable to raise My Health Record system queries with a clinical champion than with an EMR 'trainer' – regardless of whether the clinical champion was undertaking a project shift or clinical shift.

Results from the staff surveys and use-cases show a higher proportion of responses from the Royal Perth Hospital pilot site. This was attributed to the clinical champions and their method for enhancing the response rate. Clinical champions observed that their colleagues found it challenging to complete surveys and use-cases due to competing clinical priorities. Therefore, the clinical champions attended to these clinical tasks on behalf of their colleague, while the latter completed the survey or use-case. A similar approach was not adopted at other pilot sites.

Clinical champions supported their colleagues across a variety of shifts. This ensured that all ED clinicians were exposed to the project and minimised any 'roster bias', particularly against staff who exclusively worked at night or on weekends.

### **Opportunistic and vicarious learning**

Use-cases showed that ED clinicians learned how to access and use the My Health Record system from observing clinical champions. The clinical credibility of clinical champions, and established collegiate relationships, led to instances when a My Health Record was shown to ED clinicians as they were delivering patient care.

On occasion, clinical champions provided rapid My Health Record system training sessions during use-case data collection. This was often

in response to ED clinicians stating they had not used the My Health Record system because they had not been trained. The use-cases showed an improvement in the proportion of ED clinicians who had used the My Health Record system compared with those who did not. One pilot site showed that only 7% of use-cases, collected in the first month of the study, arose from actual My Health Record system use. This improved to 31% towards the end of the study.



**Patient presented 'screaming in pain', but there were certain characteristics of the presentation that were alarming. This prompted staff to look up My Health Record. Staff was able to show My Health Record capabilities to colleagues at this time as well. Staff thanks My Health Record champions for demonstrating My Health Record capabilities prior to this patient encounter.**  
– registered nurse

Having clinical champions promote a collegiate learning environment motivated other ED clinicians to show colleagues how to use the My Health Record system.

### **Exemplar use-cases as a learning tool**

All pilot sites used a tablet device to collect use-cases from ED clinicians. This supported direct data entry into the project's survey tool (via SurveyMonkey) and real-time data collection. Collecting use-cases served as a prompt to ED clinicians to access the My Health Record system. Clinical champions were recognised as the local My Health Record system subject matter experts, with most ED clinicians volunteering their My Health Record system use-cases.

Exemplar use-cases emerged, which clinical champions promoted among their colleagues to incentivise regular My Health Record system

use. For example, an interstate patient presented to a pilot site and was unable to provide any past medical history. The patient's My Health Record was accessed, which showed their regular medication and general practitioner (GP) details, and an appropriate treatment plan was developed. This use-case was shared with ED clinicians who were encouraged to access interstate patients' My Health Records. Other exemplar use-cases, as advised by clinical champions, included:

- Patients on high-risk medications (e.g. S8 scripts, methadone/opiate alternative programs)
- Patients receiving cancer treatment in private specialist clinics
- Patients who attend GP clinics that upload data to the My Health Record system
- Patients with complex and chronic medical conditions, particularly younger patients with a high awareness of IT systems – some of whom had their My Health Record available on a mobile application and quickly showed their treating ED clinician.

This promotion of exemplar use-cases among ED clinicians encouraged greater exchange of My Health Record system experiences. Practical, real-life examples proved a useful tool for motivating ED clinicians to use the My Health Record system.

## Volume and variety of My Health Record system content

Patients with the most complex medical histories are most likely to have content in their My Health Record. This is due to these patients more frequently engaging with health service organisations and therefore having a high likelihood of seeking care from a clinician who uploads content to their My Health Record. When these patients present to the ED, their complex medical situations make them more likely to require diagnostic tests, take longer to assess and require admission.

## Summary of My Health Record system content across pilot sites

There were almost 130,000 ED presentations from all pilot sites across the study (Figure 11). In summary, data from pilot sites, merged with My Health Record system data, showed that:

- 1 in 4 ED presentations did not have a My Health Record identified
- 1 in 3 ED presentations had a My Health Record, but with no content
- 2 in 5 ED presentations had a My Health Record with content.

Figure 11 illustrates three distinct patient cohorts:

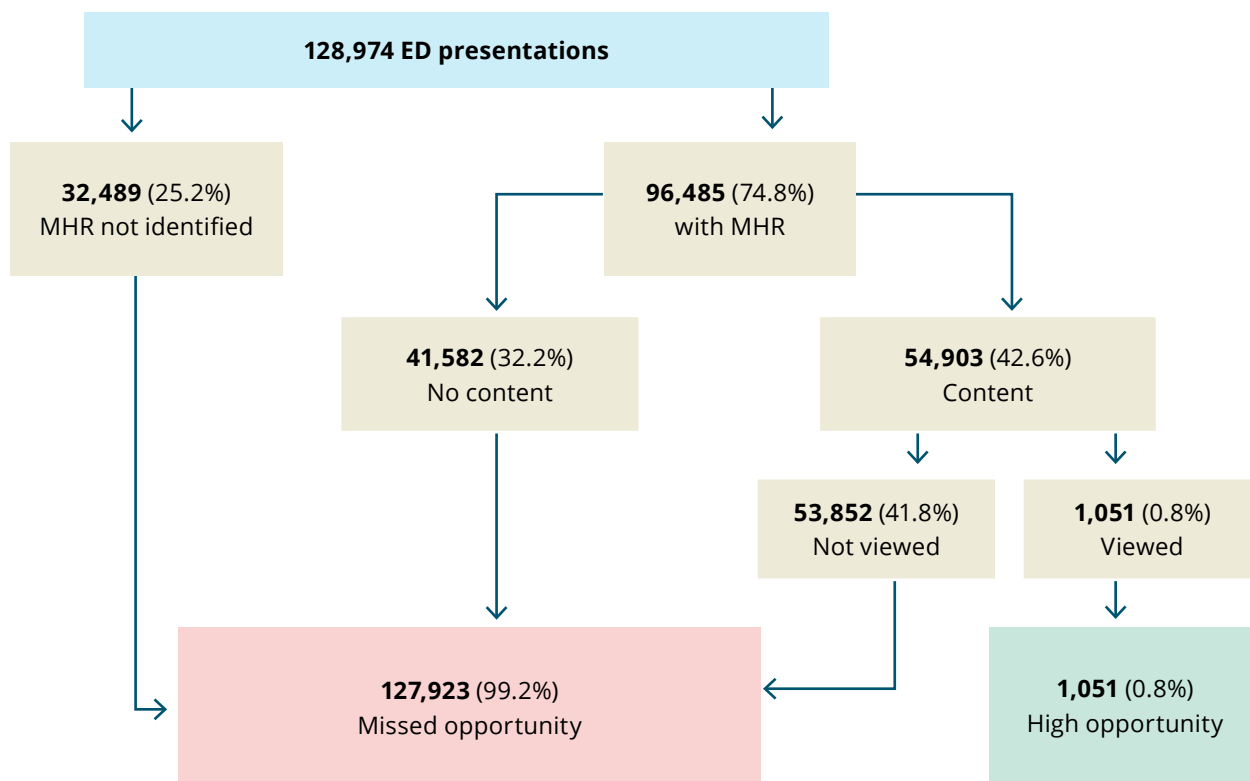
- My Health Record not identified – patients who either chose to opt out from having a My Health Record, and patients who had a My Health Record that could not be retrieved due to incorrect or missing identifiers
- Missed opportunity – patients with a My Health Record, regardless of whether there was content, which was not viewed by an ED clinician, or an empty My Health Record was viewed
- High opportunity – patients with content in their My Health Record that was viewed by an ED clinician.

The percentages refer to the proportion of the respective cohort against the total ED presentations.

The high-opportunity patients were the focus of the project. Additionally, the project explored how to convert the missed-opportunity cohort to the high-opportunity cohort. Patients in the latter cohort comprised only 0.8% of all patient encounters (1,051 out of 128,974 ED presentations). The proportion of each cohort was different in each pilot site, which is illustrated in Figure 12.

Approximately 25% of ED presentations did not have a My Health Record identified. This may be due to these patients opting out from having a My Health Record, despite the national opt-out rate being 9.9%.<sup>35</sup> An explanation could be incorrect or missing identifiers required to retrieve a patient's My Health Record. Viewing platforms display the same message for patients who have

**Figure 11:** Stratification of emergency department presentations based on My Health Record system content



ED = emergency department; MHR = My Health Record

opted out and for patients who failed to retrieve a ‘matched’ Individual Healthcare Identifier (IHI) from the Healthcare Identifiers Service (operated by Services Australia), which is used to retrieve the patient’s My Health Record (from the My Health Record Systems Operator, who is currently the Australian Digital Health Agency).<sup>36</sup> The latter depends on accurately capturing the necessary patient identifiers, as previously mentioned. This emphasises the importance of governance practices that monitor, audit and rectify ‘unmatched’ IHIs and a robust patient registration process, which is typically administered by ED clerical staff.

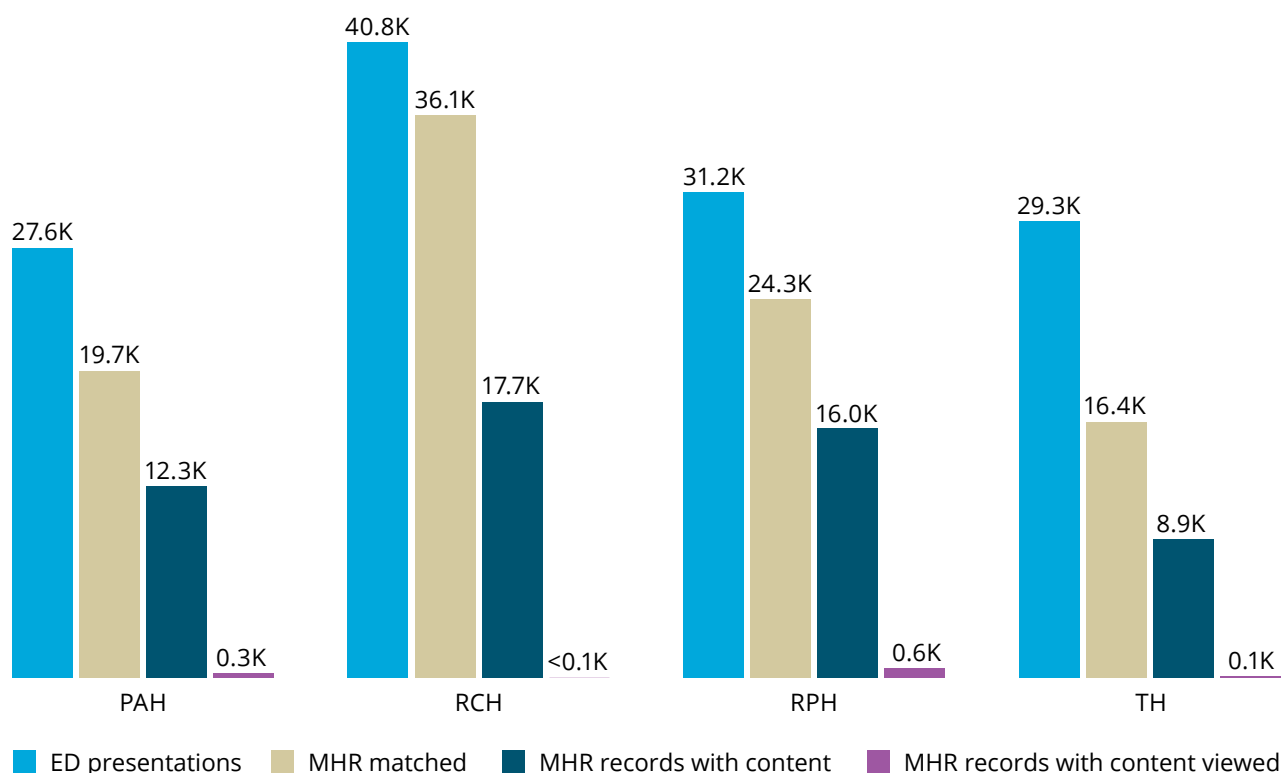
By default, two years of retrospective Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) data are uploaded automatically when a My Health Record is created. Patients in the ‘no content’ cohort can include patients who do not have any MBS or PBS

transactional data. This may be due to the patient opting to remove all MBS and PBS data from their My Health Record, or the patient not having any interaction with a clinician in the previous two years that would have otherwise resulted in an MBS or PBS claim being made. While considered an unlikely event, such a patient’s My Health Record would likely cause confusion to the viewing ED clinician, who would access a My Health Record with no content whatsoever.

### Availability of My Health Record system content

There were more than 8 million individual items in the My Health Records of patients who presented to the pilot site EDs throughout the study. MBS and PBS transactional data represented 86.7% of the available content. This is attributed to most Australians having two years of retrospective data being automatically placed into their My

**Figure 12:** Emergency department presentations, by pilot site and cohort



ED = emergency department; MHR = My Health Record; PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

Health Record when it was created. If MBS and PBS data are excluded, the clinical documents most commonly available in My Health Records were pathology reports, dispense records and prescription records. These clinical documents were also the most viewed. This suggests that ED clinicians highly value this content.

The availability of My Health Record system content was different across the pilot sites, as shown in Table 10. This was largely influenced by the availability of local 'connected' providers, who upload content to the My Health Record system.

Data showed that 3 out of 4 clinical documents were available at Royal Perth Hospital and Princess Alexandra Hospital. Similarly, more than 80% of these clinical documents were viewed at these sites.

Of all clinical documents, pathology reports were the most available at Royal Perth Hospital and Princess Alexandria Hospital. The Royal Children's Hospital Melbourne had the highest availability of Australian Immunisation Register records, reflecting the hospital's high paediatric case base. The document with the highest usability

**Table 10:** Percentage of emergency department presentations where clinical documents were available and viewed across each pilot site

Pilot site	Available clinical documents (%)	Clinical documents viewed (%)
PAH	35	34
RCH	11	1
RPH	44	54
TH	10	11

PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

was specialist letters, with an average 22% of documents available viewed – peaking at 71% for Tamworth Base Hospital. The Royal Children’s Hospital Melbourne was the only site where patients had Personal Health Achievements or eReferrals.

My Health Record system data showed a stark contrast when stratified according to age groups for individuals who had a My Health Record, those who had content and those who had such content viewed. This is illustrated in Figure 13, which shows that, while adults over 45 years old only represented 32% of ED presentations, they represented 66% of the available My Health Record documents and 78% of the My Health Record documents viewed. It also shows that patients who were 65 years or older and had a My Health Record with content represented 51% of the total documents viewed, despite only representing 16% of all ED presentations. Cumulatively, these data support the finding that ED clinicians are motivated to view the My Health Record of a chronic and complex condition, which is typical of the older Australian patient cohort.

Figure 14 shows the average number of clinical documents (i.e. excluding MBS/PBS/Department of Veterans’ Affairs [DVA] transactions). These data show a proportional relationship between more My Health Record clinical documents being available, and the increasing interactions with the health system and increasing age. This pattern

is followed across all clinical documents, except for Australian Immunisation Register reports and consumer-generated clinical documents, where there is a greater representation of paediatric patients.

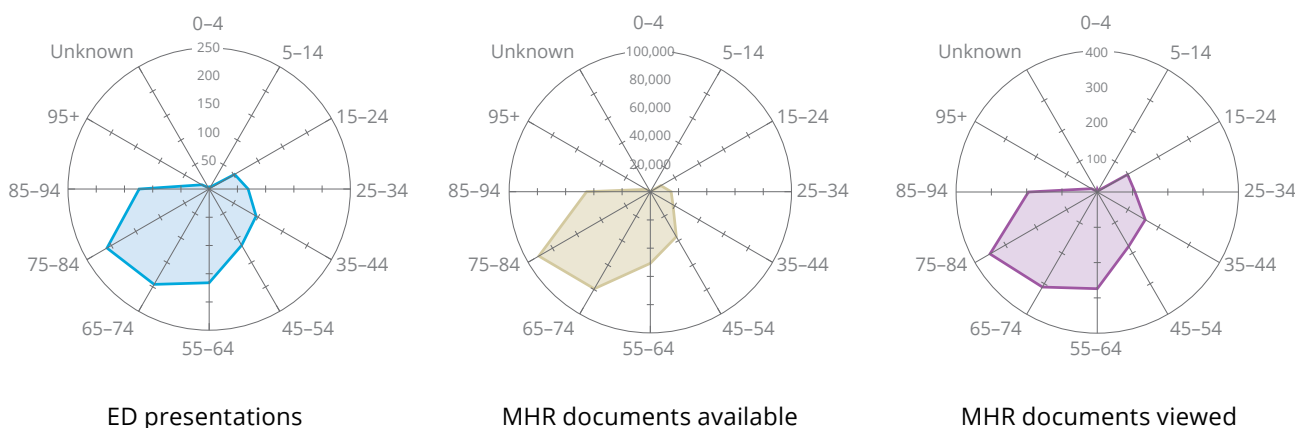
### Content availability at pilot sites

Once MBS and PBS transactional data had been excluded, there was an average of eight clinical documents in each patient’s My Health Record. While this did vary with each pilot site, this amount of content is encouraging, as this information could be used to motivate ED clinicians to access their patients’ My Health Records regularly, with assurances that content is available – which will continue to increase over time. Figure 15 shows the average number of clinical documents viewed by document type. This can be used to describe what content ED clinicians are more motivated to seek and what document type this aligns with.

### High-value content: medicines and diagnostic tests

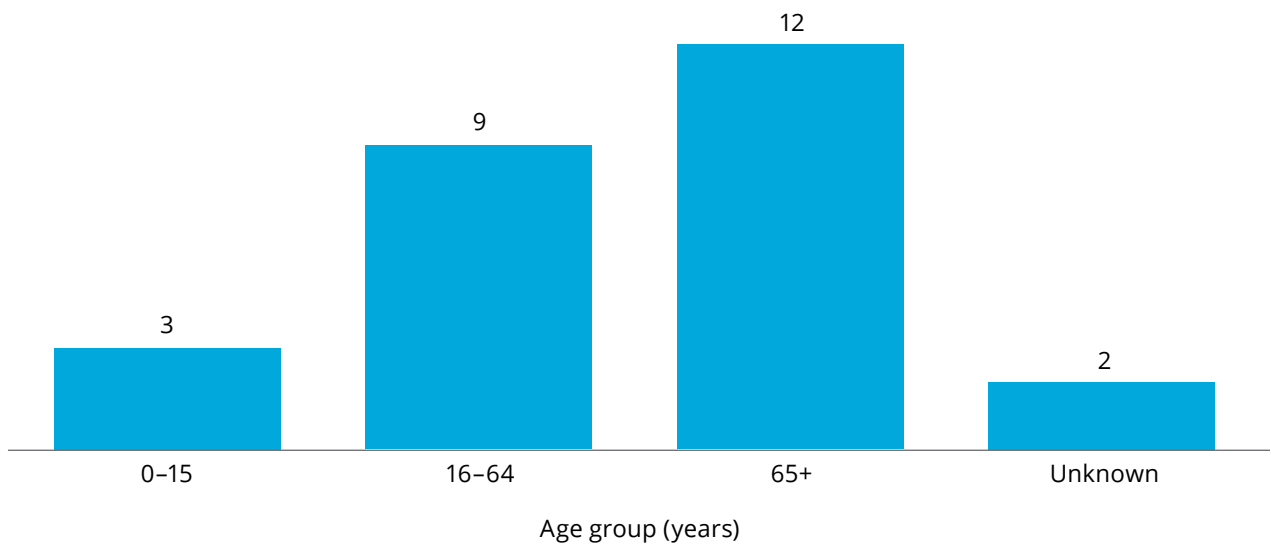
The most available clinical document type, on average across all sites, was pathology reports (Table 11). These reports represented approximately 5.8% of total My Health Record content, or 43.5% if MBS and PBS transactional data were excluded. Similarly, pathology reports

**Figure 13: My Health Record document views across age groups for all pilot sites**

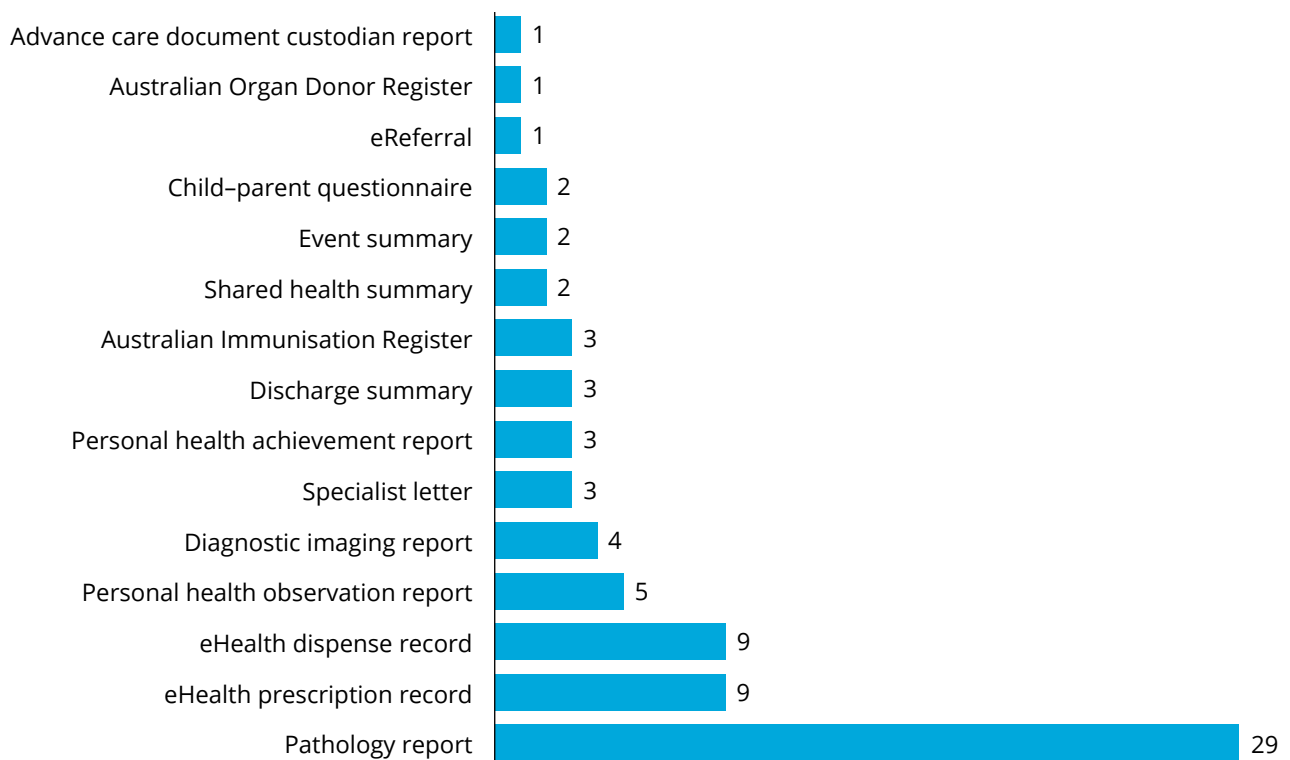


ED = emergency department; MHR = My Health Record

**Figure 14:** Average number of clinical documents for emergency department presentations with a My Health Record, by age group cohort



**Figure 15:** Average number of clinical documents available, by document type



**Table 11:** Proportion of clinical document types available and viewed across pilot sites

Document type	Clinical documents available (%)	Clinical documents viewed (%)
Pathology report	43	14
Dispense record	20	14
Prescription record	15	11
Australian Immunisation Register	9	15
Discharge summary	6	14
Diagnostic imaging report	5	14
Shared health summary	1	11
Other*	1	7

\* 'Other' comprised clinical documents that were available for less than 1% of ED presentations (with a My Health Record) – for example, event summaries, specialist letters, advance care plans and eReferrals.

represented 14% of all My Health Record content viewed.

The most viewed clinical document types corresponded to results from the follow-up staff survey. ED clinicians reported that medicines and diagnostic tests were content that they typically looked for when first accessing their patient's My Health Record. This content supported ED clinicians' workflows, such as allergies management, avoidance of repeat diagnostic tests, sourcing previous medical history and charting of regular medicines. Prescription and dispense records assisted ED clinicians, particularly pharmacists, to identify dosage. This ensured that medication safety was maintained and patients received their current medicines.



**I used My Health Record to get a patient's regular medication list, as the patient was unclear of what doses of medications they were on. I was then able to chart their meds safely for them under the guidance of the patient's assessment and My Health Record.** – registrar



**I used My Health Record to get a history of the patient from a discharge summary ... I checked their medication list so I could chart their regular medications. The patient wasn't able to give me any of this information because they couldn't remember. It would have been challenging to gather this information over night shift from other sources so My Health Record became a valuable resource.** – registrar

### Duplicated diagnostic tests

An envisaged benefit of using a patient's My Health Record is reduced numbers of duplicated diagnostic tests, such as pathology or diagnostic imaging. Should patients receive a recent diagnostic test outside the ED, such a test may yield clinical utility and eliminate the need for an ED clinician to order the same diagnostic test as part of the patient's ED assessment.

The initial staff survey showed that a patient's My Health Record only prevented 16% of ED clinicians from ordering a duplicate diagnostic test. This



increased to 22% in the follow-up staff survey. Similarly, avoided duplicate diagnostic tests were rarely observed in the use-cases.



**There was a note from the GP with a link in My Health Record to a CT report that was done 5 days prior. Didn't need to be repeated. The GP had made an 'event note' in My Health Record which explained this and the reason for transfer to hospital. There was a shared health summary also. – registrar**

Some pilot sites provided pathology and diagnostic imaging data as part of their ED operational dataset. However, use of these data were limited due to challenges with normalising these data across the pilot sites. Additionally, the clinical context of such diagnostic tests was not provided to maintain patient confidentiality, in accordance with ethics approval for the project. Therefore, avoided duplication of diagnostic tests could not be determined.

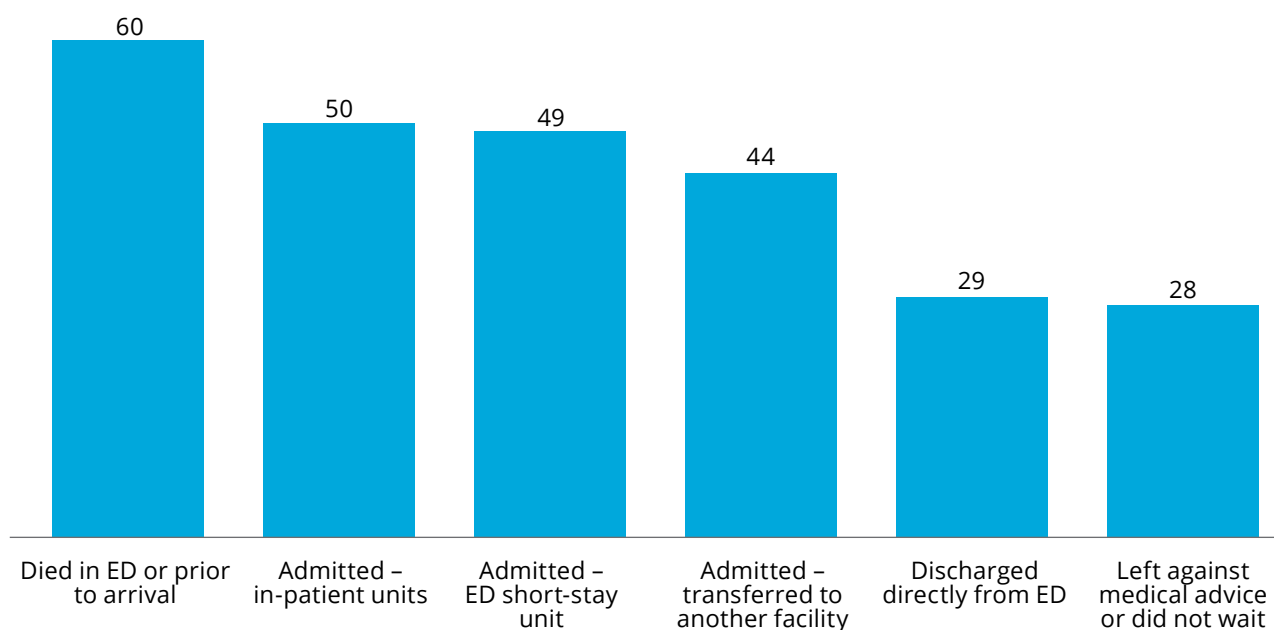
**This benefit may not be realised due to limited use by ED clinicians and a greater need for private diagnostic test providers to upload content to the My Health Record system. This should be revisited as part of ongoing efforts to increase My Health Record system use in an ED setting.**

### More My Health Record content if a patient is admitted from the ED

A key finding was that patients who had the most complex healthcare needs were more likely to have content in their My Health Record. These patients were also more likely to be admitted. ED clinicians were more likely to view the My Health Record of patients who were admitted (or transferred) compared with patients for discharge (Figure 16).

Principal diagnosis data were classified using SNOMED groups at the Princess Alexandra Hospital pilot site. My Health Record document utilisation was examined within these groups. The utility was calculated as the proportion

**Figure 16:** Average number of clinical documents available, by disposition



ED = emergency department

of documents available that were viewed by SNOMED group, which is shown in Figure 17.

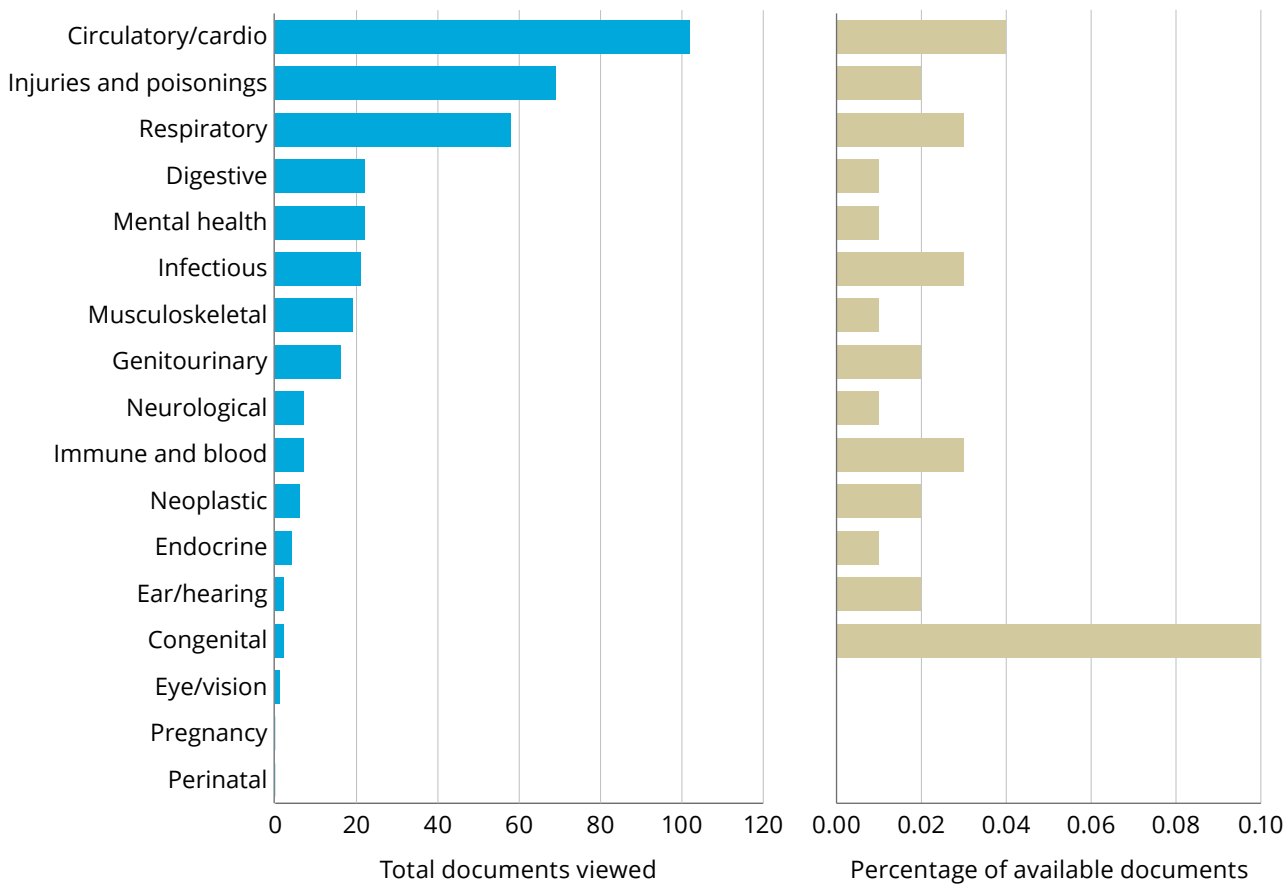
The Princess Alexandra Hospital data showed that patients whose principal diagnosis in the ED were in particular SNOMED groups had greater use of their My Health Record clinical documents than others. While the SNOMED groups are broad and dependent on accurate data entry of the clinical diagnosis, this finding reinforces that chronic health care is often complex due to the longitudinal time frame of its management and is likely to result in more My Health Record content for such patients. Greater insights could be elicited from My Health Record data and national standard terminologies as the volume of My Health Record content and accurate SNOMED coding increase.

**While the SNOMED groups are broad and dependent on accurate data entry of the clinical diagnosis, this finding reinforces that chronic health care is often complex due to the longitudinal time frame of its management and is likely to result in more My Health Record content for such patients.**

**Demand for other high-value content**

Results from the staff surveys showed that ED clinicians wish to see electrocardiograms (ECGs), advance care plans and specialist (or outpatient)

**Figure 17: SNOMED groups based on the most clinical documents available (on average, per emergency department presentation) and view rate, Princess Alexandra Hospital**



clinical letters made available in the My Health Record system. ED clinicians also sought ED discharge letters, also known as 'ED statement of attendance' letters, for patients who received care in the ED and were discharged (e.g. not admitted to a short-stay or inpatient bed). Stakeholder consultation throughout the project indicated that such a clinical document exists in the United Kingdom's National Health Service<sup>37</sup> and is in development domestically by eHealth Queensland.

The initial staff survey showed that the following percentages of ED clinicians thought that access to various documents was important:

- 74% for external radiology images
- 85% for external pathology results
- 82% for previous ECG results
- 86% for advance care plans
- 85% for medication history
- 79% for shared health summaries.

The My Health Record view data showed that specialist letters was the most sought-after My Health Record document type. Of the specialist letters available, 22% were accessed; however, they were one of the least available documents compared with all other document types. The Royal Children's Hospital Melbourne was the only pilot site to upload specialist letters to the My Health Record system, and it was the only Victorian public hospital to do so. The Northern Territory has consistently been uploading specialist letters since 2016, and Fiona Stanley Hospital in Western Australia commenced uploading specialist (outpatient) letters from December 2019. Project data suggest that an accelerated effort is needed to ensure that specialist letters are widely available in the My Health Record system, given the demand from ED clinicians.

The follow-up staff survey showed that other content sought by ED clinicians included:

- Aged Care Assessment Team documents
- Blood type
- Next-of-kin details.

**The My Health Record view data showed that specialist letters was the most sought-after My Health Record document type.**

### **Standalone immunisation information**

Information from the Australian Immunisation Register is available in the My Health Record system. However, this content is wedged within MBS transactional data, which can be extensive if the patient engages regularly with multiple health service organisations or clinicians. There is a risk that ED clinicians may overlook immunisation information if they scroll past such content, or they do not think to look for immunisations within the 'Medicare Overview' section (where MBS transactional data are located).

The follow-up staff survey asked ED clinicians about whether immunisation information should have a discrete, standalone section in the My Health Record system. Two-thirds of ED clinicians agreed that a separate section would make it easier to find immunisation information. This is particularly important in a paediatric ED environment, as the Australian Immunisation Register was the most available and most viewed clinical document at the Royal Children's Hospital Melbourne pilot site. A standalone immunisation section should contain all immunisation-related information (e.g. any vaccinations documented in a discharge summary), in addition to the Australian Immunisation Register information.

**A standalone immunisation section should contain all immunisation-related information.**

Since the study period, and particularly in view of COVID-19 vaccinations, references to the Australian Immunisation Register have been placed in a discrete section of the My Health Record system – the 'consolidated immunisation view'<sup>38</sup>; this reflects what ED clinicians from the pilot sites had sought.

## Delays with mapping new content

The Agency regularly issues new releases of the My Health Record system, which often includes new views. For example, the Agency released the pathology and diagnostic imaging views in September 2019.<sup>39</sup> These views provide the clinician with the option to search for a specific test, and then group and sort tests using different filters.

There can be a delay between when the Agency makes new My Health Record system content available and when ED clinicians can access the new content. The availability of new My Health Record content, at public and private hospitals, depends on state and territory health departments and private hospital organisations, respectively, and third-party software vendors. As previously mentioned, the change and adoption processes are influenced by any lead-time that is required to map new content to the My Health Record system viewing platform.

**There can be a delay between when the Agency makes new My Health Record system content available and when ED clinicians can access the new content.**

As such, the pathology and diagnostic imaging views were not immediately available at the pilot sites. Royal Perth Hospital and Princess Alexandra Hospital started accessing these views in October 2019. Tamworth Hospital and the Royal Children's Hospital Melbourne started accessing these views in January 2020 and April 2020, respectively.

The Pharmacist Shared Medicines List (PSML) was released in December 2019. The PSML compiles both prescription and non-prescription medicines, including over-the-counter and complementary medicines, such as vitamins and herbal remedies.<sup>40</sup> As of December 2020, no public hospitals are either uploading or viewing the PSML.

It is suggested that new content is not promoted to ED clinicians until it is available in their My Health Record system viewing platforms. This

will avoid frustrating ED clinicians who seek this new content and are unable to access it, which may discourage them from regularly using the My Health Record system.

## Awareness of local content

While the volume of content is important, ED clinicians are more motivated to use a patient's My Health Record if they know the content source – this particularly applies to local healthcare providers. The availability of clinician-authored content was variable across pilot sites for patients who had a My Health Record (1.3–5.8%). The range of overall document availability increased when including MBS, PBS and DVA transactional data (11.5–39.5%).

Staff surveys and use-cases captured the frustration of ED clinicians who accessed the My Health Record and could not find the information they had sought. This was often associated with the expectation that all health service organisations, including private diagnostic investigation providers, were connected and uploading content to the My Health Record system. More awareness of which local organisations are connected to the My Health Record system will support ED clinicians in deciding when to use the My Health Record system. This information must be maintained, particularly to notify ED clinicians when new local organisations start uploading content to the My Health Record system. Information on local organisations should be strictly relevant to the particular hospital ED, as such information at a state or territory level may yield low utility and application. Over time, ED clinicians are likely to recognise local organisations that are connected to the My Health Record system.



**Our local private hospital discharge summary was recently uploaded in the 'Documents' section, we usually wouldn't have easy access to this information.**  
– junior medical officer

## Realised and missed opportunities for use

The project team identified several realised and missed opportunities to use the My Health Record system in the ED, which are detailed below.

### Nurses' use of the My Health Record system

The nursing staff provided 52% of the use-cases, of whom two-thirds were registered nurses. This was followed by medical staff (45%), which featured more senior clinicians (physicians and registrars, 64%) than junior medical staff (36%). Allied health professionals and pharmacists each represented 1.5% of use-cases; this was considered an under-representation, considering they made up 4% and 5% of the professional groups across the pilot sites, respectively.

**Allied health professionals and pharmacists each represented 1.5% of use-cases; this was considered an under-representation.**

As part of the use-case collection process, ED clinicians were asked 'Did you use the My Health Record?' (see Table 12). My Health Record use varied across different professional groups, which reflects the different application according to each group's clinical workflow.

Although there are many clinical disciplines that are categorised under allied health professionals,

such use-cases were exclusive to physiotherapists and occupational therapists. These clinicians reviewed patients' My Health Records for regular medications, recent discharge summaries and cortisone injection dates that were documented in diagnostic imaging (e.g. computed tomography scan) reports. The majority of use-cases from allied health professionals were related to the treatment of geriatric patients. As such, allied health professionals suggested that the availability of Aged Care Assessment Team documentation in the My Health Record system would support the aged care referral process.

Approximately 40% of use-cases where the My Health Record was not used cited a lack of training and awareness as the reason. Encouragingly, as clinical champions' opportunistic training took effect, the proportion of staff who used the My Health Record system increased as the study progressed.

### Using the system for medication management

Use-cases were categorised according to themes. Medication management was the most frequently cited use of the My Health Record system. For example, ED clinicians accessed the My Health Record system for patients who were unable to recall their current medicines, including doses and administration. The clinicians were occasionally able to retrieve this information.

Other use-cases showed that the My Health Record system was useful for polypharmacy – which is recognised as patients taking

**Table 12:** Responses on whether My Health Record was used as part of the use-case collection process, by professional group, all pilot sites

Profession	Did you use the My Health Record? (%)	
	Yes	No
Nursing	20	80
Medical	50	50
Allied health	80	20
Pharmacy	87	13
<b>All professions</b>	<b>35</b>	<b>65</b>

five or more medicines at the same time, including prescription, over-the-counter and complementary medicines.<sup>41</sup> There were use-cases that showed that the My Health Record system was used for managing patients exhibiting drug-seeking behaviour. My Health Record content supported clinicians by helping them determine the appropriateness of administering medicines to such patients.

## Integrating the My Health Record system into ED workflows

ED clinicians advised of key patient cohorts and opportunities during the patient's journey where the My Health Record system can be used by integrating it with ED workflows.

ED clinician feedback indicated that the initial assessment (from both nursing and medical staff) of the patient is the best time to access their My Health Record. At this stage of the patient journey, ED clinicians are typically establishing the clinical background of the patient. Some use-cases described the difficulties ED clinicians experience with communicating with patients and carers to elicit the patient's medical history.



**There was a language barrier during a patient assessment and I was unable to get a detailed history of the patient. I looked up the patient's My Health Record to view their most recent discharge summary, regular medication list and pathology results. This information gave me some insight and background into how to care for this patient.** – nurse

Other use-cases describe how the My Health Record system was used to verify history-gathering from the patient. It was suggested that high-value content, such as pathology and diagnostic imaging results from private organisations, 'sped up' the assessment process.

It is well established that the various treatment areas of an ED correspond to the clinical acuity of the patient; this may influence ED clinicians' motivation to use the My Health Record system. Use-cases suggested that ED clinicians who are assigned to treatment areas for patients with lower acuity (e.g. 'fast-track', 'quick assessment bays') consider that a patient's My Health Record will yield minimal clinical value for their care.



**I didn't have a need to use it today yet. I am working as the nurse practitioner in the quick assessment area and most of the time the assessments are quick and to the point. I have used it in the past though and it has been helpful.**  
– nurse practitioner



**I am working in the quick assessment and care area and looking up past medical history on these patients isn't relevant.**  
– ED physician

At the start of the study, it was considered that using the My Health Record system could support the triage process. The initial staff survey showed that 42% of ED clinicians felt that the My Health Record system did not improve the accuracy of the triage process. This perspective was stronger in the follow-up survey, with 50% of staff believing that the My Health Record system did not help the triage process. Anecdotal feedback from clinical champions indicated that ED clinicians have a 'treat what is in front of you' approach to triage and are unlikely to gather medical history at this stage of the patient's ED journey.



**Unnecessary at triage, and may cause 'pigeonholing' of patients.**  
– registered nurse

Medication management was regularly cited in the use-cases as a clinical task that benefits from using a patient's My Health Record. Patients who may not be able to recall information related to their regular medication would typically prompt the ED clinician to fill this 'gap' via the patient's My Health Record.



**Used for elderly patient that was unsure of medications and doses. Able to quickly find this information at patient's bedside.**  
– registrar



**A patient could not remember a drug allergy they had, I used My Health Record to confirm what the drug allergy was and then safely prescribe medications that the patient would not react to.** – registrar



**My Health Record is used often for confirming a patient's meds.**  
– pharmacist

My Health Record system view data were reviewed to identify patterns and trends. At the project's start, it was envisaged that most use would occur after hours, when health service organisations in the community were not contactable, to provide ED clinicians with supplementary information on a patient. However, My Health Record system view times

peaked at 4 pm, with a smaller peak at noon (Figure 18).

My Health Record system use appeared to be proportional to the number of ED clinicians rostered, which corresponds to the above-mentioned peak times. This may suggest that senior clinical leadership will encourage junior ED clinicians to use all the clinical tools available to them – including the My Health Record system.

A similar review regarding day of the week showed that most of the average numbers of views were higher during weekdays than weekends (Figure 19).

Clinical champions were allocated to more weekdays than weekends. This finding supports the view that further efforts are required to influence My Health Record system use during night shifts and weekends. Another explanation is that the lower view rates on weekends could be an indication of how clinical leadership staff, who are typically rostered on weekdays, can influence the adoption of My Health Record system use by ED clinicians.

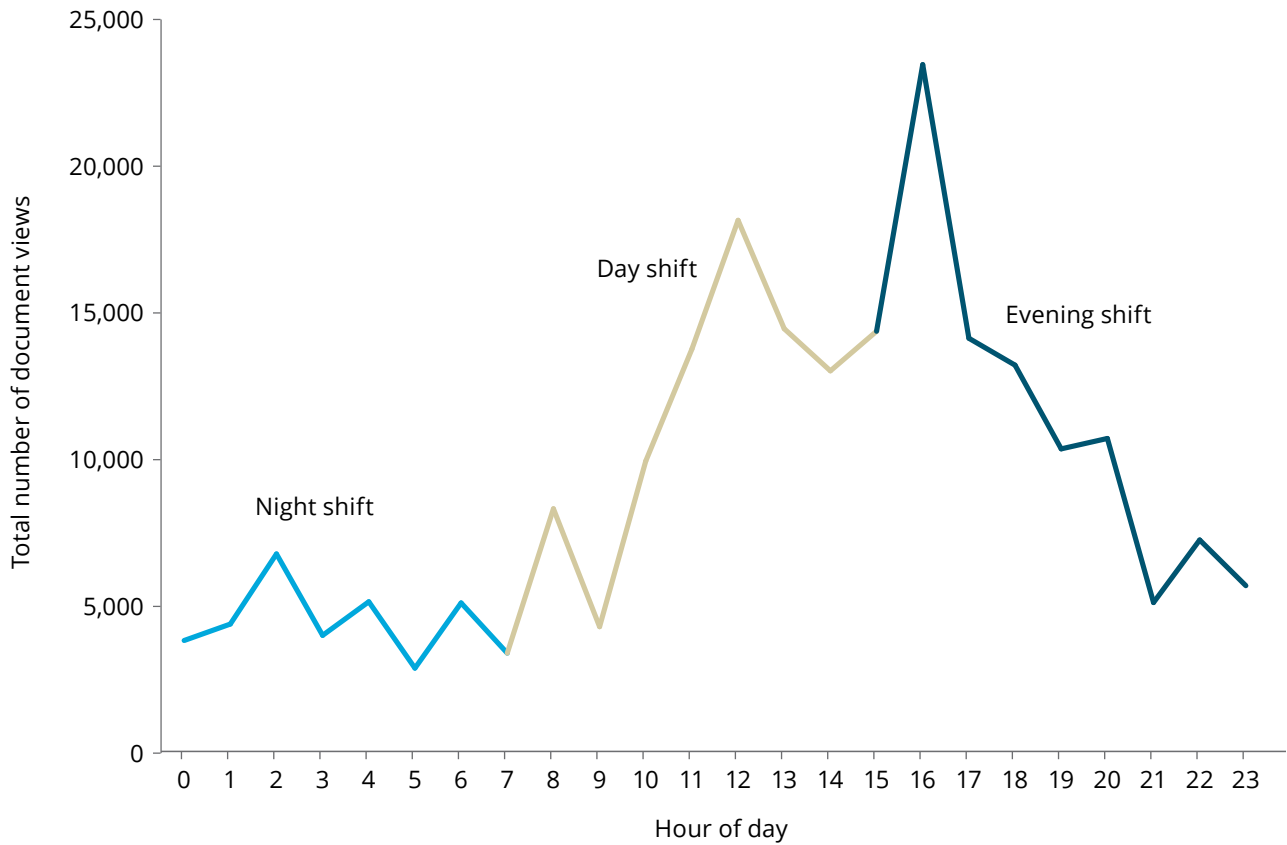
### ED patients with a My Health Record

On average, women and those who did not identify as Indigenous had higher numbers of My Health Record documents available than their male and Indigenous peers (12.2% and 7.9% greater, respectively). Based on the residential addresses, patients presented from all states and territories to the four ED pilot sites.

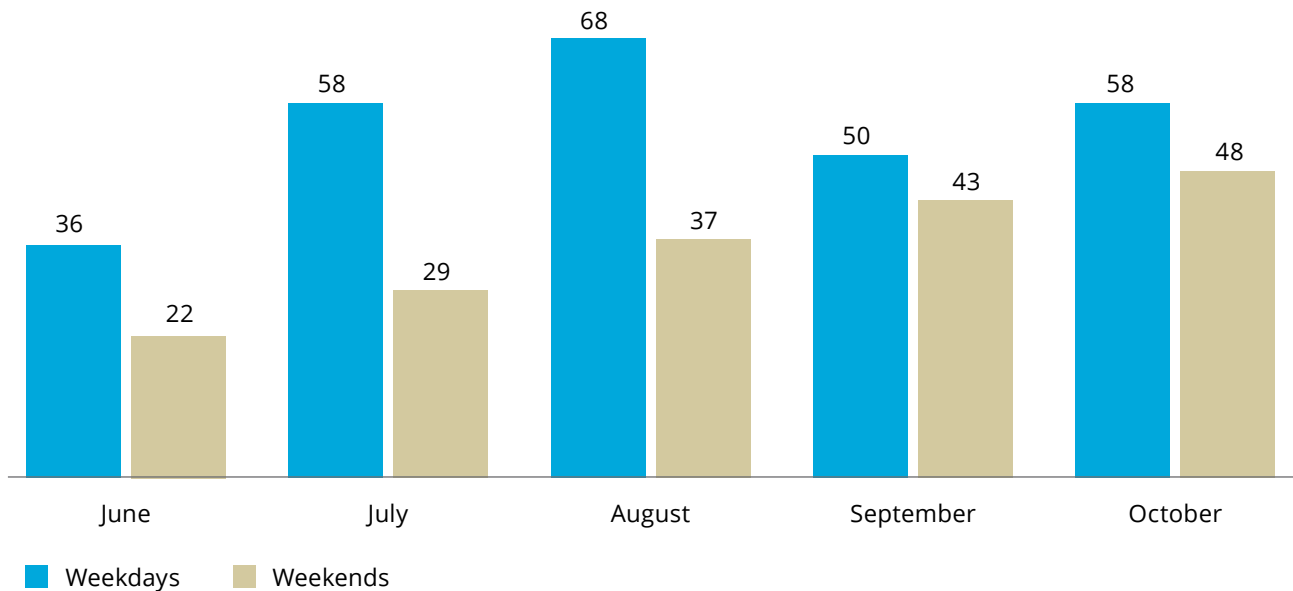
On average, there were approximately 21% more documents for patients who lived >20 km from the hospital visited; this was most pronounced at the Royal Children's Hospital Melbourne pilot site, with a 33% difference. This was appreciated by clinical staff, who proactively searched for My Health Record content if their patient was not 'local'.

Project data showed that the average age of patients who had their My Health Record viewed was 59 years. By comparison, the average age of patients who did not have their My Health Record viewed during their ED presentation was 33 years.

**Figure 18:** Count of total daily My Health Record system views at all pilot sites, per hour



**Figure 19:** Average My Health Record views on weekdays and weekends at all pilot sites





Patients who were readmitted (within 28 days of their initial admission) were more likely to have their My Health Record viewed than not. Patients who had their My Health Record viewed were more likely to, on average, have a higher number of pathology and diagnostic imaging tests performed in the ED (2.35 and 0.96, respectively), compared with those patients who did not have their My Health Record viewed (0.91 and 0.45, respectively).

Interstate patients with a content-rich My Health Record supported clinicians' decision-making and management of these patients. Use-case examples were captured that showed that interstate patients with a complex medication history or social history had enough content for ED clinicians to determine a treatment pathway.



**Almost 70-year-old lady with psychosis and unable to give history. From interstate. My Health Record useful as she had other medical problems and medications listed in My Health Record that could also have accounted for problems. Required further workup in ED.** – ED physician



**Patient transferred from airport, plane diverted to Perth due to patient deteriorating on flight. The patient was from Melbourne and there was no information on the system at our hospital. I used My Health Record to view the discharge summaries and regular medication list.** – registered nurse

## Supporting patients with the most complex medical histories

ED clinicians thought that vulnerable people with complex medical histories would benefit more from the use of the My Health Record system. Patient groups that they anticipated would be assisted by My Health Record use were (in order):

1. Chronic and complex care
2. Unconscious
3. Mental health
4. Inter-regional or interstate
5. Culturally and linguistically diverse
6. Aged care home
7. Aboriginal and Torres Strait Islander people
8. Paediatrics.



**Patient came into department unconscious, I accessed their My Health Record and viewed their GP summary. This gave me insight into the patient's medical background to find the aetiology and assisted in caring for this patient.** – registrar

## Communicating with other clinicians

The staff surveys explored whether My Health Record system use reduced the time spent by ED clinicians chasing information from, or communicating information to, other clinicians. There was minimal change between the initial and follow-up surveys in response to these statements. Results from the initial staff survey showed that 38% of ED clinicians either agreed or strongly agreed that My Health Record system use decreased the time spent chasing information from other health services or professionals. This increased fractionally to 39% in the follow-up staff survey. Similarly, the initial and follow-up staff surveys showed an increase from 24% to 30% of ED clinicians who agreed or strongly agreed that My Health Record system use decreased the time spent communicating information to other

health services or professionals. When these findings were stratified according to professional group, the results showed that more medical staff than nursing staff agreed that the My Health Record system reduced the time spent chasing information from other clinicians. There were no differences observed among pilot sites or by ED clinicians' years of experience. These survey results relied on the perceived reduction of time experienced by ED clinicians and were not verified through quantitative data sources, such as less fax or phone use.

It was anticipated that using the My Health Record system would substitute for conventional methods (e.g. fax, phone) of sourcing supplementary patient information from other clinicians. There was no difference from the initial to follow-up surveys. However, there was a difference between ED clinicians with less than 10 years experience compared with ED clinicians with more than 10 years experience – the former agreeing that the My Health Record system substituted for other methods of retrieving supplementary clinical information. This may be due to more junior clinical staff being responsible for history-gathering clinical tasks. One-third of ED clinicians across all pilot sites preferred using the My Health Record system over fax machines and phone calls, except for the Royal Children's Hospital Melbourne, with only 12% of ED clinicians in agreement. This is likely a result of lower My Health Record use in this pilot site. This is partly explained by a lower admission rate (approximately 12%) than for other sites (approximately 30–40%); project data showed that a patient's My Health Record is used more often if they are admitted, compared with those who are discharged.

## Partnering with patients

There were 918 patient use-cases collected during the study. Of these:

- 30% of patients indicated that they had a My Health Record
- 20% reported that they did not have a My Health Record

- 45% of patients did not know if they had a My Health Record
- 5% were categorised as not applicable, which was typically associated with international travellers or non-Australian residents.

Only 6% of patient use-cases recorded the patient as having advised their ED clinician that they had a My Health Record. Similarly, only 3% of staff use-cases indicated that the patient advised the ED clinician (unprompted) that they had a My Health Record.

Only 5% of staff use-cases showed that ED clinicians asked their patient if they had a My Health Record. More pharmacists made this enquiry than any other profession.

Findings from the initial staff survey indicated that two-thirds of ED clinicians would be more likely to view a patient's My Health Record if the patient informed them that they had one.

These results show that there was low awareness of the My Health Record system among patients who presented to the pilot site EDs during the study. Further awareness initiatives may empower patients to discuss their My Health Record with their clinicians. Clinical champions took the opportunity to provide patients with My Health Record system information (e.g. pamphlets).

There is an opportunity for ED clinicians and patients to partner during the latter's ED journey, by using content from their My Health Record. This can improve the patient experience by ensuring that care received from other organisations is considered as part of decision-making. It can also alleviate patient anxiety, because they do not have to rely on their own memory recall, for what can potentially be a complex medical history. Additionally, ED clinicians can be encouraged to use a patient's My Health Record if that patient prompts them to do so.

Patients can enter information into their My Health Record, which is captured as a 'consumer entered health summary'. This information typically encompasses allergies, adverse reactions and current medicines. There were 2,124 available consumer entered health summaries for all ED presentations across the pilot sites. This

represented 0.03% of all available My Health Record content (including MBS/DVA and PBS transactional data). This content could stimulate discussion between the patient and ED clinician regarding a patient’s healthcare needs.



**I have never accessed it personally but I like that healthcare professionals can look up my information as this will make their jobs easier, especially because I sometimes can’t remember all my medical history or regular medications.**

– patient



**I like the idea that I don’t have to keep telling people what I have wrong with me.**

– patient

### Application to clinical decision-making

During the study, the proportion of staff who stated that the My Health Record system provided them with information that had changed

their clinical decision-making rose from 13% to 38%. Considering that approximately 8.4 million people present to Australian public EDs annually, and if almost 4 out of 10 ED clinicians used the My Health Record system, this could potentially benefit at least 3.2 million ED presentations per year.

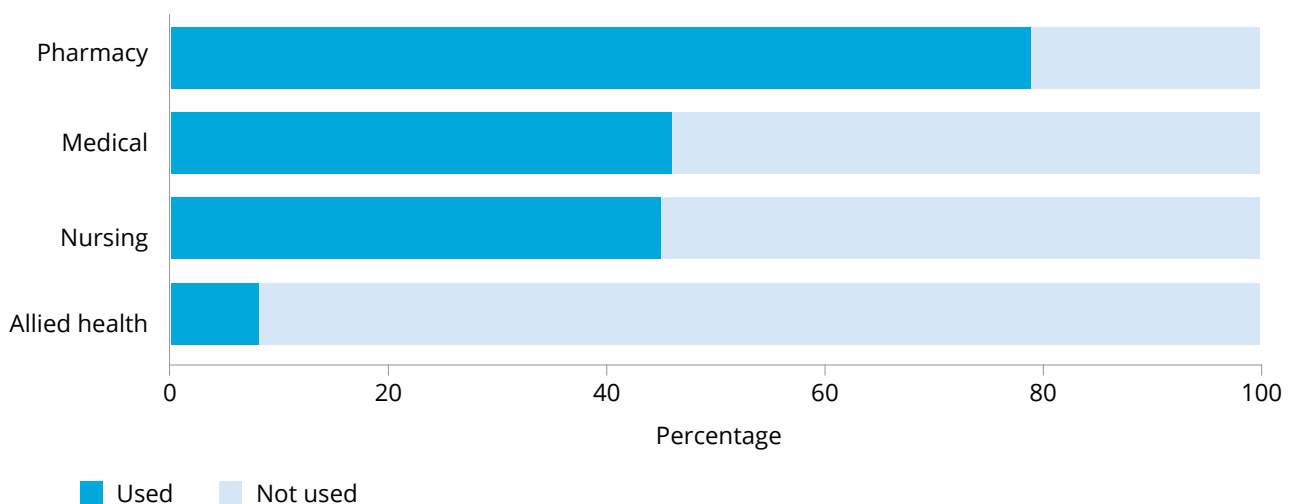
In complement to the follow-up staff survey findings, staff use-cases showed that 47% of ED clinicians who indicated that they used the My Health Record system agreed that it influenced their clinical decision-making. This varied according to professional group. Approximately 45% of both medical and nursing staff agreed that the My Health Record system influenced their clinical decision-making. A large proportion of pharmacists (80%) agreed with this statement. However, less than 10% of allied health’s clinical decision-making was influenced by the My Health Record system (Figure 20).



**Determine dispensing history which aided in deciding the dosage and quantity of medications the patient is discharged with.**

– drug and alcohol nurse

**Figure 20:** Summary of use-cases, by emergency department clinician profession, who used the My Health Record system and indicated it influenced their clinical decision-making





**I was then able to give the patient their regular medications and get the patient promptly to the ward.** – registered nurse

ED clinicians with less than five years experience were more likely to have improved their confidence in clinical decision-making from using the My Health Record system. Seeing less experienced clinicians using the My Health Record system become more confident in clinical decision-making was an encouraging finding.

In contrast, more than half (53%) of the most experienced ED clinicians (>20 years) did not agree that their confidence in clinical decision-making had improved from using the My Health Record system. The same response pattern was observed regarding if the My Health Record system helped with medication management.

In both the initial and follow-up staff surveys, ED clinicians were asked whether they checked if their patients had a My Health Record. ED clinicians were asked to reflect on their past 10 shifts. ED clinicians could select from varying frequencies regarding checking if their patients had a My Health Record:

- For most or all patients I assess or treat in the ED
- For more than half of the patients I assess or treat in the ED

- For fewer than half of the patients I assess or treat in the ED
- Never.

The three options for an ED clinician having checked whether a patient had a My Health Record were aggregated and considered as evidence for My Health Record use.

There was an improvement from 23% in the initial survey to 53% in the follow-up survey for ED clinicians who had checked if their patients had a My Health Record in their previous 10 shifts (see Table 13).

## Usability and user experience

The project team reviewed usability and user experiences, from the perspective of ED clinicians using the My Health Record system. Findings largely relate to how ED clinicians were able to access and navigate the My Health Record system from their respective viewing platform. User-friendly features that support My Health Record system use should be widely promoted and adopted by viewing platform owners, which are typically state and territory health departments, and EMR software developers.

### ED clinicians are likely to use the My Health Record system more if they have a better user experience

In the health IT context, ‘user experience’ is best described as what influences a person’s

**Table 13:** Responses to ‘Thinking about your past 10 shifts in your current ED, how often do you check whether a patient has a My Health Record?’, by pilot site

Pilot site	Initial staff survey (%)		Follow-up staff survey (%)		Increase in ‘yes’ (%)
	Yes*	Never	Yes*	Never	
PAH	25	75	49	51	49
RCH	16	84	29	71	45
RPH	20	80	61	39	67
TH	39	61	64	36	39
<b>Total</b>	<b>23</b>	<b>77</b>	<b>53</b>	<b>47</b>	<b>57</b>

PAH = Princess Alexandra Hospital; RCH = Royal Children’s Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

\* ‘Yes’ response is an aggregate of ED clinicians checking most, more than half or fewer than half of patients.

perceptions towards a digital health tool or system, such as the My Health Record system.<sup>42</sup> This is different to 'user interface', which is how a series of screens, pages and visual elements (icons and buttons) enable people to interact with a system.<sup>42</sup> The presentation of clinical documents and views, as well as the respective viewing platform, contribute to the ED clinician's overall user experience when using the My Health Record system.

A good analogy is 'the user interface is the bridge that gets us where we want to go, the user experience is the feeling we get when we arrive'.<sup>42</sup>

As with many healthcare systems, the user's overall experience is not partitioned into attitudes towards individual components; rather, it is to the entire system. The effect is that the reputations of all interacting systems are tied to the system that gives the poorest user experience, since ED clinicians do not tend to differentiate between where one system starts and another ends, particularly in a seamless, single sign-on environment.

This was evident when ED clinicians at Royal Perth Hospital could not access the My Health Record system due to a 'server error'. The error message was displayed intermittently, early in the study. The cause was attributed to IT infrastructure under the responsibility of the Western Australian Department of Health. However, several staff use-cases that reported the server error issue showed that ED clinicians were not aware of who was responsible for fixing the issue, and thus attributed their frustrations to the My Health Record system. This is likely to have demotivated ED clinicians from using the My Health Record system again.

Poor user experience, captured in the staff surveys and use-cases, was consistent with the peer-reviewed literature and the barriers to using electronic healthcare records (EHRs).<sup>43-46</sup> Better screen designs improve the user experience of an EHR<sup>44</sup> and can be further enhanced with improved collaboration with clinicians.<sup>47-50</sup>

Preferred designs are based on the doctrine that content consumption is discoverable, clear and efficient.<sup>51</sup> Inefficient navigation in EHRs has been

shown to increase users' cognitive load, which may increase the likelihood of errors, reduce efficiency and increase fatigue.<sup>52-54</sup>

**Poor user experience, captured in the staff surveys and use-cases, was consistent with the peer-reviewed literature and the barriers to using EHRs. Better screen designs improve the user experience of an EHR.**

Roman et al.<sup>49</sup> and Rule et al.<sup>52</sup> highlighted the importance of site navigation in the design of electronic healthcare systems and described the difficulties that clinicians face by having to navigate through multiple screens and sections. By having to access the EMR, a state- or territory-based portal (if available) and the My Health Record system, ED clinicians may experience the phenomenon of 'display fragmentation', as termed by the Institute of Medicine.<sup>53</sup> Such inefficient methods of piecing together a patient's health story can be taxing on the ED clinician because they must use their working memory to store the information displayed on previous screens – sometimes having to go back and forth between screens.<sup>55</sup>

As their cognitive load increases<sup>56</sup>, the possibility of medical errors increases<sup>57,58</sup>, compounding an already challenging setting, such as an ED. Better navigation can help address 'display fragmentation', to release the clinicians' cognitive resources for complex clinical reasoning and patient safety, and to increase efficiency.<sup>52</sup> It is well documented that poor usability design can significantly affect clinicians' satisfaction with a (digital health) system, and impede their ability to deliver safe and high-quality care. It is also a major contributor to clinician burnout.<sup>59-61</sup>

Many resources suggest ways to improve the usability of healthcare systems.<sup>18,44</sup> Fujita et al.<sup>62</sup> suggested five main properties:

- One view should contain a single patient's data
- Data should be summarised and details should be given on demand
- Data should be displayed in time series

- Data should be categorised by primary type
- More data should be displayed at the same time.

Norman<sup>60</sup> went further and has outlined five measures of usability:

- Learnability
  - How easy is it for first-time users to accomplish basic tasks using this system?
  - How easily can users discover and access the system’s more advanced features?
- Efficiency
  - How quickly can users perform tasks using this system?
- Memorability
  - If clinicians stop using the system for some time, how easily can they re-establish their former proficiency with the system?
- Errors
  - How many errors do users make while interacting with the system?
  - How severe are these errors, and how easily can users correct them?
- Satisfaction
  - How pleasant do users find their experience of interacting with the system?

Based on feedback received throughout the project, particularly regarding the usability of My Health Record system viewing platforms and clinical documents, the principles outlined above could enhance the current user experience of ED clinicians. A human-centred design approach should guide efforts to enhance the usability of My Health Record system viewing platforms.

### Presentation of content influences viewing behaviour

How My Health Record system content is displayed through the respective viewing platform can influence the viewing habits of ED clinicians.

The Health Identifier and PCEHR System user interface (HIPS-UI) viewing platform, used at Royal Perth Hospital, displays tabs across the top of the screen, which link to the relevant document type (Figure 21). The ‘Other Documents’ tab includes information such as discharge summaries, event summaries and specialist letters. Therefore, viewing habits corresponded with the most prominently featured tabs on the landing screen of the viewing platform.



**Make the tabs even more clear for specific info. Some info is hidden in vague tabs.** – nurse

Survey results indicate that staff prefer to have a list of all available My Health Record content prominently displayed on a single page.

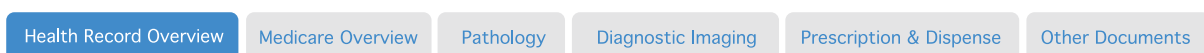
The follow-up staff survey explored ED clinicians’ opinions on whether the layout of the My Health Record system content was user-friendly and if such content was considered of high clinical value. This survey included ‘mock-up’ screenshots, which contained information related to fictional patients of each My Health Record clinical document and view. This ensured that any ED clinician who had not viewed such content in practice was still able to form an opinion based on the supplied screenshot. These screenshots of My Health Record clinical documents and views had all data fields populated; however, in practice, the completeness of such content is likely to vary.



**... need quick and easy access to a current list of medications and doses.** – doctor

The results were consistent for layout and value across My Health Record content. Some

**Figure 21:** Tab display of the HIPS-UI viewing platform



exceptions included that more ED clinicians believed that the Medicines View had high value, whereas there was less agreement that the layout was user-friendly. Similarly, pathology reports and diagnostic imaging reports, compared to other document types, had the least agreement regarding a user-friendly layout. This is consistent with My Health Record system view data, which showed that medicines and diagnostic tests were the most highly viewed (and valued) content; however, improvements to their layout are required.



**This page (Medicines View) is the most useful page in my experience and the one I will look for first. Sometimes it can be very busy. If we could filter with a drop-down arrow by date and drug name that would help.**

– doctor

## Navigability could be better

With regard to opportunities for improvement in both content presentation and navigability, 46% of ED staff felt that there was room for improvement on usability barriers such as:

- Too many mouse clicks
- Too many screens
- Lots of scrolling up and down the screen
- Links to content needing to be displayed more prominently.

Noting that only a minority of staff knew how to access the My Health Record system when the study started, usability was less than intuitive. Initial staff survey results showed that 24% found the My Health Record system easy to access, 15% found it quick to find relevant information and 13% felt that information was presented in a clear way. Encouragingly, by the end of the pilot study, the proportion of staff who found the My Health Record system easy to access had increased from 24% to 64%.

The follow-up staff survey showed that ED clinicians were frustrated with having to open each pathology test individually. This is likely because most EMRs show a trended view of pathology results that were conducted within the ED; therefore, ED clinicians are not accustomed to the cognitive burden of 'clicking' each individual pathology result.



**The layout of the pathology testing is incredibly frustrating. If I'm looking for a result, I want to see it quickly. I don't care where it was done, I want to know if it's normal and if it is a new problem compared to previous results and I want to see it displayed easily. Clicking in and out is a waste of my time.**

– doctor



**It is annoying that you have to open every single result separately. Can there just be a list with the tests that have been done and their results (including also previous results for trend).**

– doctor



**Layout of blood results should enable clinician to see trends and put results side by side rather than looking at each one individually.** – doctor

Logic branching was used in the follow-up staff survey. This meant that the My Health Record system viewing platform was displayed according to the state the ED clinician indicated they worked in. A screenshot of the viewing platform (as shown

in Chapter 3) accompanied the questions related to 'access and usability'.

Of ED clinicians, 73% from Royal Perth Hospital, 64% from Princess Alexandra Hospital, 55% from Tamworth Hospital and 42% from the Royal Children's Hospital Melbourne agreed that navigating to the My Health Record system from their EMR was easy.

A similar result was seen in response to whether links from the EMR to the My Health Record system were clearly identifiable and intuitively labelled. Most ED clinicians from Royal Perth Hospital agreed (60%), followed by Princess Alexandra Hospital (52%) and Tamworth Hospital (46%). Only 35% of ED clinicians from the Royal Children's Hospital Melbourne agreed with this statement; this is likely because there was less content available at this pilot site, and thus less My Health Record system experience among ED clinicians.

ED clinicians from Tamworth Hospital and Princess Alexandra Hospital were asked if they knew what content was available in the My Health Record system compared with their state-based portal (HealthNet and The Viewer, respectively). A quarter (24%) of Tamworth Hospital ED clinicians knew what content was available between the two systems, and 50% of ED clinicians from Princess Alexandra Hospital knew. This suggests that existing My Health Record system training programs may benefit from distinguishing which content is available from which system.

## Opportunities to enhance the viewing platforms

More than half of ED clinicians at Princess Alexandra Hospital (65%) and Royal Perth Hospital (52%) agreed that My Health Record system content was user-friendly. A quarter (25%) of ED clinicians agreed with this statement at Tamworth Hospital, and approximately one-fifth (21%) at the Royal Children's Hospital Melbourne.

At least 4 out of 10 ED clinicians agreed that their My Health Record system viewing platform could be improved (e.g. fewer mouse clicks). More

than half of ED clinicians at Tamworth Hospital (55%) agreed that the viewing platform could be improved.



**There is a duplication of data under the 'Shared Health Summary' and 'Other Documents' page and I often find the 'Prescription and Dispense' tab contains no information. However, when I access the 'Medicines View' tab, under 'Other Documents', this information is available. This leads to confusion and misinformed information being interpreted. Had I not been shown the 'Medicines View', I would not have known to open it to access the pharmacy information. – nurse**

These results suggest that ED clinicians across all pilot sites supported making improvements to the My Health Record system viewing platform. This was particularly the case at Tamworth Hospital and the Royal Children's Hospital Melbourne.

Almost 80% of ED clinicians thought that a flag, or similar visual cue, should be used to indicate when there are clinical documents in a patient's My Health Record. This is likely to assist ED clinicians in their decision-making on whether to access a patient's My Health Record. Additionally, ED clinicians suggested that links to various document types in the My Health Record system should not be displayed if there is no content. For example, ED clinicians from Tamworth Hospital indicated that a My Health Record system clinical document appears available, indicated by a document count of one or more alongside the document link. ED clinicians can click this link, which then displays the distinguishable black banner, a characteristic of all My Health Record content, without any information populated in the clinical document itself. This appearance of a



'shell' document is likely to frustrate ED clinicians, who believe they are accessing a patient's My Health Record that is populated with content.



**There is a lot of double-up of information. On the 'Health Overview' tab, you can view the same information you can access from other tabs. It's annoying because you think you are accessing new information but in fact it's just a duplication of data.** – nurse

About half of ED clinicians (49%) surveyed thought that being able to view integrated content from the My Health Record system and their EMR would be more useful. Such integration could consolidate content into an aggregated view. For example, pathology reports from public and private providers could be amalgamated and trended to enable a more comprehensive display of all available diagnostic tests. Visual aids can be used to discern between the various information sources (e.g. public hospital, private hospital, community provider).

Similarly, ED clinicians observed that medication-related information was available from a range of different clinical document types. Some ED clinicians interpreted this to mean that the same medication information could be repeated across different clinical documents. It is well documented in international literature how important it is for clinicians to have a comprehensive understanding of what medications a patient is taking. Up to 67% of patients' prescription medication histories recorded on admission to hospital have one or more errors, and 30% to 80% of patients have a discrepancy between the medicines ordered in hospital and those they were taking at home.<sup>63</sup> Up to 27% of hospital prescribing errors are attributable to inaccurate or incomplete medication histories on admission to hospital<sup>64,65</sup>, with the omission of a regular medicine being the most common error. Older patients ( $\geq 65$  years) and those taking multiple medicines experience

a higher incident of errors.<sup>66</sup> It is for these reasons that ED clinicians, via the staff surveys, called for a single display of all medication-related information, which could be achieved by harmonising the relevant documents and views that are currently available (and in addition to any clinical document, such as a discharge summary or shared health summary, which could contain medication histories in free text):

- Prescription Record
- Dispense Record
- Medicare Overview (PBS transactional data)
- Medicines View
- Prescription and Dispense View
- Pharmacist Shared Medicines List.



**Better for all information to be in one place ... any chance My Health Record could sync and combine information with a jurisdictional-based portal rather than having My Health Record on a separate tab?** – doctor

The follow-up survey showed about half (49%) of ED clinicians did not understand how to use the emergency access function. About one-third (32%) knew how to use the emergency access function, and the remaining ED clinicians indicated a neutral response (19%). Use-cases suggested that ED clinicians were anxious about using the emergency access function, largely due to the potential ramifications if such access was deemed contrary to the *My Health Records Act 2012*.



**... scared due to education about getting fines.** – nurse

More than half of ED clinicians surveyed (54%) agreed that they would prefer to know that content would become available if the emergency access function was used. Restricted records

or content could be made 'translucent'. Limited visibility, such as document type, the number of documents available and if the document was recently created, could help the ED clinician to decide if they should use the emergency access function. This could be particularly useful in instances when this function is used to no avail (e.g. no content was restricted by the patient, restricted content is revealed to hold minimal clinical utility).



**It is very relevant that a patient is hiding information from me even if I don't know what it is. I don't always have to see it.**

– doctor



**No point in putting yourself up for audit and scrutiny if the information accessed is useless.**

– doctor



**Given the ramifications ... we would like to know if there was information to be accessed before utilising the break-glass function.** – doctor

ED clinicians would be better supported through a more obvious search and filter function within their My Health Record system viewing platforms. This is despite such functions existing, to varying degrees, in viewing platforms across all pilot sites. These functions should feature in My Health Record system awareness and education programs. It is envisaged that ED clinicians will increasingly depend on these functions as My Health Record system content increases over time.



**When patients have only a few documents, it's easy to navigate and select what is relevant to my current episode of care. When the My Health Record is very full, it feels cluttered and difficult to tease out what I need. I'm concerned that as My Health Record becomes more and more used there will be so many documents that it will be too difficult to select it out. It needs to be compartmentalised a bit more to make it more ergonomic.** – doctor

ED clinicians suggested that the most relevant content to the ED setting be featured when first accessing a patient's My Health Record. For example, the main landing screen (i.e. first screen viewed when the My Health Record is opened) should display the patient's current medication and allergies, and include a 'one click' link to diagnostic test results. Considering that this content is potentially available in the My Health Record system as part of a variety of clinical documents, a purpose-built 'emergency care summary' view<sup>67</sup>, suited for the ED setting, may assist ED clinicians who are typically time-poor when attempting to gather a patient's medical history.

## **ED clinicians want to find the My Health Record system useful**

ED clinicians appreciate that the most challenging patients, from an assessment and management aspect in the ED, are those with complex medical issues or patients who find it challenging to communicate.

ED clinicians know that patients with complex clinical histories are likely to yield greater utility and benefit most from their My Health Record. The follow-up survey showed that two-thirds of ED clinicians are confident that the My Health

Record system will become more useful as the amount of content increases.

The follow-up staff survey showed that 49% of ED clinicians agreed that the My Health Record system had provided them with clinical information that they do not normally have access to. This was an increase from 36% in the initial staff survey. More medical staff (50%) than nursing staff (40%) agreed with this statement. In addition, the less experience ED clinicians had, the more they agreed that the My Health Record system provides clinical information they are not normally able to access. It is encouraging that junior staff appear to embrace the My Health Record system as a clinical tool more than their more experienced counterparts.

Unsurprisingly, ED clinicians are frustrated by issues of usability and, at times, inconsistent volume, variety and quality of clinically valuable My Health Record content for their patients. As with many digital health initiatives, unmet expectations can quickly dissuade ED clinicians from using the new technology regularly, particularly if it does not satisfy their needs on the first use.

Anecdotally, the staff surveys documented several times when clinicians had found that the My Health Record system information had improved their patients' management. In the follow-up survey, almost 40% of ED clinicians stated that the My Health Record system had changed their decision-making, which was nearly triple the percentage from the initial survey.

The project's findings have highlighted key patient cohorts and opportunities during a patient's ED journey when their My Health Record can be used – specifically, initial medical and nursing assessments, and medication management clinical tasks.

The project has also provided an excellent end-user testbed for many uses of the My Health Record system – across multiple EDs, using different EMRs and viewing platforms – which will support continued efforts to achieve and maintain regular clinician use.



**My Health Record helped the quality of my decision-making ... [it gives] me more info and I can make a better clinical decision.**

– nurse



# 5 Clinical champions workshop findings

After the pilot site study was finished, the Commission conducted a clinical champions workshop on 27 November 2019. All clinical champions from the four pilot sites, and project team members from the Commission and the Australian Digital Health Agency (the Agency) attended the workshop. It provided an opportunity to consolidate knowledge and experiences from the project, and was divided into two distinct components:

- Experiences from pilot sites
- Synthesis and analysis of key themes.

## Experiences from pilot sites

Each pilot site shared their experiences from the study and provided a snapshot of their respective digital environments in the context of My Health Record system use. Clinical champions observed, for the first time, the different My Health Record system viewing platforms in use across the four pilot sites, and how this offered different user experiences.

## Synthesis and analysis of key themes

Group discussion focused on themes extracted from project activities. Interactive tools (e.g. Mentimeter) were used to complement the workshop discussion and critically explore common issues and themes.

Clinical champions ordered themes according to importance and influence over emergency department (ED) clinicians' regular use of the My Health Record system, from most to least important:

1. Usability and interface
2. Content in the My Health Record system

3. Training, awareness and workforce preparedness
4. Patient cohorts who benefit from My Health Record system use
5. Governance and system optimisation
6. My Health Record system use in ED workflows
7. Restricted access code and emergency access use.

## Summary of observations

The project team made several observations from the clinical champions workshop, which are summarised here.

### More versatility with how the My Health Record system content is displayed

The clinical champions agreed that the My Health Record system content would be easily consumed if displayed more succinctly. ED clinicians anticipated that they would rely more on manipulating the data displayed as the content in the My Health Record system increases. Intuitive functionality such as filters, sorting by predetermined date ranges and toggle switches (to show and hide content according to source) could help manage cognitive load. Data categorisation could assist ED clinicians with differentiating large volumes of data so they could easily apply them to workflows. For example, clinical champions suggested that medicines information could be stratified according to 'regular' and 'prn' (as required) medicines. Visual cues could indicate the volume and variety of data to prevent exploratory searches.



**The system (My Health Record) needs to be rewarding in order to become habit for clinicians.**

– clinical champion

The access pathways and navigation features differed across each pilot site's My Health Record system viewing platform. Some pilot sites automatically populated the viewing platform with a patient's My Health Record content. In contrast, other viewing platforms required ED clinicians to manually select a date range or click a refresh button to generate content. This was counterintuitive, as most ED clinicians were not aware of this requirement and had believed the patient's My Health Record to be empty. Clinical champions suggested that a patient's My Health Record should automatically be populated with content based on a 'default' time period (e.g. display content from the previous three months). ED clinicians would then be able to manually adjust the time period to display more content as required.

Some ED clinicians noted that it took a long time to load a patient's My Health Record content. The Agency indicated that a delayed content loading time may be experienced when the patient's My Health Record was accessed for the first time. In effect, this initial access activated the patient's My Health Record, and lengthy load times were due to content being populated – typically with the default, two-year retrospective Medicare Benefits Schedule and Pharmaceutical Benefits Scheme transactional data. These delays, albeit one-off in nature, could deter ED clinicians from regularly using the My Health Record system, as they are often time-poor in the ED setting.

### **User-friendly configuration of My Health Record system viewing platforms**

The structure of viewing platforms influenced ED clinicians' user behaviour. Clinical champions suggested that an 'Other Documents' tab should be abandoned in any viewing platform. ED clinicians were less motivated to access this tab if

they were unaware of what content was contained within it.

Some naming conventions used for My Health Record document types were less familiar to ED clinicians. For example, a shared health summary is typically produced by a patient's primary healthcare provider (e.g. general practitioner). Therefore, it was suggested that a more intuitive document title would be 'primary care summary'. Similarly, ED clinicians preferred the term 'medications' to 'medicines' (e.g. 'Medicines View').

A summary list, by document type, was suggested to show the range of content in a patient's My Health Record. Such a list would have a consistent appearance across all viewing platforms and only indicate where documents were available. This is different to some current viewing platforms that have links to documents regardless whether they are populated with content or not – the latter resulting in the clinician unnecessarily clicking a link to discover no content is available. Clinical champions suggested that any document type (and corresponding tab) that does not have any content should be 'greyed out', which would avoid any unnecessary mouse clicks and cognitive burden. Similarly, the emergency access function should not be displayed if a patient did not have any restricted content in their My Health Record. This could minimise accidental use of the emergency access function.

Usability of the viewing platform interface was the highest rated theme by clinical champions. Ensuring that ED clinicians can comfortably navigate the My Health Record system, as determined by the viewing platform, is considered a critical success factor to regular clinician use. There was a clear preference for navigating the My Health Record 'in context', meaning the viewing platform is displayed within the hospital electronic medical record (EMR) window. This gives the appearance of seamlessness between the EMR and the My Health Record system, and less cognitive burden of having to switch between multiple screens.

The concept of trended views of My Health Record system content was well received by clinical champions. This could replicate similar

functionality that ED clinicians were accustomed to in their hospital EMR. Thus, efforts to emulate functionality from the hospital EMR in the My Health Record system viewing platform would harmonise navigation patterns and use behaviours.



**The My Health Record should focus on ‘here is where you can get the information you cannot normally get elsewhere’.**  
– clinical champion

Clinical champions were interested in stimulating patient engagement using mobile applications that integrated with the My Health Record system. Some clinical champions observed user-friendly functionality in these mobile applications, such as grouping common items (e.g. diagnostic tests), that should be replicated in viewing platforms. Patients who engaged with their My Health Record could bring specific content to their ED clinician’s attention using their mobile device. There was an appetite among ED clinicians to use the My Health Record system to facilitate communication with patients. Clinical champions acknowledged that it can be challenging to engage with patients (such as older Australians) who had low digital health literacy.

Clinical champions discussed how ED clinicians would document that they accessed a patient’s My Health Record. Typically, ED clinicians referred to relevant My Health Record content in a

patient’s clinical notes. Clinicians supported the idea that My Health Record system access should be automatically recorded in the hospital EMR to minimise any cognitive load from having to manually document it.

## Extending ED clinicians’ knowledge of the My Health Record system

Clinical champions described several scenarios where ED clinicians would benefit from further My Health Record system training.

### Use of emergency access

ED clinicians required ongoing clarification on what conditions permitted them to use the emergency access function. A prompt within the My Health Record system viewing platform could clarify these conditions before emergency access is asserted. For example, a dialogue box appears in The Viewer that requires the clinician to select the relevant situation to justify why emergency access is required (Figure 22). This was viewed favourably; however, a free-text box to expand on the reasons for asserting the emergency access function was considered cumbersome.

### Forgotten restricted access code

Clinical champions provided anecdotal feedback on the challenges experienced by ED clinicians when using a patient’s restricted access code. Sometimes a patient could not recall their restricted access code. ED clinicians were unable to retrieve the restricted content and were not permitted to use the emergency access function as it did not satisfy the strict conditions set out by the legislation. In this instance, patients are

**Figure 22:** ‘Use of emergency access’ dialogue box, as displayed in The Viewer

**Use of emergency access**

The use of this button will be audited by the Australian Government. MHR Test - 26-Nov-2018 11:59

It should only ever be used by a clinician in one of the following situations (please select):

There is a serious threat to the individual's life, health or safety and their consent cannot be obtained

There are reasonable grounds to believe that access to the My Health Record of that person is necessary to lessen or prevent a serious threat to public health or safety

Enter reason that either consent cannot be obtained (e.g. patient unconscious) or reason for serious threat to public health or safety (e.g. source of a serious infection and prevent its spread):

Accept Decline

expected to phone the My Health Record system helpline. This was considered impractical in an emergency. Alternative security measures, such as multi-factor authentication (e.g. temporary access code received via text message), was suggested as a potential solution. Clinical champions suggested that ED clinicians may feel pressured to use the emergency access function to view the patient's restricted content in the absence of a suitable workaround to retrieve a forgotten access code.

### **Displaying the emergency access option only when a My Health Record is restricted**

ED clinicians sought improved clarity to indicate that the emergency access function was used. Icons or visual cues could show what My Health Record system content was now available after using the emergency access function. Conversely, if no content was restricted, a visual cue could show that the emergency access function was asserted but did not yield any content. This could prevent repeated attempts by ED clinicians to access restricted content that does not exist. Clinical champions agreed that ED clinicians should be aware if there is restricted content in a patient's My Health Record (e.g. through a message or prompt) before using the emergency access function.



**I was able to use the break-glass function but unfortunately was not able to clearly tell the break-glass had been used. – registrar**

### **Withdrawn patient consent for upload to the My Health Record system**

At any stage of the ED presentation, patients may request that a clinical document related to their ED presentation not be uploaded to their My Health Record. In this instance, ED clinicians are expected to prevent the clinical document from being uploaded to the patient's My Health Record. This may require 'ticking a box' within the hospital EMR or advising the ED clerical staff to withhold any upload to the My Health Record system. Feedback from clinical champions

suggested that it was unclear if ED clinicians were able to 'mark' some clinical documents for upload and refrain from marking others, or if an 'all or nothing' rule applied. The follow-up staff survey showed that 7 out of 10 ED clinicians did not know how to prevent clinical documents being uploaded to a patient's My Health Record, despite the expectation that organisational policies and procedures are in place. This will likely result in the onus being placed on the patient to remove the clinical document from their My Health Record after it has been uploaded.

### **Granting My Health Record system access to temporary clinical staff**

Access to hospital EMRs is synonymous with access to the My Health Record system. Therefore, access to the My Health Record system will be limited wherever eligibility for staff to access their hospital EMR is determined by their role or profession. Access to a hospital EMR was optional for nursing staff at one pilot site, which could perpetuate the perception that the My Health Record system is a tool for medical staff only. Clinical champions discussed potential limitations to locum or agency clinicians using the My Health Record system. There was consensus that all ED clinicians should be granted access to the My Health Record system to ensure widespread use and support integration into all clinical workflows.

### **Real-time prompts to help navigate My Health Record system viewing platforms**

Educational tools built into the My Health Record system viewing platforms could provide ongoing support to ED clinicians. Viewing platforms could feature prominent links to walk-through documents or 'how to' videos. Additionally, a 'hover over' function could be used to describe clinical document types – particularly where naming conventions are not commonly used in a particular clinical setting. For example, an ED clinician could hover the mouse pointer over a tab or link to a clinical document, which would then display a small text box that defines the content about to be accessed.



## Neonates and very young children may not have a My Health Record

The Royal Children's Hospital Melbourne offered insight into My Health Record system experiences typical of a paediatric patient cohort. Anecdotally, there were instances where very young children did not have a My Health Record. Neonates and very young children may not yet have had their birth registered at the time of an ED presentation, as registration is required up to 60 days from birth (except in the Australian Capital Territory, where this is up to six months).<sup>68</sup> Upon registration of the birth, the baby can be enrolled into Medicare.<sup>69</sup> This process will result in an Individual Healthcare Identifier (IHI) being created for the neonate, which is an identifier used to access an individual's My Health Record. The National Children's Digital Health Collaborative<sup>70</sup> aims to resolve this issue by establishing processes to create an IHI at birth.

Clinical champion feedback suggested that access to maternal health history would be valuable for neonatal patients. Current My Health Record system access methods require the mother to be registered in the hospital EMR to view her My Health Record. However, the mother's My Health Record would not be available from the hospital EMR should she be discharged from the hospital prior to the neonate. Alternative methods, such as the Agency's National Provider Portal, would enable view access if the mother's complete and accurate identifiers were supplied, which are used to search and retrieve a My Health Record.

## Clinician involvement with the My Health Record system quality improvement processes

The pilot sites accessed the My Health Record system using different hospital EMRs and viewing platforms. This resulted in different access pathways to My Health Record system content. If this process was complex, it hindered functionality and created variation in usability. To resolve this, clinical champions supported practising clinicians' involvement in the design process of digital health systems that interface with the My Health Record system. Clinicians

considered that it was imperative to reduce the cognitive burden associated with protracted navigation. For example, there was concern that an excessive 'click count' would lead to clinician burnout.

Clinical champions recognised that ongoing involvement in My Health Record system design and improvement processes would support sustained use by ED clinicians. In contrast, not involving clinicians would likely lead to poor usability that would require a 'relaunch' or 'reboot' of the My Health Record system viewing platform – a contributor to 'change fatigue'.<sup>4</sup> The clinical champions workshop demonstrated how well-informed clinicians, with five months worth of intensive My Health Record experience, can devise practical solutions to common barriers experienced by ED clinicians.

Overall, there was consensus among clinical champions that the My Health Record system is a useful clinical tool. There was enough evidence to conclude that the My Health Record system assisted clinicians with their clinical decision-making across the pilot sites. Clinical champions agreed that further efforts were required to educate their ED colleagues. Ongoing work programs to optimise viewing platforms and content displays were considered necessary to integrate the My Health Record system into clinical workflows.



# 6 Recommendations

Project findings have yielded several opportunities that could improve the utility of the My Health Record system for emergency department (ED) clinicians, to support them in maximising the benefits for patient care.

Achieving regular My Health Record system use by ED clinicians is based on five foundational themes, which have emerged from the project's findings:

- Viewing – ongoing improvements to the usability of My Health Record system viewing platforms
- Value – better clinician awareness of how and when to use the My Health Record system
- Volume – continued efforts to increase the amount of content in the My Health Record system
- Variety – expanding the different document types in the My Health Record system
- Vicarious – My Health Record system training using case studies and led by clinical champions.

These themes are collectively referred to as the adoption model, which underpins the project's recommendations described in this chapter (see also [Appendix 3](#)). The adoption model supports the implementation, maintenance and optimisation of these recommendations, to realise benefits from clinicians' use of the My Health Record system.

The recommendations in this chapter have been informed by both phases of the project and the clinical champions workshop. A pragmatic approach was applied when constructing these recommendations, to promote their implementation in the operational environment. Recommendations have been grouped under headings, which align with ED workflows and aspects of the My Health Record system that require further efforts to support ED clinicians' ongoing use of the system.

Although focused on the ED setting, these recommendations are transferable and scalable to other clinical areas within the broader hospital environment. The ED's electronic medical record (EMR) platform is typically rolled out across the hospital; therefore, clinician access to the My Health Record system would be common across all settings throughout the organisation. The close working relationship between ED clinicians and their clinical colleagues in other parts of the hospital is likely to forge greater awareness of the My Health Record system through collegiate networks and dialogue.

## Increasing awareness of the My Health Record system through clinical champions

People in dedicated clinical support roles who engage with ED clinicians can facilitate awareness of the My Health Record system. Project findings show that the deployment of dedicated My Health Record clinical champions has an immediate effect on ED clinicians' awareness and use of the My Health Record system.

Collegiate learning, led by respected and credible clinical champions, helps to translate My Health Record system knowledge to clinical application, ideally during a clinical shift so that knowledge is immediately applied in a practical context. ED clinician feedback indicated that continuous peer-led reinforcement of My Health Record system use-cases and opportunistic 'at the elbow' teaching by clinical champions was the preferred teaching style.

Awareness should initially focus on My Health Record system fundamentals, especially its role in providing other sources of health information and how to use the viewing platform. Use-cases should emphasise how to integrate the My Health Record system into clinical groups' bespoke workflows. The project demonstrated that there

is a common misconception among many ED nursing staff that the My Health Record system is a tool exclusively for medical staff. There are opportunities to emphasise to the ED nurses – typically the largest proportion of the ED clinical workforce – that the My Health Record system can be integrated into ED nursing workflows.

Project findings showed that clinical champions could deliver opportunistic My Health Record system training. Staff survey results indicated that ED clinicians prefer this approach rather than a didactic, classroom-style training that is typical of digital health system rollouts.

### **Case studies are an effective learning tool**

My Health Record system training should emphasise real-life examples of how clinicians can access patient information to inform their decision-making.

Socialising local exemplar use-cases can promote the My Health Record system's role in regular workflows and practices.<sup>71</sup> This in turn can raise awareness of who within the local ED has experienced a positive outcome through My Health Record system use, which encourages collegiality and vicarious learning.

Clinicians' support of digital health system implementation is best achieved through demonstrated patient safety improvements.<sup>72</sup> An established network of clinical champions could facilitate knowledge-sharing of exemplar My Health Record system practices.<sup>73</sup> Such a network – otherwise known as a 'community of practice' – can be formed within the ED setting, within the broader hospital environment, or across different health service boundaries and providers (e.g. with general practitioners [GPs] through Primary Health Networks).

ED clinicians learn through patient case studies in a peer-led, collegiate environment. Existing learning opportunities should be used to highlight My Health Record system use, such as during:

- Staff orientation programs and clinical rotations (e.g. for junior medical officers)
- In-services

- Grand rounds
- Case reviews
- Morbidity and mortality meetings
- Reflective learning groups (e.g. 'Excellence in Learning')
- Continuing professional development sessions.

The integration of use-cases into established learning and quality assurance programs can demonstrate how the My Health Record system can be applied to emergency care and reinforce the value of clinician use.

### **Integration of My Health Record system training into a learning management system**

Staff who have completed My Health Record system training should ideally have this recorded in a learning management system, which typically tracks mandatory training.

Training records can be used to show how staff access to the My Health Record system complies with legislative requirements. Such records can also be used for any spot-check external reviews and to support health service organisations being accredited against Action 1.18 of the National Safety and Quality Health Service Standards (second edition).<sup>74</sup>

Staff surveys suggested that the 'at the elbow' approach by clinical champions may not be recognised as formal training. A clinical champion-led education session can satisfy the same learning outcomes that would be covered in a classroom or online delivery. Similarly, the initial staff survey showed that some ED clinicians could not recall whether they had received My Health Record system training. The individual clinician's learning management system profile can remind clinicians that they have received My Health Record training. This is likely to assure ED clinicians that they are authorised to access and regularly use the My Health Record system as part of their clinical practice.

## **Supplementary resources should focus on how to operate the My Health Record system**

Supplementary My Health Record system refresher education can be delivered as a self-directed online learning session or as part of local EMR training.

Hard-copy and online training resources can complement the 'at the elbow' teaching style. These resources, which are typically state or territory developed, include walk-through guides, quick reference sheets and online learning modules. Such resources could also be used to engage the hospital clinical workforce through the support of representative organisations such as medical colleges (e.g. Australasian College for Emergency Medicine), professional associations (e.g. Australasian Institute of Digital Health) and other peak bodies (e.g. College of Emergency Nursing Australasia).

Regular staff feedback forums, refresher courses and 24-hour support (e.g. a recognised clinical champion during every shift) have been known to support regular use.<sup>3,75</sup> The availability of supplementary resources and support functions should consider the 24/7 nature of an ED setting.

### **My Health Record system simulation training environment for ED clinicians**

A My Health Record system simulation training environment could demonstrate how the system could benefit emergency care and encourage use. Emulating the local EMR and viewing platform, and leveraging common use-cases based on the ED's patient demographic and workflow, will further promote the usability and usefulness of the My Health Record system.<sup>5,76</sup>

Many hospitals use the Health Identifier and PCEHR System user interface (HIPS-UI) viewing platform to access the My Health Record system.<sup>26</sup> Promotion of the HIPS-UI on-demand training environment, currently available from the Australian Digital Health Agency's (the Agency's) website<sup>77</sup>, can further support public and private hospitals. Promotion of similar My Health Record system simulations, including

state- and territory-based portals (e.g. HealthNet in New South Wales, The Viewer in Queensland), could strengthen self-directed My Health Record system education.

The Agency should consider refreshing the on-demand training environment to stratify different software simulations according to the healthcare setting (e.g. primary, acute), or to the state or territory. The availability of the on-demand training environment should be promoted to ED clinicians.

### **Ongoing support required for the transient ED workforce**

Since much of the ED workforce is dynamic and transient, it is essential that there is ongoing education and support for My Health Record system use. Such training should be frequent and correspond to clinical rotations, such as for junior medical officers and registrars, as well as mechanisms for new staff recruitment.<sup>75</sup>

### **More efforts are needed to educate ED clinicians on the emergency access ('break-glass') function**

Project findings revealed a lack of knowledge about the emergency access function. This was expected, given the common misinterpretation by ED clinicians that the emergency access function is how the ED setting accesses the My Health Record system. Training efforts to address this misinterpretation have instead caused anxiety among some ED clinicians who would rather avoid using the emergency access function. This is largely due to fear of being 'audited' and possibly incurring personal infringements if emergency access is used outside the circumstances set out by the *My Health Records Act 2012*. Avoiding using the emergency access function would render some My Health Record system content inaccessible, which would otherwise yield critical information and potential patient safety benefits.

Although these circumstances about emergency access use are universally applicable, individual My Health Record system viewing platform providers have autonomy over how ED clinicians

access restricted My Health Record system content. As such, the appearance, instructions, access pathway and method to use the emergency access function are presented in many ways.

The circumstances and method regarding emergency access use should be emphasised during My Health Record system training. The emergency access function should be demonstrated, and reflect the local ED setting and viewing platform. Formative feedback loops, administered by the clinical champions, should be provided to any ED clinician who may have used the emergency access function outside the legislated circumstances. Such assurance will allay any deterrence to emergency access use.

### **Clinical champions – a case for establishing a ‘chief clinical information officer’ role at the hospital level**

The importance of engaged clinical leaders in the successful introduction of digital health initiatives is well documented.<sup>74,78-82</sup> The benefits of the clinical champions in this project are not unique to the My Health Record system. The peer-led model is an established change management strategy in many successful digital health environments.<sup>83</sup> The key is that there is a continued presence post-implementation. This role could be blended with other digital initiatives within the ED setting and may be supported by a broader hospital-wide health informatics presence, in the form of a chief clinical information officer (or equivalent, according to profession and size of the health service organisation).

The clinical champion, or similar, could facilitate the networked support models. Exchange of My Health Record system implementation, maintenance and optimisation, including exemplar use-cases, can cultivate ownership over such digital health systems. Organisations would be best placed to identify clinical champions who could lead their peers in digitally mature clinical practices. Organisations should consider recruiting clinical champions other than doctors and nurses, such as allied health professionals and pharmacists, who have shown to be engaged My Health Record system users.

## **Promoting high-value My Health Record system content to ED clinicians**

Project findings showed that almost 42% of ED presentations during the study had at least one clinical document. There was an average of eight clinical documents for those ED presentations that had a My Health Record. The average number of clinical documents ranged from 3 to 11, across the pilot sites, for those ED presentations that had a My Health Record.

Pathology reports were the most available clinical document across all pilot sites. This was followed by dispense records, prescription records, Australian Immunisation Register reports, discharge summaries and diagnostic imaging reports. The relatively high availability of these document types during the study is likely to translate to ED clinicians generally finding such documents in their patients’ My Health Record in everyday practice.

Staff survey results indicated that ED clinicians most valued medication-related information, pathology reports and diagnostic imaging reports of all clinical documents. Specialist letters were the most sought-after clinical document; however, the availability of this document type was low across all pilot sites.

### **Promote content related to medicines and diagnostic tests**

The use-cases collected during the study showed that ED clinicians sought vital information regarding medicines and previous diagnostic tests, which influenced their decision-making. Examples focused on supporting the taking of a patient’s best possible medication history – a step crucial to both the patient’s assessment and ongoing care in hospital.<sup>84</sup> Similarly, ED clinicians discovered previous pathology and diagnostic imaging results, particularly from private providers, in their patients’ My Health Record. This information was particularly helpful during ED presentations when the patient could not recall having such diagnostic tests.

The availability of high-value My Health Record system content, such as medicines and diagnostic tests, should be regularly promoted to ED clinicians. Promotion should include the number of clinical documents uploaded, to assure ED clinicians about the likelihood that they will discover this content in their patients' My Health Record. ED clinicians should be made aware of any newly connected private providers who would typically upload medicines lists and diagnostic tests. More transparency about efforts and progress made on connecting providers who upload high-value content is necessary to encourage ED clinicians to regularly use the My Health Record system.

### **Accelerate upload of specialist and outpatient clinic letters**

A collaborative effort is needed to accelerate the upload of specialist letters. ED clinician feedback suggested that all outpatient clinic letters should be included within such efforts.

Specialist letters typically refer to a clinical document from a patient's treating specialist. The specialist letter is often in response to the patient's GP, who has referred the patient to the specialist. The clinical document architecture of a specialist letter includes structured fields that include medicines and diagnostic tests.<sup>85</sup> Two-thirds of ED clinicians agreed that such content contained in a specialist letter has high clinical value.

There is an opportunity to include outpatient clinic letters in an expanded scope of specialist letters. This expansion, mainly aimed at public hospitals, would enhance the utility of specialist letters and enable a greater variety of clinical documents and sources in the My Health Record system. Although 56% of ED clinicians agreed that they would look at the specialist letter section for outpatient clinic information, it is suggested that this be tested further beyond the ED setting and participating pilot sites.

### **Highlight local connections**

ED clinicians sought information on local clinicians who are connected and uploading content to the My Health Record system.

ED clinicians will regularly use the My Health Record system as they develop trust in the veracity of the records. This can be achieved by clinical champion-led My Health Record system consultation sessions, and by providing clear information about gaps in a patient's My Health Record.<sup>75</sup> It is equally important to highlight who is not connected, to prevent ED clinicians searching a patient's My Health Record for a particular clinician who is not contributing content, which would likely lead to fatigue and frustration.

Managing the expectations of ED clinicians can be addressed by regularly supplying information about who is connected locally. The Agency's partnerships managers could communicate this information directly to clinical champions. It is important that the communication is direct, to ensure that information is distributed to ED clinicians in a timely manner. As an example, such information could be presented in posters displayed in the ED as bedside aide-mémoires to practising clinicians.

Education should highlight local My Health Record system-connected clinicians. Ideally, this information should extend to the volume and variety of documents uploaded. ED clinicians are expected to become conditioned to recognising particular clinicians who regularly upload My Health Record system content.

### **Promote transparent My Health Record system activity reports**

Transparent reporting and collaborative information sharing of local My Health Record system use (views and uploads) will promote awareness to ED clinicians on connected and actively engaged health service organisations and clinicians – particularly new connections. Reports on the volume of uploads could support organisations in confirming the successful transmission of content from the local EMR to the

My Health Record system, respective of activity related to patients with a My Health Record. This would assure clinicians that My Health Record system content is available and cultivate trust in the system. Governance arrangements should focus on monitoring and encouraging local clinicians to maximise uploads to the My Health Record system. This could facilitate collaboration across different healthcare settings, namely acute and primary care clinicians. My Health Record reports, supported by standard national terminologies and normalised parameters to enable meaningful comparisons, should form the foundation to measurable use and benefits, as part of a My Health Record national indicator set.

Some states and territories, and individual public health service organisations appear to upload more document types than others (Table 14). My Health Record system activity reports could feature upload statistics, which could help focus efforts on uploading a greater variety of My Health Record system documents, to enrich the available content. The Agency should partner with states, territories and private hospital providers to expand the range of clinical document uploads to the My Health Record system. There are opportunities to promote greater utility of the My Health Record system by expanding the

**Table 14:** Total My Health Record clinical document uploads, by document type and state and territory, as at December 2020

Document type	Number of states or territories where uploads occur ( <i>n</i> = 8)
Diagnostic imaging	8
Discharge summary	8
Dispense record	3
eReferral note	1
Event summary	2
Goals of care	1
Pathology report	6
Prescription record	2
Shared health summary	2
Specialist letter	4

types of documents uploaded (e.g. specialist letters). Additionally, certain document types are uploaded regularly for specific hospitals within a state or territory, and harmonising upload capabilities across all My Health Record system-connected public hospitals should be considered.

By monitoring and auditing clinical document upload data, any anomalies that require further investigation and intervention could be identified. Consultation with ED clinicians beyond the pilot sites suggested that some health service organisations find it challenging to upload content to the My Health Record system. Clinical document uploads can be rejected due to non-conformance with My Health Record system clinical document architecture, as set out in the Agency's technical specifications. The Agency makes upload failure reports available to state and territory health departments. These reports can be disseminated to the specific hospital to interpret and resolve the technical barriers to clinical document uploads. Clearer reporting capabilities and collaboration between the Agency, states and territories, and hospitals are required to examine whether all healthcare information generated has been successfully uploaded to the My Health Record system.

## Rollout of new content

ED clinician feedback suggests there is a delay between the Agency's release of new My Health Record system features (e.g. Pharmacist Shared Medicines List) and these becoming available in the hospital's My Health Record system viewing platform. This can give the perception that there is no content and may diminish staff's motivation to check a patient's My Health Record. There are opportunities to better align rollout dates of newly released My Health Record system content between the Agency and health service organisations, particularly the states and territories. Promotional activities should commence once the new document type is available.

States and territories, and software providers should consider how any new My Health Record system content is best integrated with their



respective viewing platforms. This might include how the viewing platform's search functions, interface display and access pathways would be optimally applied to the new content. Clinical champions may prove invaluable to a user acceptance testing process as part of any new content rollout.

### **Characteristics of ED patient cohorts with high-yielding My Health Records**

Specific exemplar use-cases identified patient cohorts that would particularly benefit from ED clinicians using a patient's My Health Record:

- Patients with chronic complex comorbidities (who often need multiple specialties)
- Interstate or rural visitors (or hospitals near state and territory boundaries)
- Communication-compromised patients (unconscious people, and people from non-English-speaking backgrounds)
- Vulnerable populations (Aboriginal and Torres Strait Islander people, and people with mental illness)
- Patients who are more likely to be admitted.

Clinicians could be strongly encouraged to regularly use the My Health Record system for these patient cohorts, supported by documented clinical pathways, patient streams, policies and forms (electronic and paper based). Documented treatment protocols could incorporate when a patient's My Health Record is ideally reviewed. This could support the credibility of the My Health Record system as a vital clinical tool, particularly for the most complex and vulnerable patients who present to the ED. Project findings were consistent with the literature, which states that repeat and complex patients presenting to the ED motivate clinicians to regularly use an electronic healthcare record (EHR) such as My Health Record.<sup>4,5,27</sup>

### **Integrating the My Health Record system into ED clinical workflows**

The project team identified several ways to encourage clinicians to integrate the My Health

Record system into their ED clinical workflows. It also found situations where clinicians did not consider the My Health Record system to be useful.

### **The My Health Record system is a useful tool throughout a patient's ED presentation**

ED clinicians have shown that the My Health Record system can be useful throughout the assessment and management process in a patient's ED journey. It is important for ED clinicians to consider integrating the My Health Record system into all their ED clinical workflows. The most opportune stages of My Health Record system use during the patient's ED journey include:

- Registration – to validate individual and next-of-kin contact details
- Nursing assessment – to check allergies, medication history and social history
- Medical assessment and management
- Life-saving resuscitation – to check medical history and advance care planning
- Medication reconciliation – to check medication history.

Amalgamating EHRs with ED workflows encourages clinician use, as evidenced by the literature.<sup>86</sup> For example, a Norwegian study showed that clinicians are likely to seek additional information from an EHR immediately following examination of the patient.<sup>87</sup> During the study, ED clinicians suggested that it is intuitive to use a patient's My Health Record during their initial nursing and medical assessment.

Calculating the time differential between arrival time and time of first document access/view gives an understanding of where in the patient's journey the MHR retrieval process starts. The median time is at 256 minutes (approximately 4 hours), and the earliest time is 35 minutes following the patient's arrival at the ED (Figure 23).

## Low-acuity areas of the ED are less likely to use the My Health Record system

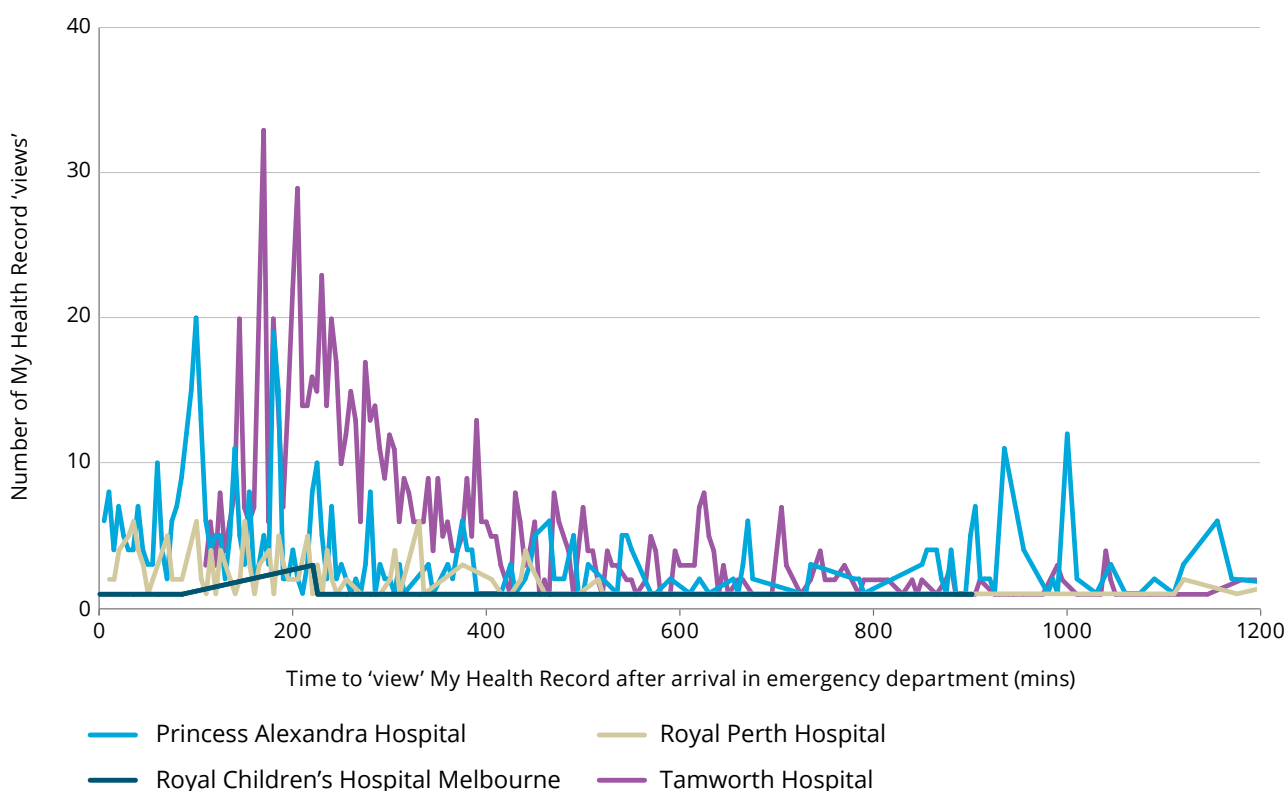
ED clinicians indicated that they did not use the My Health Record system if they were assigned to a low-acuity area of the ED. For example, areas such as ‘fast-track’ or a ‘quick assessment bay’ are typically characterised by patients with minor conditions. ED clinicians are unlikely to draw on a patient’s My Health Record for their medical history if they do not believe it will change their decision-making for ED presentations that are ‘straightforward’.

## Transition away from conventional information sourcing methods

The increasing volume and variety of content in the My Health Record system should assure ED clinicians that it is a reliable source of supplementary patient information. It is suggested that measures be taken to transition ED clinicians away from conventional communication methods such as fax or telephone, which they have traditionally used to gather patient information from external sources.

Project findings showed that ED clinicians with less than 10 years of experience use the My Health Record system more often than fax machines or telephones to retrieve supplementary clinical information. Fax machines should be limited to establish the My Health

**Figure 23:** Frequency, and minimum, median and maximum, of durations between arrival time and first My Health Record access



<b>Minimum</b> time to view from arrival	_____	<b>35 seconds</b>
<b>Median</b> time to view from arrival	_____	<b>4hrs 16 minutes 54 seconds</b>
<b>Maximum</b> time to view from arrival	_____	<b>43hrs 13 minutes 9 seconds</b>

Record system as the primary method of gathering externally sourced patient information. Clinical champions are best placed to encourage their colleagues, particularly junior clinical staff, to regularly use the My Health Record system as a supplementary information source.

An ED should have enough computer terminals available to ensure that ED clinicians can conveniently access the My Health Record system at any time during their clinical shift – an expectation highlighted in staff use-cases. Appropriate signage at computer terminals can serve as visual cues on how to access the My Health Record system. Royal Perth Hospital used this method, which accounted for more than half of all My Health Record system clinical documents viewed.

### **Document My Health Record system use in the local electronic medical record**

EDs should establish documentation guidelines for when an ED clinician accesses the My Health Record system.<sup>11</sup> This would support healthcare record practices to document any supplementary patient information from external sources.

ED clinicians should appreciate that it may not be appropriate (or possible) to ‘cut and paste’ content from My Health Record system clinical documents, and must understand that their patient might subsequently remove or restrict their My Health Record content. For example, ED clinicians raised concerns that information sourced from the My Health Record system, used as part of clinical decision-making, may be permanently deleted by the patient later. This may leave the ED clinician vulnerable to any retrospective review of their clinical judgement exercised during the patient’s treatment in the ED. In anticipation of a patient deleting clinical documents from the My Health Record, ED clinicians printed these documents and placed them into the patient’s healthcare record held by the pilot site. However, these clinical documents were subsequently removed by the pilot site’s medical records department, as they were not official records produced by the pilot site. To address ED clinicians’ concern, clinical champions

guided them on how to record whether the patient’s My Health Record was reviewed as part of their clinical care.

### **Establish local downtime protocols and escalation procedures for My Health Record system use**

During the project, a pilot site’s viewing platform ‘went down’ intermittently, which temporarily suspended access to the My Health Record system. It was later determined that IT infrastructure, under the control of the respective state health department, and not the My Health Record system, experienced unplanned downtime. ED clinicians mistakenly attributed this downtime to the My Health Record system, which (anecdotally) diminished its perceived reliability. There were no known occasions during the study when the My Health Record system itself experienced any downtime.

This example demonstrates the importance of establishing system-wide redundancies for when dependent systems (e.g. EMRs) and infrastructure (e.g. servers) are compromised, even if the My Health Record system is not. For example, even if the My Health Record system is functional, ED clinicians will not be able to access it if the state- or territory-based viewing platform is unavailable. Such EHR downtime or inaccessibility is a known safety concern among clinicians.<sup>3,4,88</sup> In such circumstances the My Health Record system would prove even more valuable, as it could be the sole source of information about a time-critically ill patient.

It is realistic to expect that there may be occasions when hospital EMRs, viewing platforms or the My Health Record system itself experiences downtime. Should this occur, it is the system owner’s responsibility to clearly articulate what steps ED clinicians need to take to escalate any downtime-related issues. It is important that any downtime message contains the appropriate contact (and system owner) and an expected recovery time. A generic message (e.g. ‘Contact your local service desk’ or ‘Try again later’) contains insufficient information for ED clinicians to act on and does not assure

clinicians that the downtime is being addressed. Poor communication regarding any system compromise to the My Health Record system carries patient safety risks and can demotivate ED clinicians' engagement with the My Health Record system. Such risks will continue as the My Health Record system becomes a regularly used information source. Organisations should consider alternative methods of accessing the My Health Record system that do not depend on the usual viewing platform. Thus, access to the My Health Record system would not be compromised should the viewing platform experience any downtime.

Similar downtime issues can be the result of incompatibility with software, particularly web browsers. Some of the pilot sites' My Health Record system viewing platforms are only accessible through a web browser (e.g. Microsoft's Internet Explorer, Google's Chrome, Apple's Safari). The remaining pilot sites' viewing platforms are contained 'natively' within the EMR. The type and version of web browser used may render the My Health Record system viewing platform inaccessible. This poses similar patient safety risks as previously described, particularly since the IT department of the health service organisation (e.g. Local Health District or Local Health Network) usually determines the web browser to be used; thus, minimal consideration is given to the My Health Record system, as it sits outside the local digital environment. For example, anecdotes from one pilot site suggested that an automatic software update resulted in Microsoft Edge becoming the default browser. An error message was displayed upon any attempt to access the My Health Record system viewing platform. This was validated by manually enabling a compatibility mode in Microsoft Edge to an earlier version, which reinstated access to the viewing platform. It is highly unlikely that ED clinicians would have the knowledge and patience to execute complicated IT workarounds. Rigorous testing processes should be carried out by system owners before software updates are rolled out across a health service organisation to ensure that the My Health Record system is not compromised. The product owner – in this instance, the My Health Record System Operator

– should issue regular advice on browser compatibility to avoid any compromise to My Health Record system access.

### **Encourage ED clinicians to use the My Health Record system through patients and carers**

Health service organisations should consider measures to increase the presence of the My Health Record system in the ED.

Presentation to an ED is an opportunity for patients and carers to partner with ED clinicians about their My Health Record. Consumer feedback during the project showed that 6% of patients knew they had a My Health Record and made this known to ED staff. Anecdotal feedback showed that 97% of ED clinicians did not ask the patient if they had a My Health Record. Greater consumer awareness in the ED environment, through My Health Record system promotional posters or verbal prompts by ED clinicians, can stimulate discussion regarding a patient's My Health Record and engagement with their own health care.

Patients and their carers should be empowered to understand whether information pertaining to their ED presentation or admission will be available to them and their GP through their My Health Record. Conversely, patients should feel empowered to request that any clinical documents related to their ED presentation be withheld from upload to their My Health Record. As patients become familiar with, and feel ownership over, their My Health Record, they will be more likely to direct ED staff to this information source for allergies, medicines, diagnostic tests and other healthcare information.

Patients who are engaged with their healthcare needs are likely to be a rich source of information. The consumer entered health summary supports patients who wish to enter information into their My Health Record and have this viewed by clinicians. This information can include allergies, adverse reactions and current medicines. Viewing platforms should highlight a consumer entered health summary, which may supplement a patient's medical history and support a

collaborative relationship between the patient and clinician.

Engagement with patients regarding their My Health Record can extend to ED clerical staff, who play an important role in accurately recording the necessary patient identifiers to retrieve a successfully matched My Health Record. For example, during the registration process, ED clerical staff may ask the patient if they have a My Health Record, which could be relayed to ED clinical staff for use during treatment.

## Enhancing existing and new My Health Record system content

Several enhancements to existing and new My Health Record system content were elicited from ED staff surveys and use-cases.

### Consolidate medication-related content – ‘one source of truth’

Currently, six clinical documents and views focus on a patient’s medicines information. Medication information may also appear in clinical documents with a broader scope, such as discharge summaries and specialist letters.

Almost 3 out of 4 ED clinicians (74%) agreed that the Medicines View contains high clinical value. It is suggested that all other clinical documents and views that specifically focus on medications be consolidated into the Medicines View. While the Medicines View aims to achieve this, the other medication-related documents are still available in the My Health Record system, which causes confusion among ED staff. This confusion could potentially be abated if these medication-related documents were only available through the Medicines View. This would force clinicians to access medication-related My Health Record content from the Medicines View in the first instance.

The consolidation of medication-related content into a single view would reduce the cognitive burden of navigating the range of My Health Record system content. This will establish ‘one source of truth’ and address some ED clinicians’

perception that they must compare medication-related content to get the full picture. A discrete view that draws on all medicines information can minimise the appearance of doubling up when an ED clinician observes the same information across multiple clinical documents.

ED clinician feedback indicated that they were confused between the Prescription and Dispense View, and the other medication-related content. The layout of the Medicines View was considered more user-friendly than the Prescription and Dispense View. This observation was more prominent at Royal Perth Hospital, given its use of the HIPS-UI viewing platform. Towards the end of the study, a ‘medicines’ tab was enabled, which led clinicians to the Medicines View. This was adjacent to the ‘prescription and dispense’ tab, which resulted in confusion regarding the differences between two tabs that seemingly displayed the same content. Consideration should be given to integrating the Prescription and Dispense View into the Medicines View.

### Consistent uploads of different document types to the My Health Record system

At present, there is disparity across the acute setting in relation to the variety of clinical document types that are uploaded to the My Health Record system. As shown previously in Table 14, different states and territories are contributing different document types to the My Health Record system. The project has shown that ED clinicians are encouraged to regularly use the My Health Record system if they are likely to encounter content they would not normally have access to.

It is suggested that a collaborative effort be established between the Agency and states and territories to increase the variety of clinical document types that are uploaded to the My Health Record system. This will enrich content in the My Health Record system and motivate clinician use, within both the ED and the broader hospital community. Lessons learned from states and territories that are uploading a greater variety of clinical document types could be

shared with other states and territories. Pilot sites and clinician partnerships could accelerate how newly enabled clinical document types are ideally 'mapped' within each state's or territory's My Health Record system viewing platform. This is considered essential to identifying and managing any unforeseen patient safety risks when enabling access to a wider range of content. For example, ED clinicians may have more content to navigate, which could diminish clinical utility from longstanding My Health Record system content.

## **Environmental scan of the My Health Record system in public and private hospitals**

ED clinicians should be able to assume that all My Health Record system clinical documents are accessible, regardless of viewing platform. If the system owners of any My Health Record system viewing platform decide not to enable or map any clinical documents or views within their viewing platform, it should be apparent at the time of use (and not rely on ED clinicians being told or remembering this from a training session). This is particularly relevant for ED clinicians who work across different networks or hospitals (particularly in a mix of public and private facilities), who might use different My Health Record system viewing platforms.

An environmental scan could show what content has been enabled in each public and private hospital's respective My Health Record system viewing platform. This could establish a baseline of viewable content, which may prove timely given that it has been two years (at the time of writing) since the national expansion of the My Health Record system in February 2019. Understanding what content is enabled is unlikely to be obvious. This was experienced during the study, when it was determined that a pilot site had not yet mapped the Medicines View. Therefore, viewing data related to the Medicines View at this pilot site could not be compared with the other pilot sites. An environmental scan on a national scale may assist with fair and accurate comparisons of My Health Record system activity, at the state and territory, and hospital levels. This may also enable opportunities to leverage existing indicators to

recognise My Health Record system use, such as the National Indicators for Quality Use of Medicines (QUM) in Australian Hospitals.<sup>89</sup>

Emerging from this environmental scan could be a roadmap that sets out when My Health Record system content will become available. Such transparency would support clinical champions' planning and training activities, as well as any adjustments to how the My Health Record system is integrated into ED clinical workflows. This can support efforts to maximise the variety of My Health Record system clinical documents that are available for ED clinicians to use.

## **Prominently displayed document list**

ED clinicians preferred to see a list of clinical documents available in the patient's My Health Record on the initial landing page of the viewing platform. Some viewing platforms had a 'Documents view' or 'health overview' with filters by document type or date range. Organisations should consider incorporating these user-friendly document lists into all viewing platforms.

## **Disclaimers**

Certain clinical documents and views would benefit from incorporating a disclaimer message before ED clinicians are granted access to such content. This can assist with managing expectations, cultivate trust and promote transparency regarding the scope of the particular clinical document or view. For example, a disclaimer for the Australian Immunisation Register could remind ED clinicians that it may not contain all of a patient's vaccinations (e.g. seasonal influenza vaccine, tetanus booster). Similarly, the Medicare Overview section (which contains Medicare Benefits Schedule [MBS] and Pharmaceutical Benefits Scheme [PBS] transactional data) should disclose to the ED clinician that it only contains medicines dispensed under the PBS or Repatriation Pharmaceutical Benefits Scheme (RPBS), and should not be interpreted as an exhaustive list of all medicines that the patient has taken or is currently taking. The disclaimer should also notify the ED clinician that MBS and PBS transactional data depend on

Services Australia having processed MBS and PBS claims, which can take up to one month. Additionally, the clinician should be made aware that any non-PBS, over-the-counter drugs may be available in the patient's Pharmacist Shared Medicines List (PSML), if enabled. This advice should be complemented by a direct link to the PSML from the PBS/RPBS section, to assist navigability.

## Quality of clinical documents

As an increasing volume and variety of content become available in the My Health Record system, there will be a commensurate need to maintain a high quality of such content. Efforts focused on achieving high-quality content can ensure continued utility of the My Health Record system. The uptake of safety and quality frameworks, focused on clinical documents, can support such efforts – for example:

- *National Guidelines for the On-Screen Presentation of Discharge Summaries*<sup>80</sup>
- *National Guidelines for the On-Screen Display of Medicines Information*<sup>90</sup>
- Standard national terminologies, such as the Australian Medicines Terminology and SNOMED CT-AU, as per the Agency's National Clinical Terminology Service.<sup>91</sup>

Quality initiatives can assist ED clinicians in completing high-quality clinical documents at the source (i.e. within their hospital's EMR). This can ensure that these clinical documents are well populated and presented when they are uploaded to the My Health Record system. Such initiatives should consider the My Health Record system's clinical document architecture and recognise any data entry sensitivities that could result in upload failures (as previously mentioned).

Using standard national terminologies in My Health Record system content could also support health service organisations in meeting Action 1.17c of the National Safety and Quality Health Service Standards (second edition).<sup>74</sup>

## Expand the range of diagnostic tests in the My Health Record system

ED clinicians have consistently requested that electrocardiograms (ECGs) be available in a patient's My Health Record. Immediate access to previous ECGs can significantly alter clinical management – for example, a missed diagnosis, or over-investigation and unnecessary treatment of acute myocardial infarction (with the risk of complications from such procedures and treatment).

There are opportunities to increase the variety of other diagnostic procedures and investigations in the My Health Record system, such as:

- Angiograms
- Exercise tolerance tests
- Endoscopies
- Nuclear medicines tests
- Respiratory function studies
- Nerve conduction tests.

Adding these diagnostic tests, likely under the existing 'diagnostic imaging reports' section, would further emphasise the importance of user-friendly navigation tools, such as grouping by investigation type, search filters and tags. This will maintain usability and support ED clinicians as they navigate an expanded variety of reports available.

## Access to images referred to in diagnostic imaging reports

ED clinicians prefer to see actual images rather than relying on reading diagnostic imaging reports. There are many clinical circumstances when it is essential to be able to compare current and previous diagnostic images to allow assessment of disease progression or resolution. Increasingly, private diagnostic imaging and public hospitals have online image repositories. ED clinicians can view the respective radiographs or scans by accessing the private diagnostic imaging provider's image repository, using sign-on credentials typically provided to the patient with their diagnostic imaging report. Ideally, the My Health Record system could partner with

private diagnostic imaging providers to enable ED clinicians to view these image repositories directly through the My Health Record system, using a single sign-on access. This would ensure that images could be viewed without having to store images within the My Health Record system directly.

## Opportunities to present high-value content with new My Health Record views

The project team identified several opportunities to present high-value content through new My Health Record views.

### Immunisation view

The My Health Record system features immunisation information in two exclusive and different ways: as a direct feed from the Australian Immunisation and Australian Childhood Immunisation registers (contained within the Medicare Overview), and in unstructured, free text as part of other My Health Record system clinical documents. Neither methods have high visibility to an ED clinician searching through their patient's My Health Record.

Following the pilot study, a consolidated immunisation view was established that can capture all references to immunisations and vaccination boosters from all My Health Record system clinical documents and beyond those listed in the Australian Immunisation Register.<sup>92</sup> This new view aligns with ED clinicians' request for a single, consolidated view of immunisation information from discharge summaries, event summaries and shared health summaries (particularly annual 'flu shots' administered by the patient's GP or boosters given in the ED).

Ideally, all such vaccination-related information (e.g. type, date, place, schedule, batch number) could be collated into a single, searchable table and be linked to the National Immunisation Program Schedule to help clinicians appreciate if their patients are missing any important vaccinations.<sup>93</sup>

### Allergies and adverse reactions view

While there is a designated 'allergies and adverse reactions' section contained in the Medicines View, it is easily overlooked and does not obviously reflect allergies or adverse reactions mentioned in any other clinical documents in the My Health Record system. A new allergies and adverse reactions view could reconcile this issue and feature such critical information more prominently in the My Health Record system. It could provide a consolidated view of all references to allergic or adverse reactions across the document types in the My Health Record system.

### Emergency care summary view

High-value content, specific to ED clinicians, could be drawn into a new emergency care summary view. A similar view exists in the EHR used in the United Kingdom's National Health Service. Based on the staff surveys and use-cases, this view could comprise:

- Current medicines (including dose)
- Allergies and adverse reactions
- Recent diagnostic test results (defined by a specific time frame)
- Blood type (which could expedite critical blood transfusions)
- Frequent clinician contact details (e.g. regular GP)
- The patient's contact number or address
- The patient's next-of-kin and emergency contact details
- General advice on guardianship or power of attorney arrangements, if applicable.

It is important to recognise that any documents uploaded to the My Health Record system that refer to guardianship or power of attorney arrangements might not be current or valid in all states and territories and circumstances. This information would also need a disclaimer that other such documents might exist that are not present in a patient's My Health Record. Also, this information would need to include a disclaimer to make it clear that any identified arrangements are only those documented in the My Health Record system, and others may exist.



## Potential modifications to existing My Health Record system content

The project team identified several ways to modify existing My Health Record system content that would encourage ED clinicians to use the system more.

### Medicare Overview

The Medicare Overview comprises four separate sections:

- MBS/Department of Veterans' Affairs (DVA) transactions
- Australian Immunisation Register
- Organ Donor Register
- PBS/RPBS transactions.

All four sections should be separated to help ED clinicians differentiate between them. It is suggested that each section be collapsed by default, and could be expanded using plus and minus buttons. This will avoid each section being viewed on a single page, which often requires the ED clinician to scroll excessively.

These sections, along with My Health Record system clinical documents, feature a Coordinated Universal Time (UTC) to mark certain clinical events (e.g. pathology test specimen collection time). It is suggested that this time stamp is limited in most clinical documents, as such information yields little utility and gives a 'cluttered' appearance, resulting in greater cognitive burden. It is suggested that a more recognisable time zone, such as Australian Eastern Standard Time, is used for the Australian healthcare setting.

### MBS/DVA transactions

This section is of limited value to ED clinicians due to a lack of search capabilities and low utility of clinical information. The latter may be addressed by including additional fields that populate the specialty of the clinician who billed for the corresponding MBS item. This can provide insight to ED clinicians who view this content, by highlighting the clinical specialty and thus context in which the patient received treatment, per the MBS item.

The billing clinician could be cross-referenced with existing Australian Government databases, such as registration details managed by the Australian Health Practitioner Regulation Agency. Ideally, the billing clinician's workplace contact details would be available to facilitate any follow-up for an ED clinician who is viewing such information in a patient's My Health Record.

Given that almost 88% of all available content in patients' My Health Records, observed across all pilot sites during the study, was MBS and PBS transactions, it is recommended that further consideration be given to enhancing the utility of this content by enriching it with additional fields, as suggested above.

### PBS/RPBS transactions

Similar to the MBS/DVA transactions, the utility of this section is diminished due to an absence of filtering, sorting, searching and grouping functions. As there are other medication-related document types in a patient's My Health Record, which are consolidated into a single view, this section may be retired or inaccessible for viewing. Too many medication-related document types can overwhelm an ED clinician.

### Pathology reports and views

ED clinicians aim to identify trends or patterns in pathology results, regardless of source, and have this presented in a collated, tabulated format. This assists with their clinical decision-making and patient care. Many EMRs present their results in such a format – albeit not from multiple sources as the My Health Record system does. Project findings are consistent with the literature, which shows that EHR access by clinicians decreases when information is not displayed in a summary format; this problem is compounded during busy periods.<sup>27,87</sup>

When examining pathology results within a patient's My Health Record, ED clinicians prefer to see the results in a table, rather than having to open and compare multiple reports. Opening one report at a time increases the cognitive load, which is particularly cumbersome if using a single monitor; this is described as the 'display fragmentation' phenomenon.<sup>42</sup>

Note that, since the study ended, a new 'pathology reports overview' has been released, which has improved user-friendly functionality (e.g. sorting options by alphabetical test name or specimen collection date, pathology organisation and requester).

### **Normalisation of tests – implications for pathology and diagnostic imaging reports overviews**

For ED clinicians to efficiently review groups or 'batches' of investigations, it is essential that diagnostic tests are correctly allocated by examination type. A known barrier to this process is the inconsistent naming conventions used by authoring systems across diagnostic test providers – whether they be private or public diagnostic imaging and pathology organisations.

It is appreciated that it would be challenging for the Agency to standardise naming conventions across all diagnostic test providers, and it is not appropriate for the My Health Record system to change the contents of diagnostic imaging or pathology reports. However, consideration should be given to a normalisation process that could occur when documents are uploaded to the My Health Record system, which could normalise how similar investigation types are grouped together. Such a system design would require input from clinical experts and extensive user acceptance testing, due to the complexity and variation of terms used. Appropriate validation checks would be essential to accommodate free text or misspelt terms. Such normalisation could be automated when diagnostic test reports are uploaded to the My Health Record system.

Without improved searching, sorting and grouping of content related to diagnostic tests, the manual search for specific content is likely to get more difficult for the ED clinician as the volume of pathology and diagnostic imaging reports increases over time.

### **Medicines View**

Medication reconciliation is an intensive and often error-prone task. Project findings suggest several modifications that could enhance the usability of the Medicines View, which could strengthen its application to medication reconciliation.

To maximise safety, all medication details from within any My Health Record system document should be presented in a single tabulated format with obvious and intuitive filter, searching, grouping and sorting functions.

A review would be needed to determine if the Medicines View is available in the My Health Record system viewing platform for all public and private hospital EDs; this could form part of the environmental scan mentioned earlier. The Medicines View should feature prominently on the main landing page of the viewing platform, to minimise the number of mouse clicks and screens that the ED clinician must navigate to reach this high-value content.

Considering the importance of high-risk medicines to patient safety, appropriate identification of such medicines is essential, in accordance with state and territory, and the Commission's medication safety work programs.<sup>47</sup>

### **Specialist letters**

The healthcare community does not typically use the phrase 'specialist letter'. While it is unambiguous in that the letter was authorised by a medical specialist, many other outpatient or allied health clinic letters might not be included in this section because they are not written by a 'medical specialist'. A registrar or another profession, such as a nurse practitioner or physiotherapist, could author an outpatient clinic letter.

There should be consideration to renaming the specialist letter section to, for example, 'clinic letters', to imply a wider definition. A second tier of markers or tags can enable filtering according to the author's profession or setting.

### **Event summaries**

This section is likely to become highly populated over time, as it can serve as a catch-all section for miscellaneous documents that do not fit into the other My Health Record system clinical document types. Clinicians do not commonly use the phrase 'event summary', which could lead to confusion regarding the type of information found in such a document.

Consistent with the suggestion above for specialist letters, a second tier of markers or tags could help ED clinicians to filter the expected wide variety of clinical documents that are uploaded to this section of the My Health Record system. Likewise, consideration could be given to producing clear guidance to clinicians who upload event summaries, to ensure that they label and 'send' these documents to the most appropriate My Health Record section.

Project findings highlighted how ED discharge letters, or ED statement of attendance letters, could be uploaded to the My Health Record system. This could result in potentially millions of additional clinical documents added to the My Health Record system, considering there were 8.4 million ED presentations in 2018–19.<sup>2</sup> There is debate regarding whether such a document would be more appropriately aligned with a discharge summary or an event summary. The Agency, states and territories, and clinicians should reach a consensus about the language that is most intuitive to clinicians seeking such information as part of their workflows.

### **Advance care plans**

All hospitals must ensure that all the available advance care planning information held within a patient's My Health Record is accessible in any viewing platform. A commensurate promotional campaign should be considered to advise that a clinician can upload this document type at the patient's request (formerly, only the patient could upload advance care plans).

Appropriate disclaimers should be included in the advance care planning section to notify ED clinicians of any legislative considerations of the state or territory in which they practice. This could be mandated through the requirements outlined in the My Health Record system technical specifications and conformance profiles.

## **Optimising My Health Record system viewing platforms to support ED clinicians**

ED clinicians would be more likely to use the My Health Record system if the viewing platforms were optimised.

### **Develop a best-practice guide for viewing platforms**

An improved and intuitive My Health Record system interface that enhances usability and on-screen presentation of content, guided by the 'best of breed' components from existing viewing platforms, would greatly improve ED clinicians' user experience.

The four viewing platforms featured at the pilot sites demonstrated a range of user-friendly functions that helped to reduce the cognitive burden associated with poor navigability. However, it is recognised that there are many other viewing platforms available on the market that were not considered as part of this project. Therefore, establishing a best-practice guide for viewing platforms should encompass all viewing platforms used in public and private acute settings. A collaborative effort is essential, particularly since the clinical champion workshop demonstrated the lack of visibility and awareness of viewing platforms in use in other clinical settings other than a clinician's own.

A best-practice guide should consider the access pathways from a hospital's EMR to My Health Record system content, through the viewing platform. Project findings showed differences in the number of mouse clicks, screens and scrolling required to access such content. Existing viewing platforms can be compared with each other and with the Agency's National Provider Portal, to identify opportunities for more efficient navigation sequences and access pathways to My Health Record system content. The best-practice guide could establish the cognitive load threshold that is conducive to the workflows of time-pressured ED clinicians.

There is an opportunity to bring together the most effective user-friendly functions to support

ED clinicians to use the My Health Record system regularly. States and territories, and software vendors could integrate these functions into their viewing platforms. Health service organisations could incorporate the best-practice guide into their procurement processes for digital health systems. A national best-practice guide for viewing platforms could be a foundational document that outlines the high-value, user-friendly functions that encourage ED clinicians to use the My Health Record system regularly.

### **Toggle between information sources**

ED clinicians from Princess Alexandra Hospital praised the toggle feature in The Viewer's viewing platform. ED clinicians can toggle between My Health Record system content produced by Queensland Health and content external to Queensland Health. The former is contained in the hospital EMR or the state-based portal.

The ability to differentiate between information sources by toggling between showing and hiding content according to the authoring health service organisation can reduce the cognitive burden of navigating through such content, which is likely contained in other systems. This can also reduce the perception that My Health Record system content has been duplicated or triplicated across local, state and territory, and national systems.

In contrast, content exclusive to the My Health Record system could be identified as such, using a distinctive visual cue (e.g. a My Health Record system logo). Rather than hiding locally sourced content, it may be preferable to highlight exclusive My Health Record system content.

### **Use document badge counters to indicate the volume of My Health Record content**

ED clinicians value document badge counters that help identify the most populated sections of a patient's My Health Record. This is similar to international EHRs that use push alerts to clinicians when content is available.<sup>78</sup> ED clinicians can potentially avoid accessing sections of a patient's My Health Record that do not contain

content, which can reduce the cognitive burden and perceived lack of utility. It is important that document badge counters do not recognise empty document 'containers' or 'shells' as content, as observed during the project.

### **Make a translucent emergency access function**

All viewing platforms should have clear, unequivocal instructions on how to access restricted content in a patient's My Health Record, either using a restricted access code or asserting the emergency access function.

When deciding to assert the break-glass function, understanding the metadata of the restricted documents would help ED clinicians to make an informed decision. Metadata could include the document type, document creation date and document count. No identifying or clinical details would be needed, as such metadata could help guide whether the restricted content is likely to have any utility in the ED. More than half (54%) of staff surveyed supported the concept of a 'translucent' emergency access function.

It is appreciated that this may require amendments to the current legislation, but it should be considered, given that ED clinicians currently often feel anxious or intimidated about using the emergency access function. Hence, improving its usability can have positive implications for patient safety. Accessing the emergency access function in a genuine time-critical emergency can unlock information that could change the care provided.

The Agency should consider a policy for when a patient (or authorised or nominated representative) gives consent for ED clinicians to access their restricted My Health Record content but are unable to provide the access code (e.g. poor memory recall). Current Agency policy requires the patient to contact the My Health Record helpline, which is not always feasible in a time-critical environment such as an ED.

## Use consistent naming conventions for the My Health Record system in all viewing platforms

Naming conventions within EMRs, state- and territory-based portals, and viewing platforms should all reference the 'My Health Record' system. The current lack of consistency causes confusion among ED clinicians, who typically look for a discrete My Health Record system reference, to gain access. All legacy references to the previous iteration of the My Health Record system – the Personally Controlled Electronic Health Record – should be updated, to minimise confusion. Similarly, alternative references to the My Health Record system, such as 'e-health record' should be updated to 'My Health Record' system. Using distinguishable My Health Record system icons could help the clinical workforce to recognise their local access pathway.

## Collaborate with practising clinicians to streamline My Health Record system content

Common fields that yield minimal clinical benefit should be removed from all My Health Record system clinical documents and views, to create a 'leaner' appearance that emphasises the clinical information. Examples of non-clinical information include time of vaccinations (which is in addition to the date), time zones and document properties (e.g. document ID). Project findings showed that ED clinicians cited challenging screen displays and 'number of mouse clicks' as barriers to efficient workflow and disincentives to using the My Health Record system.



**The presentation is complex, and it details too much irrelevant information and not what the current problems and current medications are.**

– ED physician

If non-clinical information is required for legislative purposes, these data fields can be retained within the document's metadata and hidden from the clinician's view (e.g. by a toggle switch or drop-down button). This can minimise distraction and focus on the clinical information relevant to patient care.

## Improve prominence and display of hyperlinks

Some viewing platforms display hyperlinks in clinical documents greyed-out, which ED clinicians can overlook. My Health Record system screen design should ensure that all hyperlinks are clearly distinguishable from other text (e.g. blue and underlined) and in accordance with the My Health Record clinical documentation architecture conformance specifications.<sup>94</sup>

## Enable customised views according to the needs of clinicians

Feedback from ED clinicians suggested they would like the autonomy to use common data fields from My Health Record system clinical documents to customise how content is viewed. This is akin to Microsoft Excel's pivot tables, which allow the user to adjust how data are displayed based on a data field selector. This is an opportunity to further enhance the usability of the My Health Record system by enabling a clinician to customise their view based on their needs and setting.

## Integrate the My Health Record system into the EMR – an ideal future state

ED clinicians would prefer to view My Health Record system content in their EMR. This more familiar digital environment could support the integration and singular view of patient information, regardless of source. For example, integrating pathology results from the My Health Record system with the local EMR can support an aggregated, trended view.

ED clinicians would only need to check one digital health system or platform for their patients. Such integration would likely depend on codified

My Health Record system content, which would enable better data linkages, standardisation and interoperability.

### **Partner with clinicians to maximise My Health Record system utility**

Practising clinicians must be engaged in all aspects of user acceptance testing and user experience design. Ongoing end-user feedback, provided in real time at the point of My Health Record system use, should be enabled for ED clinicians. This could be extended to discovering and reporting inaccurate information in a patient's My Health Record – whether the ED clinician or the patient identifies the error.

ED clinicians expressed a keen interest to continue their involvement with the My Health Record system, and digital health more broadly. This presents an opportunity to cultivate a network of engaged ED clinicians that could enrich the utility and credibility of the My Health Record system. Project findings have proven the positive impact clinical champions have on promoting acceptance of the My Health Record system among their peers and the value to clinical practice.

# 7 Implications

The long-term success of the My Health Record system relies on optimising how emergency department (ED) clinicians discover its clinical information. This will involve improving how My Health Record system content is presented and augmenting the usability of viewing platforms. Enhanced usability can be supported by an improved patient and clinician engagement strategy that corresponds with how the My Health Record system is being used in the respective health service organisation.

In the interim, measures are required to embed how the My Health Record system can be integrated into clinical practice by demonstrating its capacity to improve clinical care. Once ED clinicians appreciate the value a patient's My Health Record can add to their care, they will be incentivised to regularly use the system. Such utility is best understood by ED clinicians' real-life experiences with the My Health Record system. This can be realised by incorporating case studies as part of regular reflective learning and quality improvement activities. This has the potential to be more impactful on culture and ED clinician behaviour than didactic education on the conventional 'what and how' of the My Health Record system.

This chapter outlines the stakeholders that are best positioned to lead the implementation of the project's findings and recommendations. These stakeholders include:

- The Australian Digital Health Agency (the Agency)
- Health system operators, such as state and territory health departments
- Hospitals and health service organisations, including clinicians
- Software vendors.

While the implications for these stakeholder groups are outlined in detail below, progress can only be achieved through continued partnerships between these groups. The focus of the project's

recommendations is consistent across all stakeholders – how clinicians discover clinical information from the My Health Record system must be optimised and aligned with workflows, bespoke for the clinical setting.

## For the Australian Digital Health Agency

The following are recommendations for the Agency.

### Improve usability as My Health Record system content increases

Project findings showed an increasing amount of content in patients' My Health Records who presented to pilot site EDs as the study progressed. While this is reassuring for ED clinicians, attention will shift towards usability as My Health Record system content increases over time. ED clinicians identified opportunities to improve the design of My Health Record system clinical documents and views. By addressing ED clinician feedback to improve My Health Record system content, the Agency is likely to improve clinicians' experiences with using the My Health Record system.

Improved navigation in viewing platforms will reduce the cognitive burden on ED clinicians, which is expected as the volume and variety of content expand. The Agency has an opportunity to lead the development of a best-practice guide for My Health Record system viewing platforms. The guide should apply to all healthcare settings and software vendors. A best-practice guide may have even broader applicability to other national digital health infrastructure and hospital digital health systems. The Agency, leveraging from the clinical safety program operated by the Commission<sup>95</sup>, could partner with states and territories, and private hospital organisations to establish a baseline of user-friendly functions

that clinicians consider to be high value. Implementation of any usability enhancements to viewing platforms would be implemented by the software vendor, at the direction of the health service organisation, or state or territory (depending on organisational structure). The Agency would have direct responsibility for the Health Identifier and PCEHR System user interface (HIPS-UI), of which the Agency is the product owner.

Stakeholder consultation with practising clinicians (e.g. clinical champions) would help the workforce accept the guide and improve its credibility. System-wide recognition and realisation of the fundamental usability requirements will support clinicians to use the My Health Record system regularly.

### **Enhance My Health Record system utility through expanded connections and content**

ED clinicians indicated that a variety of clinical documents, across different healthcare settings, would motivate their regular use of the My Health Record system if these documents were available. Examples include ED discharge letters for non-admitted patients and specialist letters – the latter would encompass private medical specialists and hospital outpatient clinics. Connections with aged care homes would support a patient's transition of care to and from the ED.

The Agency is best placed to accelerate connections with clinicians who are considered high-value information sources in an ED setting. Industry offers and My Health Record system registration support can increase connections, particularly with clinicians in private practice or who may not operate in a digitally mature environment. The Agency should guide newly connected clinicians about which clinical document types they could contribute to the My Health Record system.

Project findings have shown that medication-related information and diagnostic tests were the most available and highly valued content ED clinicians viewed from the My Health Record system during the study. The Agency could

expand the scope of diagnostic tests that could be uploaded to the My Health Record system – starting with electrocardiograms (ECGs). Supplementary material, such as user-friendly clinical document architecture technical specifications, can enable software vendors and clinicians to upload new content. Other clinical documents that were considered high value, such as specialist letters and advance care plans, were not present in patients' My Health Records, which limited ED clinicians' use and application.

### **Promote a clinical champion network to fast-track My Health Record system adoption and use**

Project findings have highlighted how clinical champions engaged their peers to use the My Health Record system more regularly. While this project focused on the ED setting, the findings apply to the clinical workforce throughout the broader hospital community, given the common patient assessment and management workflows that are likely to benefit from using the My Health Record system. The size and scope of clinical champions should be determined by, and commensurate with, the health service organisation.

The Agency, in partnership with states and territories, should promote a clinical champion network for the hospital and ED setting. States and territories are best placed to coordinate the delivery of My Health Record system training, and to meet change and adoption requirements. There may also be opportunities to form partnerships with the Agency's clinical reference leads, who include digital health subject matter experts and clinicians from different healthcare settings. Engaging clinical champions can strengthen existing My Health Record system user experiences and quality improvement processes. Clinical champions are positioned to provide valuable insight into the practical challenges and opportunities in using the My Health Record system, based on their clinical colleagues' experiences. A clinical champion network could be used to collect and promote exemplar My Health Record system practices, which could be leveraged for education and learning opportunities. These



collective experiences could fast-track My Health Record system adoption and application. This knowledge-sharing could extend to new My Health Record system clinical documents, as early adopters can share lessons learned to support widespread integration of new content into clinical workflows. Peak bodies, such as the Australasian College for Emergency Medicine, could help promote an ED clinical champion network, which may include continuing professional development programs and greater focus on digital health in practice at annual conferences.

Understanding how the My Health Record system is being used in the fast-paced, busy ED setting could inform the Agency's work plan and shared opportunities with state and territory partners. For example, greater clinician engagement regarding the rollout of new content can equip health service organisations and clinical champions to integrate this content into clinical workflows. My Health Record system training gaps can be addressed through close working relationships with clinical champions. Simulated training environments that emulate the local ED digital environment (e.g. electronic medical records [EMRs], viewing platform) could be enhanced by scenario-based learning, elicited from use-cases collected by clinical champions, to reinforce the practical benefits of the My Health Record system on patient care. The Agency's stewardship depends on enduring relationships with practising clinicians, whose needs and expectations will evolve with the volume and variety of My Health Record system content.

## For health system operators

The following recommendations are for state- and territory-based health system operators.

### Improve the usability of My Health Record system viewing platforms and state- and territory-based portals

The viewing platform, or state- or territory-based portal – usually selected by the state or territory health department – determines the way in which ED clinicians access and interact

with the My Health Record system. Health system operators, usually represented by their state or territory health department, are primarily responsible for how My Health Record system content is presented to ED clinicians. While it is acknowledged that existing state- and territory-based portals and the My Health Record system have been developed independently, the increasing co-dependence means that their successful integration is an important factor to regular My Health Record system use. The importance of integration is proportional to the volume of clinical content contained in each system. Simply, the more content clinicians need to sort through, the more important are the tools required to navigate and retrieve the content.

Project findings have highlighted opportunities to improve the usability of viewing platforms and state- and territory-based portals, as well as the user-friendly functions that improve navigability and reduce cognitive load. Components of the study could be incorporated into existing user-testing processes, including heuristic analysis, to elicit what supports regular My Health Record system use by clinicians. Health system operators are encouraged to partner with the Agency to develop a best-practice guide for My Health Record system viewing platforms. The guide could be incorporated into the procurement processes of public or private hospitals seeking digital health infrastructure that can interface with the My Health Record system.

### Prioritise enablement and expansion of My Health Record system content

Project findings have shown some disparity across states and territories in relation to the range of clinical document types that are uploaded to the My Health Record system. In some instances, ED clinicians cannot access the full range of content (clinical documents and views). Health system operators should uniformly enable all My Health Record system content in their viewing platform or state- or territory-based portal. The contributions of states and territories to the My Health Record system, through their upload capabilities, should be maximised. This will enrich the clinical information available to ED clinicians, which will

provide the greatest opportunities to have this information inform their clinical decision-making.

Enabling My Health Record content needs to consider technical and clinical aspects. Clinical champions could advise on the documentation practices that influence how potential My Health Record system clinical documents (created in the hospital EMR) conform to technical specifications and enable successful upload. Health system operators should partner with practising clinicians to determine how content is ideally displayed through My Health Record system viewing platforms. This will support applying this content to clinical workflows, and optimise the safety and quality of patient health care.

### **Promote governance and reporting related to state- and territory-based My Health Record system activities, and make them available to the clinical workforce**

Targeted promotion and visibility of the My Health Record system – led by the state or territory health department – could help abate the lack of clinician awareness of the My Health Record system. The initial staff survey showed ways to improve connections between ED clinicians and those leading My Health Record system activities at the state or territory level. Engaged ED clinicians who wish to contribute to enhancing the clinical utility of the My Health Record system are often unsure where to direct their input. This is exacerbated by the paradox of a nationally administered electronic healthcare record (EHR) that is operationalised at the state or territory, and health service organisation levels.

My Health Record system use should be integrated into existing reporting arrangements between health system operators and health service organisations. Accountability frameworks, such as service agreements, can underpin efforts focused on using the My Health Record system. Policies set by the state or territory health department can promote consistent foundational practices and support health service organisations with establishing local procedures. Greater transparency is likely to promote continued

efforts to embed the My Health Record system into clinical workflows and infrastructure. Health system operators, supported by the Agency, could produce timely reports that focus on My Health Record system viewing behaviours and patterns. This can be a tool for further engagement with the clinical workforce. Reporting should encompass locally connected healthcare providers to reassure ED clinicians that accessing a patient's My Health Record would likely yield content.

The clinical workforce should be aware of the governance arrangements that oversee clinical document uploads to the My Health Record system. Observations from public hospitals beyond the project's pilot sites showed that successfully uploading clinical documents to the My Health Record system depends on conforming to clinical document architecture technical specifications. While this upholds the integrity of My Health Record system content, the visibility for any rejected clinical documents is unclear. The health system operator is likely able to identify any anomalies with upload patterns, which could activate further interrogation of My Health Record system activity data. This may require local clinicians and health information managers to resolve any technical barriers, particularly as the former may have inadvertently contributed to the unsuccessful upload of a clinical document to the My Health Record system (e.g. by including a special character into a text-only field). Processes should be available to retrospectively upload content once these barriers have been addressed. Otherwise, the absence of content could diminish the My Health Record system as a supplementary information source and thus opportunities to improve patient care.

### **Establish My Health Record redundancy measures to enable continuity of access during EMR downtime events**

Health system operators should consider how clinicians could access the My Health Record system independently of the hospital's EMR. Given that the My Health Record system is only accessible in public hospitals through the EMR and viewing platform, any disruption to these systems will render the My Health Record system

inaccessible. A standalone computer terminal, conformant with secure login processes, can bypass the EMR and viewing platform to enable My Health Record system access, which may prove to be a critical information source for patient care if the EMR is temporarily inaccessible. Alternatively, access to the Agency's National Provider Portal may be permitted under these exceptional circumstances. As the My Health Record system becomes a regularly used tool by hospital clinicians, it becomes more important to establish alternative access methods during EMR downtime.

## For hospitals and clinicians

The following recommendations are for hospitals and clinicians.

### Use clinical champions to encourage ED clinicians to regularly use the My Health Record system

Project findings have shown the value to existing My Health Record system training programs of clinical champions supporting them. Clinical champions could facilitate practical integration of the My Health Record system into a clinical setting, and drive regular use by collecting and promulgating exemplar My Health Record practices and case studies. The clinical champion position description and tools used throughout the study could be localised for any ED setting.

Clinical champions' roles do not need to be exclusive to the My Health Record system; such roles could encompass other digital health initiatives within the ED or broader hospital environment. Clinical champions could support existing health informatics organisation-wide roles, such as a chief clinical information officer or chief nursing information officer.

### Integrate the My Health Record system into established education and quality assurance programs

Health service organisations control established education programs, such as orientation and clinical rotations. The My Health Record system

should be integrated into these education programs. This will strengthen training in, and awareness of, the My Health Record system, as well as making it recognised as a vital tool for patient care. Clinical champions should partner with education program administrators (e.g. director of pre-vocational education and training, clinical nurse educators) to maximise the visibility of the My Health Record system.

Self-directed learning can complement formal education about the My Health Record system. Examples include training videos, walk-through guides and case-based scenarios. Integrating the My Health Record system with education programs extends beyond one-off training, as ongoing stewardship is required to maintain knowledge, address practical barriers to use and share exemplar practices. The My Health Record system should be integrated with continuing education and quality improvement opportunities, such as morbidity and mortality meetings.

Learning management systems should be capable of recording all staff who have completed My Health Record system education.

### Develop My Health Record system policies and procedures

Policies and procedures should support My Health Record system use. This documentation can support clinicians on how the My Health Record system is applied operationally to the clinical setting. The My Health Records Rule 2016 outlines the requirements of a written policy. Anecdotally, ED clinicians did not know if a written policy existed in their respective pilot site. Reference to such resources should be made during structured and opportunistic My Health Record system training. A written policy would support a health services organisation's compliance with Actions 1.17 and 1.18 of the National Safety and Quality Health Service Standards (second edition).<sup>74</sup>

## Increase visibility of the My Health Record system in the ED to support clinician–patient partnerships

Patient ownership of their My Health Record could stimulate their partnership with clinicians when seeking care in the ED. A highly visible My Health Record system presence in the ED setting (e.g. posters, flyers) can prompt patients to bring their My Health Record to their ED clinician’s attention.

A patient’s My Health Record could be used to improve their ED experience by minimising repetition of their medical history to multiple clinicians. Patients are likely to feel empowered and assured that their ED presentation is reflected in their My Health Record, which can support their follow-up care needs with other clinicians.

Asking about a patient’s My Health Record could be incorporated into regular clerical tasks, such as patient registration. ED clerical staff are responsible for acquiring the correct patient identifiers to successfully retrieve a patient’s My Health Record. This task is likely under-appreciated for its importance to enable My Health Record system access for clinicians. ED clerical staff could advise an ED clinician if the patient has a My Health Record.

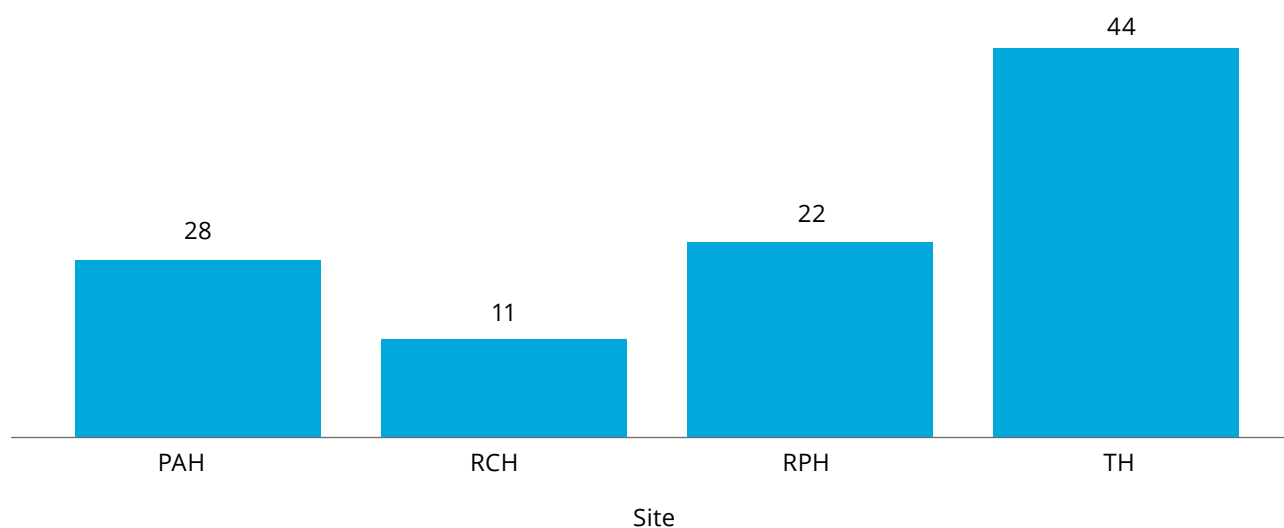
## Ensure that policies and procedures support the collection and validation of identifiers required to retrieve all available My Health Records

Approximately 25% of ED presentations, during the study period, did not have a My Health Record identified. This varied according to pilot sites, as shown in Figure 24. A higher proportion of patients’ My Health Records not being identified suggests that there are incorrect or missing identifiers, which impedes the ‘matching’ of a patient’s Individual Healthcare Identifier (IHI) and thus the My Health Record retrieval process.

During the study period, there were 31,908 ED presentations that did not have a My Health Record identified. If the national My Health Record opt-out rate of 9.9%<sup>35</sup> was applied to this cohort, there would have been 29,273 ED presentations where a My Health Record could have been retrieved, had the necessary identifiers matched the patient’s IHI.

Strengthening a hospital’s patient identification process can ensure that the patient’s information is current and accurate, and aligns with Medicare. This includes a validation process that ensures that a patient’s information on the hospital EMR is up to date, to minimise the risk that patient details have changed since their most recent presentation. All healthcare organisations should

**Figure 24:** Percentage of ED presentations that could not be matched to a My Health Record



PAH = Princess Alexandra Hospital; RCH = Royal Children’s Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

encompass patient identification procedures to ensure the accurate capture of the patient's name, date of birth, gender, and Medicare or Department of Veterans' Affairs number at the point of care. These details are the necessary information to retrieve the patient's IHI and identify their My Health Record. Anecdotally, some pharmacies may not routinely collect or confirm the patient's date of birth, which may limit IHI acquisition and My Health Record retrieval.

A high ascertainment rate of My Health Record is necessary for ED clinicians to be confident that a patient's My Health Record is available for review (notwithstanding if the patient elected to opt out). Robust patient identification processes, reinforced through staff training, are critical to successfully retrieving a patient's My Health Record.

### **Incorporate the My Health Record system into clinical quality assurance processes**

There is an opportunity for an increased presence of the My Health Record system during clinician-led quality assurance processes. Routine activities, such as morbidity and mortality meetings and grand round meetings, can promote My Health Record system use among the clinical workforce. These processes are often led by the multidisciplinary clinical team, which can foster dialogue across professions and encourage feedback mechanisms that inform system improvements. Incorporating the My Health Record system into quality assurance processes can 'hard-wire' system use into clinical practice. Acceptance of the My Health Record system through collegiate 'word of mouth' discussion is key to embedding system use in ED clinician culture.

### **For software vendors**

Software vendors of hospital EMRs and My Health Record system viewing platforms have an opportunity to improve their products' usability and integration with the My Health Record system, consistent with legislative requirements. The development of a best-practice guide for viewing

platforms could be incorporated into a health service organisation's procurement processes; therefore, software vendors are likely to be more competitive if their products demonstrate a range of user-friendly functions sought by ED clinicians when they are using the My Health Record system.

### **Limitations of the project**

Although the project yielded valuable information and recommendations, it is important to note its limitations.

#### **Pre-fetch or batch collection initiated by viewing platform**

The National Infrastructure Operator (NIO) provided the My Health Record system data. Analysis of the My Health Record documents viewed showed that there were multiple view 'types'.

Further enquiries with the NIO and the Agency showed that these view types were associated with different interactions between the clinician and a patient's My Health Record. For example, 'getHealthOverview' can relate to when a clinician first accesses a patient's My Health Record. This was exclusive to the Royal Perth Hospital pilot site, as the Health Overview was only available in its viewing platform (HIPS-UI) at the time. The initial screen (landing page) displayed is the Health Overview, which lists all the viewable documents in a patient's My Health Record. The 'getHealthOverview' view count was equivalent to the number of viewable documents – this is regardless of whether a clinician viewed these documents or not. A similar anomaly was discovered for the 'getMedicareOverview' view type. Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) transactions are listed in the Medicare Overview of a patient's My Health Record. When a clinician accesses the Medicare Overview, the 'getMedicareOverview' view count reflects the amount of MBS and PBS transactions as listed in the Medicare Overview.

Both these view types represent an automatic 'pre-fetch' or 'batch collection' by the My Health

Record system viewing platform in use. In contrast, the NIO advised that a 'getDocument' view type was associated with a clinician manually viewing a document in a patient's My Health Record. This view type had a smaller count than the 'pre-fetch' view types, as shown in Figure 25. The 'getDocument' data showed occasions when documents were viewed within a few seconds of each other, which resembled similar patterns observed in the 'getHealthOverview' and 'getMedicareOverview' view types.

The impact of different view types was observed when comparing NIO-supplied data, purpose-built for the project, and routinely generated My Health Record system data from the Agency. For example, the latter was used to produce Figure 26, which shows monthly My Health Record system views, across all departments, at Royal Perth Hospital. The data used for this report include the view types 'getHealthOverview', 'getMedicareOverview' and 'getDocument' – the latter being the only view type that represents when a document was opened by a clinician.

Understanding the differences in view types is critical to interpreting view counts. This is particularly important if both clinician-initiated

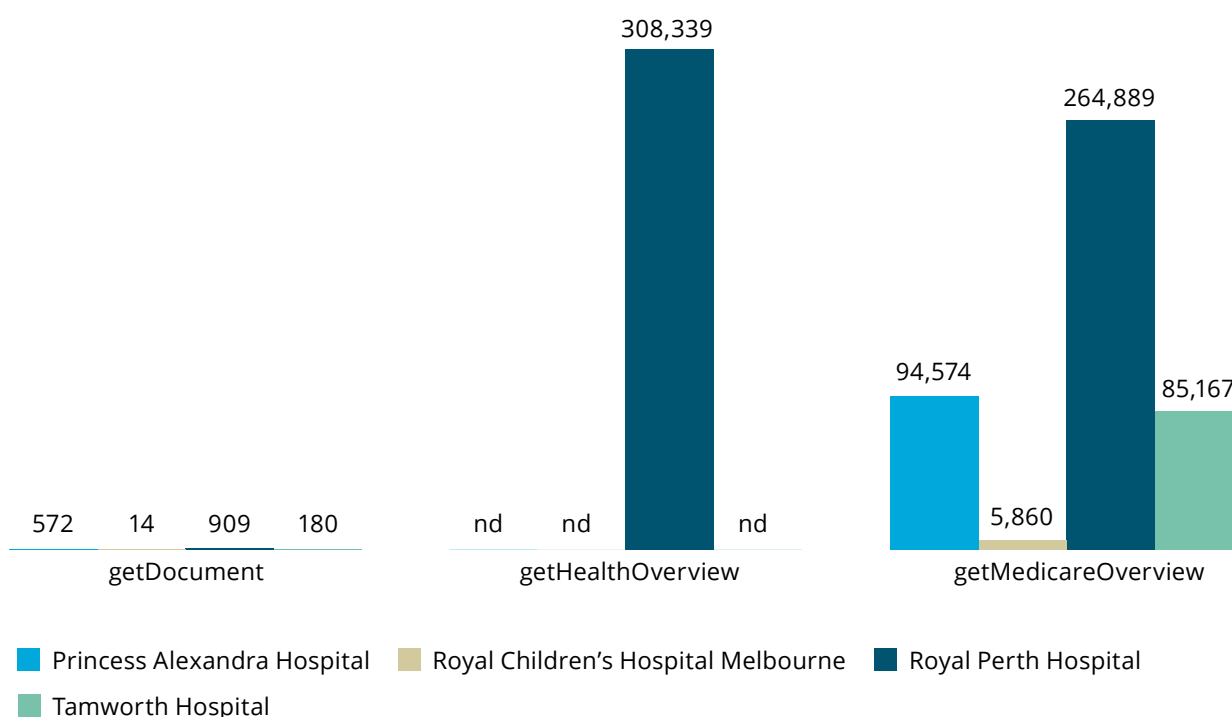
and viewing platform-initiated view types are aggregated, which would inflate My Health Record view counts and could erroneously attribute them exclusively to clinicians. My Health Record view count reports should transparently describe the view types used to produce such reports.

### Limited attribution of My Health Record system data due to entity reporting levels

Agency-supplied My Health Record system data can capture monthly uploads and views by document type. A limitation of these data is the entity reporting level. Hospitals are the most granular reporting level – also known as the 'seed' entity reporting level. My Health Record system activity cannot be stratified further to an individual department or unit level within the hospital setting. These data were able to demonstrate the change in My Health Record system activity for two pilot sites – Royal Perth Hospital and the Royal Children's Hospital Melbourne.

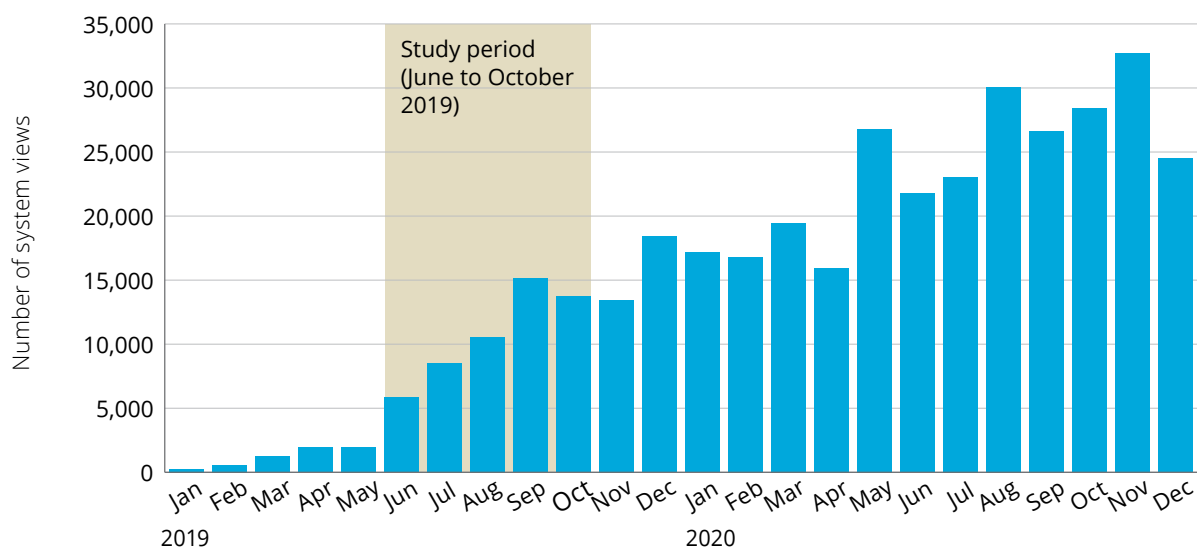
Data related to My Health Record system uploads were observed for the other two pilot sites –

**Figure 25: Count of view type, by site**



nd = no data; PAH = Princess Alexandra Hospital; RCH = Royal Children's Hospital Melbourne; RPH = Royal Perth Hospital; TH = Tamworth Hospital

**Figure 26:** My Health Record system views at Royal Perth Hospital before, during and after the study, January 2019 to December 2020



Princess Alexandra Hospital and Tamworth Hospital. However, My Health Record system view data were not reported at the hospital level for these pilot sites. This is because most states and territories report My Health Record system view data at the 'parent' entity reporting level – this being the state or territory health department. New South Wales, Queensland, South Australia, Tasmania and the Australian Capital Territory report My Health Record system view data at the parent entity reporting level. Conversely, Victoria, Western Australia and the Northern Territory report at the hospital entity reporting level.

Entity reporting levels are established when the health service organisation registers with the My Health Record system. These reporting levels are at the sole discretion of the health service organisation. Some health service organisations aggregate reporting at the health service level. This can encompass multiple hospitals into the one entity, which makes it hard to attribute My Health Record system upload and view data to individual hospitals.

These limitations with Agency-supplied My Health Record data should be considered for any future similar projects. There is an opportunity for standardising entity reporting levels; however, this will likely require significant negotiation

between the Agency and states and territories. Entity reporting levels should be aligned with established reporting arrangements, such as with states and territories, and the Australian Institute of Health and Welfare. This is considered critical if My Health Record system activity reports are made available to the clinical workforce as part of more intensive clinical engagement efforts, as well as linking to other national health datasets.

### Activity data related to state- and territory-based repositories were unavailable

Activity data related to HealtheNet (New South Wales) and The Viewer (Queensland) were not made available to the project team. These data could have determined whether state- and territory-based repositories were the preferred source for supplementary patient information that is common to the My Health Record system. As there are multiple access pathways for clinicians to discover content within state- and territory-based portals, activity data could have highlighted any preferred pathways. It was hypothesised that My Health Record system views would be lower for these pilot sites due to the availability of a state-based portal. This logic also applies inversely: My Health Record views would

be higher at pilot sites that did not have a state-based portal as a supplementary information source. Hence, the My Health Record system would be the only system available to access such information, other than conventional methods (e.g. fax, telephone). A comprehensive evaluation of clinicians' access and use of supplementary patient information sources should consider the activity data from both the My Health Record system and the state- or territory-based portal (if the latter is in use).

### **Inconsistency with respondents to the initial and follow-up staff surveys**

The transient nature of the ED workforce meant that some respondents did not complete both the initial and follow-up staff surveys. This was evident in the voluntary, free-text comments ('I didn't do the initial survey'). It was determined that a wider response rate was preferred over requiring that anyone who did the follow-up survey also needed to have completed the initial staff survey. However, some respondents to the follow-up staff survey had been exposed to the My Health Record system and project activities later than their colleagues who had participated from the start of the study – particularly junior medical officers who started their clinical rotation in mid-August. ED clinicians who became involved in project activities later in the study were less aware of the My Health Record system, which in turn affected their perception towards My Health Record system use in the ED setting. Therefore, the follow-up staff survey responses had a range of attitudes, which were influenced by their level of My Health Record system awareness and use – reflective of ED clinicians' different experiences.

### **Duplicate records in My Health Record data**

The My Health Record data, supplied by the NIO, contained approximately 0.2% of duplicate records. These were instances when the same ED presentation, indicated by the unique IHI, had been recorded an unrealistic number of times on the same date (to a pilot site's ED). For example, an ED presentation was recorded

on the same date approximately 22,000 times, with more than 1,700 My Health Record system clinical documents being viewed 13 times each. This anomaly related to more than 3,300 ED presentations across all pilot sites, from an entire dataset encompassing almost 440,000 ED presentations. In such instances, these duplicate records were removed from the dataset and any further data analysis.

The duplicate records phenomenon warrants further investigation by the Agency and the NIO. This is particularly important should future work programs increasingly use My Health Record system data to determine clinician use behaviours and patterns. Supplementary material, such as a data dictionary, would ensure consistent interpretation and application of My Health Record data.

### **Opportunistic My Health Record training by clinical champions was an intervention**

A significant part of the clinical champions' role was supporting their colleagues to use the My Health Record system. This inevitably involved education and awareness activities, in keeping with the project's objective of getting ED clinicians to regularly use the My Health Record system. However, this was an intervention. Awareness and use of the My Health Record system likely would have remained low (as demonstrated in the initial staff survey) had ED clinicians not received opportunistic training from clinical champions.

### **Concurrent activities to support clinicians' use of the My Health Record system**

During the study period, there were activities focused on supporting clinicians when using the My Health Record system. The Agency and health system operators have longstanding strategic and operational plans that feature the My Health Record system. Activities that were concurrent with the project included training and engagement efforts, promotional initiatives in mainstream media, and improved viewing



platform capabilities. Clinicians who participated in the project may have observed or participated in these activities, which is likely to have amplified their engagement with the My Health Record system.

### **Inconclusive results regarding reduced duplicative diagnostic tests from My Health Record system use**

The data collected were limited when measuring clinical benefits following an ED clinician's use of the My Health Record system. For example, it had been hypothesised that recent and relevant diagnostic tests in a patient's My Health Record could influence a clinician's decision-making to avoid a repeat diagnostic test. Although diagnostic test data from the pilot site EDs were collected, the absence of contextual information, typically available in the patient's notes, limited any conclusions that My Health Record system use reduced the amount of diagnostic tests performed in the ED. It was not possible to unequivocally state that an ED clinician refrained from ordering a diagnostic test due to a recently completed diagnostic test that was available in the patient's My Health Record.

It is suggested that an accurate measure can be achieved by examining individual cases and confirming with the treating ED clinician avoidance of a diagnostic test due to recent diagnostic test results in the patient's My Health Record.

### **Insufficient data to determine source of My Health Record system content**

My Health Record system data supplied did not show the source of content available in patients' My Health Records. While it is intuitive that some document types are more likely to originate from certain healthcare providers than others (e.g. shared health summaries from general practitioners), the source of other document types may not be straightforward. Sources of My Health Record system content could have provided greater context on the perceived utility by ED clinicians of different document types. For example, diagnostic tests were considered high value, which could have been further examined

had such content been stratified according to public and private providers. Survey results showed that ED clinicians supported the view that utility of the My Health Record system will improve as the amount of content from private providers increases.

### **No private hospital was included as a pilot site**

While consideration was given to including a private hospital ED as a pilot site, it was decided that no single private hospital ED could be a true representation of the group. Proportionally, private hospital EDs represent a small sector of the overall number of EDs across Australia. There are several standalone private hospital EDs, and many have different and bespoke clinical information systems. After visiting several private hospitals, the project team considered that the principles and findings of the report would still be applicable to the private hospital ED setting without the need for a separate study in a private hospital pilot site.

### **Opportunities for future work programs**

The project revealed several opportunities for future work programs.

### **Adopt study activities into future projects**

Activities performed during the study could be adopted into future projects. This project was one of the original 'test beds' aligned with the National Digital Health Strategy's 'enhanced models of care'. This project could inform the quantitative and qualitative measures examined in future test beds. For example, using a patient's IHI to determine which content the patient had in their My Health Record when presenting to an ED would provide valuable insight into what content local clinicians contributed to the My Health Record system. Such insight could inform the Agency's targeted approach to accelerate clinical document uploads from typical information

sources (e.g. specialist letters from private specialists).

Health service organisations, using the project's staff survey and use-case tools, can perform a 'status check' on how their clinicians are engaging with the My Health Record system. This could include evaluating existing training and awareness programs for quality improvement purposes. Staff surveys could be used as a way for ED clinicians to express their views on the My Health Record system, their My Health Record system viewing platform and the interface with their local EMR. ED clinicians' expectations will evolve over time, including what content they seek in the My Health Record system. Regularly engaging with clinicians through surveys, use-cases and focus groups would help policymakers to understand how the My Health Record system is being used and what new content would augment its utility. Clinical champions should lead these engagement efforts at the local level – preferably at a hospital unit or ward level – to maximise the response rate. Efforts could be aggregated later to establish an organisation-wide view. Appreciating how the multidisciplinary team applies the My Health Record system differently could identify ideal opportunities to integrate use in clinical workflows. These workflows change and evolve over time; thus, the My Health Record system should encompass iterative review processes to ensure that it is performing optimally for use in patient care.

This project provides a blueprint that shows how data can be used to determine high-yielding patient cohorts and My Health Record system content. Health service organisations are encouraged to perform a similar exercise to elicit local My Health Record system characteristics. The project showed differences between pilot sites that exclusively serve adult patients and those serving paediatric patients – the latter typically having a lower admission rate and My Health Record system use than the adult setting. The volume and variety of My Health Record system content specific to the local ED could help further align the system with clinical workflows. A My Health Record system minimum dataset with clinical indicators could be modelled on

the quantitative attributes of this project and integrated into future work programs.

## **Integrate new My Health Record system content into ED clinical workflows**

Project findings indicated that ED clinicians seek out new My Health Record system content, such as ECGs. Future work programs could prioritise new content according to the greatest yield for clinical decision-making. Commensurate work should be undertaken to ensure that new content is accessible and presented in the My Health Record system viewing platforms with minimal cognitive burden. Clinical champions could support training and awareness programs regarding new My Health Record system content. Quantitative and qualitative methods, used during the study, could ascertain whether ED clinicians use new My Health Record system content to deliver patient care.

## **Repeat pilot studies to determine sustainability of My Health Record system use**

The study design could be replicated to quantify how often clinicians use the My Health Record system. A repeat study could examine the effect of project findings and recommendations, if implemented, on My Health Record system clinician use. Longitudinal data could trend My Health Record system use and compare this with peer EDs and hospitals. The maximum number of uploads could be determined using My Health Record system data (e.g. local My Health Record opt-in rate) and ED operational statistics (e.g. number of ED presentations). This is based on the principle that approximately 90% of ED presentations will have a My Health Record and should therefore have ED-related content uploaded to their record. My Health Record system uploads should be commensurate with clinical activity and confirm that the maximum amount of My Health Record system uploads is being realised.

The activities performed throughout the study could be repeated at regular intervals to determine their effect on My Health Record

system clinician use. Efforts should target known times when My Health Record system use is expected to deteriorate, such as during clinical rotations. Clinicians may alternate between maintenance and intensive training efforts in response to fluctuations with My Health Record system use.

Each activity employed during the study could have a different effect on individual clinicians. Clinical champions, staff surveys and use-cases may motivate ED clinicians to use the My Health Record system to varying degrees. Undertaking My Health Record system activities in parallel with other digital health initiatives should be avoided, as this may exacerbate fatigue and result in diminished returns. For example, ED clinicians at one pilot site experienced survey fatigue due to simultaneous research projects within the ED setting. Intensive efforts to promote My Health Record system clinician use, beyond maintenance activities, should consider the demand imposed on ED clinicians in an already challenging environment. Health service organisations should establish ongoing monitoring and evaluation of My Health Record system initiatives to support regular use by the clinical workforce.

### **Shift towards examining quality of clinical documents**

Future work programs should consider examining the quality and completeness of My Health Record system content. The volume and variety of content are expected to increase over time. This, in turn, should shift research activities towards achieving high-quality clinical documents. This would require efforts directed to where My Health Record system content is created and curated. Health service organisations should develop a long-term plan to ensure that high-quality clinical documents are produced, which could impact the utility of the My Health Record system. Practices such as ‘copying and pasting’ entire clinical notes into a discharge summary can compromise the extraction and application of information. It is known that such practices exist, which results in poor documentation and heightens the risk of adverse ED discharge-related events.

Tools that examine the quality of clinical documentation are well documented in the literature<sup>96</sup> and should be incorporated into My Health Record system work programs. This is critical to supporting patients’ transition of care from the ED to community health care. Health service organisations could align their clinical document practices with the *National Guidelines for On-Screen Presentation of Discharge Summaries*.<sup>80</sup> Establishing similar guidelines, or updating existing guidelines, in the context of the My Health Record system and the broader digital health environment could form the foundation for high-quality electronic clinical documentation. This could enable a platform for digital health systems to widely incorporate standardised terminologies and healthcare identifiers into clinical documentation practices. Future work programs that focus on high-quality clinical documentation in the My Health Record system should be aligned with the National Health Information Strategy<sup>97</sup>, led by the Australian Institute of Health and Welfare. This presents opportunities to future-proof My Health Record system utility through codified data and enhanced interoperability. Codified data could be used to improve clinical decision support systems and enable functionality, such as automatic medication reconciliation.

### **Scale the project to the broader hospital environment**

Project findings are transferable to the broader hospital environment. The study design could be repeated beyond the ED, into inpatient and outpatient settings throughout the hospital. This would allow for focused efforts to integrate the My Health Record system with other specialty workflows. Additionally, such efforts could broaden My Health Record system use across the broader clinical workforce. This is likely to encounter technical barriers when interfacing the My Health Record system with digital health systems that are unique to certain hospital settings – for example, cancer care outpatient clinics and mental health services.

A state- and territory-based scan of My Health Record system uploads and views across public

and private hospitals is needed to evaluate progress made since the national expansion of the My Health Record system in February 2019. This can inform future work programs to scale up My Health Record system use to all clinical settings within the hospital environment. A critical mass of these work programs, done in partnership between the Agency and states and territories, would accelerate the adoption by less digitally mature organisations. A broader approach to achieving regular My Health Record system use by hospital clinicians could support benefits-realisation work programs, focused on delivering better patient care.

## Conclusion

The My Health Record system has tremendous potential to improve health care across Australia. This report has shown how this can be achieved, through improvements to the volume and presentation of content within the system, coupled with enhanced clinician awareness and integration into clinical workflows.

ED clinicians from the pilot sites showed that regular use is achieved through high-value content, accessed through user-friendly viewing platforms. The most sought-after content was consistent with international studies<sup>98</sup>, which show that having access to a patient's medication history, and pathology test and diagnostic imaging results influences a clinician's decision to admit or discharge a patient.

Project findings have emphasised the importance of a continued campaign to increase the volume and variety of clinical content within the My Health Record system. Content-rich EHRs can validate clinical decision-making by increasing a clinician's confidence about a selected treatment plan or by discovering unanticipated relevant clinical information.<sup>99</sup> As My Health Record system content increases over time, there will emerge a commensurate need to direct efforts towards achieving high-quality documents. Clinical utility of the My Health Record system will decay in the absence of intuitive access to curated content.

Almost triple the number of ED clinicians agreed that the My Health Record system influenced their clinical decision-making compared with baseline levels. This highlights the opportunities that the My Health Record system can bring to patient safety in an increasingly digitised healthcare system. Project findings suggest that benefits realised from these opportunities depend on addressing usability challenges regularly experienced by clinicians. Ensuring safe and optimal use of the My Health Record system requires enduring clinical governance in the digital health ecosystem.

A summary of the findings and recommendations in the report are provided in [Appendix 4](#).

# Appendix 1: Stakeholder interviews and clinical champions

As part of Phase I, telephone interviews were conducted with emergency department directors and health IT subject matter experts from November to December 2017 (Table 15). These interviews focused on the stakeholders' experience working with electronic medical records generally, and the My Health Record system specifically.

As part of Phase II, clinical champions from the pilot sites' emergency departments (Table 16) were recruited to support project activities. These local clinicians demonstrated expertise to their colleagues on how to use the My Health Record system, and were invaluable to data collection and contextualisation.

**Table 15:** Phase I stakeholder participants, as at November–December 2017

Name	Position	Organisation	Location
Mr Scott Adams	Executive Director, Corporate Services	Tasmanian Health Service	Tasmania
Ms Kerrie Aitken	ICU pharmacist	Cairns Hospital	Queensland
Dr Ofir Ben-Assuli	Senior Lecturer	Ono Academic College	Israel
Dr Andrew Blyth	Co-Director of Emergency Medicine	Southern Adelaide Local Health Network	South Australia
Ms Julie Cashin	Program Director, HealthNet Program & Integrated Care	eHealth NSW	New South Wales
Mr Markos Chouris	Director, e-health Strategy and Architecture	SA Health	South Australia
Dr Marlow Coates	Senior Medical Officer	Thursday Island Hospital	Queensland
Ms Sandra Cook	Director, Future Capability & Governance	ACT Health	Australian Capital Territory
Dr Tim Green	Director of Emergency Medicine	Royal Prince Alfred Hospital	New South Wales
Dr Charles Gutteridge	Chief Clinical Information Officer	Barts Health, National Health Service Trust	United Kingdom
Dr Jim Holland	Co-Director of Emergency Medicine	Southern Adelaide Local Health Network	South Australia
Mr Tony Hucker	Director of Clinical Quality and Patient Safety	Queensland Ambulance Service	Queensland
Dr Andrew Knight	Chair	Nepean Blue Mountains Primary Health Network	New South Wales
Professor Anmarie Lassen	Head of Research Unit	University of Southern Denmark	Denmark

*continues*

**Table 15:** *continued*

Name	Position	Organisation	Location
Associate Professor Richard Loh	Co-Chair	National Allergy Strategy	Western Australia
Dr Greg McDonald	Director of Emergency Medicine	Sydney Adventist Hospital	New South Wales
Mr Nicholas McInnes	Project Lead, Improving Emergency Access Collaborative	Peninsula Health	Victoria
Ms Melissa McKnight	Project Director, My Health Record	eHealth Queensland	Queensland
Professor Paul Middleton	Director of Emergency Medicine Research Unit	Liverpool Hospital	New South Wales
Dr Pieter Nel	Director of Emergency Medicine	Mackay Hospital	Queensland
Associate Professor Didier Palmer	Director of Emergency Medicine	Royal Darwin Hospital	Northern Territory
Associate Professor Christopher Pearce	President	Australasian College of Health Informatics	Australia
Mr Morten Elbæk Petersen	Chief Executive Officer	sundhed.dk	Denmark
Dr Stephen Priestley	Emergency physician	Nambour Hospital	Queensland
Dr Matthew Smith	Director of Emergency Medicine	Bankstown-Lidcombe Hospital	New South Wales
Dr Tom Soulsby	Director of Emergency Medicine	Royal Adelaide Hospital	South Australia
Professor Peter Sprivulis	Chief Clinical Information Officer	WA Health	Western Australia

ICU = intensive care unit

**Table 16:** Phase II pilot site clinical champions

Name	Position	Organisation	Location
Ms CJ Cabilan	Nursing Clinical Champion	Princess Alexandra Hospital	Queensland
Dr John Cheek	Medical Clinical Champion	Royal Children's Hospital Melbourne	Victoria
Dr Michael Foster	Medical Clinical Champion	Tamworth Hospital	New South Wales
Ms Tiffany Graham	Nursing Clinical Champion	Royal Perth Hospital	Western Australia
Ms Amelia Hodge	Nursing Clinical Champion	Princess Alexandra Hospital	Queensland
Ms Trish Holliday	Nursing Clinical Champion	Royal Children's Hospital Melbourne	Victoria
Ms Erin Kelley	Nursing Clinical Champion	Royal Perth Hospital	Western Australia
Ms Rebecca Kenny	Nursing Clinical Champion	Tamworth Hospital	New South Wales
Associate Professor Andrew Staib	Medical Clinical Champion	Princess Alexandra Hospital	Queensland
Dr Sophie Wallace	Medical Clinical Champion	Royal Perth Hospital	Western Australia

# Appendix 2: Comparison of My Health Record viewing platforms

This appendix shows a comparison between the My Health Record viewing platforms in use at the pilot sites, from June to October 2019. This comparison illustrates the differences in viewing platforms, which influenced how emergency department (ED) clinicians interacted with the My Health Record system, ultimately determining their overall experience. An examination of the viewing platforms and survey feedback showed what ED clinicians perceived as the most user-friendly features of each viewing platform, and what aspects required improvement.

One consideration when selecting the project's pilot sites was the different viewing platforms used by clinicians to access the My Health Record system. The four viewing platforms of the pilot sites (Health Identifier and PCEHR System user interface [HIPS-UI], New South Wales's HealtheNet, Queensland's The Viewer and Melbourne's EpicCare) represent how most Australian hospital clinicians currently access the My Health Record system.

While an examination of the different My Health Record system viewing platforms was not a primary focus of the project, there were several observations made by the project team:

- Replication of clinical documents across electronic medical record (EMR), state-based repositories and the My Health Record system
- Multiple processes and labels to access restricted documents or assert the break-glass function, illustrated by different break-glass use rates across the pilot sites
- Multiple routes within each viewing platform to My Health Record system documents and views (see Table 17)
- Inconsistent user-friendly features and information-finding functions (see Table 18)
- Counterintuitive placement of documents and views

- Inconsistent inclusion of all My Health Record system components (e.g. advance care planning documents and Health Overview not prominently displayed or featured across all viewing platforms)
- Different organisation of My Health Record system documents and views
- Contact details for the patient and next of kin mapped differently across platforms
- Inconsistent nomenclature of My Health Record system content.

## Implications for clinicians

Clinicians consistently reported that user-friendly functions are critical to enhancing the usability of My Health Record system viewing platforms and encouraging repeated clinician use.

Feedback from ED clinicians indicated that the inconsistent navigation pathways and prominence given to clinical documents in the My Health Record system increased the cognitive burden to access high-value content. ED clinicians expressed their frustration when navigating different routes in a patient's My Health Record, only to reach the same content.

Clinicians were particularly irritated when content was repeated across the local EMR, state-based portals and the My Health Record system. The impact was that ED clinicians had to navigate through a higher amount of content than was necessary, which impeded their objective to interrogate a patient's My Health Record content, unique to that system. Some clinical documents were in duplicate in two pilot sites: across the local EMR and the My Health Record system. Clinical documents could appear in triplicate for the other two pilot sites that had a state-based portal, operated by the respective state health department. Clinicians who reviewed a patient's

**Table 17:** Routes to how content is accessed within pilot sites' My Health Record system viewing platforms

<b>Content</b>	<b>Epic</b>	<b>HealtheNet</b>	<b>HIPS-UI</b>	<b>The Viewer</b>
Advance care plans	Documents	Advance Care Plans	Advance Care Directive Custodian	Documents
Diagnostic Imaging Report View	Documents	2 routes: Diagnostic Imaging View, Patient Summary	Diagnostic Imaging	2 routes: Diagnostic Imaging Report View, individual reports available in Documents View
Health Record Overview	Not enabled	Landing page	Landing page	Landing page
Medicare Overview	Documents	2 routes: Medicare Overview, Patient Summary	Medicare Overview	Documents View
Medicines View	Documents	3 routes: Medication, Patient Summary, Medicines View	2 routes: Other Documents, Shared Health Summary documents	Documents View
Pathology View	Documents	3 routes: Pathology View, Pathology, Pathology Report	Pathology	2 routes: Pathology Report View, individual reports available in Documents View
Prescription and Dispense View	Documents	2 routes: Medication with HealtheNet and My Health Record tabs	Prescription and Dispense	2 routes: Prescription and Dispense Record View, individual reports available in Documents View

HIPS-UI = Health Identifier and PCEHR System user interface



**Table 18:** Summary of user-friendly functions in pilot sites' My Health Record system viewing platforms

Function	Epic	HealtheNet	HIPS-UI	The Viewer
Access to diagnostic images via My Health Record diagnostic imaging reports	No	Yes	No	No
Access to My Health Record via a 'single sign-on' from the clinician's local EMR	Yes	Yes	Yes	Yes
Active hyperlinks in My Health Record content to third-party reports	No	Yes	Yes	Yes
Filtering and sorting of My Health Record content (e.g. sort by date range, authoring organisation)*	No	Yes	Yes	Yes
My Health Record content updated automatically (i.e. once opened by the clinician)	No	Yes	Yes	Yes
Navigation to My Health Record content via a single access pathway	Yes	No	Yes	Yes
Toggle display of content originating within the local EMR or contained within state-based clinical portal	No	No	No	Yes

EMR = electronic medical record

\* Filtering and sorting functionality not applied to Medicare documents, such as the Medicare Overview (Medicare Benefits Schedule) reports, Pharmaceutical Benefits Scheme reports, Australian Organ Donor Register and Australian Immunisation Register.

My Health Record and discovered replicas of the same information from the local EMR and/or state-based portal said that the value proposition of the My Health Record system diminished, which deterred them from repeated system use. A toggle button in The Viewer allows clinicians to show or hide any documents in the My Health Record system that were sourced from a Queensland Health hospital; widespread adoption of this feature can mitigate document replication and reduce cognitive load on the clinician.

The matter of multiple different routes to information is a challenge – navigation should be sufficiently flexible to be intuitive to all, yet not make it counterproductive where clinicians believe they are going to discover new information only to find documents they had already seen. Viewing platform system owners should continue to make access pathways to clinical documents as efficient as possible.

## Case for change – best-practice guide for My Health Record viewing platforms

The findings described have been extracted from staff surveys, and anecdotal observations made by the clinical champions and the report authors. User experience feedback is critical for achieving an optimal design of My Health Record system viewing platforms. Sustained change could be facilitated by the development of national best-practice guidelines for My Health Record system viewing platforms. Such guidelines would be a foundational piece that establish the baseline user-friendly features that support regular clinician use of the My Health Record system. The guidelines would have far-reaching application across EMR and state- or territory-based portal designs, across public and private hospital sectors, and beyond the acute setting into community-based healthcare organisations.



# Appendix 3: Adoption model

The My Health Record system is a huge advancement in Australian health care. The system can provide a comprehensive health history of a patient from information sources that are not readily available in the emergency department (ED) setting. The My Health Record system can also facilitate communication between clinicians across a range of environments. Greater My Health Record system use in EDs has been shown to achieve:

- Better, safer clinical decision-making due to increased visibility of an ED patient's medical history
- Improvements in medication reconciliation and reduced medication-related errors through greater visibility of allergies and medication histories by accessing information from community pharmacies and dispensaries
- Greater information-gathering capability to support patient assessment and management.

Integrating the My Health Record system into regular clinical practice is ultimately determined by the clinician's decision to use the system. Clinicians are typically motivated to use the system if they believe that it will provide supplementary patient information. High-value content derived from the My Health Record system provides a more comprehensive patient history, which has been shown to influence decision-making for safer patient care.

The following themes, derived from the project's findings, offer a pragmatic approach to what is needed to support and encourage ED clinician use of the My Health Record system:

- Viewing – ongoing improvements to the usability of My Health Record system viewing platforms
- Value – better clinician awareness of how and when to use the My Health Record system
- Volume – continued efforts to increase the amount of content in the My Health Record system

- Variety – expanding the different document types in the My Health Record system
- Vicarious – My Health Record system training using use-cases, led by clinical champions.

These multiple, interrelated themes can support a clinician's use of the My Health Record system. Conversely, the absence of these themes is likely to deter and even impede use. These themes in combination are greater than the sum of each individual component. The themes are the foundation of an adoption model that aims to show how ED clinicians can realise benefits for their patients from using the My Health Record system.

## Viewing

Clinicians consistently report that the design of digital healthcare systems and how they engage with them plays a significant role in whether they consider the experience rewarding or not. Minimum usability elements of viewing platforms can reduce the cognitive burden on clinicians when using the My Health Record system. User-friendly functions that support clinician use should be regularly reviewed in partnership with practising clinicians. Such functionality is likely to evolve as the clinical application of the My Health Record system content matures over time. Functions that improve navigability should emulate the local digital environment (e.g. hospital electronic medical record [EMR]) to achieve a seamless transition between the various digital health systems that clinicians use in their practice. Clinical and technical integration of the My Health Record system into the ED setting will maximise its influence on clinical decision-making for safer patient care.

Greater visibility regarding clinician use of the My Health Record system will inform continued efforts to maximise the utility of the system towards providing safer patient care. Transparent reporting at the hospital level on My Health

Record system activity (views and uploads) can be used to interrogate the range of variables that influence a clinician's motivation to use the system. These reports should highlight what document types are more often viewed than others. This information can help health service organisations and health system operators to determine clinicians' perceptions of value and accessibility of certain document types. The latter is attributed to how easily a clinician can navigate a patient's My Health Record to view a clinical document. Ideally, the most highly valued content has the simplest access pathway through the My Health Record system viewing platform in use.

The My Health Record system must be integrated into all clinical workflows that involve patient assessment and management. These workflows should support regular My Health Record system use that reflects the local context and considers patient demographics, acuity and clinical workforce composition. Information unique to each My Health Record system clinical document type is likely to align with particular functions and tasks in the ED workflow. For example, the most opportune stages of the patient's ED journey to integrate My Health Record system content include:

- Registration – validation of individual and next-of-kin contact details
- Medical assessment and management
- Nursing assessment – allergies, medication history, social history, triage
- Resuscitation – medical history, advance care planning
- Medication reconciliation – medication history.

As clinicians become proficient in using the My Health Record system, efforts should shift towards optimising the quality of content. Local clinical documentation practices should focus on the accuracy and completeness of any documents uploaded to the My Health Record system. The quality of My Health Record system content will become a critical success factor to continued clinician use once the volume and variety of My Health Record system content reach a critical mass.

## Value

Clinicians are more encouraged to use the My Health Record system for patients with complex medical problems or those who cannot communicate their needs. This is consistent with literature findings that show that clinician use is motivated by repeat (e.g. readmissions) and complex patients presenting to the ED.<sup>100-102</sup>

ED patient cohorts were identified that would particularly benefit from clinicians accessing their My Health Record:

- Patients with chronic complex comorbidities (who often need multiple specialties)
- Interstate or rural visitors (or hospitals near state and territory boundaries)
- Communication-compromised patients (people who are unconscious, people from non-English-speaking backgrounds)
- Vulnerable populations (Aboriginal and Torres Strait Islander people, people with mental illness)
- Patients who are more likely to be admitted.

Feedback from clinicians suggested that My Health Record system content that is not readily available in their local EMR and is 'fit for purpose' to what the clinicians seek to know about the patient's ED presentation is considered high value. ED clinicians consider medication-related documents and diagnostic tests (e.g. pathology and diagnostic imaging) to be high-value content. Medical histories were also highly sought after, and were often found in shared health summaries and specialist letters. Health system operators should prioritise the awareness, availability and accessibility of this content for clinical decision-making. Initial patient assessment workflows should integrate My Health Record system review to determine whether such high-value content is applicable to the patient's ED presentation. This could expedite the assessment process, facilitate patient-clinician communication and potentially avoid duplicate diagnostic tests from being performed.

Standardised national terminologies, such as the Australian Medicines Terminology and SNOMED CT-AU, should be incorporated into hospital EMRs

and, in turn, the My Health Record system. These system enablers are necessary to address current interoperability issues and future enhancements, such as automated medication reconciliation.

## Volume

Clinicians must be updated regularly on which content is available in the My Health Record system from local health service organisations. This content is unlikely to be available from the hospital EMR and should be regularly promoted to ensure that clinicians know which information sources are connected to the My Health Record system. This information should encompass volume and variety of documents uploaded, as these are likely to differ according to the type of clinician. Reports, specific to the local ED setting, can highlight the availability of content in patients' My Health Records. Reports can offer transparency regarding consistent uploading to the My Health Record system by local organisations. This can serve as a verification process that shows that contributions to the My Health Record system are successful and not compromised by technical barriers. The Australian Digital Health Agency (the Agency) is best placed to regularly supply information on My Health Record system-connected organisations directly to practising clinicians, through clinical champions. Such information could be prominently displayed in an ED as bedside aide-mémoires.

It is anticipated that navigability of My Health Record system viewing platforms will become increasingly burdensome for ED clinicians as the volume of content increases. User-friendly functions, such as toggling between information sources (e.g. internal versus external to the ED clinician's hospital), can reduce the appearance of duplicated information between the hospital EMR, state- and territory-based portals, and the My Health Record system.

It is expected that all clinical document types are mapped in all My Health Record system viewing platforms. Clear visual cues (e.g. document badge counts) should indicate whether each document type is populated with content – this will avoid ED

clinicians having to search a patient's My Health Record to find out what content is available. A content inventory should be displayed when accessing a patient's My Health Record. Improved usability can reduce the cognitive burden on ED clinicians when attempting to sort through My Health Record content.

## Variety

ED clinicians need a wide range of document types to motivate them to regularly use the My Health Record system. Education and training efforts should focus on what clinical information resides in each document type – it should not be assumed that the document title intuitively reflects the content. The depth of this information itself will determine its utility towards a patient's care. Clinical champions are best placed to reinforce the composition of each clinical document to their colleagues and how this benefits clinical workflows.

Demand for new document types will emerge as clinicians become more familiar with the My Health Record system. Information gaps in the clinical workflow can be addressed either through new views that present content from multiple clinical documents into a consolidated interface, or through new information sources that align with existing My Health Record system clinical document architecture. It is critical that the collaboration between the My Health Record System Operator and practising clinicians becomes the primary driver for expanding the clinical document repertoire in the My Health Record system.

Conversely, variety must be minimised in relation to access pathways for My Health Record system content. ED clinicians are likely to fatigue if there are multiple ways to access the same clinical document in the My Health Record system viewing platform. Establishing a single access pathway for each document type will encourage the 'one source of truth' perception and promote trust among ED clinicians.

Newly available My Health Record system content should be complemented by a communication

campaign, supported by clinical champions. Such promotion should correspond to when this new content is available in the local organisation's viewing platform, rather than when it is released by the Agency – this accounts for technical processes to enable new content in the viewing platform. Inconsistent messaging can give the perception that there is no content and may diminish ED clinicians' motivation to check a patient's My Health Record. All opportunities for greater alignment between the Agency and health system operators (e.g. states and territories) are crucial for ED clinicians – and patients – to realise the benefits from new content.

## Vicarious

Collegiate, case-based learning, supported by clinical champions, can translate My Health Record system knowledge to clinical application. These roles should focus solely on supporting their clinical colleagues in using the My Health Record system. The clinical champion role should be balanced between support functions and continued clinical practice – the latter enabling firsthand experience on the practicalities of My Health Record system use.

My Health Record system clinician training and support should emphasise patient safety capabilities, with consideration of how this may be suited to each profession's workflow. A delivery method that focuses on opportunistic learning within the clinical setting is preferred by clinicians over didactic, classroom-style training that is typical of digital health-related rollouts. Training delivered 'at the elbow' by clinical champions lends itself well to integrating My Health Record system use into existing education and quality assurance activities in the ED, such as clinical teaching, and morbidity and mortality meetings.

Case studies can demonstrate exemplar applications of the My Health Record system to emergency care, which in turn can motivate continued clinician use. The socialisation of local successes with My Health Record system use can promote the role of the system in regular workflows and practices. Localising simulations and case studies based on the hospital's patient

demographic and ED workflow will further promote the usability and usefulness of the My Health Record system.

Since much of the ED workforce is transient, it is crucial that there is ongoing education and support for My Health Record system use. Such training should be frequent, and correspond with clinical rotations of junior medical officers and registrars, as well as mechanisms for new staff recruitment. Staff who have completed My Health Record system training should ideally have this recorded in a learning management system for record-keeping and auditing purposes.

Clinical champions should be a continued presence to support a business-as-usual My Health Record system practice. A clinical champion's role could be blended with other digital health initiatives (e.g. electronic medication management) within the ED or hospital. Regular staff feedback forums, refresher courses and 24-hour support contribute to maintaining regular use. It is anticipated that clinical champion efforts will shift towards maintaining use once regular My Health Record use becomes embedded in ED clinicians' behaviour.

#### **Box 4: Adoption model checklist**

- Enhance viewing platform usability through collaboration with practising clinicians.
- Enable access to the My Health Record system for the clinical workforce, via the electronic medical record, state- or territory-based portal, or My Health Record system viewing platform.
- Partner with practising clinicians to determine opportunities to expand connections and content to the My Health Record system.
- Promote high-value content and support streamlined access pathways to this content in the My Health Record system viewing platform.
- Build trust via regular reporting of local health service organisations that are connected and uploading to the My Health Record system (e.g. local connections).
- Maximise the quantity and quality of uploads to the My Health Record system.
- Identify clinical champions.
- Incorporate My Health Record case studies into training and awareness activities, and quality improvement opportunities.
- Integrate My Health Record training into the health service organisation's learning management system .
- Stimulate clinician–consumer dialogue regarding the My Health Record system.





# Appendix 4: Findings and recommendations



Table 19 contains a summary of the findings and recommendations featured throughout the report. The recommendations are listed thematically according to training, content, usability and governance. Time frames for

implementation are best determined through collaborative efforts by the various stakeholders listed in Chapter 7 and in alignment with their respective work plans.

**Table 19:** Summary of findings and recommendations

Theme	#	Finding	Recommendation
Training	1	Patients with the most populated My Health Records often had the most complex healthcare needs.	ED clinicians should be strongly encouraged to regularly use the My Health Record system for ED patient cohorts that typically have content-rich My Health Records.
	2	Survey findings showed that 85% of ED clinicians felt that they had not received enough My Health Record system training.	Further education and training are required to promote use of the My Health Record system.
	3	Some ED clinicians suggested that they had not received any 'formal' My Health Record system training.	Staff who have completed My Health Record system training should ideally have this recorded in a learning management system.
	4	Junior medical staff reported a preference to use the My Health Record system to retrieve supplementary clinical information compared with more conventional methods such as phoning or faxing external sources.	My Health Record system training should be frequent and correspond to clinical rotations of junior medical officers and registrars; this reflects the dynamic and transient nature of the ED workforce.
	5	ED clinician feedback indicated that continuous peer-led reinforcement of My Health Record system use-cases and opportunistic 'at the elbow' teaching by clinical champions was the preferred teaching style.	Clinical champions with local knowledge are better positioned to deliver My Health Record system training.
	6	Practical, real-life examples proved a useful tool for motivating ED clinicians to use the My Health Record system.	An established network of clinical champions could facilitate knowledge-sharing of exemplar My Health Record system practices.
	7	ED clinician feedback indicated that the initial assessment (by both nursing and medical staff) of the patient is the best time to access their My Health Record.	The My Health Record system should be aligned with documented clinical pathways, patient streams, policies and forms (electronic and paper based).
	8	A My Health Record system simulation training environment could demonstrate how the system could benefit emergency care and encourage use.	The Agency should consider refreshing the on-demand training environment to stratify different software simulations according to the healthcare setting (e.g. primary, acute), or to the state or territory. The availability of the on-demand training environment should be promoted to ED clinicians.

*continues*

**Table 19:** *continued*

<b>Theme</b>	<b>#</b>	<b>Finding</b>	<b>Recommendation</b>
Training ( <i>continued</i> )	9	The follow-up staff survey showed that 7 out of 10 ED clinicians did not know how to prevent clinical documents being uploaded to a patient's My Health Record.	Health service organisations are to ensure that training, policies and procedures are in place that support ED clinicians on how to withdraw patient consent for uploading content to their My Health Record.
	10	Almost half of respondents (49%) did not know how to use the emergency access function, which was often mistakenly interpreted as the method of access specifically for ED clinicians.	More efforts are needed to educate ED clinicians on the emergency access function.
Usability	11	More than half of respondents (54%) preferred to know what content was hidden before using the emergency access function.	Restricted records or content could be made 'translucent'. Limited visibility, such as document type, the number of documents available and whether the document was recently created could help the ED clinician to decide if they should use the emergency access function.
	12	ED clinicians can assert the emergency access function even if a patient does not have any access controls applied to their My Health Record.	The emergency access function should not be displayed on the My Health Record system viewing platform if there are no access controls applied to the patient's record.
	13	Many ED clinicians agreed that their My Health Record system viewing platform could be improved.	Usability improvements should be made to My Health Record viewing platforms, which will encourage clinicians to use the My Health Record system.
	14	My Health Record system viewing platforms can have multiple pathways to the same content, which ED clinicians found time-consuming and of low value.	Viewing platform system owners should continue to make access pathways to clinical documents as efficient as possible.
	15	The ability to differentiate information sources by toggling between showing and hiding content from the health service organisation can reduce the cognitive burden of navigating through content available in other systems.	A toggle feature could be enabled in My Health Record system viewing platforms that can show or hide content according to source, to avoid repetition of content and ineffective information discovery.
	16	An improved and intuitive My Health Record system interface that enhances usability and on-screen presentation of content, guided by real-life case studies from health service organisations and their existing viewing platforms, would greatly improve ED clinicians' user experience.	A practical guide for viewing platforms, based on real-life case studies, could be a foundational document that outlines the high-value, user-friendly functions that encourage ED clinicians to use the My Health Record system regularly.

*continues*

**Table 19:** *continued*

<b>Theme</b>	<b>#</b>	<b>Finding</b>	<b>Recommendation</b>
Content	17	ED clinicians regard medication-related documents and diagnostic tests as high-value content.	The availability of medication-related documents and diagnostic tests in the My Health Record system should be maximised.
	18	ED clinicians have consistently requested that ECGs be available in a patient's My Health Record. There are opportunities to increase the variety of other diagnostic procedures and investigations in the My Health Record system.	The Agency could expand the scope of diagnostic tests that could be uploaded to the My Health Record system – starting with ECGs.
	19	ED clinicians wish to see ECGs, advance care plans and specialist (or outpatient) clinical letters made available in the My Health Record system.	A collaborative effort is needed to accelerate the upload of ECGs, specialist and outpatient clinic letters, and advance care plans.
	20	ED clinicians sought ED discharge letters, also known as 'ED statement of attendance' letters, for patients who received care in the ED and were discharged.	The Agency, states and territories, and clinicians should reach a consensus about the most appropriate My Health Record document type that ED discharge letters (or ED statement of attendance letters) could be uploaded to.
	21	An emergency care summary could present a view specific for emergency care situations. This view could also be drawn upon in other hospital areas outside an ED during times of clinical deterioration and in support of responding medical emergency teams.	An emergency care summary view could present a 'fit for purpose' view specific for emergency care situations.
	22	Two-thirds of ED clinicians agreed that a discrete, standalone section on immunisation information would be easier to find in a patient's My Health Record (compared with this content being currently located within MBS data).	A new immunisation view could capture all references to immunisations and vaccination boosters from all My Health Record system clinical documents and beyond those listed in the Australian Immunisation Register.
	23	There is disparity across the acute setting in relation to the variety of clinical document types that are uploaded to the My Health Record system.	A collaborative effort should be established between the Agency and states and territories to increase the variety of clinical document types that are uploaded to the My Health Record system.
	24	ED clinicians are more motivated to use a patient's My Health Record if they know the content source – this particularly applies to local healthcare providers.	ED clinicians should be regularly supplied with information about local healthcare providers who are connected and uploading to the My Health Record system.

*continues*

**Table 19: continued**

Theme	#	Finding	Recommendation
Governance	25	Approximately 25% of ED presentations did not have a My Health Record identified, which is linked to 'unmatched', incorrect or missing patient identifiers required to retrieve their My Health Record.	Governance practices should be ensured that monitor and rectify 'unmatched' IHIs, and are complemented by policies and procedures that support the collection and validation of identifiers required to retrieve all available My Health Records.
	26	My Health Record system access will not be possible during EMR downtime if the My Health Record is only available through the EMR.	Access to the My Health Record system, independent of the EMR, should be built into a health service organisation's downtime capabilities.
	27	There can be a delay between when the Agency makes new My Health Record system content available and when ED clinicians can access the new content, which depends on state and territory health departments and third-party software vendors.	It is suggested that new content is not promoted to ED clinicians until it is available in their My Health Record system viewing platforms. This will avoid frustrating ED clinicians who seek this new content and are unable to access it, which may discourage them from regularly using the My Health Record system.
	28	Reporting and collaborative information sharing of local My Health Record system use (views and uploads) will promote awareness to ED clinicians on connected healthcare providers and their own use behaviours.	Health system operators, supported by the Agency, could produce timely reports that focus on My Health Record system viewing behaviours and patterns. This can be a tool for further engagement with the clinical workforce.  Standardised entity reporting levels should be negotiated between the Agency and states and territories, which would support transparent My Health Record reporting and comparative data analysis.
	29	As clinicians become proficient with using the My Health Record system, efforts should shift towards optimising the quality of content. Local clinical documentation practices should focus on the accuracy and completeness of any documents uploaded to the My Health Record system.	There should be an increased focus on achieving high-quality content in the My Health Record system, supported by safety and quality frameworks and national standard terminologies.
	30	Contacting the My Health Record system helpline to retrieve a forgotten restricted access code was considered impractical in an emergency clinical setting.	Alternative security measures, such as multi-factor authentication, should be considered as a more practical retrieval method.

Agency = Australian Digital Health Agency; ECG = electrocardiogram; ED = emergency department; EMR = electronic medical record; IHI = Individual Healthcare Identifier; MBS = Medicare Benefits Schedule

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