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Aged Care Standards for CIS
Gap analysis and environment scan

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Approved

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1 Executive summary

The Australian Digital Health Agency (the Agency) has worked with the Department of Health and Aged Care (DoHAC) to address recommendations of the Royal Commission into Aged Care Quality and Safety. The Royal Commission final report was released in March 2021 included 148 recommendations.

The Aged Care Clinical Information System (ACCIS) Standards has addressed two recommendations. Recommendation 68 relates to the universal adoption of digital technology and My Health Record in the aged care sector. Recommendation 109 relates to "interoperability of information and communications systems to enable the sharing of data and information about people receiving care between aged care providers and relevant government agencies".

The ACCIS Standards will support residential aged care homes and software developers to achieve better connections between CIS and national infrastructure.

The Agency will work with software developers and government bodies to produce:

- an environment scan of existing standards[1] outlined in this document
- recommended minimum requirements to CIS in Residential Age Care Homes (RACH).

This document is the outcome of that environment scan and will serve as inputs into the minimum requirements applicable to aged care CIS.

The project has identified six broad categories to align the digital health standards.

- connections to national systems
- standards payload formats for exchange
- standards for point-to-point (P2P) information transport methods
- standards for local software controls
- standards for terminology code sets
- standards for on-screen display of clinical terms.

These categories will enable a structured approach and a way to address a range of topics.

The matrix below is a non-exhaustive summary of the potential standards that might apply to each category.

[1] This document uses the term "standards" to mean the standardisation of software systems.

Category / Standards	On-screen display of clinical terms	Payload formats for exchange	P2P transportation methods	Local software controls	Terminology code sets	Connections to national systems (My Health Record)
FHIR	✓	✓	✓		✓	My Health Record specifications
IHE		✓				
HL7 v2		✓				
eNRMC template	✓			✓		
SNOMED					✓	
AMT	✓				✓	
ICD-10 & 11	✓				✓	

Engagement with industry aims to validate this environment scan and form a basis for further discussions regarding the standardisation of RACH CIS systems.

2 Introduction

2.1 Purpose

The Aged Care Clinical Information System Standards has three deliverables.

1. *Gap analysis* and environment scan of digital health standards to identify existing and emerging standards for use in aged care (this document)
2. *Recommended minimum system requirements* for clinical information systems used in residential aged care homes
3. *Road map* for recommendations on adoption, implementation, and identification of development work for digital health standards in aged care

This document is the first deliverable and is the result of an environment scan to identify suitable standards that might be relevant to CIS and electronic medication management systems (eMM) operating in the aged care sector.

The aim of the gap analysis is to establish the standards that are available, the standards that are emerging, and standards that are yet to be developed. This gap analysis document serves several purposes:

- to provide input into future consultations regarding the standardisation of residential aged care home CIS and eMM with a focus on interoperability
- to identify standards that need to be developed.
- To shape the road map for:
    - the development of future standards (the gap) and
    - change and adoption activities.

The Agency recognises that Recommendation 68 calls for system interoperability which is a broad domain that cannot be described by a single standard. The Agency will develop a document (the 'recommended minimum requirements') that references other technical standards, which collectively describes the technical specifications a CIS needs to satisfy to move towards interoperability.

The recommended minimum requirements will be published in the National Digital Health Standards Catalogue. This catalogue is a technical resource library developed by the Agency to support Interoperability. The catalogue will be published on the Agency's website and offers streamlined access to digital health standards, specifications and supporting materials.

To support the adoption of a CIS standard, consideration of current standards established within RACH is imperative. This document identifies standards that are potentially applicable to RACH CIS and eMM.

In some cases, the referenced standard is a high-level framework or similar and is often not sufficiently detailed to be implementable. If software developers favour a specific framework, then there may be additional work to identify, or develop, lower-level standards within that framework that provides sufficient guidance to software developers.

The gap analysis will support the development of a roadmap outlining recommendations on adoption, implementation and identification of development work for digital health standards.

2.2 Intended audience

The intended audience for this document is the aged care sector including but not limited to RACH CIS developers, eMM developers, managers of aged care homes, clinicians, jurisdictions, peak bodies, standards developing organisations (SDO), DoHAC and other government agencies.

2.3 Scope

This document presents a list of known, emerging and future standards pertaining to the aged care sector with a focus on CIS and eMM systems operating within RACHs.

Standards relating to connected healthcare sectors might be included with no attempt at being exhaustive.

The scope includes documents that may not be a formal standard but contribute to efforts towards standardisation. This includes frameworks, guidelines, specifications and other documents that are not formal standards.

2.3.1 Out of scope

This document does not include standards:

- relating to clinical practices and workflows
- business practices and workflows relating to the operation of RACHs
- unrelated to the aged care sector
- all matters relating to compliance, policy or legislation (i.e., non-technical matters) and
- resident, relative or carer facing information channels.

Some standards might require localised or national infrastructure or specialised technical implementations. The provisioning of this infrastructure is not in scope for this project and needs to be considered when measuring the support for standards that depend on that infrastructure.

2.4 Overview

Standards create consistency and compatibility, support a single source of truth and enable interoperability. This document will be the basis of consultation and sector engagement and used as a tool to understand the standards favoured by software developers.

Efforts to standardise software systems aligns to the interoperability principles stated in the National Healthcare Interoperability Plan [Agency2023]. The sections in this document specifically touch on the following interoperability principles:

- health information is discoverable and accessible
- national healthcare identifiers are used across the healthcare sector
- national digital health standards and specifications are agreed and adopted
- core national healthcare digital infrastructure is used across the sector
- collaboration and stakeholder engagement underpins interoperability.

The process of standardising software systems needs to reflect the above interoperability principles for project success.

3 Methodology

The aim of the gap analysis is to identify publicly available specifications and standards. It will be a living document for the life of this project as consultations provide more content for this gap analysis.

An initial environment scan discovered over 100 potential standards pertaining to a RACH CIS. Analytics and subject matter expertise applied by the project team reduced the set of candidate technical standards to those identified in this document. Suitability centred on established or emerging standards that have a high adoption rate and enjoy popular support from the software developer community. Localised and free-to-access standards are preferred, and standards adopted by other government programs are also included to ensure silos are not formed.

These standards will be used as a basis for future requirements. This document will also highlight gaps and the potential for the co-development of future standards.

The methodology for the development of future standards and change and adoption activities for RACH CIS developers is not described in this document.

Approach

To support the development of the project scope, the Agency commissioned an environmental scan and literature review. The environmental scan outlined the use of clinical information systems standards in aged care. Further, the Agency engaged the Aged Care Industry Information Technology Council (ACIITC) to scope clinical systems that are used in aged and community care providers. ACIITC assessed the current state of digital maturity in aged and community care and developed resources to support improvement.

This gap analysis is based on the initial research completed as part of the project scope and a project-initiated environment scan. Consultations with subject matter experts also helped ascertain existing standards and gaps. The gap analysis has been expanded to include mandated government programs, frameworks, and plans. This information has been used to define priority areas and identify use cases for structured analysis.

User stories which are used in the gap analysis were validated by workshops which were held in conjunction with ACIITC during 2023. These were attended by over 30 representatives from across the aged care sector and included software developers, providers and clinicians.

The initial scoping suggested four logical categories of standards that can be applied to CIS to enable effective use of digital systems and the delivery of safe, high-quality care. These are clinical, technical, quality and useability. The categories are not mutually exclusive, and a standard may fall into more than one category. These four categories have been further described as on-screen display of clinical terms, payload formats for exchange, P2P information transportation, local controls, terminology codes sets and connections to national systems. The gap analysis maps known and relevant standards to these categories.

The gap analysis and environments scan will inform the development of the Aged Care CIS standard and recommended minimum requirements for clinical information systems used in residential aged care homes.

3.1 Definitions

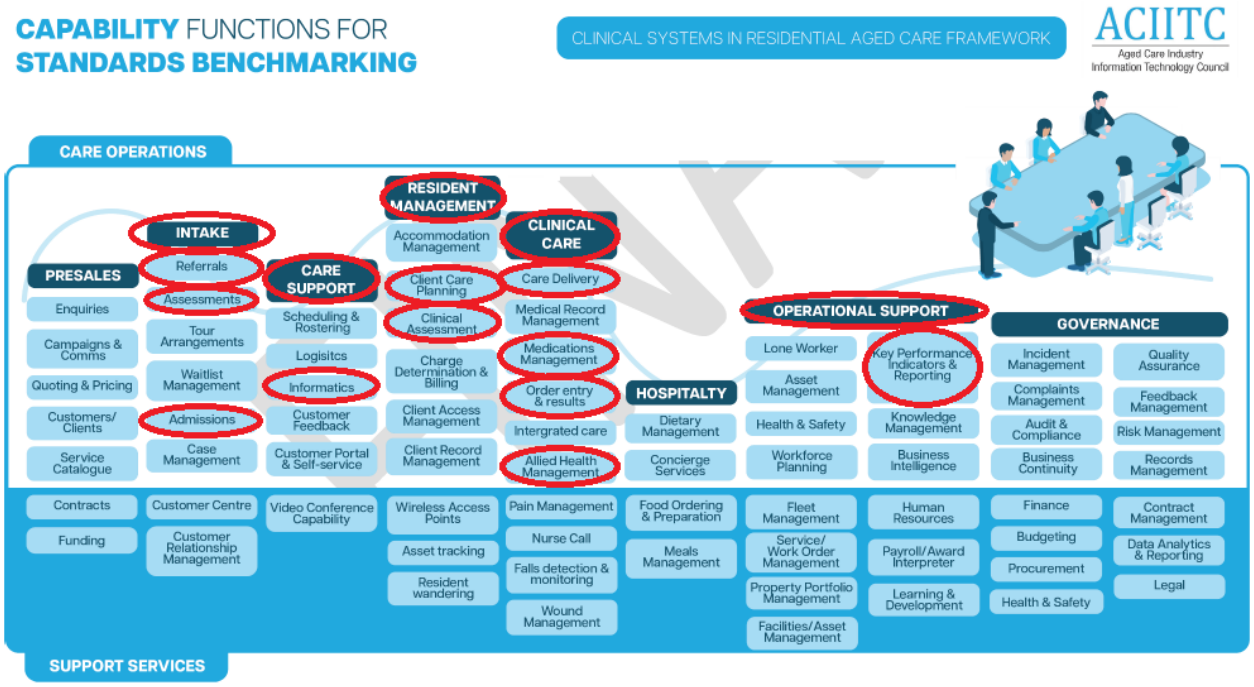
This document includes publications that may not be a formal standard but contribute to efforts towards standardisation. This includes frameworks, guidelines, specifications and other documents that are not formal standards. Software developers might support documents that are too high-level to be implementable. For example, a reference set may be well defined and ready for implementation, whereas a 'guideline' will be high level and may not be implementable. It is acknowledged that there might be work required to understand how a high-level framework can be implemented and might involve identifying specifications within that framework. Roadmaps will identify these instances. This document refers to the following types of documents:

Conformance	A determination of the adherence of an implementation to a specification or standard.
Framework	A system of rules, ideas, or beliefs that is used to plan or decide something.
Guideline	Information intended to advise people on how something should be done or what something should be.
Reference set	A reference set contains unique values that you can use in searches, filters, rule test conditions, and rule responses.
Requirement	An official rule about something that it is necessary to have or to do.
Specification	A detailed description of how something should be done, made etc.
Template	A preset format for a document or file.

4 Capability functions and framework

The project team reviewed the *clinical systems in residential aged care framework* [ACIITC2023] to understand the areas standards can impact the RACH sector. In 2021, ACIITC undertook a series of co-design workshops with RACHs to understand the type of information and the scope of clinical systems in residential aged care. These co-design activities aimed to seek expert input to the approach undertaken and resulted in the development of a capability and system architecture framework. The framework identified terminology and standards applied in the aged and community care sector concerning clinical software technology deployment and implementation.

The below graphic summarises the care operations that might be positively influenced through the adoption of CIS standards[2].



The research which informed the project scope suggested that there are multiple types of standards which can be applied to clinical information systems used in residential aged care homes and across the health sector. The work suggested the logical groupings assigned to standards are:

- Clinical
- Technical
- Quality
- Useability

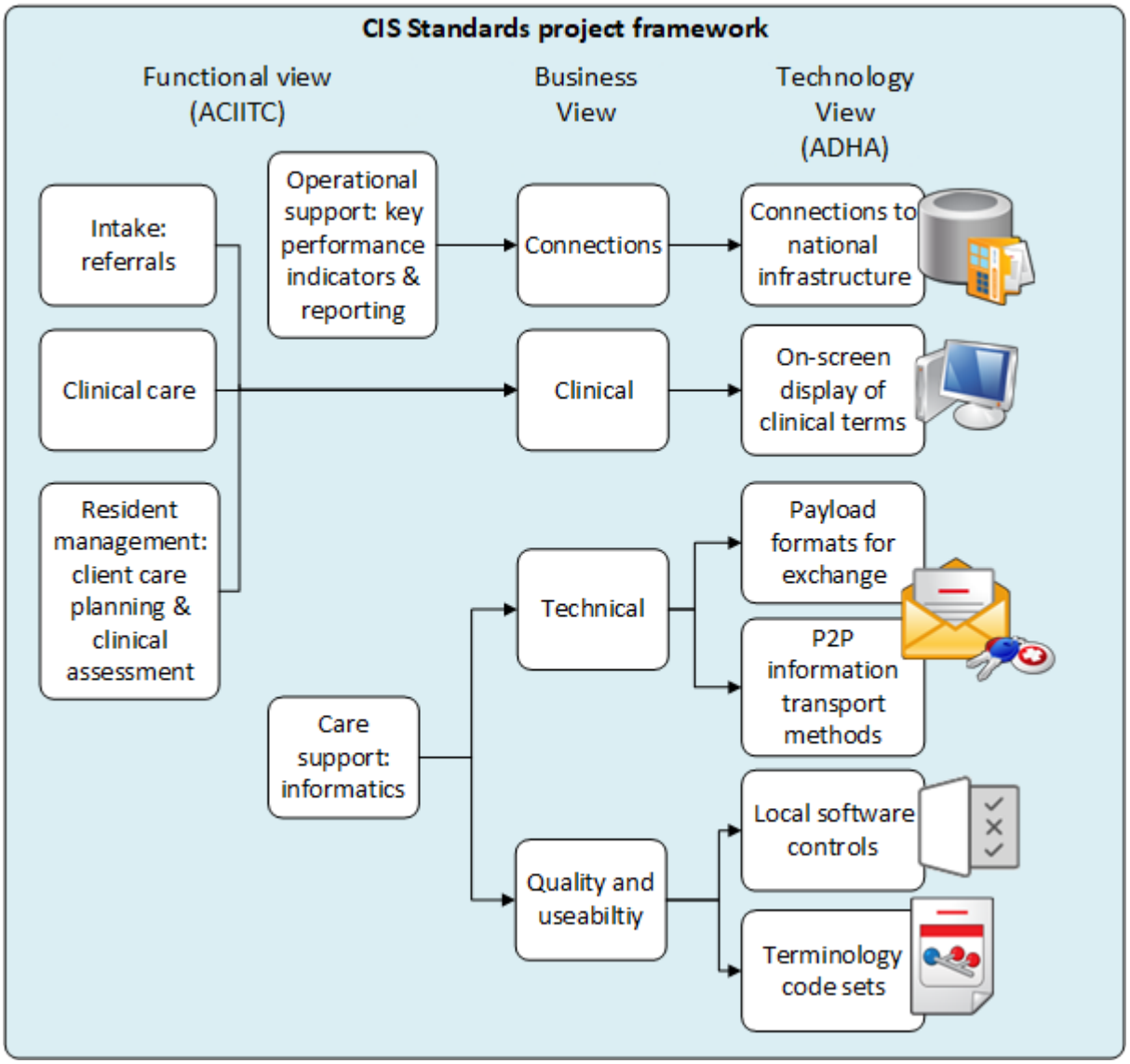
The project team has retained those groupings and added a fifth group in recognition of the direct reference to My Health Record in Recommendation 68:

- Connections to national systems

[2] Image provided by ACIITC. Red circles added by the Agency.

Combining the ACIITC *clinical systems in residential aged care framework* [ACIITC2023] with the high-level standards groupings above, the project team has derived the following framework for categorising the broad field of candidate standards applicable to RACH CIS are:

- connections (to national systems): e.g., My Health Record
- payload formats for exchange: e.g., FHIR
- P2P information transport methods: e.g., secure message delivery
- local software controls: e.g., local cyber security controls
- terminology code sets: e.g., SNOMED
- on-screen display of clinical terms: i.e., clinician facing language.



5 Environment scan of available and emerging standards

This section contains the results of an environment scan for existing and emerging standards that might apply to RACH CIS.

To provide structure to this section and future collaboration, this document uses the following categories:

- connections (to national systems): e.g., My Health Record
- payload formats for exchange: e.g., FHIR
- P2P information transport methods: e.g., secure message delivery
- local software controls: e.g., local cyber security controls
- terminology code sets: e.g., SNOMED
- on-screen display of clinical terms: i.e., clinician facing language.

These categories are introduced in section 4 and the meaning of each section is described in the relevant sub-sections below.

This section does not promote or nominate preferred standards but presents identified standards as candidates for consideration during future engagement. The future engagement will result in a document describing preferred standards the RACH CIS and eMM developers can implement.

The approach to the development of standards that are not yet available and the identification of change and adoption activities for RACH developers is not described in this document.

It is acknowledged that this document describes high-level frameworks that might have developer support but are not implementable without unpacking the various specifications within those frameworks. This document lists frameworks as discussion points with the intention of unpacking preferred frameworks as necessary.

This document preferences standards that are Australian or Australian based and freely available to software developers. Standards that are not Australian based or require license fees can be considered if there is developer support for those standards.

5.1 Electronic medication management systems

Recommendation 68 directly references electronic medication management systems (eMM) and therefore are within the scope of this document. The technical standards referenced in this document apply to software systems and software products and, where applicable, apply to electronic medication management systems, and not the documents or artefacts produced by these systems – specifically electronic medication charts. This document uses the following definitions:

- Electronic medication chart: often referred to as eNRMC, is the electronic representation of a medication chart that is used for the prescribing, dispensing and administration of medicines. The electronic medication chart is an electronic document that has legal recognition.
- Electronic medication management systems: the software system that creates and/or maintains electronic medication charts.

- Clinical information systems: often referred to as a patient management system (PMS), contain a broad range of clinical information for each patient or resident and is not restricted to just the electronic medication chart. A CIS may or may not also provide eMM functionality.

5.2 Connections to national systems

This section describes key government owned, operated or funded national systems a RACH CIS must or might connect to.

5.2.1 User story: sharing clinical information nationally

As healthcare provider, I want the RACH CIS to connect to key national systems, so I can share and view clinical information with residents' consent.

5.2.2 National systems

Name of system	System Operator	Priority
My Health Record	Australian Digital Health Agency	**Required**
Healthcare Identifier Service	Australian Digital Health Agency	**Required**
Aged Care Business-to-Government API Gateway	DoHAC	Optional
Australian Immunisation Register	DoHAC	Optional
National Prescription Delivery Service[3]	DoHAC	**Required for eMM**
National Real Time Prescription Monitoring system (RTPM)	DoHAC	Strongly recommended for eMM[4] Optional for CIS
Provider Connect Australia (PCA)	Australian Digital Health Agency	Optional
National Health Services Directory (NHSD)	Health Direct	Optional

Recommendation 68 references the My Health Record system and this implies connection to the Health Identifier (HI) Service. Onboarding processes to these national systems are already documented. Clearly articulated upgrade pathways to these national systems will be described in the co-designed road map to ease change and adoption activities for software not yet connected to those systems. On-boarding processes already exist for national systems and will be highlighted during change and adoption activities.

[3] The national e-Health service contracted by the Commonwealth or Agency that supports defined interfaces and services to facilitate the transfer of electronic prescriptions for persons and related information between participating systems.
[4] Connection to RTPM is a legislated requirement in some State and Territories.

5.3 Standard payload formats for exchange

Payload formats for exchange describe the structure of payloads and the types of data they must contain when exchanging payloads outside organisational boundaries or to other systems within the home (e.g., RACH CIS -> RACH eMM). These standards specify how to structure payloads that are to be exchanged so recipient systems will know how to make the payload content available for clinical use. See section 5.4 for standards relating to the transportation of a structured payload.

5.3.1 User story: sending a transfer summary

As a Registered Nurse, I want to use the CIS to send a transfer summary to another aged care home in a format that the system can understand, so the receiving staff won't need to transpose the transfer summary on receipt and risk losing important clinical information.

Available standards	Publisher	Type of document
Fast Health Interoperability Resources (FHIR)	HL7	Framework
Integrating the Healthcare Enterprise (IHE) collateral	IHE	Framework and profiles

5.3.2 User story: sending an electronic medication chart to a community pharmacy

User story: sending an electronic medication chart to a community pharmacy

As a Registered Nurse, I want to use the CIS or eMM to send a resident's electronic medication chart to a community pharmacy, so that pharmacy can dispense from the chart and courier medicines back to the aged care home.

Available standards	Publisher	Type of document
Electronic Prescribing Conformance Assessment Scheme	Australian Digital Health Agency	Conformance
Fast Health Interoperability Resources (FHIR)	HL7	Framework

5.3.3 User story: receiving a pathology report

As a Registered Nurse, I want to use the CIS to receive an electronic pathology report into the local patient record, so I can see if there are any alerts or abnormal results highlighted by the pathologist.

Available standards	Publisher	Type of document
Fast Health Interoperability Resources (FHIR)	HL7	Framework
HL7 v2	HL7	Specification
Integrating the Healthcare Enterprise (IHE) collateral	IHE	Profiles and frameworks

5.3.4 User story: sending clinical information to an eMM

As a General Practitioner, I want to use the RACH CIS to send clinical information (e.g., allergies) to the eMM system used by the same aged care home, so that clinical information is incorporated into the correct resident's medication chart.

Available standards	Publisher	Type of document
Fast Health Interoperability Resources (FHIR)	HL7	Framework
Integrating the Healthcare Enterprise (IHE) collateral	IHE	Profiles and frameworks

5.3.5 User story: receiving clinical notes from a GP clinic

As a Registered Nurse, I want to receive clinical notes stored in a visiting General Practitioner (GP) CIS electronically, so the notes can be added to the local patient record on receipt without retyping those clinical notes.

Available standards	Publisher	Type of document
Fast Health Interoperability Resources (FHIR)	HL7	Framework
Integrating the Healthcare Enterprise (IHE) collateral	IHE	Profiles and frameworks

5.3.6 Emerging standards

Name of document	Description
FHIR AU Core	AU Core defines the data model and RESTful API interactions that set minimum expectations for a system to record, update, search, and retrieve core digital health and administrative information associated with a patient

Name of document	Description
Primary Care Practice-to-Practice Terminology (FHIR)	FHIR specification in advance draft form and championed by CSIRO

5.3.7 De-scoped standards

These standards have been investigated but removed as candidate standards.

Name of document	Descope reason
TBD	

5.4 Standards for point-to-point information transport methods

P2P information transport standards facilitate data exchange between different health systems. They define transportation architectures, authentication methods, encryption standards and other concepts important for interoperability.

Different architectures are available (push/pull etc), and this section is as inclusive as possible.

5.4.1 User story: sending a transfer summary to another home

As a Registered Nurse, I want to use the CIS to send a transfer summary to another aged care home in a way that is safe and secure, so there is a high level of confidence the clinical document will reach the receiving organisation without interference.

Context	Available standards	Publisher	Type of document
Authentication	Provider Digital Access (PRODA)	Services Australia	Infrastructure
Push	Fast Health Interoperability Resources (FHIR) messaging	HL7	Framework
Pull	Fast Health Interoperability Resources (FHIR) subscriptions	HL7	Framework
	SMART on FHIR	HL7	Framework

User story: sending an electronic medication chart to a community pharmacy

As a Registered Nurse, I want to use the CIS or eMM to send a residents electronic medication chart to a community pharmacy, so that pharmacy can dispense from the chart and courier medicines back to the aged care home.

Context	Available standards	Publisher	Type of document
Authentication	Provider Digital Access (PRODA)	Services Australia	Infrastructure
Push	Fast Health Interoperability Resources (FHIR) messaging	HL7	Framework
	Electronic Prescribing Conformance Assessment Scheme	Australian Digital Health Agency	Conformance

User story: sending clinical information to an eMM

> As a Registered Nurse, I want to use the CIS to send clinical information (e.g., allergies) to the eMM system used by the same aged care home, so that clinical information is incorporated into the correct resident's medication chart.

Context	Available standards	Publisher	Type of document
Authentication	Provider Digital Access (PRODA)	Services Australia	Infrastructure
Push	Fast Health Interoperability Resources (FHIR) messaging	HL7	Framework
Pull	Fast Health Interoperability Resources (FHIR) subscriptions	HL7	Framework
Pull	SMART on FHIR	HL7	Framework

5.4.2 Emerging and Future standards

Name of document	Description
Secure Messaging	Defines a messaging solution that can be implemented by clinical information and secure messaging systems to enable secure, reliable, interoperable exchange of clinical documents between Australian healthcare providers.

5.4.3 Descoped standards

These standards have been investigated but removed as candidate standards.

Name of document	Descope reason
TBD	

5.5 Standards for local software controls

Local software controls refer to locally implemented software features that influence concepts such as privacy, clinical safety and cyber security standards. These standards establish administrative workflow and technical controls to protect sensitive health data, information systems and individual's privacy. Controls might influence workflows, security, audit logs, error messages, escalation pathways etc.

5.5.1 User story: data privacy and integrity

As a Registered Nurse, I want to ensure the CIS I use addresses concerns in the following domains:

- Privacy
- Cyber security
- Clinical Safety

So I have confidence that locally stored clinical information is safe, secure, private and fit for purpose.

Available standards	Publisher	Type of document
Information Security Manual, specifically: - Guidelines for Software Development - Guidelines for Cryptography - Guidelines for Database Systems	Australian Signals Directorate	Requirements
Security requirements for My Health Record connecting systems	Australian Digital Health Agency	Conformance
Electronic Prescribing Conformance Assessment Scheme	Australian Digital Health Agency	Conformance
Minimum requirements for clinical information systems	RACGP	Guidelines
eNRMC software vendor information resource	ACSQHC	Guidelines
eNRMC template	ACSQHC	Template
Electronic Medication Management Systems: A Guide to Safe Implementation	ACSQHC	Guidelines

5.5.2 User story: visiting healthcare providers

As a visiting healthcare provider, I want temporary access to the RACH CIS or eMM, so I can add clinical notes to a patient record in a way that is safe and controlled.

Available standards	Publisher	Type of document
None identified (see section 5.5.4)	N/A	N/A

5.5.3 User story: required reporting

As a manager of an aged care home, I want to ensure the CIS or eMM I use can satisfy my reporting needs, so I can deliver safe and efficient healthcare and meet legal requirements around mandatory quarterly reports.

Available standards	Publisher	Type of document
National Aged Care mandatory quarterly reports	DoHAC	Specification(s)

5.5.4 Future standards

Description
Guidance to software developers on best way to support clinical workflows for visiting and temporary healthcare providers.

5.5.5 Descoped standards

These standards have been investigated but removed as candidate standards.

Name of document	De-scope reason
AS/NZS ISO/IEC 27001:2023 - information security, cyber security and privacy protection — Information security management systems — Requirements	Information Security Manual (see above) is government sponsored and freely available so is referenced instead of ISO documents.
HB 174-2003 – Information security management – implementation guide for the health sector (for AS/NZS 17799:2001)	Relates to healthcare organisations (compliance) and not software developers (technical conformance)

5.6 Standards for terminology code sets

Standards in this category describe code sets and reference sets that reflect important health concepts. The adoption of universal code sets supports universal application of on-screen clinical terms (see section 5.7), the content within payloads used for exchange (see section 4.3), aids in secondary use research programs and enables other systems to ingest information for re-use (i.e. enables interoperability).

This section lists available standards that might be applied in a range of different contexts such as within the graphical user interface (GUI), within a clinical payload and within reports. Consultation will be required to determine which standard is applicable in different contexts. This consultation may be shaped by the outcomes of section 5.7 and 5.3.

5.6.1 User story: consistent application of GUI elements

As a Registered Nurse, I want the CIS user interface to contain controls that enforce consistent language and definitions across different systems, so I can move between systems and digest clinical content quickly.

5.6.2 User story: consistent language in clinical information

As a Registered Nurse, I want the printed and electronic clinical documents I receive from other aged care homes to contain familiar language and clinical terms, so I can locate and digest clinical information quickly and consistently.

5.6.3 User story: safe ingestion of clinical information

As a Registered Nurse, I want electronic clinical notes received from other healthcare providers to apply consistent language and definitions, so information can be ingested into the local patient record in a safe and accurate way.

Available standards	Publisher	Type of document
SNOMED-CT AU & AMT	IHTSDO/Australian Digital Health Agency	Reference sets
NCTS FHIR Code Systems	National Clinical Terminology Service	Reference sets
Aged Care National Minimum Data Set (NMDS)	AIHW	Specification
Medical Benefits Scheme	DoHAC	Reference sets
National quality use of medicines – glossary	DoHAC	Guidelines
Pharmaceutical Benefits Scheme	DoHAC	Reference sets

Available standards	Publisher	Type of document
RCPA Standardised Pathology Informatics In Australia (SPIA)	Royal College of Pathologists of Australia	Reference sets
LOINC	Regenstrief Institute	Reference sets
ICD-10 & 11	World Health Organization (WHO)	Reference sets
Real time prescription monitoring	Various	Reference sets

A better understanding of the necessary clinical content is required before the relevance of the above standards can be determined (see section 5.7). Terminology mapping tables between code sets are intentionally omitted but are an essential element of change and adoption road maps.

5.6.4 Emerging standards

Name of document	Description
Primary Care Practice-to-Practice Terminology (FHIR)	FHIR specification in advance draft form and championed by CSIRO
Australian Core Data for Interoperability (AUCDI)	A standardised set of health data items and constituent data elements

5.6.5 De-scoped standards

These standards have been investigated but removed as candidate standards.

Name of document	Descope reason
TBD	

5.7 Standards for on-screen display of clinical terms

Standards in this category influence how clinical terms, languages, and vocabularies are presented to clinicians in the RACH CIS and eMM systems. The contents of electronic medical records (EMR) supported by CIS are wide and varied with inconsistent application of clinical terminology presented to clinicians. This document approaches this subject in two parts:

- Standards for sections within a resident's electronic medical record.

  These standards will articulate the minimum mandatory and optional sections a CIS needs to support for the resident's electronic medical record. A section is a high-level grouping of related information e.g., 'weight management' or 'vital signs'. These are sometimes called 'entities'. The section carries no clinical information by itself but helps organise the electronic medical record into logical groups for easy reading. Sections might be represented as tabs or forms within the CIS. Standards describing sections might also describe the order or sequence of presentation of each section within the resident's record.

- Standards for clinical terms within electronic medical record sections.

  These standards describe mandatory and optional clinical information appropriate for each section. The standards will describe the clinical information expected as well as the language to be used for that clinical information.

  Example:

Allergy		← Section
	Reaction type	← clinical data item
	Date of reaction	← clinical data item

Given there are no current standards that describe 1) the minimum set of sections each EMR should contain and 2) the clinical information relevant to each section, the below is a list of known standards that might be applicable once points 1 and 2 are better understood.

5.7.1 User story: consistent application of GUI elements

As a Registered Nurse, I want the CIS user interface to contain controls that enforce consistent language and definitions across different systems, so I can move between systems and digest clinical content quickly.

Available standards	Publisher	Type of document
Aged Care National Minimum Data Set (NMDS)	AIHW	Specification
National Aged Care Data Clearinghouse (NACDC)	AIHW	Report
National residential medication chart (eNRMC)	ACSQHC	Template

Available standards	Publisher	Type of document
National Guidelines for On-Screen Display of Medicines Information	ACSQHC	Specification
Electronic Prescribing Conformance Profile	Australian Digital Health Agency	Requirements
National Aged Care mandatory quarterly reports	DoHAC	Template
Medication management in residential aged care facilities – guiding principles	DoHAC	Guidelines
Aged Care Plan (MHR)	Australian Digital Health Agency	Specification
Aged Care Transfer Summary (MHR)	Australian Digital Health Agency	Specification
Shared Health Summary (MHR)	Australian Digital Health Agency	Specification
International Patient Summary Implementation Guide (FHIR)	HL7	Specification
SNOMED-CT AU & AMT	IHTSDO/Australian Digital Health Agency	Reference sets

A better understanding of the necessary clinical content is required before the relevance of the above standards can be determined. The application of standard terminology code sets (see section 5.6) is also likely to impact clinician facing language.

5.7.2 Emerging standards

Name of document	Description
Primary Care Practice-to-Practice Terminology (FHIR)	FHIR specification in advance draft form and championed by CSIRO
Australian Core Data Set for Interoperability (AUCDI)	A standardised set of health data items and constituent data elements
National Best Practice Data Set (AIHW)	Metadata set for health data that is recommended for collection by agencies and organisations

5.7.3 Future standards

Description
A specification that describes mandatory and optional sections in a resident's electronic medical record (e.g., allergies, vital signs, weight management etc.) and the mandatory and optional data items relevant to each section, for example: **Allergies** • Substance • Reaction type • Date of reaction

5.7.4 De-scoped standards

These standards have been investigated but removed as candidate standards.

Name of document	Descope reason
TBD	

6 Descoped organisations

These organisations have been investigated but have been de-scoped from this project. The Agency can include the below standards as candidates if they are preferred by software developers.

Name of document	Descope reason
National Institute of Science and Technology (NIST)	No standards for healthcare.
ISO standards (general)	Difficult to access due to paywall.
IEEE standards (general)	Content is not localised to Australia. Difficult to access due to paywall.

Acronyms

Acronym	Description
ACIITC	Aged Care Industry Information Technology Council
ACSQHC	Australian Commission on Safety and Quality in Health Care
AIHW	Australian Institute of Health and Welfare
AMT	Australian Medicines Terminology
API	Application Programming Interface
AUCDI	AU Core Data Set for Interoperability
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CIS	Clinical information system
DoHAC	Department of Health and Aged Care
eMM	Electronic medication management
EMR	Electronic Medical Record
eNRMC	Electronic National Residential Medication Charts
FHIR	Fast Healthcare Interoperability Resources
GP	General Practitioner
GUI	Graphical user interface
HI	Healthcare Identifier
HL7	Health Level Seven International
ICD-10	For coding mortality (cause of death)
ICD-10-AM	AM for coding of diseases and related health problems in hospitals (morbidity).
ICD-11	The reporting of mortality and morbidity into one classification. It replaces ICD-10/ICD-10-AM
IEEE	Institute of Electrical and Electronics Engineers
IHE	Integrating the Healthcare Enterprise
ISO	International Organization for Standardisation
IHTSDO	International Health Terminology Standards Development
LOINC	Logical Observation Identifiers Names and Codes
MHR	My Health Record
NACDC	National Aged Care Data Clearinghouse
NCTS	National Clinical Terminology Service
NHSD	National Health Services Directory

Acronym	Description
NIST	National Institute of Science and Technology
NMDS	Aged Care National Minimum Data Set
P2P	Point-to-point
PCA	Provider Connect Australia
PMS	Practice Management Software
PRODA	Provider Digital Access
RACGP	Royal Australian College of General Practitioners
RACH	Residential Aged Care Home
RTPM	National Real Time Prescription Monitoring System
SDO	Standards Development Organisation
SNOMED CT	Systematized Nomenclature of Medicine – Clinical Terms
SPIA	Standardised Pathology Informatics in Australia
WHO	World Health Organisation

Glossary

Term	Meaning
Approved provider	An organisation approved under Part 7A of the Aged Care Quality and Safety Commission Act 2018 (Cth) to receive subsidies from the Australian Government for providing home care, residential aged care or flexible care services, or a combination of these.
Clinical Information System	A system that deals with the collection, storage, retrieval, communication and optimal use of health-related data, information, and knowledge. A clinical information system may provide access to information contained in an electronic health record, but it may also provide other functions such as workflow, order entry, and results reporting. A CIS may also serve the roll, or have similar features to, an electronic medicines management system.
Conformance	A determination of the adherence of an implementation to a specification or standard.
Digital Care Management System	A technology-driven solution designed to streamline and enhance the management of care services. It encompasses various functionalities, including scheduling, communication, care planning, and documentation.
Electronic Medicines Management System	The utilisation of electronic systems to facilitate and enhance the communication of a prescription or medicine order, aiding the choice, administration and supply of a medicine through knowledge and decision support and providing a robust audit trail for the entire medicines use process. Also see Clinical Information System.
eNRMC template	A set of guidance documents to support the safe implementation of Electronic National Residential Medication Chart (eNRMC) medication management systems in residential care facilities. Also see https://www.safetyandquality.gov.au/our-work/medication-safety/electronic-medication-charts/electronic-national-residential-medication-chart.
Framework	A system of rules, ideas, or beliefs that is used to plan or decide something.
Guideline	Information intended to advise people on how something should be done or what something should be.
Payload	The part of transmitted data that is the actual intended message.
PRODA	An online identity verification and authentication system operated by Services Australia.
Reference set	A reference set contains unique values that you can use in searches, filters, rule test conditions, and rule responses.
Requirement	An official rule about something that it is necessary to have or to do.
Specification	A detailed description of how something should be done, made etc.
Secure Messaging	Defines a messaging solution that can be implemented by clinical information and secure messaging systems to enable secure, reliable, interoperable exchange of clinical documents between Australian healthcare providers.
Standard	Standards are voluntary documents that set out specifications, procedures and guidelines that aim to ensure products, services, and systems are safe, consistent, and reliable.
Template	A preset format for a document or file.

References

ACIITC2023 *Residential Aged Care Facilities Use of Clinical Care Software: Final Report*, Aged Care Industry Information Technology Council, 2023

AGENCY2023 *National Healthcare Interoperability Plan 2023 – 2028,* Australian Digital Health Agency, 2023

AIHW2023 *Aged Care National Minimum Data Set 2023-24*, Australian Institute of Health and Welfare, 30 June 2023

COMM2020 *Final Report: Care, Dignity and Respect Volume 1 Summary and Recommendations,* Royal Commission into Aged Care Quality and Safety 2023

Appendix A Principles & Quality Statements

The Agency co-designed Principles and Quality Statements to articulate the benefits of a clinical information system used in a residential aged care home that meets recommended minimum requirements. This appendix describes the outcomes of that collaboration.

6.1 Background

Principles and quality statements have been developed to provide a high-level summary of minimum requirements for an effective residential aged care home CIS.

A co-design process has been used to ensure that the aged care sector has been engaged in finalisation of the principles and the development of the quality statements. Representatives were invited to co-design workshops from across the aged care sector, including government bodies, jurisdictions, primary health networks, software developers, aged care providers, clinicians, Agency digital health advisors and consumer representatives.

Over 130 people attended the workshops. A follow up survey with a 43% response rate outlined that the responses to the workshops and quality statements were generally positive.

- 88% of workshop attendees said that the workshop they attended was “good” or better.
- Over 90% of respondents said that they understood what a quality statement was after reviewing the draft, and over 80% said that they agreed that the language used in the drafts was “clear and concise”.

6.2 Principles

The principles have been developed as part of Phase 1 of the project. The principles help to communicate the benefits to the aged care sector and support the understanding of why adhering to standards is important.

The five principles resulting from consultation are:

- Data is reliable, consistent, computable and contemporary.
- Data can be seamlessly shared between systems, care settings and organisations.
- Data is accessible and transparent and drives improved consumer choice and decision-making.
- Data drives efficient and safe clinical decision-making and positively impacts the end user experience.
- Data is captured once, retains its original meaning, and can be used securely many times as appropriate.

6.3 Quality Statements

Quality statements provide high level guidance to the aged care sector about what is required from clinical information systems used in residential aged care.

In a healthcare setting, quality statements refer to concise and measurable declarations that describe the expected standard of care and desired outcomes for patients in a specific context. Quality statements serve as a benchmark for guiding, evaluating, and improving the quality of

health care services. The quality statements listed below were developed during co-design workshops.

Clinical Information systems used in RACHs should demonstrate the following quality statements:

- Connectivity
    - Enable clinical information to be shared with My Health Record (MHR)
    - Enable data to be shared between systems, care settings and organisations to support access to accurate and timely information and support safe clinical handover.
    - Support usable structured data entry and the use of standard national terminology.
    - Support interoperability by using national healthcare identifiers for providers, organisations and individuals.
    - Support collection of information and data for reporting requirements.

- Clinical care and care support
    - Ensure accurate electronic medication records and use of nationally standardised electronic medication charts and conformant electronic National Residential Medication Chart systems.
    - Ensure members of a RACH care team can access residents' health records and other important information digitally to support clinical decision making.
    - Incorporate clinical decision making and decision support that re-enforces good clinical practice to prevent incidents and errors.

- Information security/patient data
    - Adhere to Australian Privacy Principles to ensure privacy and confidentiality.
    - Ensure business continuity and disaster recovery plans are supported via back up mechanisms and other data protection functions.
    - Ensure access control and identity management systems align with industry standards.
    - Ensure industry standard cyber security controls are used to protect patient data.
    - Promote system interoperability between healthcare organisations through the adoption of industry standards.
    - Ensure transmission of data between healthcare organisations is safe and secure.

- Residents and family
    - Provide channels for the sharing of information with residents and authorised representatives who wish to access information about health status, change in care needs, care planning and general activities.

Additional resources

Aged Care National Minimum Data Set, Aged Care NMDS

Business to Government developer portal, Organisation registration (health.gov.au)

Electronic Medication Management Systems: a Guide to Safe Implementation, Australian Commission on Safety and Quality in Health Care, 2019

Electronic National Residential Medication Chart, https://www.safetyandquality.gov.au/our-work/medication-safety/electronic-medication-charts/electronic-national-residential-medication-chart

Electronic Prescribing, Electronic Prescribing - Technical Framework Documents v3.4 | Digital Health Developer Portal

Government Provider Management System (GPMS), Government Provider Management System (GPMS) | Australian Government Department of Health and Aged Care

Health National Best Practice Data Sets, Data set specifications (aihw.gov.au)

Health National Minimum data sets, Data set specifications (aihw.gov.au)

Healthcare Identifiers Service, Healthcare Identifiers Service (HI Service) | Digital Health Developer Portal

IHE International, Integrating the Healthcare Enterprise (IHE) - IHE International

Medication management in residential aged care facilities – guiding principles, Department of Health and Aged Care, 2022

My Health Record, My Health Record B2B Gateway | Digital Health Developer Portal

NACDC User Guide, NACDC User Guide

National Guidelines for On-Screen Display of Medicines Information, Australian Commission on Safety and Quality in Health Care, 2017

RACGP aged care clinical guide (Silver book), Royal Australian College of General practitioners, August 2023