1. FHIR repository?
2. Populating your repo?
3. Data structure?
4. Data security?
5. Share data

FHIR in practice:
From Policy to Implementation

For healthcare managers and IT professionals, it has become increasingly clear that HL7® FHIR® (Fast Healthcare Interoperability Resources) is well on its way to becoming the leading standard for medical data exchange. This modern, web-based technology makes health data accessible in a flexible and standardised way—both within institutions and across organisational boundaries.

At the policy level as well, FHIR is rapidly gaining ground. Regional and national governments—and the European Union through initiatives such as the EHDS (European Health Data Space)—are increasingly positioning FHIR as the foundation for secure and interoperable data exchange in healthcare.

This evolution presents both tremendous opportunities and significant challenges. In this white paper, we use a real-world example to show how FHIR can be integrated into your IT architecture and processes—and what pitfalls you may encounter along the way.

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Secure and structured information sharing: use cases

We will illustrate secure and structured information sharing through a concrete example: **Hospital A.**

Like many other healthcare institutions, Hospital A faces the challenge of sharing medical information safely and in a structured way with external parties, for both:

- **Primary data use** (data used to directly support patient care)
- **Secondary data use** (data used, for example, to optimise processes and improve efficiency in healthcare delivery)

Hospital A is currently running four projects that make data available externally via FHIR:

1. **Sharing allergies and medical history on a national scale:**

   In this project, Hospital A makes data on allergies and medical history accessible via a regional hub, which in turn makes the data available nationwide. This enables healthcare providers anywhere in the country to check, at the time of the patient's admission, which medical problems the patient has and whether they have had allergic reactions to certain medications in the past.

2. **Enabling regional querying of laboratory results across hospitals to track the evolution of specific values:**

   To quickly see how a certain value (creatinine, for example) has evolved for a patient, physicians can perform queries that search all test results available for that patient across all institutions in the region.

3. **Benchmarking birth-related data within the hospital network:**

   Hospital A is part of a network of seven hospitals. The network wants to make birth care data centrally available for statistical purposes and clinical benchmarking. This allows, for example, a quick overview of how many caesarean sections or inductions have been performed.

4. **Benchmarking infection control data:**

   The same network also wants to collect infection control data (HOST – Hospital Outbreak Support Teams) across the seven hospitals to gain insights into prevailing infections such as influenza and to enable monitoring of infection pressure over time.

Key challenges in implementing FHIR projects

When implementing such data-sharing projects, your hospital should consider several important challenges, all of which **Hospital A** encountered in practice.

Challenge 1
What do you need to get started?

At present, most EHRs are not yet capable of being queried via FHIR; this was the case for Hospital A. As a temporary solution, Hospital A decided to install a FHIR repository for storing data in FHIR format.

This solution, however, raises a number of questions. Which vendor should you choose for your FHIR repository? How many databases do you need, and how large should they be? Do you want a scalable solution that can serve you in the long term? And should it be installed locally or in the cloud?

Beyond infrastructure, how will you ensure the security of sensitive patient data, and how will you handle patient consent?

You also need to be sure your hospital has enough people with the right knowledge and skills to support these projects, which may require either training for your team or hiring external experts. But those options require finding quality trainers and consultants.

> Mid-2025 Amaron has already supported more than 20 hospitals—large and small—in getting started with FHIR, and provided training to their teams. Based on that experience, we've built extensive expertise. We'd be happy to help your hospital find the right answers to these questions.

Challenge 2

How do you get data from existing systems into your FHIR repository?

Simply having a FHIR repository is not enough: before it can be queried, it needs to be populated with data.

This can be done in several ways:

- You can use existing vendor components, such as "HL7 to FHIR" translators, which map data from older HL7 v2 messages to FHIR resources[1], ready for storage in your repository.

- Alternatively, your hospital can choose to write data directly in FHIR format. If you choose this approach, make sure to give your team sufficient time. Even seemingly simple resources such as Patient involve many related resources (or profiles[2]), such as Organisation or Practitioner. For each of these, you must check whether it already exists in your FHIR repository or needs to be created. More complex resources, such as lab results, are even more challenging to convert to FHIR.

> **Hospital A** aims to use existing HL7 v2 interfaces wherever possible, for exchanging ADT data, lab results and medication data. For other types of data exchange, the hospital generates the necessary FHIR structures itself: for example, allergies and medical history extracted from the medical record and stored in the FHIR repository as FHIR messages.

[1] Resources in FHIR are standardised building blocks used to organise different aspects of health information. They can refer to patients, admissions, medications, diagnoses, lab results, appointments, treatments and more. Each resource has a unique identifier and is structured according to a common set of data elements or "attributes". Resources can also reference each other: for example, a "Condition" resource may refer to a specific patient and describe their medical condition.

[2] https://www.ehealth.fgov.be/standards/fhir/core/

Challenge 3

How do you ensure consistent data?

To obtain a usable dataset in the FHIR repository, it's crucial that all parties write data in a consistent manner. This requires clear rules and agreements within the hospital that define precisely who or what system may write or create which information.

> **Hospital A** decided to automatically write all patient ADT information into the FHIR repository from a certain date onward, using the HL7v2 standard.
>
> For the birth care data-sharing project, however, the timeline goes further back. Much of the data that is shared within this project is linked to patients who do not yet exist in the repository. In those cases, the patient can be created. If the patient already exists, the rule is that existing data may never be overwritten.

Things get even more complex when multiple information systems are allowed to create patients or modify patient data. Which system has which rights? Can they edit all data, or only specific fields?

> **Hospital A** faced the question: when do we consider it the same patient? Patients from Belgium have both a national registration number and a hospital ID. What happens when two hospital numbers exist for the same national number? Or a patient has a national number but no hospital number? To address this, the hospital defined rules to ensure all patients are consistently represented in the FHIR repository.

In addition to defining who can register and adapt data, the content of the messages must also be written consistently. To enable this, agreements must be made at several levels. For example, in Belgium it is mandatory to follow the BePatient FHIR resource profile. Yet even within that profile, certain choices remain open—such as the status value that is attributed to a patient. This is something that must be coded identically by everyone entering data.

Challenge 4

Who is allowed to query which data?

One of FHIR's key strengths is that it makes data easily queryable for both internal and external parties.

However, no one wants their medical data exposed without strict safeguards. As a healthcare organisation, you must exercise extreme caution and always comply with data protection regulations such as the GDPR. For instance, you must ensure that only data strictly necessary for a given project is shared.

Hospital A stores (among other things) patients, admission information, medical history, medication, lab results and practitioners in its FHIR repository. Within each use case, only project-relevant data is shared, for example:

- only data related to a patient's allergic reactions
- only lab results concerning infections
- all creatinine values for a given patient over a specific period

De-identification and pseudonymisation

In some cases, personal data may not be shared, requiring patient identifiers to be removed (de-identification).

If re-identification must be possible afterwards, the remaining data is linked to a unique code or pseudonym that can only be traced back to the patient under strict conditions (pseudonymisation).

Challenge 5

How to choose the right partner for your data-sharing journey?

Sharing medical data with external parties involves far more than just technical connectivity. Hospitals must meet a long list of stringent requirements in areas such as data security, standardisation and compliance—each requiring deep expertise.

If your organisation lacks the necessary resources or skills, or if you want to make sure you are prepared for the unexpected, consider working with a partner who not only masters the technology but also understands the complex healthcare context.

Getting started with FHIR — build on a strong foundation

The road to FHIR implementation is one full of potential—but also of pitfalls. Good preparation, clear objectives and an experienced partner can make the difference between a difficult rollout and a successful transformation.

At Amaron, we combine technical know-how with a deep understanding of the healthcare sector. We think alongside our clients and guide hospitals step by step toward future-proof interoperability.

> Curious to learn what FHIR can mean for your organisation? Feel free to get in touch with us.

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