Clinical Information System and Electronic Medical Record Application and Interoperability Standard



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| Digital Health StandardAugust 2018 |

Department of Health

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| Clinical Information System and Electronic Medical Record Application and Interoperability Standard Digital Health StandardAugust 2018 |

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# Version control and reviews

### Version control

The following table identifies some basic information about this document:

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Issue Date | Author | Comments  |
| 3.2 | 08/08/2018 | Health Sector Standards & Advisory – HSSA. (Formerly Health Design Authority). | Re-design & redevelopment of contents into a new template, with new sections and general updates. |
| 3.0 | 13/11/2012 | Health Sector Standards & Advisory. | Updates |
| 1.0 | 29/10/2012 | Health Sector Standards & Advisory. | Final |

### Quality reviews

The following table identifies the reviews conducted prior to the release of this document:

| Version | Date | Name | Action |
| --- | --- | --- | --- |
| 3.2 | August 2018 | Sector Design Standards Reference Groups (SDSRG) | Review and feedback. |
| 3.2 | August 2018 | Health Sector Standards and Advisory. | Review and update. |

### Referenced artefacts / publications

The following table identifies the various artefacts/publications referenced or considered in this

document:

| Document Name | Owner /Author | Comments |
| --- | --- | --- |
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### Endorsements and approvals

This document has been endorsed and approved for publication by Standards and Advisory, Digital Health, Department of Health and Human Services

# Standards overview

This Standard defines the minimum set of functional requirements for any implementation of Clinical Information Systems and Electronic Medical Record by health services in the Victoria Public Health Sector. They are a base set of interface, terminology and functions that enable interoperability within and external to a health service.

The standard will enable health service EMR and CIS applications to integrate with current and emerging national digital health services such as My Health Record, the HI service, national electronic transfer of prescriptions.

Prior to this standard, the department (i.e. DHHS) has spent many years delivering standard and guides to the Victorian Public Health Sector (VPHS) which not only supports interoperability within the state in the current environment, but positions health services to better receive and implement national initiatives, like My Health Record.

The standard includes both mandatory and optional requirements.

The mandatory requirements cover the categories of Terminology, Interfacing, ADHA, localisation to Australian and Victorian requirements and functional requirements, while the optional/future requirements cover the categories of terminology, ADHA and functional requirements.

# Introduction

## Digital Health Branch

The Digital Health branch led by the Chief Digital Health Officer reports to the Deputy Secretary of Health and Wellbeing. As a branch in the Health and Wellbeing division, Digital Health collaborates closely with a wide range of stakeholders across the department, sector agencies and other jurisdictions to perform the following functions:

* Provides engagement, standards, policy advice, planning and assurance functions across the health sector in the areas of digital health
* Is responsible for the system management required to operationalise health sector reform
* Provides outward-facing whole of health sector leadership in digital health enablement as well as commissioning of digital health and ICT functions
* Maintain a close working relationship with other branches of the division which has the levers, relationships and responsibilities across the health system to ensure digital projects are properly governed, resourced, and ensure all risks are well managed
* Guides health ICT initiatives towards an interoperable future eHealth environment using well-established standards, best practice guides, methodologies and principles

Digital Health utilises the people, process and technology components, with a strong emphasis on transformational change elements when implanting new health systems and workflow processes.

Digital Health focus on four areas:

1. Digital Health strategy, policy and architecture standards for the Victorian health sector.
2. Commissioning of digital health functions within Victorian public health services.
3. Sponsoring digital health programs to implement sector-wide health information sharing platforms including those at a national level (to which Victoria contributes) as well as sector-enabling capabilities sponsored by DHHS.
4. Health service system management function including sector assurance (e.g. major program, operations and cybersecurity).

Digital health program areas include:

* Health Sector Standards and Advisory which provide information on emerging health technologies, feasibility, architecture, design and integration.
* Sector Assurance which provides assurance on all approved health service projects funded or co-funded by the government to ensure health services operate safely, securely and cost-effectively.
* Sector Governance and Reporting which provides governance and reporting on the system manager function and the overall digital health branch function.
* Health Sector Planning which provide planning and pipeline management for the health sector, managing concept proposals, business bases, funding bids and subsequently funding allocation and funding agreements.

Health Sector Standards and Advisory (HSSA) is committed to open, independent and best practice view of healthcare Information and Communication Technology (ICT), application solution principles. HSSA can provide recommendations to the overarching enterprise application design and associated services to integrate healthcare applications. For this guide, HSSA will:

* Deliver guides and advice around interoperability across healthcare applications
* Define messaging standards for Victorian health applications
* Facilitate a higher level of integration knowledge and associated quality processes in the Victorian health sector

Align innovation, efficiencies and effective use of ICT within health to encourage and drive standards-based approaches that encourage a high level of interoperability.

## Background

Australian Digital Health Agency (Formerly National eHealth Transition Authority) has worked over many years to deliver a suite of national eHealth services in conjunction with technology partners. The services include:

* My Health Record (Formerly Personally Controlled Electronic Health Record -PCEHR)
* The Healthcare Identifiers (HI) Service, supporting access to national identifiers for patients, healthcare provider organisations (i.e. health services) and healthcare provider individuals (i.e. clinicians).
* Electronic Transfer of Prescriptions (eTP) – delivery pending[[1]](#footnote-2)
* The National Authentication Service for Health (NASH)

In addition, specifications or standards have been released to support:

* Secure message delivery
* The Endpoint Locator Service (ELS)
* A variety of clinical documents in HL7 CDA v3 format, including
	+ Discharge Summary
	+ Electronic Referral
	+ Shared Health Summary
	+ Event Summary
	+ Specialist letter.

The department (i.e. DHHS, Victoria) has spent many years delivering standards and guides to the Victorian Public Health Sector (VPHS) which not only supports inter-operability within the state in the current environment, but positions health services to better receive and implement national initiatives, like My Health Record. It has been well noted by ADHA that the work that Victoria has undertaken over the past five years through the Digital Health branch (Formerly Office of the Chief Information Officer (OCIO)) has provided an excellent foundation for better national inter-operability.

Some of these standards and guides include:

* Digital Health Unified Standard[[2]](#footnote-3)
* National pathology and Radiology catalogues
* Solution design architecture documentation
* Medications catalogues and design principles localised to the Victorian health care environment.

More information on ADHA and Victorian standards can be found at:

* https://www.digitalhealth.gov.au/
* <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/digital-design-unified-standard>
* [www.standards.org.au](http://www.standards.org.au)
* https://www2.health.vic.gov.au/hospitals-and-health-services/data-reporting/health-data-standards-systems
* https://www2.health.vic.gov.au/hospitals-and-health-services/planning-infrastructure/health-design-authority

Health Sector Standards and Advisory (HSSA) is currently engaged to help a number of Victorian public health services looking to implement new clinical information systems, typically with Electronic Medical Records (EMR) capability.

While health services are more than capable of determining functional requirements for their future Clinical Information Systems (CIS) solution, they may have less exposure to the new and future national requirements. HSSA can assist with identifying these requirements for the EMR/CIS which will enable integration with national eHealth services such as My Health Record, Health Identifier (HI) Service and national electronic transfer of prescriptions (ETP).

This document includes a list of high level principles and representative requirements that should be included in any tender for a CIS and EMR or similar.

## Purpose

The purpose of this standard is to specify the minimum requirements for the implementation of CIS and EMR by health services, to enable integration with national eHealth services such as My Health Record, the HI service, national electronic transfer of prescriptions (ETP) and other state solutions.

Health services should use this standard as a guide and include it as part of their initial requirements to acquire eHealth services solutions.

## Assumptions

The assumptions for this standard are as follows:

* Health services use the most recent and approved versions related to specific categories (i.e. SNOMED CT-AU) and is updated monthly.
* Where Health services are unable to comply with the standard, they will have a roadmap for their EMR/CIS applications to work towards compliance with this standard.

## Scope

### In Scope

This standard includes a base set of:

* Interfacing
* Clinical Terminologies
* EMR functionality that enable interoperability within and external to a health service.

## Audience/Stakeholders

This include:

* Victoria Public Health Services
* Digital Health branch
* DHHS Health Sector Projects
* DHHS Health Technology Solutions

# Principles and Standards

The following material defines the minimum set of standards that are to be adopted for an EMR/CIS implementation. They are a base set of interface, terminology and functions that enable interoperability within and external to a health service. This is a minimum set of functional requirements for any implementation. This standard supports the implementation of the VPHS Reference Architecture in the category of EMR – see below:

Figure 1: VPHS Reference Architecture - EMR



##

## Mandatory

The following have been identified as mandatory minimum requirements to implement an EMR/CIS. It also includes a column, to indicate level of compliance by each agency. Level of compliance is based on agency’s own judgement and not a universal rating. A guide to the compliance rating is as below:

**1: None or Low compliance 2: Partial compliance 3: Compliant**

| **Category** | **Sub Category** | **Description** | **Notes** | **Agency Compliance Rating (1 – 3)** |
| --- | --- | --- | --- | --- |
| Terminology | Pathology and Imaging | Common pathology and imaging results and orders catalogues have been created by Victorian Public Health Sector (VPHS). These catalogues are to be used as the base set of terminology for pathology and imaging results and orders.<https://www2.health.vic.gov.au/hospitals-and-health-services/planning-infrastructure/health-design-authority/catalogues-guides>In addition to this base set of terminology, additional provision should be enabled to exchange local pathology results and order, by using a standard such as LOINC. Logical Observation Identifiers Names and Codes (LOINC) is the international standard for identifying health measurements, observations, and documents. https://loinc.org/ |  |  |
|  | Diagnosis and Procedure codes | A common national set of diagnosis and procedure terminology is to be used for clinical diagnosis and procedure codification. The accepted national and Victorian standard is SNOMED-CT. https://www.digitalhealth.gov.au/news-and-events/news/snomed-ct-au-and-australian-medicines-terminology-amt-august-2017-release |  |  |
| Provider Directory | NHSD | The National Health Services Directory. The product must use the content from the NHSD for general practitioner, specialist and allied health information.https://www2.health.vic.gov.au/about/publications/policiesandguidelines/Governance-and-the-use-of-National-Health-Service-Directory-datahttps://about.healthdirect.gov.au/nhsd |  |  |
| Interfacing | HL7 Standards for application to application Interfacing | Alignment and adoption with the Digital Health HL7 Guidelines and code sets: “Digital Health Unified Implementation Standard”.https://www2.health.vic.gov.au/hospitals-and-health-services/planning-infrastructure/health-design-authority/catalogues-guidesWhere the above Standard do not apply, adherence at a minimum to HL7 v2.4 Australian Standards is required.This information also provides standard codes and details on Medication Order interfaces to a local Pharmacy application, Orders interfaces to diagnostic services, Discharge Summaries to General Practitioners and Specialists. This includes sending prescription orders to external Prescription Exchange Services. |  |  |
|  | Medication Orders | Where a medication interface is required, the interface should conform to the Digital Health standard as a baseline: “Medications Interfacing Specification”. Variations to the guides are to be performed in consultation with the Digital Health – Health Sector Standards and Advisory. | Attachment providedOrders.zip |  |
|  | Orders | Pathology, Imaging and medications interoperability for orders to follow the Digital Health Unified Implementation guide and standard as a baseline: https://www2.health.vic.gov.au/about/publications/policiesandguidelines/digital-design-unified-standardWhere the Digital Health Unified Implementation guide and standard do not apply, there should be adherence at a minimum to HL7 v2.4 Australian Standards.This information also provides standard codes and details on Medication Order interfaces and Orders interfaces.Variations to the guides are to be performed in consultation with the Digital Health - Health Sector Standards and Advisory. |  |  |
|  | Patient Registration, and details updates | Patient registration details and identifiers are allocated by the PAS system, as the master. Bi-directional patient details updates across applications is not endorsed practice.  |  |  |
| ADHA | IHI | Individual Healthcare Identifiers specifications. Capability to store the national IHI. General capability to link and store several national and local patient identifiers |  |  |
| Localisation to Australian and Victorian requirements | Reporting | Victorian regulatory and statutory reporting requirements where relevant, e.g. VEMD, VAED, VINAH, ESIS |  |  |
|  | PBS | Must support Australian PBS and Victorian Reform PBS regulatory requirements.<http://www.pbs.gov.au/pbs/home>  |  |  |
|  | ICD-10-AM | Must support ICD-10-AM (with incorporated ACHI procedure information) and future ICD versions that are endorsed for use in Victoria. Victoria has a specific adaptation of the Australian Standards ICD-10-AM terminology including an Emergency Department subset for diagnosis codes. Support for the Australian Standard and the Victorian modification is required.https://www.accd.net.au/icd10.aspx |  |  |
|  | CMBS | Must support CMBS codes for emergency and surgery functionality. The application must align with SNOMED-CT-AU where this terminology is leveraged. |  |  |
| Functional | Clinical modules | Providing functions to support clinical care such as diagnosis, treatment, closed-loop medication management, real-time decision support and alerts. This must include access to historical clinical information such as scanned paper documents and other unstructured data. The clinical modules must also generating discharge summaries, . |  |  |
|  | Specialist modules | Includes support for specialised clinical-care processes, such as modules to manage dialysis, cardiology or transplantation surgery patients. These modules may also include extended support for clinical research. | Capability for the EMR to service clinical areas |  |
|  | Administration | Providing functions to support patient management in order to support interoperability with a Patient Administration System or this standalone capability where this is integrated with the CIS. The EMR must support down time patient registration processes, if the PAS is not available in an outage. |  |  |
|  | Ordering | Pathology, Imaging and medication orders are to be initiated/managed from the EMR or the associated diagnostic system when there is no EMR in place. Orders should not be initiated from other applications, e.g. An independent Emergency department system.For more information, please refer to the Application Solution Design, or consult with the Digital Health - Health Sector Standards and Advisory.https://www2.health.vic.gov.au/hospitals-and-health-services/planning-infrastructure/health-design-authority/catalogues-guides | Where ordering is implemented, mandatory |  |

## Currently optional / Future capability for alignment

The following key minimum requirements have been identified for EMR/CIS as additional capabilities to support enhanced interoperability. It also includes a column, to indicate level of compliance by each agency. Level of compliance is based on agency’s own judgement and not a universal rating. A guide to the rating are:

**1: None or Low compliance 2: Partial compliance 3: Compliant**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Category** | **Sub Category** | **Description** | **Mandatory/Non** | **Agency Compliance Rating (1 – 3)** |
| Terminology | AMT | The AMT is a comprehensive national catalogue.https://www.digitalhealth.gov.au/news-and-events/news/australian-medicines-terminology-amt-v3-model-release | Mandatory future requirement3-4year adoption timeframe |  |
|  | Medications | A common set medication orders terminology has been created by the VPHS. This information is currently under review for appropriate use as the base for medication orders terminology | This may become a mandatory future requirement |  |
| ADHA | ETP | Capability to support ADHA ETP  | Highly desirable requirement |  |
|  | eReferral | Ability to send and receive an ADHA conformant CDA eReferralhttps://www.digitalhealth.gov.au/implementation-resources/clinical-documents/ereferral | Mandatory future requirement3-4year adoption timeframe |  |
|  | Discharge Summary | Ability to send an ADHA conformant CDA Discharge Summaryhttps://www.digitalhealth.gov.au/implementation-resources/clinical-documents/discharge-summary (self-registration required) | Mandatory future requirement2-3year adoption timeframe for Level 2 and 3 |  |
|  | Shared Health Summary Details | Ability to send and receive ADHA conformant CDA Shared Health Summaries (General practice, specialists and community systems)https://www.digitalhealth.gov.au/using-the-my-health-record-system/how-to-use-the-my-health-record-system/uploading-a-shared-health-summary | Mandatory future requirement3-4year adoption timeframe |  |
|  | My Health Record (MHR) | Capability to generate and send Shared Health Summaries (SHS) and Discharge summary information to the My Health Record. The ability to support a range of My Health Record interfaces, including document upload/download and portal views.https://www.myhealthrecord.gov.au/ | Highly desirable requirement |  |
|  | IHI | Management of IHI from within the master patient administration application.https://www.digitalhealth.gov.au/implementation-resources/national-infrastructure/healthcare-identifiers-service-support-documents/NEHTA-1162-2009 | Mandatory future requirement |  |
|  | HPIs | Ability to support the acquisition and management of HPI/Is and HPI/Os | Future requirement1-2year adoption timeframe |  |
| My Health Record Viewer | MHR Viewer | Through the My Health Record system, authorised agencies can access timely information about their patients such as shared health summaries, discharge summaries, prescription and dispense records, pathology reports and diagnostics imaging reports. | Future requirement1-2year adoption timeframe |  |
| Function | Clinical Decision Support | The capability to provide Active Decision support at a minimum for:* + Clinical alerts, allergies checking and documentation
	+ Drug–to-drug interaction checking
	+ Drug duplication checking
	+ Dose range checking
 | Mandatory future requirement |  |
|  | Managing other administrative functions | The administrative modules to cater for direct consumer participation by viewing their clinical information. Where the Patient Administration System is integrated with the EMR, the capability to view bookings to the organisation. | Mandatory future requirement |  |
|  | Alerts and Allergies | The EMR must be the designated master for capturing clinical alert and allergy, and Adverse Drug Reaction (ADR) details. Information can be interfaced from the EMR to other applications. | Mandatory future requirement |  |
| Interoperability | Clinical Information Sharing Platform | Share real-time information with the Victorian Clinical Information Sharing Platform. Refer to the Clinical Information Sharing platform interoperability requirements. This should be using international and Australian interoperability standards: HL7, FIHR and CCD document types.  | Mandatory future requirement for new procurements |  |

## Other Related Standards

Other related specifications to this standard include:

* SNOMED-CT
* ICD-10[[3]](#footnote-4)
* Pharmaceutical Benefit Scheme (PBS)
* Australian Medicines Terminology (AMT)
* National Human Service Directory
* HL7 2.4
* CMBS

## Benefits

Application of this standard to the implementation of EMR/CIS by health agencies will ensure continued interoperability of data applications across the state, now, and position health services to exchange data in line with future Victorian initiatives such as state-wide unique patient identification and sector wide shared clinical information whilst enabling connectivity to the national eHealth infrastructure.

# Appendix A – Glossary

|  |  |
| --- | --- |
| **Term** | **Description** |
| AMT | Australian Medicines Terminology |
| ACHI | Australian Classification of Heath Interventions |
| ADHA | Australian Digital Health Agency |
| BTIM | Business Technology and Information Management System |
| CDA | Clinical Document Architecture |
| CIS | Clinical Information System |
| CMBS | Commonwealth Medicare benefit Scheme |
| DHHS | Victorian Department of Health & Human Services |
| DH | Digital Health |
| Dose Range Checking | Functional medications administration capability that:* assists pharmacists to validate a patient’s dose based on age, weight and surface area, frequency and route of administration, and other patient criteria
* takes into consideration, dosing interval and duration of therapy
* enables decision support rules across atomic pathology and medication doses to be formed
 |
| EHR | Electronic Healthcare Record |
| ELS | Endpoint Locator Service |
| EMR | Electronic Medical Record |
| eTP | Electronic Transfer of Prescriptions |
| GP | General Practitioner |
| HSD | Human Services Directory |
| HSSA | Health Sector Standards and Advisory |
| HI | Healthcare Identifier |
| ICT | Information & Communication Technology |
| IHI | Individual Healthcare Identifier, national ADHA patient identifier |
| NASH | National Authentication Service for Health |
| PAS | Patient Administration System – a system used for the recording of patient and provider information to support management and coordination of service provision.  |
| MHR | My Health Record |
| PBS | Pharmaceutical Benefit Scheme |
| SHS | Shared Health Summary |
| SNOMED CT | Systematised Nomenclature of Medicine Clinical Terms |
| VPHS or Health Service Agency | Victorian Public Health SectorOne of the 85 Victorian Public Health Services offering healthcare across the state |
| VEMD | Victorian Emergency Minimum Dataset |
| VAED | Victorian Admitted Episodes Data |

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1. https://www.digitalhealth.gov.au/implementation-resources/clinical-documents/electronic-transfer-of-prescription [↑](#footnote-ref-2)
2. https://www2.health.vic.gov.au/about/publications/policiesandguidelines/digital-design-unified-standard [↑](#footnote-ref-3)
3. http://apps.who.int/classifications/icd10/browse/2016/en [↑](#footnote-ref-4)