

Introduction to FHIR

About this Quick Reference Guide

This Quick Reference Guide (QRG) summarises the key concepts, tables and reference information from the Introduction to FHIR course.

Contents

Topic: Starting with FHIR	2
What is interoperability	2
The evolution of interoperability	2
Connected health systems make a difference	4
Topic: FHIR Fundamentals	4
FHIR unpacked	4
Why FHIR matters and what it makes possible	5
Key FHIR terms	5
How FHIR affects the decisions you make	5
FHIR's global adoption and recognition	5
Topic: Benefits of FHIR	5
The case for FHIR	5
How FHIR can work with existing systems	6
FHIR in action	6
Topic: Starting a FHIR-Based Program	6
Who needs to be involved (and why)	6
Key questions to ask	7
Aligning with national digital health strategy and direction	7
Procurement considerations for FHIR-capable systems	7
Activity: Program Manager Decision Points	7
Topic: Understanding a FHIR Specification	8
What is a FHIR specification and why does it exist	8
Key components of a FHIR specification	8
What a FHIR specification looks like	8
AU Base and AU Core	8
Topic: Australian Context	9
Overview of Australia's Digital Health Strategy	9
My Health Record (modernisation and FHIR adoption)	9
State and Territory Digital Health Records (FHIR in action)	9
Health Connect Australia	9
The Role of the Agency	9
Topic: Tools and Resources for Non-Technical Users	10
Key organisations and communities	10
Glossary of key terms	10

A quick summary of Fast Healthcare Interoperability Resources (FHIR, pronounced 'fire').

Item	Detail
Published by	Health Level Seven International (HL7 International), based in the United States. Available at hl7.org/fhir .
What it is	An internationally recognised standard for how health information is structured, requested and shared between systems, using modular building blocks called resources and modern web technology.
Most widely implemented version	FHIR R4 is the most widely implemented version worldwide, including in Australia.
Key principle	FHIR is a key enabler, but not the complete solution. Whether information is actually shared also depends on consent, policy, legislation and on health services choosing to take part.

Topic: Starting with FHIR

What is interoperability

Interoperability is the ability to share information easily between people, organisations and systems, with the same meaning understood by everyone involved. It enables a connected healthcare system where information is shared securely and safely, with minimal effort from people and organisations.

The evolution of interoperability

Health information standards have developed over several decades. Each generation solved real problems for its time and many are still in use today across the Australian health system. HL7 is one of several standards development organisations; others include SNOMED International for clinical terminology and GS1 for product and location identifiers.

Scroll down to view the timeline of the development of FHIR and HL7 standards, including relevant milestones within the Australian context.

Year	Milestone	Description	Scope
1987	HL7 releases Version 2 (V2)	Widely adopted for clinical messaging. Flexible but lacked semantic clarity.	Global
1995	HL7 releases Version 3 (V3)	Introduced structured, semantically rich messaging. Too complex for wide-spread adoption.	Global
2005	HL7 releases V3 CDA (Clinical Document Architecture)	XML-based document format. Used for specific use cases but limited broader interoperability.	Global
2010	Interoperability challenges persist	V2, V3 and CDA fail to meet modern data exchange demands.	Global
2011	Birth of FHIR	HL7's "Fresh Look" initiative leads to Grahame Grieve proposing FHIR.	Global

Year	Milestone	Description	Scope
2012	HL7 releases the Draft Standard for Trial Use 0 (DSTU 0)	Shared by HL7 for community review, DSTU 0 was a working draft (a proof of concept) to test and demonstrate FHIR's potential.	Global
2014	HL7 releases DSTU 1	First official release for real-world testing.	
2015	HL7 releases DSTU 2	Expanded and refined FHIR resources, introduced the FHIR Maturity Model (FMM) and enhanced terminology services, profiles and implementation guides. It set the foundation for FHIR Release 4 (R4).	Global
2014–2016	Early FHIR exploration by HL7 Australia & The Agency	FHIR pilot projects begin in Australia. The Agency explores FHIR's potential.	Australia
2016	HL7 Australia FHIR Connectathon	First national Connectathon to promote developer engagement.	Australia
2016–2017	My Health Record FHIR APIs go into production	The My Health Record Mobile Gateway adopts FHIR-based APIs.	Australia
2017	HL7 releases FHIR DSTU 3	Adds support for clinical/admin workflows and implementation tooling.	Global
2017	FHIR-based API for MHR previewed	The Agency explores FHIR interfaces for provider/consumer access to My Health Record (MHR).	Australia
2018	FHIR adoption expands	UK, Canada and Australia begin national implementations.	Global, Australia
2018	Secure Messaging Framework released	The Agency framework includes FHIR as a long-term messaging solution.	Australia
2019	HL7 releases FHIR R4	First normative content (Patient, Observation, REST API), stable foundation for production use.	Global
2019	FHIR Implementation Guides for Australia (drafts) published	Localised profiles (e.g. medications, observations) released by The Agency & CSIRO.	Australia
2020	FHIR mandated in U.S. regulations	21st Century Cures Act Final Rule requires FHIR-based APIs.	Global
2020	COVID-19 accelerates digital interoperability	FHIR used in rapid digital health responses (e.g. eReferrals).	Australia
2021	SMART on FHIR V2 & Bulk Data API	Support for large-scale, third-party data access and population health.	Global

Year	Milestone	Description	Scope
2021	National Digital Health Strategy update includes FHIR	Australian strategy names FHIR as key interoperability enabler.	Australia
2022	FHIR R5 Ballot released	Community review version introduces new resources and features.	Global
2022	e-Referral and Provider Directory IGs published	Australia publishes national FHIR-based standards to support digital services.	Australia
2023	FHIR R5 final release	Adds canonical extensions, improves search, supports advanced use cases.	Global
2023	My Health Record FHIR APIs in production	FHIR-based MHR APIs released for specific data views (e.g. patient summaries).	Australia
2023	The Agency roadmap for FHIR-based interoperability	National vision shifts toward FHIR-centric architecture.	Australia
2024 (Ongoing)	FHIR R6 Development	Normative expansion, real-time interoperability, global alignment.	Global
2024 (Ongoing)	FHIR Training & Adoption Programs	The Agency, HL7 Australia and universities expand national capacity-building.	Australia
2025	AU Core FHIR IG v1.0 released	HL7 Australia publishes the AU Core FHIR implementation guide.	Australia
2026 (Expected)	FHIR R6 Final Release	Fully normative release expected, no breaking changes. Major stability milestone.	Global

Connected health systems make a difference

A scenario follows nurse practitioner Maya at a busy community health clinic whose record system, the pathology provider and the referral hospital are not interoperable. The topic illustrates the cost of non-interoperable systems: clinicians spend significant time managing the consequences, manual re-entry introduces errors, decisions get made with incomplete information and tests already done elsewhere get ordered again.

Topic: FHIR Fundamentals

This topic builds on the first with more context on what FHIR is and what makes it different from earlier approaches.

FHIR unpacked

FHIR is a standard published by HL7 International that defines how health information is structured, requested and shared between systems. It breaks health information into discrete, reusable pieces called resources, each representing one type of health information (a patient record, a medication, a test result, a diagnosis), so systems can request and receive exactly the information they need.

Key message: FHIR gives health systems a common way to structure and exchange information, so information can move accurately between different software, different organisations and different parts of the health system.

Why FHIR matters and what it makes possible

FHIR is a technical standard, but its value is measured in practical outcomes. Better data sharing means health information can move between systems without fax, phone call or manual re-entry; for example, a specialist receives a referral with the relevant history already attached.

Key FHIR terms

You do not need technical expertise to work with FHIR, but four terms appear regularly in meetings, procurement documents and strategy discussions.

Term	What it is
Resource	A standardised building block: a defined way of representing one type of health information, such as a patient, a medication, a test result or a diagnosis. Each resource has a defined structure.
Profile	A set of rules that adapts a base resource for a specific context, such as an Australian patient profile. A profile does not change the base resource; it adds constraints.
Extension	An extra field added to a resource for information the base international standard does not include, such as Indigenous status added to the Patient resource.
Implementation guide	The complete package, bringing together profiles, extensions, terminology and usage guidance for a specific program or use case.

How FHIR affects the decisions you make

FHIR is a technical standard, but the decisions it influences are not always technical. The topic explores this for policy makers (what to fund, mandate and rule out), program leaders, clinicians and business stakeholders.

FHIR's global adoption and recognition

National programs in the United States, United Kingdom, European Union, Canada, New Zealand and Singapore have made FHIR central to how health information is exchanged at scale. This international alignment means Australian health data standards are consistent with those used by research partners, technology vendors and health systems worldwide and Australian programs can draw on a global ecosystem of FHIR tools, expertise and experience.

Topic: Benefits of FHIR

This topic explores the case for FHIR, framed across patient outcomes and the course audience roles. It also covers how FHIR builds on established standards such as HL7 v2 and the Clinical Document Architecture (CDA).

The case for FHIR

The benefits of FHIR are best understood as outcomes, not features. FHIR builds on modern web standards and can work alongside or progressively replace older approaches such as HL7 v2 and CDA, so the benefits

are achievable without overhauling existing systems all at once. Much of the value of interoperability is ultimately felt by the person receiving care.

How FHIR can work with existing systems

A common concern about adopting a new standard is the fear of wholesale system replacement. FHIR is designed to avoid this: it can often be added to an existing system as an interface layer, a component that speaks FHIR to the outside world while the existing system continues to operate internally. The course shows two common approaches, adding FHIR over an existing interface, or connecting FHIR directly to the system's data.

FHIR in action

The benefits are felt differently across roles:

Perspective	How the benefit is felt
Patients and care	When systems use the same FHIR specifications, a person's health information can be accessed across their care journey. A medication change made by one provider appears across the others; an allergy recorded in an emergency department is visible at the next GP visit; test results are visible across the patient's care rather than held in a single system.
Policy makers	FHIR gives policy makers a practical lever for system-wide change. Mandating specific FHIR-based specifications in procurement, funding and program design creates consistent market pressure for interoperability and consistently structured data makes population-level insights possible.
Program leaders	FHIR shifts the procurement conversation. A vendor whose system meets Australia's national FHIR specification (AU Core) can demonstrate that capability in a test environment. Programs designed around FHIR are easier to extend, connect and evolve. FHIR-readiness is a baseline requirement, not an optional extra.
Clinicians	FHIR gives clinicians information in a form that systems can reason with. Decision support can flag a prescribing risk against known allergies, referral pathways can be pre-populated with relevant history and follow-up care can be triggered when a result meets a defined threshold.
Business stakeholders	FHIR shifts the balance in vendor relationships. When systems use an open standard, data is not locked in a single vendor's proprietary format, so systems can be changed and contracts renegotiated from a position of choice. The business case strengthens over time through reduced long-term integration costs and greater flexibility.

Topic: Starting a FHIR-Based Program

This topic explains the stakeholder and strategic considerations for a FHIR-based program. Getting the right people involved early prevents costly rework later.

Who needs to be involved (and why)

Starting a FHIR-based program involves more stakeholders than most digital health projects. Decisions about governance, procurement, clinical workflow and organisational change require people from across the organisation:

Stakeholder	Role in the program
Executive and Governance	Executive sponsorship provides the authority to make decisions about procurement, vendor relationships, data governance and national-strategy alignment and the organisational backing to sustain the program.
Clinical	Clinicians identify what information is clinically essential and where workflows must adapt; clinical informatics expertise translates clinical needs into requirements. Identify clinical champions early.
Your technical team	Developers, business analysts and solution architects who develop the requirements, use cases and solution architecture and who need to understand FHIR R4 and AU Core.
Vendors	Vendors whose products will participate must demonstrate specific FHIR capability, not just a general claim of support.
Program and Change Management	Coordinates delivery and the organisational change the program requires.
FHIR Implementation Guide Authors	The specialists who write and maintain the implementation guides that set out how systems are to be built; without them there is no agreed specification to build to.

Key questions to ask

Before committing resources, a set of foundational questions should be answered. These are strategic and organisational rather than primarily technical:

- What problem are we solving?
- Which systems need to connect?
- Where does FHIR fit in our solution architecture?
- What is our national program alignment?
- What does our vendor roadmap look like (and can you demonstrate compliance)?
- What governance structure will oversee the program?
- What is our change management approach?

Aligning with national digital health strategy and direction

Australia's approach to FHIR is nationally coordinated. Programs that align with national direction from the start are better positioned to connect with infrastructure already being built and to avoid having to rebuild when national requirements crystallise.

Procurement considerations for FHIR-capable systems

Procurement is one of the most powerful levers for FHIR adoption: what you ask for in a tender shapes the FHIR capability of the systems you acquire. Start with specifics, such as which version of FHIR a system supports and whether it supports AU Core.

Activity: Program Manager Decision Points

A scenario activity puts the learner in the role of a program manager leading a FHIR connection, working through decision points including a governance-first start, formal vendor commitments and a scope-change decision.

Topic: Understanding a FHIR Specification

This topic explains what a FHIR specification is and why it is needed and the role of specifications in turning the FHIR standard into consistent, shared practice.

What is a FHIR specification and why does it exist

A specification turns the general FHIR standard into agreed, consistent practice for a particular context, defining which resources are required, what data must be included and which terminology is used, so different systems implement FHIR the same way.

Key components of a FHIR specification

FHIR specifications are built from several components. The building blocks worth knowing are:

Component	What it is
Base FHIR standard	The global rules published by HL7 International. Every FHIR implementation starts here and the base standard defines the core resources that all FHIR systems share.
Profile	A set of rules that adapts a base resource for a specific context. It does not change the base resource; it adds constraints that make it suitable for a particular use.
Extension	An extra field added to a resource for information the base international standard does not include (for example, Indigenous status on the Patient resource).
Terminology binding	The approved code lists that define which values are allowed in a field, so the same concept is represented consistently across systems.
Implementation guide	The complete package, bringing together profiles, extensions, terminology and usage guidance for a specific program or use case. It is the document a developer or vendor uses to build a system that participates in a particular health exchange.

Key message: You do not need to read or interpret a FHIR specification yourself. What matters is knowing what a specification does and who in your organisation is responsible for it.

What a FHIR specification looks like

The topic shows the components combined into a worked example, illustrating how a base resource is profiled, extended and bound to terminology within an implementation guide.

AU Base and AU Core

AU Base and AU Core are key foundational FHIR implementation guides for using FHIR in the Australian context:

Guide	What it does
AU Base	The foundation layer for all Australian FHIR implementations. It adapts the global FHIR standard for Australian use (Australian identifiers, terminology and data formats) and adds Australian-specific elements such as Indigenous status and Closing the Gap registration. It describes how data should look rather than mandating which fields must be present. Published at hl7.org.au/fhir .

Guide	What it does
AU Core	Builds on AU Base to define the minimum data requirements for consistent health information exchange across Australia. When a system supports AU Core, others can rely on which data elements are present, which makes connection to national infrastructure possible. It is the specification vendors and health organisations are expected to align with for the Australian market. Published at hl7.org.au/fhir/core .

Useful question for vendors: When a vendor says their system supports FHIR, the follow-up question is whether it supports AU Core.

Topic: Australian Context

This topic unpacks Australia's national digital health strategy and FHIR's role in delivering its interoperability goals.

Overview of Australia's Digital Health Strategy

A short video sets out the human case for a more connected, interoperable system, with clinicians and care workers describing the challenges of working with disconnected health information today and the difference a connected system would make.

My Health Record (modernisation and FHIR adoption)

My Health Record is Australia's national digital health record, operated by the Agency, giving patients and clinicians access to information including medical summaries and pathology and diagnostic imaging reports. It was originally built using CDA (Clinical Document Architecture), which structures information as whole documents and remains the foundation for existing content. It is being modernised to a FHIR-enabled, near-real-time record.

State and Territory Digital Health Records (FHIR in action)

Several Australian states and territories are developing or deploying Digital Health Records (DHRs): state-level clinical information systems designed to give clinicians a comprehensive view of a patient's health information across the care continuum. These are large clinical record platforms and FHIR is increasingly used to connect and exchange information across them, so a clinician in any participating facility can access the same patient information, structured consistently, regardless of which system originally created it.

Health Connect Australia

Health Connect Australia is an emerging national initiative, led by the Australian Digital Health Agency, to improve the secure sharing of health information across the system. It is being delivered in stages and is designed to use FHIR as it develops, so organisations building FHIR capability now will be better placed to connect as it matures.

The Role of the Agency

The Agency is the national body responsible for implementing Australia's digital health strategy. It leads the development and operation of national digital health infrastructure and plays a central role in setting the standards and specifications that organisations, vendors and developers are expected to follow.

Key message: For FHIR programs across the Australian health system, the Agency is a key point of reference. It publishes the national FHIR specifications, operates My Health Record and provides the governance and conformance frameworks that support consistent, safe digital health implementation.

Topic: Tools and Resources for Non-Technical Users

This topic points to publicly available digital health references, FHIR resources and key organisations and a plain-language glossary. It is a reference you can return to at any time.

Key organisations and communities

Organisation / resource	What it offers	Link
HL7 Australia	The primary technical community for FHIR in Australia; develops and maintains AU Base and AU Core and holds FHIR Connectathons three times a year that non-technical stakeholders can attend to observe.	hl7.org.au
Sparked FHIR Accelerator	Brings together health organisations, vendors and government to develop and test FHIR specifications for Australian use cases; produced AU Core. Following its outputs is a practical way to stay current.	sparked.csiro.au
FHIRside (Agency drop-in sessions and webinars)	Hosted by the Australian Digital Health Agency in partnership with HL7 Australia; virtual drop-in sessions and webinars for anyone learning about or working with FHIR.	digitalhealth.gov.au/digital-health-standards/fhirside
The FHIR specification	The international FHIR standard published by HL7 International.	hl7.org/fhir

Glossary of key terms

Term	Definition
API (Application Programming Interface)	The connection point between two software systems. In FHIR, APIs allow health systems to request and exchange clinical information in a standardised way. Most FHIR APIs use a web-based approach called RESTful APIs.
AU Base	Australia's foundational FHIR implementation guide, defining how Australian-specific identifiers, terminology and data elements should be represented in a FHIR record. Published at hl7.org.au/fhir .
AU Core	An Australian FHIR implementation guide that builds on AU Base to define the minimum data requirements for consistent health information exchange across Australia. Published at hl7.org.au/fhir/core .
CDA (Clinical Document Architecture)	A standard for structuring clinical documents such as discharge summaries and referrals. Part of the HL7 family of standards and the current foundation for My Health Record documents; FHIR modernisation will progressively replace CDA-based exchange with FHIR-based exchange.
Digital Health Record (DHR)	A state or territory-level clinical information system that gives clinicians access to a patient's health information across participating health services. Several Australian states are developing or deploying DHRs using FHIR.

Term	Definition
Extension	An additional field added to a FHIR resource when the base standard does not include what a particular context needs (for example, Australian identifiers such as the IHI). Extensions follow strict rules so they remain interoperable.
FHIR (Fast Healthcare Interoperability Resources)	An internationally recognised standard for exchanging health information between systems, published by HL7 International. FHIR R4 is the most widely implemented version worldwide, including in Australia.
Health Connect Australia	A national initiative to improve the secure sharing of health information across the Australian health system, being designed to use FHIR as it develops.
HL7 Australia	The Australian affiliate of HL7 International and the primary technical community for FHIR in Australia. Develops and maintains AU Base and AU Core, is a partner in Sparked and holds FHIR Connectathons three times a year.
HL7 International	Health Level Seven International, the global standards development organisation responsible for publishing and maintaining the FHIR specification, as well as earlier standards including HL7 v2 and CDA. Based in the United States.
IHI (Individual Healthcare Identifier)	A unique 16-digit number assigned to every Australian eligible for Medicare or DVA benefits, used to match patient records across systems. AU Base defines how the IHI is represented in a FHIR patient record.
Implementation Guide	A document that brings together FHIR resources, profiles, extensions and usage guidance for a specific program or use case. AU Base and AU Core are both implementation guides.
Interoperability	The ability of different health systems to exchange information accurately and to use it effectively. True interoperability means the receiving system understands what the data means and can act on it.
My Health Record	Australia's national digital health record, operated by the Agency and being modernised to make significantly greater use of FHIR.
Profile	A set of rules that adapts a FHIR resource for a specific use case by specifying which fields are required and what values are allowed. It does not change FHIR itself; it tailors FHIR to a particular setting, organisation or country.
Resource	A building block of health information in FHIR. Each resource represents one type of clinical or administrative data and has a defined structure, so every system that uses FHIR knows what to expect.
RESTful API	The type of API most commonly used in FHIR, using the same web architecture that powers most websites and apps to request, send and update health information over the internet.
SNOMED CT-AU	The Australian edition of SNOMED CT, a standardised clinical terminology used to represent clinical concepts consistently across Australian health systems. Maintained by the NCTS.

Term	Definition
The Agency	The Australian Digital Health Agency, the national body responsible for implementing Australia's digital health strategy. Operates My Health Record and publishes national FHIR specifications.
The Sparked FHIR Accelerator	An Australian program bringing together health organisations, vendors and government to develop and test FHIR specifications for Australian use cases; produced AU Core.