

Data sharing, interoperability and care integration

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Executive summary

Digital systems and data sharing are now central to how the NHS delivers care. After years of investment in Electronic Patient Records (EPRs) – with 96% of Trusts having an EPR in place – the focus is shifting from basic digitisation to interoperability and care integration. The question for NHS organisations is no longer “do we have the IT systems?” but “how do we connect them to truly improve care?”. Achieving this is not just a

technical endeavour; it is a system-wide transformation that enables safer, more efficient and coordinated care delivery.

This white paper explores how NHS Trusts can progress from simple data exchange to full integration of care. It introduces a three-stage Interoperability Maturity Model to describe the journey from basic point-to-point data sharing to seamless cross-boundary care coordination.

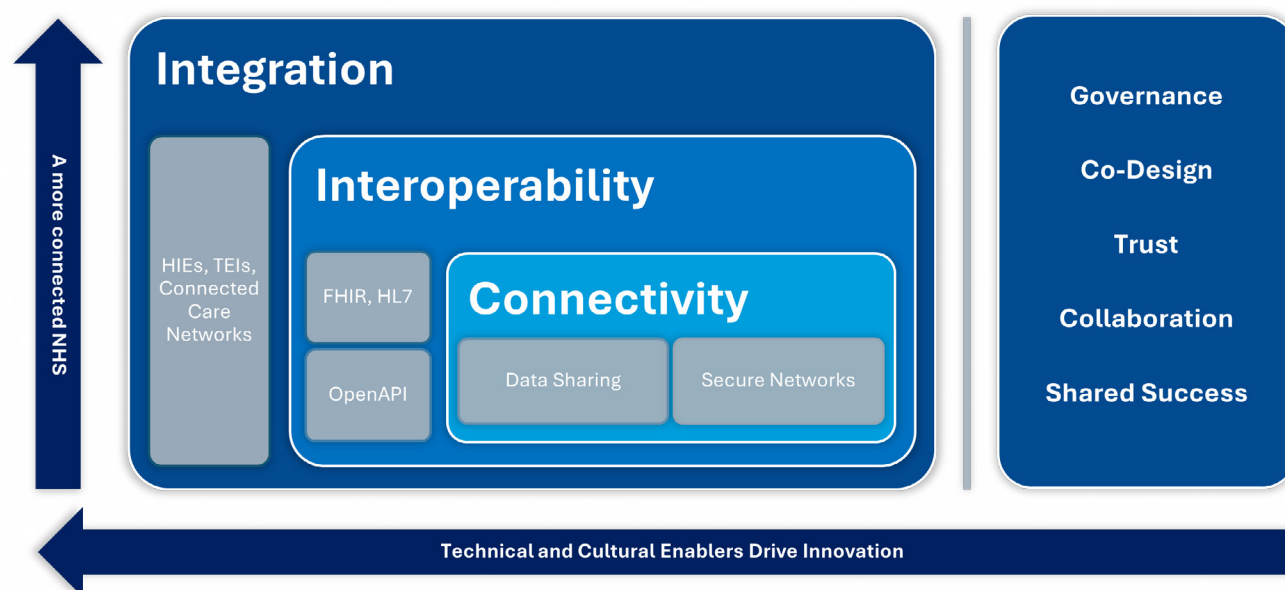


Figure 1: Connectivity, Interoperability and Integration

Drawing on practical examples from members of the UK EPR Network ([BridgeHead](#), [Orion Health](#), [CLEO Systems](#), [Dedalus](#), [Integrella](#), [Harris Health Alliance \(HHA\)](#), [System C](#) and [S1](#)), the paper highlights real-world progress:

► **Integrated prescribing:** At Midlands Partnership NHS FT, embedding an e-prescribing system into the CLEO EPR and connecting it via the NHS Spine led to over 120,000 electronic prescriptions, saving

nearly £40,000 in postage and £170,000 in travel annually. It also cut lost prescriptions by 55% and freed clinicians from 2,866 days of administrative burden per year.

► **Patient-driven appointments:** At Imperial College Healthcare NHS Trust, integrating a Dedalus self-service booking portal with the EPR reduced missed appointments (DNAs) from 12.1% to 3.1% and cancellations from 31% to 11.8%, while raising booking completion to 93%.

This saved staff time (five minutes per booking) and improved patient experience through greater convenience.

- **Legacy system retirement:** University Hospitals of Derby and Burton (UHDB) used BridgeHead's clinical data repository, HealthStore®, to decommission three legacy systems, saving ~£1 million per year and allowing information from those systems to be accessed in "three clicks" via the EPR. A similar approach at Cheshire Trusts avoided costly migration delays and saved £30k–£400k per system annually.

Furthermore, Mayden transitioned its laptus patient management system from internal legacy lookup tools to Quicksilver's (part of Harris Health Alliance) cloud-hosted PDS integration service, modernising its access to patient demographics. This shift established a resilient, scalable connection to the NHS Spine that reduced technical debt and operational overhead while ensuring accurate, real-time data availability.

- **Regional integration:** In Northern Ireland, a single digital care record across all hospitals and community services was achieved by coordinating multiple vendors. Integrella provided integration middleware to link diverse systems, while Orion Health delivered the region-wide Shared Care Record platform. These consolidated dozens of legacy systems and migrated 1.5 million records, resulting in a unified record and operating model that enabled consistent data standards, ~200 optimised workflows and seamless care coordination across the region. The same impact was seen in England across Mid and South-Essex, projected to deliver £3.8million in annual efficiency savings.



- ▶ Similarly, Barnsley Hospital established a highly connected care environment by deploying System C's CareFlow EPR with integrated modules for e-prescribing and theatre management, ensuring critical data follows patients seamlessly throughout their journey. This move toward deep workflow integration has improved patient safety and operational efficiency by providing clinicians with a single, real-time view of medical history while eliminating the errors associated with manual data entry.

These cases demonstrate that true interoperability yields compound benefits – financial savings, efficiency gains, improved safety and better patient/staff satisfaction – by design,

not by accident. They also underscore that interoperability is not a one-off IT project but a continuous journey of improvement. NHS organisations must treat data as a strategic asset beyond organisational walls. When information flows freely and meaningfully, every pound invested in digital technology works harder for patient care.

This white paper provides NHS leaders and stakeholders with:

- ▶ A clear framework (and visual model) for assessing and advancing their interoperability maturity.
- ▶ Practical insights into enabling technologies and data standards that underpin integration.



- ▶ Case studies and evidence from across the NHS vendor ecosystem illustrating what “good” looks like in practice.
- ▶ Tables summarising key case study outcomes and the critical enablers of interoperability.
- ▶ Recommendations for Trusts and Integrated Care Systems (ICSs) to foster a culture of openness, co-design and continuous value measurement.

Ultimately, interoperability is shown to be the backbone of integrated care – a foundation on which safer, more efficient and proactive healthcare can be delivered. It is not just about IT systems talking to each other; it is about building a connected NHS where every clinical interaction adds to a shared health story, enabling better decisions and better outcomes. In an NHS facing resource constraints and rising demand, such integration is no longer optional – it is essential for a sustainable, high-performing health system. The UK EPR Network is striving to break barriers to the future of integrated care through partnership, education and build tomorrow’s NHS.



Electronic Patient Record Network

Bringing the EPR Community Together

The EPR Network is a neutral, vendor-agnostic forum created by Healthcare Innovation Consortium (HIC).

Bringing together an active and growing community of Trusts, suppliers, clinicians and policymakers, the Network aims to share learning, align on national goals, and tackle shared barriers to digital maturity within UK healthcare organisations.

[Find out more about the EPR Network here](#)

1. Introduction – Beyond connection: towards true integration

Across the NHS, digital infrastructure is no longer a peripheral enabler but a core determinant of how care is delivered, how staff work and how resources are used. The past decade has seen NHS Trusts implement EPRs and myriad other systems, reshaping clinical workflows at scale. Yet simply having these systems in place is not enough.

The central challenge now is connecting and coordinating these digital tools to unlock their full potential for patient care.

Despite major investments in EPRs and the rollout of shared care records across England, inconsistent data standards, fragmented architectures and organisational silos continue to limit progress.

Today's NHS cannot achieve its goals – from Integrated Care Systems (ICS) improving population health, to the vision of a Single Patient Record – without advancing through these stages. National initiatives including NHS England's Frontline Digitisation programme and the Connecting Care Records mandate reflect this priority. Indeed, each ICS is now expected to have a Shared Care Record connecting its major providers and as of 2023 every ICS does have at least a basic shared record in place between

NHS Trusts and GPs, but basic data sharing is just the starting point; the ultimate aim is an environment where information travels with the patient and informs every care decision, no matter where they are treated.

The cost of not achieving interoperability is tangible. When systems are isolated, clinicians lack critical information, leading to delays, duplicate tests and avoidable errors.

Consider a common scenario:

A patient's medication is recorded in one system, lab results in another, and imaging in a third – if these systems don't talk to each other, clinicians must log into multiple platforms (or rely on patients to relay information) to piece together the full picture. This fragmentation frustrates staff and patients alike and poses real risks to safety and efficiency.

As one NHS digital leader observed, integration is the bare minimum – without it, the gains of digitisation are lost.

Moreover, the issue goes beyond hospital walls. Patients frequently receive care from multiple organisations (acute Trusts, GPs, community services, social care).

If those agencies operate on disconnected systems, vital context can be missed during transitions. An elderly patient may be discharged from hospital to a care home without the GP or community nurse easily seeing the hospital's discharge summary; test results might not follow a patient who travels across an ICS boundary for a specialist appointment. These gaps force patients to repeat their history and can lead to mistakes or repeated procedures.

It is increasingly clear that:

Interoperability is not just a technical aspiration, but a core component of safe, high-quality care.

When clinicians lack information due to siloed systems, patient safety is at risk and opportunities to improve outcomes are missed. Conversely, when data flows seamlessly, care can be proactive and coordinated: the right information gets to the right provider at the right time, every time. The NHS's pursuit of integrated care is fundamentally a pursuit of better use of data.

This white paper addresses how NHS organisations can move “beyond connection” to true integration. It sets out a staged model for interoperability maturity and distils lessons from across the EPR Network on how to progress in real-world conditions of constrained finance and legacy IT.

The goal is to demonstrate that interoperability is not a technology project, but a transformation of culture and practice – one that requires aligning people, process and technology around the shared goal of connected care delivery. In the sections that follow, we outline the maturity journey, examine the enablers of success (from standards to data quality to governance), showcase integration in practice through case studies and provide recommendations for NHS leaders to accelerate progress. Throughout, the emphasis is on practical, value-driven interoperability: making tangible improvements in patient care, operational efficiency and system sustainability through better data sharing.

(Figure 1 provides a visual overview of the Interoperability Maturity Model described in Section 2, for reference).



2. Digital maturity and the interoperability imperative

Most NHS organisations are now highly digitised on paper – they have the key systems in place – but digital maturity varies widely in how those systems are used and connected. While nearly all Trusts have an EPR as a foundation, the extent to which their digital tools actually interoperate can range from basic interfacing of a few systems to fully integrated regional platforms. This disparity defines the current landscape: a fragmented but evolving ecosystem.

At a minimum, any new clinical IT system must interface with the core EPR to avoid creating new silos. This principle has become a baseline expectation: whether it's an emergency department system, a maternity application, or an e-prescribing module, if it doesn't talk to the main EPR, it doesn't truly fit. Failure to meet this baseline has clear risks. As described above, siloed systems force staff to act as "human interfaces" between softwares – manually re-entering data or making phone calls to chase information. This leads to frustration, delays and potential errors. In financial terms, it also represents wasted investment:

An expensive system that can't share data is like a phone with no signal – it never reaches its intended potential.

Interoperability vs. Integration

It is important to clarify terminology, in the scope of this white paper, as we discuss the imperative of connecting systems:

- ▶ **Data Sharing/Connectivity (Stage 1):** Systems can exchange or expose data to each other – for example via portals, file transfers or simple interfaces. Data may be unstructured and often sits outside the recipient's normal workflow.
- ▶ **Interoperability (Stage 2):** Systems exchange data in a structured, standards based way that allows the receiving system to automatically interpret, reconcile and use the information in its own workflows (e.g. FHIR + SNOMED coded meds, allergies, problems).
- ▶ **Integration (Stage 3):** Interoperable data flows are embedded into shared workflows, governance and operating models across organisations, so that care feels seamless and coordinated. Clinicians and patients experience "one record, one plan", regardless of which organisation they're in.

As one might say, data sharing makes data available, interoperability makes it understandable and actionable. A simple example: interfacing might allow a PDF of a discharge summary to be sent to another system, but true interoperability would send structured

data (problems, medications, allergies, etc.) that the receiving system can directly import into the patient's record, and be able to process in context. Data sharing ensures data is exchanged between neighboring systems; interoperability and integration ensures the data moves in a format that is usable, consistent and meaningful across different settings.

In practice, NHS organisations need to progress from basic connectivity (point-to-point interfaces) towards robust interoperability to enable integrated care.

Interoperability is the key to making digital maturity translate into better outcomes.

Without it, even advanced systems function in isolation; with it, even older systems can contribute to a composite, system-wide patient record. For instance, a Trust may have a top-tier EPR and numerous specialty systems – but if each operates in a vacuum, the overall digital maturity is low from a patient care perspective. Conversely, a Trust with moderately capable systems that are well-integrated might achieve more effective digital care.

The national push for Shared Care Records across all ICSs is a recognition of this imperative. These shared records allow clinicians to view key patient information from different care settings. However, simply having a

shared viewer is not the end state, it's a stepping stone. Many current shared care records only provide snapshots; true integration will mean moving to interactive, real-time data exchange that supports clinical workflows across organisations. The distinction is crucial: having access to data (data sharing) is necessary, but using data effectively in workflow (interoperability) is what improves care coordination. The next frontier, as experts note, is "interactive interoperability – where systems can act on shared data rather than just view it".

To illustrate why higher interoperability maturity matters, consider two scenarios:

- ▶ **Low interoperability scenario:** A patient with complex needs is seen by multiple services – their GP, an acute hospital and community care. Each service documents in its own system. The systems are partially integrated (basic summaries sent via email or portal). The GP might not see the hospital's latest notes until a letter arrives days later; the hospital might not know the patient's medication changes from the GP. Care is reactive and fragmented.
- ▶ **High interoperability scenario:** The same patient's data flows through a shared platform or tightly integrated systems. When the patient is discharged from hospital, the GP's system automatically receives the structured discharge summary and medication changes instantly. Community nurses can

- ▶ see the hospital and GP records in their workflow. Everyone knows the care plan without chasing faxes or phone calls. Care is proactive and joined up.

In the second scenario, duplication of tests and medication errors are less likely and the patient doesn't have to repeat information – the system of care operates as one. This is the promise of integration: it

enhances quality, safety and efficiency simultaneously. For the NHS, pursuing this is not just a technical upgrade but a strategic imperative to handle the mounting pressures of an aging population, workforce constraints, and finite budgets. By eliminating waste (like repeated investigations, avoidable admissions due to communication gaps, etc.), interoperability directly contributes to sustainability and ["making every pound count"](#).

The rest of this paper delves into *how* to achieve such maturity:

- ▶ **Section 3** – Presents a model that breaks down the journey into three progressive stages.
- ▶ **Section 4** – Discusses the enablers that support this progression, from data standards to modern architecture.
- ▶ **Section 5** – Examines the state of shared care records and regional integration efforts, using real examples.
- ▶ **Section 6** – Provides additional case studies of integration improving care pathways on the ground.
- ▶ **Section 7** – Recognises that technology alone is not enough, highlights the role of partnerships, vendors and collaborative culture.
- ▶ **Section 8 and 9** – Measures success and offers practical recommendations for NHS organisations to advance interoperability.
- ▶ **Section 10** – Concludes with a forward-looking vision for a truly interoperable NHS.

Before moving on, we emphasise: interoperability is a journey, not a one-time project. It requires sustained commitment. The journey can be challenging, especially with real-world barriers like legacy systems, funding limits and data governance issues – but as this paper shows, even incremental steps can yield outsized benefits. Interoperability is often the most sustainable route to efficiency in a resource-constrained system – it enables reuse of data and avoidance of duplication, achieving value without needing constant new investment. With a clear roadmap and shared commitment, every NHS organisation can make progress on this journey.

3. The interoperability maturity model

To guide organisations in assessing and advancing their capability, we propose a simple three-stage maturity model for interoperability:

1) Connectivity – basic data exchange. Systems are linked so that data can pass between them, but often in ad-hoc or point-to-point ways.

Examples: sending an electronic discharge summary via email or a direct interface, or viewing another system's data through a portal. At this stage, data sharing is possible but may be limited in scope or require manual steps. It solves the immediate problem of access but may not integrate into workflows. Systems "talk" to each other, but perhaps only in fragments or after prompting.

2) Interoperability – standardised, useful data exchange. At this stage, systems not only exchange data, but do so in a structured, semantically interoperable manner. Common standards (like openEHR for clinical data modelling and persistence, HL7 FHIR for APIs, SNOMED CT for clinical terminology) are used so that information from one system can be interpreted by others. The data exchanged starts to improve workflows – e.g. an allergies list from one system is automatically reconciled in another; an e-prescription is transmitted and can be dispensed anywhere. Data flows are more automated, consistent and embedded. Technical integration is more advanced (often via an integration engine or shared platform) and information begins to move seamlessly between care settings. This stage builds on connectivity by adding quality and consistency to the data flow.

3) Integration – coordinated, proactive care across boundaries. This final stage is where interoperability yields true care integration. The distinction between systems blurs from the user perspective: clinicians and patients have the information they need at their fingertips, regardless of where it was entered. Care pathways span multiple services with digital tools supporting a continuous journey. For example, a primary care referral to a hospital is accompanied by the full patient record; the hospital's treatment plan is immediately visible to community carers and all contribute to one longitudinal record. Analytics and population health tools draw on integrated data to identify at-risk patients (enabling interventions like virtual wards). The technology enables new models of care – multidisciplinary teams, collaborative workflows – because systems function as one network. At this stage, we see not just IT integration but operational integration: organisations act on shared information in real time to deliver coordinated care.

Each stage builds on the previous one, requiring both technical upgrades and increased trust and collaboration. For instance, reaching Interoperability (Stage 2) means adopting open standards and agreeing on data definitions across organisations – a process that involves governance and cooperation, not just IT fixes. Moving to Integration (Stage 3) often requires new ways of working, like joint care protocols, data-sharing agreements and aligned incentives across providers. In other words, maturity is as much about organisational and cultural readiness as it is about technology.

It may help to visualise this model as a pyramid or ladder (see Figure 1). Connectivity is the base – essential, but basic. Interoperability is the middle layer that adds meaning to the connections. Integration is the top, where the benefits manifest in patient care. Importantly, this is a continuous journey, not a one-off leap. Trusts and systems will find themselves at various points on this spectrum with different projects. One might achieve Stage 3 integration in a specific area (e.g. an oncology pathway that links hospital and community services closely) while still being at Stage 1 or 2 elsewhere. The model is meant to guide incremental progress: identify where you are and plan how to move to the next level in each domain of care.

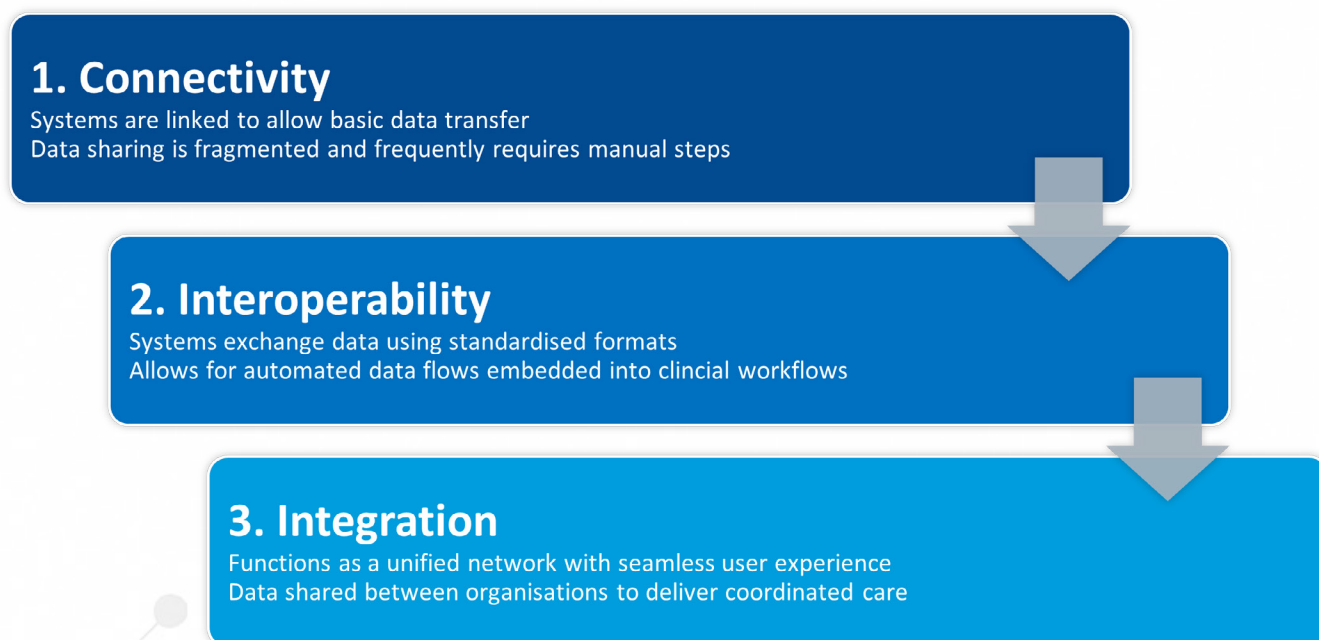


Figure 1: Connectivity, Interoperability and Integration

Progressing through these stages requires enabling factors:

- ▶ **Standards and APIs:** Standard protocols (like HL7 FHIR for data exchange, DICOM for imaging, etc.) and open APIs are crucial for Stage 2 (Interoperability). Without common standards, connectivity remains bespoke and brittle. Adopting national and international standards ensures that systems speak the same language. Of course, using a standard like HL7 FHIR is less useful if every vendor implements their own version of FHIR APIs, as the meaning and context of information can get lost in translation. The latest thinking in this area is to base FHIR APIs on robust clinically-approved information models based on openEHR. Australia are leading the way on this with the Sparked AU initiative.
- ▶ **Data quality and structure:** “Poor data in, poor data out” remains a truism. If the data captured is incomplete or unclear, sharing it won’t help much. Thus, achieving interoperability also means improving data quality at the source (consistent coding, timely entry, avoiding free-text where structured data is needed). Information should be accurate, up-to-date and actionable wherever needed. Investments in data cleansing, master patient indices and training staff in good data practices pay off in better interoperability.
- ▶ **Integration engines and repositories:** Technically, many NHS Trusts use an integration engine (middleware) to manage interfaces between systems. At higher maturity, these engines handle complex transformations and orchestration of data across multiple endpoints. Similarly, Clinical Data Repositories (CDRs) become important to aggregate and store data from legacy or external systems for easy access. This will be discussed more in Section 4, but it’s worth noting here: a repository approach can facilitate connectivity by acting as a hub where multiple systems read/write data.
- ▶ **Architectural planning:** NHS Trusts should plan for a modular, scalable and vendor-neutral architecture. This means avoiding monolithic designs that can’t adapt; instead, use loosely coupled systems connected via APIs, cloud platforms that can scale and ensure new components can plug in without extensive rework. A well-planned architecture can evolve over time – which is essential because integration needs will change as new services and technologies emerge.
- ▶ **Governance and partnerships:** As we climb the maturity ladder, the need for strong data governance and inter-organisational agreements increases. For full integration, ICSs must establish

Trust frameworks, data sharing agreements and joint governance bodies to oversee how data is used. Building a culture of openness – where data is viewed as a shared asset rather than an institution’s property – is key to Stage 3 success. Likewise, collaboration with vendors and partners (who must align on open standards and interoperability goals) becomes a strategic enabler (this is covered in Section 7).

Table 1 below provides a high-level summary of the three maturity stages and their hallmarks:

Maturity Stage	Definition	Example	System Characteristics
1. Connectivity	Basic data exchange between systems with minimal integration of workflows.	A laboratory system sends test results to the hospital EPR via a one-way interface.	Point-to-point interfaces using basic messaging standards (e.g. HL7 v2). Semantic standards are minimal, with data often shared as simple text or PDF documents. Systems remain siloed, so users may need to switch between applications to view all information.
2. Interoperability	Exchange of data in standardised, interpretable formats, enabling systems to use each other’s information to improve processes.	An electronic prescribing module is embedded in the core EPR and shares structured medication data via open APIs and the NHS Spine, allowing automatic reconciliation of records.	Uses common data standards (e.g. FHIR APIs, SNOMED CT codes) for semantic compatibility. Integration engines enable near real-time, two-way data flow. External information is incorporated into primary systems’ workflows, reducing duplicate data entry and context switching.
3. Integration	Seamless integration of data and workflows across multiple organisations, enabling coordinated and proactive care.	A shared care record across a region allows GPs, hospital clinicians, community and social care teams to access and update one patient’s record in real time – supporting joint care plans and virtual ward management.	Unified data standards and governance are adopted across partner organisations. Real-time, bi-directional data sharing spans all care settings. Cross-boundary workflows (e.g. e-referrals, shared care plans) are supported by a common digital infrastructure, giving clinicians a single, holistic view of the patient across the care continuum.

Table 1: Stages of Interoperability Maturity and their key characteristics.

Moving up this maturity curve is a strategic journey for every NHS organisation. It's not achieved overnight and it's not "all or nothing" – even within a single Trust, some departments may be more integrated than others. However, the model provides a roadmap. The next section examines the foundational elements that help organisations climb from one stage to the next.

Assessing the Model with The Digital Interoperability Maturity Model (DIMM)

Created by SI² and introduced through the EPR Network, DIMM offers a structured protocol for moving from Connectivity, through to Interoperability and Integration. Utilising DIMM to conduct rapid capability diagnostics, prioritise investments and produces phased integration roadmaps that outline the transition up the digital maturity model. Using three workstreams the model ensures organisations are appropriately

prepared for digital innovation and can push towards a more digitally mature future:

- ▶ **Technical Design:** openEHR/FHIR alignment, data quality tooling
- ▶ **Commercial Templates:** Vendor neutral contracts, procurement artefacts
- ▶ **Governance:** Clinical safety playbook, data steward roles, benefits tracking

With DIMM, clearer procurement decisions can be made more rapidly, reducing duplication in integrations and aligning CIOs, CMIOs and procurement around measurable progress. It provides a repeatable route to scale interoperability across ICSs and the wider NHS to prioritise innovation and expand Trusts digital capabilities.

The forthcoming DIMM Pilots are expected to generate first operational metrics and validate the proof of concept.



Enabling Semantic Interoperability

Across many NHS organisations, legacy EPRs, bespoke codification tables and inconsistent data standards continue to limit true interoperability. Semantic variation prevents clinicians and systems from interpreting information consistently. Variable digital maturity and difficulty aligning workflows to FHIR, SNOMED and OpenAPI standards has plagued the NHS during its 'digital transformation era'; shared semantic layers aim to solve this problem.

For example, Dedalus' Ontoserver (a FHIR-based multi-terminology server) was deployed to a large, multi-vendor NHS ecosystem, where bespoke legacy codifications were ingested, enriched with descriptive metadata, and automatically mapped to SNOMED subsets leading to an increase of over 40% in successful code mapping to national standards. Additionally, a sidecar FHIR resource server, automated release-management pipelines and SNOWMED workflow tools were also implemented.

FHIR alone does not guarantee interoperability.

The importance of data quality and standardisation should not be underplayed in comparison to other EPR technologies such as APIs.

The importance of clinician-facing UIs should also be considered, allowing users to browse hierarchies,

run value-set expansions, and build cohorts based on standardised terminology – supporting downstream use cases such as research, quality improvement and population health. Evidently, collaboration between clinicians, suppliers and technical teams is essential to ensure that data is accurate and clinically safe, providing better health outcomes for patients, and better user experience for clinicians.



4. Infrastructure enablers: standards, data quality and architecture

Reaching higher levels of interoperability requires certain infrastructure and data foundations to be in place. These are the under-the-hood factors that determine whether integration efforts flourish or flounder. We've put these into a few categories:

- ▶ **Data and Coding Standards:** Shared standards are the language of interoperability. Key among these are openEHR for clinical data modelling and persistence (the canonical 'semantic truth'), FHIR (Fast Healthcare Interoperability Resources) for structuring data exchange and SNOMED CT (and other terminologies like ICD-10, dm+d for medications, etc.) for consistent clinical coding. FHIR has become the NHS's preferred standard for APIs because it is modern, web-friendly and designed for interoperability of healthcare data. Semantic standards like openEHR and SNOMED CT ensure that a diagnosis or allergy recorded in one system is coded in a way that any other system can interpret the same meaning. Without common standards, each interface is essentially a bespoke translation job – a costly and fragile approach. Adopting standards may require investment in upgrading systems or middleware, but it pays off by simplifying integration efforts long-term. Many NHS vendors now provide FHIR APIs out-of-the-box

and NHS England has been pushing for "FHIR-first" in new procurements. Trusts and ICS should enforce standards in their contracts and architecture principles.

- ▶ **Data Quality and Liquidity:** As noted, data quality is foundational to effective sharing. A saying often cited is "*garbage in, garbage out*" – if data is poor, merely transmitting it doesn't create value. Therefore, a focus on data quality improvement goes hand-in-hand with interoperability projects. This includes standardising data entry (e.g. using structured fields and drop-down lists where appropriate),



cleaning up legacy data (resolving duplicate patient records, coding historical free-text entries, etc.) and training clinicians in the importance of accurate data capture. Additionally, the concept of data liquidity is useful: data should not be stuck in one place; it should be fluid and accessible wherever and whenever needed (with proper security controls). Achieving data liquidity might involve creating enterprise data warehouses or repositories where consolidated copies of key data are maintained for easy retrieval, or ensuring real-time updates propagate to all relevant systems (so data isn't stale). In short, interoperability is only as good as the data being exchanged. A practical tip for Trusts is to include data quality metrics in their digital programmes – e.g. completeness of certain fields, reduction in duplicate records – as part of readiness for integration.

- ▶ **Integration Engines and Middleware:** The unsung hero of many integration successes is the integration engine – a software layer that sits between systems and handles data translation, routing and business logic. Many NHS Trusts use engines like Rhapsody, IRIS for Health (formerly Ensemble/Health Connect) or others. These allow one incoming message to be mapped to many targets, data to be transformed (e.g. local codes to national codes) and workflows to be managed (e.g. if system A is down, queue the data until it's

back up). A robust integration engine is an enabler for Stage 2 interoperability: it makes it easier to implement standard messages Trust-wide and to scale interfaces without exponential effort. Trusts should invest in skilled interface developers and maintain a library of re-usable integration components.

- ▶ **Open APIs:** Alongside traditional HL7 messaging, modern integration relies on APIs – particularly RESTful APIs using FHIR. Encouraging vendors to expose open APIs and utilising national services (like the NHS APIs for demographics, GP Connect, etc.), accelerates interoperability. For example, rather than building a custom interface to fetch GP records, using GP Connect APIs can give immediate access to primary care data in a standard way. APIs also enable innovative use cases like mobile apps or remote monitoring devices integrating with EPRs. NHS organisations should demand open, documented APIs in their procurement specs and collaborate in API economies (e.g. sharing apps or tools that connect to common systems).
- ▶ **Modular and Evolving Architecture:** A key principle for interoperability is to design a modular architecture – one where components can be added, removed, or replaced with minimal impact on others. The move towards this 'plug and play' world is dependent on there being a canonical data model at the core.

In a modular setup, interoperability is achieved via clearly defined interfaces (services, APIs) rather than hardwired connections. This goes hand-in-hand with a cloud-first or hybrid-cloud approach for many, as cloud platforms offer scalability and easier connectivity. Some Trusts are moving toward enterprise master patient indexes (EMPIs) and shared data repositories as central hubs to ensure consistency of patient identity and record matching across systems.

- ▶ **Planning the architecture also means considering future needs:** for example, ensuring that any new application can plug into the integration engine easily, or that data generated today can feed tomorrow's analytics platform. NHS England's architecture principles (like "public cloud first" and "adopt open standards") support this direction.
- ▶ **Legacy System Mitigation:** One cannot talk about NHS IT infrastructure without addressing

legacy systems. Many Trusts still have older departmental systems (or recently replaced ones) that hold valuable data but are not easily integrated. These can severely hinder interoperability if not managed. A proven strategy is to retire or integrate legacy systems via Clinical Data Repositories (CDRs). As mentioned earlier, a CDR acts as a central store for data from decommissioned systems, making that information searchable and accessible through the main EPR. This approach, championed by solutions like BridgeHead's HealthStore®, allows Trusts to preserve legacy data value while simplifying the application estate. At UHDB, using a CDR to archive legacy EPR, ED and PAS systems led to nearly £1million in annual savings and removed those systems from the risk register – all their data became available via the new EPR in just a few clicks. Similarly, at Mid and East Cheshire, integrating a CDR during an EPR rollout averted migration delays and saved between £30k and £400k per retired

system per year. These cases show that addressing legacy IT is both a cost saver and an interoperability enabler. Without doing so, Trusts are often stuck maintaining read-only old systems (silos by definition) or paying high costs to migrate years of historical data into new systems. A repository strategy offers a safe middle ground: “retire the system, keep the data” – and importantly, keep the data useful by linking it to the live record.

- **Benefits Measurement Systems:** Lastly, a subtle enabler is having mechanisms to measure data flow and outcomes. This might include analytics that track interface

usage (e.g. how many shared records viewed, how many e-referrals sent electronically vs paper) and outcome metrics (duplicate tests avoided, time saved). By measuring the impact of interoperability, organisations can adjust their focus and justify further investment.

It’s an enabler in the sense that *what gets measured gets improved*. We will discuss specific metrics in Section 8, but establishing the tooling and governance to monitor interoperability progress is an important foundation.

Many of these enablers are summarised in Table 2 below, along with their roles and example benefits:

Enabler	Description	How it Contributes to Interoperability Maturity
Standardised Data and Interfaces	Adopting common data standards (e.g. openEHR, FHIR, SNOMED CT) and consistent information models across all systems.	Provides a shared language for data so different systems can truly understand and use each other’s information – a foundation for semantic interoperability and higher maturity.
Data Quality and “Data Liquidity”	Ensuring data is accurate, complete and timely and that it can flow to where it is needed without friction.	High-quality, “liquid” data builds trust in shared information and ensures that data exchange adds value, enabling meaningful use of data at more mature interoperability stages.
Open APIs and Integration Platforms	Implementing open, well-documented APIs and robust integration platforms to connect disparate systems.	Facilitates seamless real-time data exchange and workflows, moving organisations from basic point-to-point connectivity towards deeper, automated system interoperability.
Modular, Scalable Architecture	Designing IT architectures that are modular, vendor-neutral and able to evolve (e.g. through cloud services or microservices).	Allows new systems or capabilities to plug in with minimal disruption, so the digital ecosystem can grow and adapt – essential for progressing to integrated care across platforms.
Strong Data Governance	Establishing clear governance structures, policies and agreements for safe data sharing and consent management.	Provides accountability and trust across organisations, so data is shared securely and consistently – a critical organisational support for scaling interoperability efforts.

Enabler	Description	How it Contributes to Interoperability Maturity
Leadership and Strategic Alignment	Securing executive commitment and embedding interoperability objectives in organisational strategy and investment plans.	Ensures sustained resources and oversight for interoperability initiatives, signalling that integrated data and systems are a long-term priority and not just an IT project.
Cross-Organisational Collaboration	Partnering across Trusts, ICSs and with vendors using shared standards, joint projects and open innovation.	Breaks down silos between organisations and systems, aligning stakeholders on common goals and enabling broader data integration across care settings and regions.
Workforce Engagement and Training	Involving clinicians and staff in designing digital workflows and providing training in using shared systems and data.	Increases buy-in and digital literacy, ensuring that technical interoperability translates into practical improvements – staff trust and use the integrated systems in daily care.
Culture of Openness and Trust	Fostering a culture that values transparency, data sharing and co-design with front-line users and patients.	Overcomes cultural resistance to information sharing, building confidence that shared data will be used ethically and effectively – a cultural bedrock for higher interoperability maturity
Benefits Realisation and Continuous Improvement	Measuring the benefits of interoperability (e.g. time saved, reduced errors) and feeding lessons learned back into the process.	Demonstrates tangible value from data sharing (to staff and leadership), reinforcing support for interoperability and guiding continuous improvements that help advance toward full integration.

Table 2: Key enablers of interoperability and their contributions. Note: Technical enablers must be paired with organisational commitment. For example, adopting a standard (technical) means little if users don't agree to change data entry habits or if organisations won't share data (cultural). Thus, governance and culture underpin all these factors.

Having established the “building blocks”, we turn next to what integrated care looks like in practice when these enablers are leveraged. Section 5 will examine shared care records and other cross-boundary integration efforts, as a bridge from the technical foundations to the clinical impact.

5. Shared care records: a stepping stone to integrated care

One of the flagship initiatives in England's digital strategy has been the creation of Shared Care Records in every region. These are essentially longitudinal, integrated patient records that span multiple organisations within an ICS. The aim is straightforward: *put the relevant information about a person's care history in the hands of any clinician (or care professional) who needs it, at the point of care.* Achieving this has involved significant collaboration, procurement of shared record platforms and integration of data from various sources (acute Trusts, GP systems, community, mental health, etc.). By late 2023, every ICS had implemented a basic shared care record connecting NHS providers, a major milestone towards nationwide interoperability.

However, as noted, a shared care record is a stepping stone, not the final destination.

In many cases, these records are currently portals or repositories where clinicians can view data compiled from different systems. This is incredibly valuable – early benefits have been seen in avoiding duplicate tests and providing more informed care. For instance, if a patient arrives at an emergency department, the clinician can quickly check the shared record to see recent GP visits, medications, or any care plans, rather than relying

solely on the patient's memory. This can prevent adverse events (like prescribing a drug the patient is allergic to, which the GP record would flag).

Yet, shared view access has its limits. Often the data in these records may not be fully up-to-date (depending on frequency of feeds) and clinicians might still need to log into their native EPR to actually act (write orders, update notes). The next evolution is to make shared records interactive and embedded in workflows. That means, for example, a hospital doctor not only reads the GP's notes from the shared record but can also contribute back (write a note that the GP will see), or a community clinician can update a care plan in the shared system that immediately reflects in the acute EPR. This "write-back" capability and real-time bidirectionality is challenging but is the hallmark of true integration (Stage 3).

As one source frames it, the goal is for systems to act on shared data, not just view it.

Regional Progress

There are regions beginning to push into this territory. One particularly ambitious example is Health and Social Care Northern Ireland (HSCNI), which has embarked on creating a single, connected digital care record for the

entire region. Unlike England, Northern Ireland has a unified health system (no separate Trusts) which allowed a bold approach: replacing multiple hospital systems with a single regional EPR and implementing a region-wide shared care record spanning all services. This multi-year programme involves multiple technology partners and an unprecedented scale of consolidation – bringing data and workflows from dozens of legacy systems into one environment.

- ▶ **Integrella** provided the integration architecture and middleware to connect existing systems into the new regional setup. Essentially, they ensured that all the diverse legacy systems (from labs to pharmacies to community systems) could interface with the new central EPR. This included building the complex APIs, adapters and message flows needed to exchange data across organisational boundaries.
- ▶ Orion Health delivered the Northern Ireland Shared Care Record platform, which serves as the unified view for clinicians. Orion Health's solution aggregates data from the new EPR and other sources, enabling any authorised clinician – regardless of site or specialty – to access a patient's key information in real time. It bridges secondary care, primary care and community care, ensuring continuity.

The results in Northern Ireland have been remarkable. Together, these efforts led to:

- ▶ **A unified regional record:** all citizens' core health information in one place (with appropriate access controls), replacing what used to be separate records in each hospital/Trust. Consistent data standards and processes across every hospital in the region.
- ▶ **Optimisation of ~200 clinical workflows:** processes like referrals, discharges, medication reconciliation were redesigned to be seamless across settings.
- ▶ **Migration of 1.5 million patient records from legacy systems:** historical data was not lost.



This is a critical point: integration was not just IT connectivity but operational alignment, creating what was described as “a unified operating model” for care. Patients experience seamless transfers between services; staff use the same data definitions and can trust information entered by colleagues in other sites. Improved care coordination: for patients who previously navigated fragmented systems, there was a “step-change” – for example, a person with chronic illness has one care plan everyone follows and if they show up at any hospital or clinic, their record is immediately available.

Northern Ireland’s approach, of course, benefited from being a smaller, integrated health system to begin with. NHS England, with its dozens of ICSs and legacy estates, is not in a position to achieve full convergence overnight. However, the trajectory is clear: moving towards greater regional integration, underpinned by shared standards and national infrastructure,

is the path forward. England’s strategy instead encourages convergence where possible (like neighbouring Trusts using the same EPR instance, where feasible) and interoperability between the heterogenous systems that will continue to exist. The lesson from Northern Ireland that can be generalised is that when data flows freely across organisational boundaries, the whole system benefits.

Without interoperability, even the best EPR is just an expensive silo; with it, digital investments become amplifiers of value beyond one organisation.

Back in England, the deployment of Shared Care Records (ShCR) in each ICS is the foundational step. There are various vendor solutions in play (some ICSs use Graphnet – part of the System C group, others use Orion Health or Cerner or other platforms).



The immediate goal is achieved: each ICS has a way to view cross-org patient data. The focus now is on improving the quality, completeness and usage of these records:

- ▶ **Completeness:** Ensuring all key providers (including social care, mental health, ambulance services) contribute data. Initially, many ShCRs started with acute and GP data; efforts are underway to incorporate community and social care information to get the full picture of a patient.
- ▶ **Real-time updates:** Moving towards more frequent or event-driven data sharing rather than infrequent batch uploads. The closer to real-time the shared record is, the more useful (e.g. a GP can see a hospital's new results immediately, rather than a week later).
- ▶ **User adoption:** Embedding the ShCR into clinical workflows. For example, making it accessible directly within the clinician's EPR interface (contextual launch) so it's not an extra step, or training staff on using it for specific scenarios (like medication reconciliation on admission).
- ▶ **Two-way interactivity:** Piloting write-back features – for instance, some regions are working on allowing GPs to see hospital feeds but also send information or alerts back to the hospital via the shared record platform.

Beyond the shared care record

One example of using an integrated approach to care is the concept of “virtual wards”, where hospital-level care is provided to patients in their homes with remote monitoring and multi-disciplinary support. These virtual ward programs, being rolled out in many ICSs, rely heavily on data sharing: the hospital team, community nurses, GP and often the patient/family, all need to stay updated on the patient's status.

Interoperability ensures that, say, a patient's vital signs collected via a home device are fed into a system that all can see, or that if a patient in a virtual ward has an emergency, paramedics and the ED can see the virtual ward notes immediately. This is a clear example where a shared care record and integrated digital tools directly enable a new care model.



Shared Care Records provide the scaffolding for integrated care, but they must evolve from static repositories to dynamic, workflow-integrated tools. The NHS should view current ShCRs as *necessary but not sufficient*.

The aspiration is a future where the “seams” between organisations disappear from the patient’s perspective – and that requires the systems to not only share data, but to use it in unison.

As one commentary put it, many ICSs have achieved the technical connection, but *“the seams between organisations remain visible”* until true process integration happens. The next sections will highlight more on integration in practice (Section 6) and how partnerships facilitate this (Section 7), but the progress with shared records is a positive foundation.

Before moving on, it’s worth noting that interoperability across regions is also being considered via national services. The NHS Spine is one such critical backbone – it allows, for example, any Trust to fetch a patient’s Summary Care Record (basic GP information) or send documents through the Medical Interoperability Gateway (MIG).

The Spine also handles things like electronic prescriptions and referrals nationwide. The Midlands Partnership example we’ll see in the next section

uses Spine connectivity so that an electronic prescription can be picked up by any pharmacy nationally. As local integrations strengthen, leveraging these national services ensures that integration isn’t limited to within an ICS but extends to cross-ICS or national levels when patients move around.

Personal Demographics Service

Keeping on the topic of the NHS Spine, another key component of it is the Patient Demographic Service (PDS); the national electronic database for patient details (e.g. Name, Address, NHS Number, etc.). Evidently, digital maturity varies across Trusts, and as data demand grows, in-house solutions can fail to scale. Risks to data quality, security and overall continuity of care are all side-effects of ineffective or inefficient data management systems, especially for PDS. For healthcare systems provider Mayden, this challenge was evident, whose cloud-based patient management system (Iaptus) supports Psychological Therapy Services across the country.

Addressing the internally hosted PDS lookup solution through transitioning to Quicksilver’s (part of Harris Health Alliance) cloud-hosted PDS integration service, providing a resilient, standards-aligned interoperability layer. This scalable service strengthens the integrity of clinical workflows and enables providers to refocus resources on innovation – not being held back by dated legacy components.

Key outcomes of modern PDS hosting:

- ▶ **An efficient and resilient service:** Seamless shift to a service that enables high-volume, real-time PDS access, while providing users with accurate data and reduced operational overheads. A reliable, consistent PDS system ensures that the best care is delivered to patients – the primary goal of digital innovation in the NHS.
- ▶ **Universal applicability:** The same scalable integration model can be applied to other national services including CP-IS, FGM-IS and any future FHIR-based APIs, bridging the gap between primary and secondary care across ICSSs. Robust, cloud-based architecture strengthens digital resilience, reduces technical debt, and ensures alignment with modern interoperability standards.
- ▶ **Vendor-neutral integration:** Acceleration of system wide progress towards a more connected, data driven NHS is reliant on interoperability and Trust integration – vendor neutrality prioritises universal accessibility to care; equitable care delivers improved both staff and patient experience; this is the path to a digitally united NHS.



6. Integration in practice: towards connected care

Integration ultimately matters because of what it enables in the day-to-day delivery of care. In practice, a fully integrated digital ecosystem translates to countless small improvements in how patients are treated and how staff perform their jobs. This section examines some concrete examples and emerging models that show the power of integration in action.

Electronic Prescribing and Medicines Administration (EPMA)

Medication management is a domain that benefits hugely from interoperability. At Midlands Partnership NHS Foundation Trust, the introduction of an electronic prescribing solution (CLEO Systems' EPS) was done not as a standalone project, but as an integrated module within the Trust's digital environment. CLEO's EPS was embedded in the existing EPR workflows and connected to the NHS Spine for national prescription exchange. This dual integration meant that when a doctor e-prescribed a medication, it not only populated the local record and medication chart but also could be transmitted electronically to community pharmacies or other care settings via the Spine. As a result, the prescribing process became faster, safer and paper-free across care boundaries.

Key Initiative Outcomes:

- ▶ Over 120,000 electronic prescriptions were generated without printing or posting forms, meaning those many fewer pieces of paper moving around.
- ▶ Nearly £40,000 per year in postage costs were saved (no letters to mail out) and £170,000 in mileage was saved as staff no longer needed to drive prescriptions between sites.
- ▶ Safety improved: There was a 55% reduction in lost or stolen prescriptions – a common problem with paper scripts that can lead to treatment delays or fraud. Fewer lost scripts mean patients get their meds without unnecessary repeat visits.
- ▶ Critically, the CLEO system freed up clinician time. By removing administrative burden (like hunting down charts or re-entering data), they saved the equivalent of 2,866 clinician-days per year – roughly 8 working days per prescriber freed for clinical work instead of paperwork.
- ▶ Staff feedback was very positive, with users describing the system as “quick, saves time, saves hassle” – evidence that good integration not only creates efficiency but reduces frustration for frontline workers.

This EPMA case demonstrates how interoperability compounds benefits: it started as an IT project to digitise prescribing, but by ensuring the system was interoperable (within the EPR and with national services), it delivered financial savings, time savings and safety gains simultaneously. It also hints at sustainability benefits (less paper, fewer car journeys) and better user experience. Notably, these kinds of results only come when the digital tool is embedded into workflow. If the e-prescribing had been a standalone app that didn't talk to the EPR or national pharmacy systems, those benefits would be much more limited.

Patient-Facing Integration – Appointment Management

Integration isn't only about clinician-facing systems. It also empowers patients by enabling self-service and more convenient interactions. A prime example comes from Imperial College Healthcare NHS Trust, where a digital patient portal for managing

appointments was introduced. The portal (Swiftqueue) was integrated with Imperial's Orbis-U EPR to allow patients to book, cancel, or reschedule their outpatient appointments online in real time. Traditionally, appointment changes were a cumbersome process (phone calls, letters, manual re-booking), often leading to high Did-Not-Attend (DNA) rates and administrative overhead.

With the integrated portal:

- ▶ Patients gained control and flexibility – they could choose their appointment slots or make changes without needing to contact the hospital.
- ▶ DNA rates fell from 12.1% to 3.1% – a nearly 75% reduction in missed appointments. This indicates patients were more likely to attend when they had the ability to manage timings that suit them and/or the reminder mechanisms in the digital system were effective.



- ▶ Cancellation rates dropped as well (from 31% to 11.8%) and completed bookings rose to over 93% of all appointment slots. This means clinic capacity was much better utilised.
- ▶ Each booking transaction done by the patient online saved ~5 minutes of admin staff time (time that would have been spent on the phone or processing letters). Those minutes add up – across thousands of appointments, this is significant staff capacity redirected to other tasks.
- ▶ Qualitatively, the Trust reported smoother patient pathways and less frustration. Patients benefitted from the convenience, while staff saw fewer repetitive tasks and more predictable clinic schedules. Ultimately, the Trust could treat more patients on time, helping with waiting list pressures, thanks to the efficiency gained.

This case underscores a theme: integration enables empowerment. By integrating patient-facing tools with back-end systems, you allow patients to directly interact with their health information and services. That not only improves patient experience but also creates efficiencies (as seen in reduced DNAs and admin work). Many Trusts are now pursuing similar integrations – examples include allowing patients to upload pre-assessment information from home straight into the EPR, or linking personal

health record apps with hospital records.

With proper security and consent in place, they extend the reach of healthcare beyond traditional encounters.

Emergency Care and Transfers: Another scenario where integration is crucial is urgent and emergency care, especially when patients move between services (A&E, ambulance, GP follow-up, etc.). Shared care records have shown benefits here: ambulance crews with access to a patient's medications/allergies en route to hospital can inform A&E doctors on arrival; emergency departments viewing GP records can avoid drug interactions or get important history when the patient is unable to communicate.

In one region, for example, the shared record allowed an emergency physician to quickly see a patient's end-of-life care plan from their GP and community notes, ensuring the patient's wishes were respected during a crisis – something that wouldn't have been possible in a siloed setup.

This kind of outcome is hard to quantify but profoundly important for quality of care.

Integrated Pathways (Hypothetical examples)

Let's envision a few pathways moving through interoperability into integration:

- ▶ **Frailty pathway:** An elderly patient with frailty is supported by multiple services (GP, community geriatrician, social care). With interoperability, a single shared care plan is created. If the patient has a fall and is seen in A&E, the hospital team immediately accesses the community care plan (seeing what support is in place at home, what meds they're on, etc.) and after treatment, updates the plan with new recommendations. The community team gets an alert of the ED visit and can follow up the next day. This leads to reduced admissions (because community can act early), smoother discharges and the patient doesn't have to repeat their story.
- ▶ **Sepsis early warning:** A Trust integrates its EPR with vital signs

devices and a regional alert system. If a patient in any ward or even at home (on a virtual ward) shows a pattern of vitals indicating possible sepsis, an alert is generated and sent to the clinical team's dashboard. Also, through interfacing with the lab system, if a high lactate result comes back on a patient outside ICU, it flags an alert. The integration of data streams leads to faster sepsis recognition and response, saving lives.

- ▶ **Chronic disease management:** For a diabetic patient, data from their GP, endocrinologist, retinal screening program and home glucose monitor could be integrated. This gives a holistic view of their disease control. If the patient's blood sugar readings at home are trending poorly, the system might notify the care coordinator to intervene before the patient lands in hospital. Integration here supports a proactive care model rather than reactive.



All these examples rely on the free flow of information and the ability for systems to not just capture data, but to trigger actions across the care continuum. That is the essence of integration in practice: it closes loops in patient care that were previously left open by information gaps.

We have already covered several real case studies (prescribing, appointments, regional shared record). Table 3 below summarises the major case studies presented in this paper and the outcomes achieved, to reinforce how interoperability translates to tangible benefits:

Organisation	Focus Area	Key Actions Taken	Outcomes
UNIVERSITY HOSPITALS OF DERBY AND BURTON NHS FT	Legacy System Consolidation	Retired 3 major legacy systems (a legacy EPR, ED system and PAS) and consolidated their data into a Clinical Data Repository (CDR) integrated with the main EPR.	~£1 million annual savings by eliminating legacy system costs, removal of those applications from the risk register and rapid access to archived records (FOI/SAR requests completed in “three clicks”).
NHS ENGLAND – NATIONAL TERMINOLOGY SERVICE	Terminology Services	Developed a central FHIR-based terminology server hosting standard code systems (e.g. SNOMED CT, dm+d) and providing APIs for mapping local codes to national standards.	Enabled all systems to “speak the same language” – making code mapping between organisations faster and easier and ensuring consistent, meaningful data across different software systems. This semantic interoperability underpins safer data exchange and analytics.
HEALTH AND SOCIAL CARE NORTHERN IRELAND (HSCNI)	Regional Unified Care Record	Undertook a region-wide EPR integration program, consolidating dozens of legacy systems into a single unified digital care record across all hospitals and community services. Multiple vendors, such as Orion Health and Integrella partnered to deliver open integration architecture and a shared care record platform.	Created a single source of truth for patient information across the region – migrating 1.5 million records and harmonising 200+ workflows into one system. The result is a unified record and operating model that allows seamless patient transfers, consistent data standards and a step-change in care coordination across the entire region.

Organisation	Focus Area	Key Actions Taken	Outcomes
MIDLANDS PARTNERSHIP NHS FT	Integrated Electronic Prescribing	Embedded an e-prescribing system (CLEO Systems) into the existing EPR and connected it via the NHS Spine to national pharmacy systems.	Over 120,000 electronic prescriptions generated annually, saving ~£40k in postage and £170k in travel. Reduced lost prescriptions by 55% and saved 2,866 clinician-days per year by reducing administrative burden.
IMPERIAL COLLEGE HEALTHCARE NHS TRUST	Patient-driven appointments	Integrated a patient portal (Swiftqueue) with the Dedalus Orbis-U EPR to allow patients to book and reschedule outpatient appointments online in real time.	Reduced DNA (missed appointment) rates from 12.1% to 3.1% and cancellations from 31% to 11.8%. Saved admin staff approx. 5 minutes per booking transaction and improved patient experience through self-service flexibility.
BARNSELY HOSPITAL	Connected Care Environment	Deployed system c's careflow epr with integrated modules for e-prescribing and theatre management, linking third-party theatre systems and national data into a single view.	Created a seamless data flow where medication information and theatre scheduling are fully transparent. Eliminated duplicate transcription errors and improved safety and resource utilisation by providing a single, real-time view of patient history and status.
MID AND EAST CHESHIRE TRUSTS	Legacy Data Archiving	Integrated a Clinical Data Repository during an EPR rollout to archive data from retired legacy systems.	Avoided costly migration delays and saved between £30k and £400k per retired system annually, while keeping historical data accessible.
THE ROYAL WOLVERHAMPTON NHS TRUST	Cross-Boundary Integration	Partnered with System C to ensure their CareFlow EPR interoperates with the regional Shared Care Record, enabling bi-directional access to ICS-wide patient data.	Enabled clinicians to view external records (e.g. recent tests at neighboring hospitals) in real-time within the EPR, preventing duplicate investigations, improving prescribing safety and speeding up hand-offs between care teams.
MAYDEN (IAPTUS)	National Service Integration	Transitioned to a cloud-hosted PDS integration service (via Quicksilver/ HHA) to replace internal legacy PDS lookup tools for their psychological therapy patient management system.	Established a resilient, scalable connection to the NHS Spine for patient demographics, reducing technical debt and operational overhead while ensuring accurate, real-time patient data availability.

Table 3: Summary of EPR Network member case studies and key benefits from past initiatives.

From these examples, a pattern emerges: Interoperability is a force multiplier; integration is the end goal. A single initiative can yield improvements on multiple fronts – financial, clinical, operational, experiential – when systems and teams are properly connected. It bears emphasising that none of these successes came from technology alone. In each case, process redesign, stakeholder engagement and strategic planning were integral:

- At UHDB, there was an overarching application strategy to identify and retire legacy systems.
- In Midlands Partnership, clinical staff were involved in shaping the prescribing workflows and providing feedback (leading to user adoption and trust in the system).
- Imperial's portal required patient engagement strategies and training for staff to handle the new way of booking.
- Northern Ireland's program was as much an organisational change project as an IT one, aligning multiple facilities under common practices.

This reinforces the message:

Integration is not achieved by IT departments in isolation – it's achieved by the whole system working differently.

In the next section, we focus on that aspect: the role of vendors, partners and collaboration in pushing for interoperability and integration and why no single organisation can do it alone.

Advancing from Connectivity to Integration

SCRs provide a tangible example of progressing from basic connectivity to true integration across an Integrated Care System. By embracing national interoperability standards (like HL7 FHIR) and open interfaces such as GP Connect, advancing SCRs enable data to flow seamlessly between primary, secondary and community care settings. For example, the System C and Graphnet Alliance has even integrated its shared care record platform with NHS National Record Locator services using FHIR APIs, so that clinicians (for example, paramedics or mental health teams) can instantly discover and retrieve critical patient records (e.g. crisis plans, end-of-life wishes) held in other organisations.

Integration with GP Connect enables coded medications, allergies, medical problems, immunisations and consultations to flow seamlessly into acute and community workflows; SCR integration allows patient information to be viewed in-context; NRL integration brings in mental health crisis plans, ambulance teams and healthcare in the community – all of this culminating in better experiences for patients and clinicians alike.

This standards-based openness means GPs, hospital clinicians and community providers are finally viewing one version of the truth, utilising PRSB Core Information and Care Homes Views, reducing information gaps and enabling coordinated, proactive care rather than siloed treatment.

In practice, moving to integration delivers concrete benefits:

- At Barnsley Hospital, deploying System C's CareFlow EPR with modular add-ons has created a more connected care environment through integration with the SCR and other national or regional data systems. The Trust integrated its e-prescribing and medicines management module with the core EPR and lab systems, allowing clinicians to view a patient's entire medication chart on one screen alongside up-to-date lab results and history. As patients move between departments, their medication information moves with them digitally – eliminating duplicate transcription and ensuring safer, consistent prescribing across the hospital. Barnsley also linked its third-party theatre system into CareFlow, creating a "truly connected" surgical pathway that improved scheduling transparency and resource utilisation through seamless data flow between the theatre and EPR systems. These integrations show how moving beyond basic point-to-point interfaces toward deeper workflow

integration leads to tangible improvements in patient safety and operational efficiency (fewer errors, less re-keying and more time for care).

- Royal Wolverhampton NHS Trust partnered with System C to modernise its digital infrastructure and join up care across organisational boundaries. As part of its CareFlow EPR deployment, Wolverhampton worked to ensure the new system interoperates with the region's SCR, meaning hospital staff can both access and contribute to the patient's broader ICS record in real time. This cross-boundary visibility helps avoid redundant investigations and delays – clinicians can immediately see if a test or imaging was recently done elsewhere, preventing unnecessary duplicate orders. For instance, a shared care record view in A&E might show a patient's latest GP medications or a recent MRI at a neighboring hospital, enabling more informed decisions without repeating work.

Early outcomes from such integration are promising. Information follows the patient, leading to safer prescribing, fewer duplicate tests and faster hand-offs between care teams. This real-world progress underscores this white paper's core message that interoperability and integration, when pursued through national standards and genuine collaboration, translates directly into better-coordinated, safer care for patients.

7. The role of vendors, partners and collaboration

Delivering true interoperability in healthcare is a team sport.

No single supplier, NHS organisation or policy mandate can achieve it in isolation. It requires a concerted effort across the ecosystem – EPR vendors, niche system suppliers, integration specialists, standards bodies, INTEROPen, national bodies, Trust and ICS leadership and even patients and frontline staff. This section discusses how collaboration and an openness ethos are crucial, highlighting some contributions from industry partners and the EPR Network itself.

Cross-Vendor Collaboration

One of the historical barriers to interoperability has been proprietary systems and a reluctance to open data exchange. This mindset is changing, driven by both policy and necessity. Vendors who once aimed to be the all-in-one solution are now recognising that integration with others is essential for client success. Open standards adoption (like providing FHIR APIs, using openID for authentication, etc.) is increasingly seen as a market advantage rather than a threat. For example, multiple EPR providers have joined networks and partnerships where they agree on common integration approaches. The EPR Network is an example of this, being a vendor-neutral forum where suppliers

and NHS stakeholders share lessons and align on interoperability goals. As a result, we see things like joint testing environments and “connectathons” where different systems are tested together to ensure they can exchange data.

A concrete outcome of vendor collaboration is when a Trust can upgrade one part of its system without breaking all the interfaces – because vendors adhered to standard APIs. One EPR Network member (SI²) has emphasised that no single supplier can deliver true interoperability alone – it requires joint frameworks and shared priorities. In practice, this means vendors working together on things like common data models in an ICS or integrating each other’s products more smoothly. For instance, a patient flow system and an EPR from different companies might form an alliance so that the patient flow data is natively visible in the EPR; they co-develop that interface rather than leaving the client to custom-build it.



Collaboration must extend beyond

Standards it's a team sport!

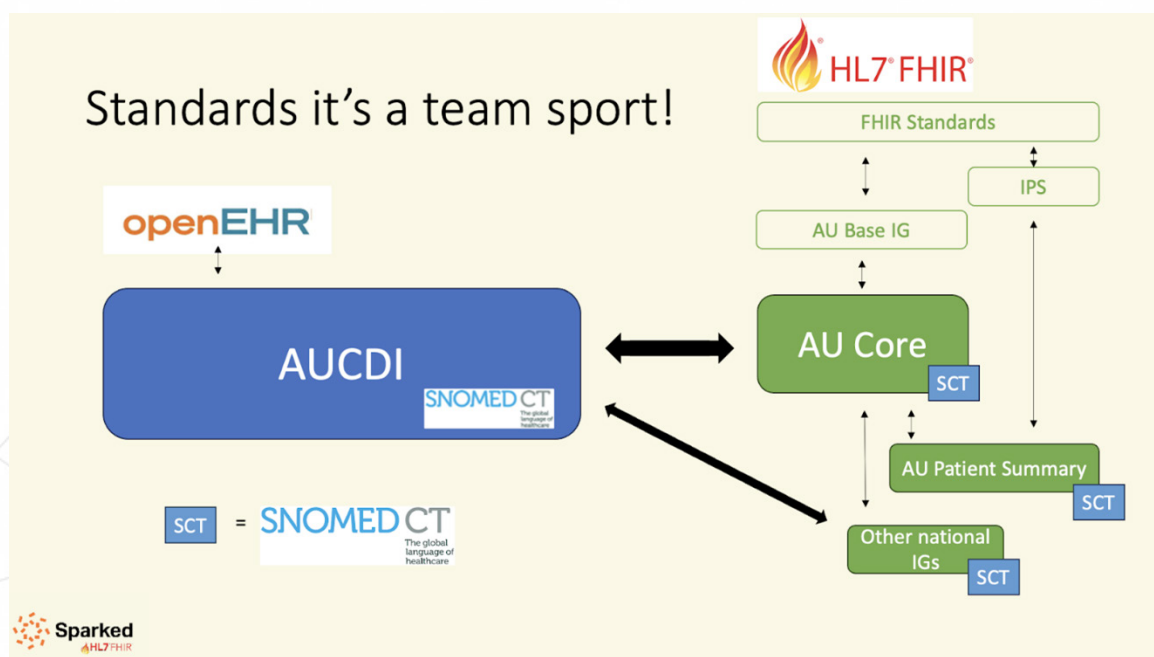


Figure 2 – The Australian Model

Examples of partnership in action:

- ▶ The Northern Ireland case already described is a stellar example: multiple suppliers, plus the regional health service collaborated under a unified vision. It wasn't about one vendor doing everything, but each contributing their expertise (core EPR, integration, shared record) to a joint outcome. The success there hinged on an effective partnership model with clear shared goals.
- ▶ In some English ICSs, acute Trusts and local councils (social care) are working together to integrate health and social care records. This involves bridging very different systems (NHS systems vs local authority systems). In one case, an integration specialist company helped create an API that let hospital discharge summaries flow directly into the council's social care system, alerting social workers when a patient was sent home and might need support. This kind of cross-sector integration requires trust and agreement on data sharing at leadership level, plus technical work – a partnership between the NHS, council and IT providers.
- ▶ The EPR Network, convened by Healthcare Innovation Consortium (HIC), is supporting collaborative innovation. By bringing complimentary vendors and healthcare suppliers into the same room to solve common problems (like standardising certain data exchanges), it accelerates progress. One output has been consensus on approaches to legacy integration and cloud adoption, which individual Trusts can then reference knowing it's industry supported.



Cultural Alignment

An often under-appreciated aspect of interoperability is the cultural change needed. Data sharing can challenge traditional notions of ownership and control. Successful integration is seen in organisations (or regions) that foster a culture of “our patient” instead of “my patient”, where sharing information is the default because it's in the patient's best interest. The most advanced ICSs treat data as a shared public asset, not an institutional possession. This culture must extend to vendors

too – vendors should see themselves not just as software sellers but as partners in a larger ecosystem. When a vendor works on an interface that actually helps a competitor's system work better with theirs, that is the kind of collaborative ethos that ultimately benefits the customer (the NHS and patients). We are seeing more of this as integrated care demands it.

Workforce and Training

Collaboration also means investing in the people side – interoperable tech needs interoperable people. Multi-disciplinary workshops, joint training sessions across organisations on new integrated processes and even rotating staff roles (like a nurse from a hospital spending time with a community team to understand each other's systems) can build the human connections that smooth the digital ones. Some ICSs have created digital boards or committees that include CIOs from all local providers, ensuring ongoing alignment and peer support on integration projects.

In summary, partnership is not a “soft” aspect of interoperability – it is a core requirement. Technology projects framed purely as procurement and deployment often falter on integration because they hit the walls between systems and organisations. Projects framed as partnerships – between NHS bodies, between NHS and suppliers and between end-users and developers – tend to navigate those barriers better. A mindset of “let's solve this together” goes a long way when, for example, mapping how a community system

will feed data into a hospital EPR; challenges can be addressed through collective problem-solving rather than finger-pointing. The future will likely involve even greater collaboration:

- ▶ National frameworks where multiple vendors sign up to interoperability charters.
- ▶ Open source or open platform elements where community contributions improve integration tools that everyone uses.
- ▶ Public-private partnerships to build shared infrastructure (like regional integration hubs).
- ▶ Patients as partners – engaging citizens in data sharing decisions and even data input (patient-generated data) for integrated records.

As we foster these partnerships, maintaining patient trust and robust governance is crucial. Interoperability should never mean uncontrolled data flows; governance (both technical like access controls and ethical like consent) is what maintains trust in a highly connected system. NHS Trusts and vendors share responsibility for adhering to strong information governance standards (e.g., UK GDPR, clinical safety standards for IT, etc). Sustaining trust among all stakeholders ensures data is shared appropriately. Having covered culture and collaboration, we next discuss how to measure success in interoperability initiatives and ensure these efforts deliver true value. After all, partnerships and projects must show outcomes to justify the investment and learn what works best.

8. Measuring success: value, outcomes and benefits realisation

If interoperability is the enabler of better, more efficient care, then its success must ultimately be measured in those terms – not by IT metrics alone, but by improvements in care and operations. This section outlines approaches to evaluating interoperability efforts and ensuring a continuous focus on outcomes over outputs.

Traditional metrics vs. Outcome metrics: It is easy to fall into counting “IT outputs” – number of interfaces built, number of records shared, etc. While those indicate progress, they don’t by themselves show that care improved. A truly value-driven interoperability program will measure things like:

- ▶ **Clinical outcomes:** e.g. reduction in medication errors, reduction in adverse events or readmissions due to better information sharing. One case showed medication errors down 55% after an EPMA implementation – a direct patient safety outcome.
- ▶ **Operational efficiency:** e.g. decrease in duplicate diagnostic tests, shorter length of stay due to smoother discharge processes, faster clinic workflows. For instance, if a shared care record prevents duplicate MRIs because clinicians can see previous images, that’s a measurable outcome (cost and patient convenience).

- ▶ **Time savings:** e.g. clinician time reallocated from administrative tasks to patient care. We saw 2,866 clinician-days saved in one prescribing project; that could be translated into seeing X more patients or reducing backlog by Y%. Similarly, if an integration cuts referral processing time from 5 days to 1 day, it speeds up patient access to care.



- ▶ **Financial impact:** e.g. cost savings or cost avoidance attributable to integration. The case studies gave examples: nearly £1m saved by legacy system retirement; £210k/year saved by e-prescribing efficiencies. Across an ICS, one might track savings from shifting to digital referrals vs. old paper ones.
- ▶ **User satisfaction:** While harder to quantify, surveys or feedback from staff and patients can gauge if things are tangibly better. If 90% of clinicians report that the shared care record saves them time or prevents mistakes, that's a powerful success indicator. Patient satisfaction scores (like for outpatient experience post-portal introduction) can similarly reflect success.

It's wise to align interoperability KPIs with the broader strategic objectives of the NHS. For example:

- ▶ **NHS efficiency (operational productivity):** measure how integration contributes to efficient use of resources (like clinic slot utilisation improved, bed days saved).
- ▶ **Patient safety:** track incidents where lack of information was a factor and aim to reduce those with better data sharing. Perhaps include a metric like "% of admission medication reconciliations that had all info available from GP – target 100%".

- ▶ **Elective recovery and wait times:** see if digital integration helps reduce waits (e.g. faster triage because referrals are complete and electronic).
- ▶ **Staff well-being:** consider metrics including "number of different systems clinicians must log into" – a lower number implies more integration and potentially less burnout. Interoperability can reduce the cognitive load of dealing with multiple disparate systems.

Continuous improvement: Importantly, success is not a one-time trick – it's about sustained improvement and adaptability. Measurements should be ongoing. An interface might work great at go-live, but if not monitored, issues can creep in (like data quality degrading). Setting up dashboards for key indicators and reviewing them regularly ensures issues are caught and benefits are realised continuously, not assumed.

Recall the earlier white paper *'Making Every Pound Count'* which stressed that benefits realisation must be proactive and disciplined. The same applies here: an interoperability project should have a benefits realisation plan from the start, defining expected benefits, baselines and how they'll be measured.

For example, before implementing a shared care record, measure current duplicate test rates or current time spent gathering info. After implementation, measure again. This isolates the effect of the new capability.

Showcasing success stories: Sharing outcomes builds momentum. When one Trust demonstrates that integrating their EPR with community systems reduced delayed discharges by, say, 20%, that story should be circulated (with data) so others can learn and be motivated. In our case studies, seeing the numbers (like DNA rates dropping by three-quarters at Imperial) makes a compelling case for similar integrations elsewhere. The EPR Network has a role in disseminating these success metrics across the NHS, creating a virtuous cycle of learning.

Balancing quantitative and qualitative data: Numbers are crucial, but qualitative insights matter too. A narrative example: a clinician might share that *“Now that I can see the GP’s notes instantly, I caught a critical detail that prevented a patient’s medication error – that wouldn’t have*

happened before”. Collecting such testimonials complements the hard metrics and appeals to the human side of care, reminding stakeholders that interoperability affects lives, not just spreadsheets.

Adapt and iterate: Measurement also helps identify what’s not working as expected. Perhaps an interface was built but clinicians aren’t using the new system because it’s not user-friendly – usage logs would show low adoption, prompting a need for training or system tweaks. Or maybe data is flowing but it’s not being acted on – e.g., a shared record is viewed but if there’s no process to reconcile differences, the value is lost. Monitoring outcomes can reveal these gaps so that processes can be refined. Essentially, treat interoperability improvement as a continuous quality improvement (CQI) exercise: **Plan > Do > Study > Act** (PDSA cycles) with data at each step.

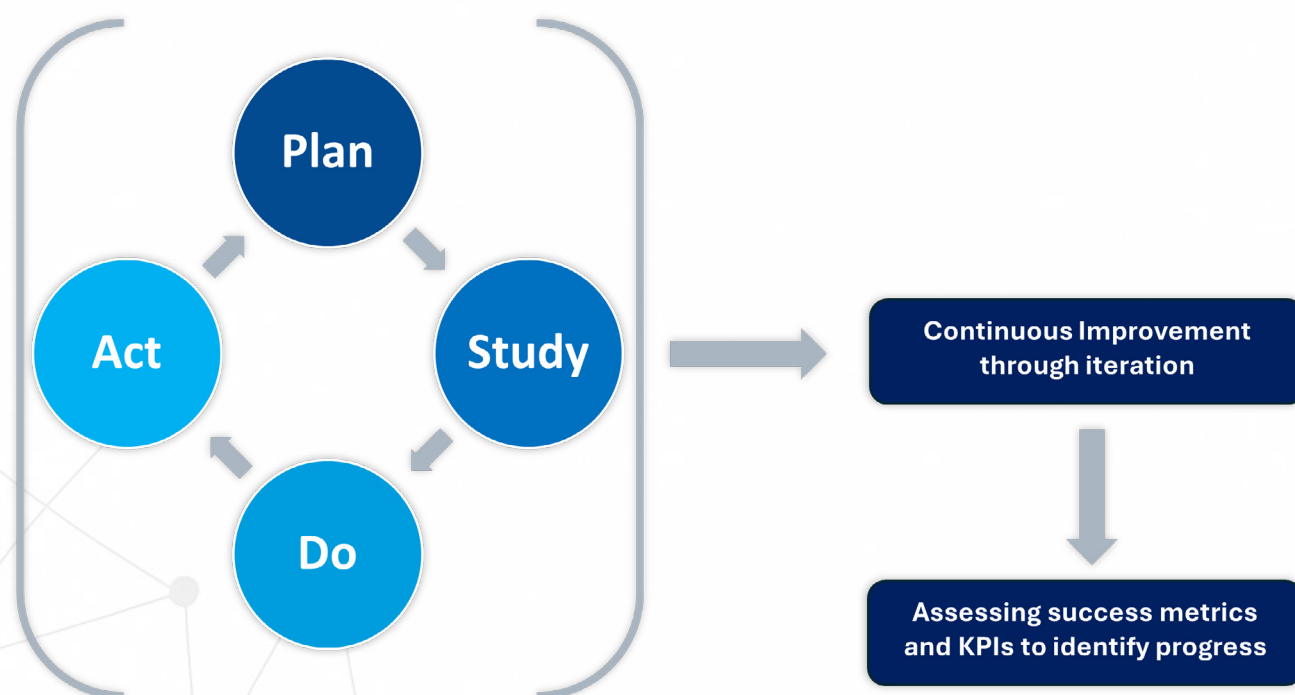


Figure 3 - Continuous Improvement

Sustainability and long-term value:

Another angle of success is long-term sustainability. Interoperability can contribute to things like the Net Zero goal by reducing paper and travel (as we saw with the e-prescribing case achieving 162.8 kg CO² savings by cutting paper and car trips). While carbon reduction might not be the primary goal of a data-sharing project, it's a valuable side benefit that aligns with NHS commitments. So measuring environmental impact could be a supplementary success criterion.

Finally, it's worth reiterating the point from earlier – integration is now arguably the most sustainable route to efficiency in the NHS. As budgets tighten, the NHS cannot simply pour money into new capacity endlessly. It must work smarter. Interoperability is a means to that end, making better use of existing data, reducing duplication, automating processes. Therefore, measuring and proving those efficiency gains is key to making the case for ongoing investment in digital integration. When decision-makers see that an upfront spend on an interface yielded a 10x return in savings or productivity, it justifies further funding of such projects.

Measuring success in interoperability should focus on how it moves the needle on patient care and system performance. By using clear KPIs tied to strategic goals and rigorously tracking them, NHS organisations can ensure that interoperability efforts are not just technical achievements but true clinical and economic

wins. Transparent reporting of these outcomes also helps maintain accountability and support from all stakeholders (frontline to board level) by showing “this is making a difference”.

With a solid approach to measurement, we can now confidently formulate recommendations for NHS organisations to progress their interoperability journey, armed with the insights and evidence discussed. These recommendations follow in the next section.



9. Recommendations for NHS organisations

Achieving the vision of integrated, data-driven care requires deliberate action on multiple fronts. Based on the insights throughout this paper, here are key recommendations for NHS Trusts and ICSs to advance data sharing, interoperability and care integration, which the EPR Network stands ready to support:

- 1. Develop a Clear Interoperability Strategy:** Treat interoperability as a strategic programme, not an ad-hoc IT task. Map out your current state (systems, integrations, data gaps) and define a target maturity level (Connection – Interoperability – integration; as defined in this white paper) Align this plan with organisational objectives (e.g. safer care, efficiency, ICS priorities) so it has executive buy-in and funding.
- 2. Embed Interoperability in All Projects:** Make integration a default requirement for every new system or digital initiative. Include interface and standards requirements in procurement (e.g. mandate FHIR API support, adherence to NHS Integration Standards). Do not purchase or build systems that can't communicate with your core EPR and other key systems – *“non-negotiable integration”* should be a guiding principle.
- 3. Invest in Data Standards and Quality:** Prioritise the adoption of SNOMED CT, dm+d, NHS Number usage and other standards across all systems – this lays the groundwork for seamless data sharing. Simultaneously, implement data quality improvement programs (data cleansing, training on good record-keeping) because high-quality data is essential for high-quality interoperability. Consider establishing a data governance group to oversee standardisation and quality metrics.



4. Modernise Your Integration Infrastructure: Ensure you have a robust integration engine or platform that can scale. Explore the use of APIs and national services (Spine, GP Connect, etc.) to avoid reinventing wheels. Plan for a modular architecture – e.g., use a central master patient index and APIs so new systems can plug in easily. Where legacy systems linger, implement Clinical Data Repositories to surface their data and enable legacy system retirement – this reduces siloed data and saves costs.

5. Collaborate at the ICS Level: Work with partners in your ICS to agree on data sharing protocols and collective infrastructure. Leverage your Shared Care Record as a platform for deeper integration (e.g. pursue write-back functionality, include more partners like social care). Establish joint governance (ICS-level digital boards or informatics committees) to manage interoperability efforts that span organisations. Think beyond your Trust – aim for system-wide connectivity so patients experience *one NHS*.

6. Engage Vendors as Partners: Involve your IT suppliers early and communicate your interoperability goals. Push them to deliver on open interfaces and jointly develop solutions (e.g., co-create integrations between their product and your EPR). Choose vendors known for collaboration and openness. Use forums like the EPR Network to share requirements and learn from others' vendor experiences. Hold vendors accountable in contracts for delivering interoperable solutions but also foster a partnership approach – invite them to planning workshops, clinical user group feedback sessions, etc., to ensure solutions meet real needs.

7. Focus on User-Centered Design: Whether it's clinicians or patients, design integration solutions around the end-user workflow. Use co-design: gather input from frontline staff on what information they need and where it should surface in their workflow. Pilot new integrations in small settings and incorporate user feedback (for example, test a new shared record view with a few GPs or ward staff before wider rollout). Smooth, intuitive integration will drive adoption – if it's clunky, users will find workarounds and the investment will be underutilised.

8. Strengthen Information Governance and Trust: Build and communicate strong IG practices to support data sharing. Ensure proper consent models or opt-outs are in place and publicised, so patients trust how their data is used. Internally, create clear policies on data access and train staff on confidentiality in a shared data environment. Trust between organisations is fostered when everyone sees that data is handled safely and ethically. Use Data Protection Impact Assessments (DPIAs) proactively for new integrations and involve Caldicott Guardians early in design.

9. Measure and Publish Benefits: Define success metrics (see Section 8) at the start of each interoperability project. Regularly measure and review these – e.g., monitor reductions in duplicate tests, time saved in referrals, etc. Share the results within the organisation and across the ICS. This builds momentum and learning. Also track any issues (like data mismatches or user issues) to address them quickly. Consider including interoperability goals in organisational performance dashboards to maintain focus.

10. Cultivate a Culture of Data Sharing: Perhaps most importantly, work on the cultural mindset. Encourage staff to view the patient record as one continuous story, not “ours vs theirs”. Highlight stories where data sharing prevented harm or improved care and celebrate those wins. Provide training and change management when introducing new integrated systems so staff understand the “why” and “how”. Leadership should consistently push that working collaboratively (across departments, across organisations) is the new normal, supported by digital integration. Breaking down silos in people’s minds is as critical as breaking down the technical silos.

By following these recommendations, NHS organisations will be better positioned to turn the aspiration of integrated care into everyday reality. The journey will have challenges – technical complexities, alignment of stakeholders, resource constraints – but the case for interoperability as an enabler of a safer, more efficient NHS is undeniable. Each step forward creates value and builds the foundation for the next.



10. Conclusion – towards a truly interoperable NHS

Interoperability is often discussed in technical terms, but at its heart it is about people and patients. It is about ensuring that every clinician has the information they need to make the best decisions and every patient experiences care as a coordinated, thoughtful process rather than a disjointed series of encounters. As we conclude this paper, it's clear that:

Achieving a truly interoperable NHS is not an overnight switch but a continuous journey; a maturation that will evolve with technology, policy and practice over time.

Yet, it is a journey that must be pursued with urgency and purpose, because the stakes are high. Patient safety, care quality, system sustainability, and even the morale of the workforce, depend on it.

Technology and transformation

We have reinforced throughout that interoperability is not a standalone IT project. It is a transformation of culture and practice as much as one of systems. Yes, it involves deploying new standards and interfaces, but it equally requires forging new partnerships, redesigning workflows and reimagining “how we work” in a more connected

paradigm. The NHS has undergone digital transformations before, but the integration phase is a step change that will unlock the full potential of those digital tools. In essence, we are moving from digitisation to digital integration, which is where meaningful value lies.

Partnership and collective action

The path to a fully interoperable NHS can only be travelled together. This means NHS organisations big and small, across all sectors (acute, primary, community, mental health, social care), must collaborate and share solutions. It means vendors working in coalitions and adhering to common standards, understanding that in healthcare, no single system can meet all needs in isolation. Policymakers have a role too – to create the incentives and frameworks that encourage data sharing while protecting privacy. The vision of integrated care that the NHS is striving for through ICSSs inherently depends on integrated data. Thus, interoperability is the thread that weaves all these system reforms together.

Every interaction counts

We can envision a near-future where every time a patient interacts with the NHS, that interaction adds to a growing, shared picture of their health, accessible to those who need to see it for the patient's benefit. In such a

future, duplicative questions and tests are minimised, delays due to missing information are rare and care feels intelligent and personalised. The work to get there is happening now – in the interface teams mapping data fields, in the governance meetings establishing trust across organisations, in the training sessions where staff learn a new integrated process. It's hard, detailed work, but it contributes to something greater: a health system where information flows as freely as the patient flows we aim to create.

Integration as a platform for innovation

It's worth noting that interoperability is not just about optimising current processes; it also lays the foundation for the next generation of healthcare innovation.

Robust data sharing is a prerequisite for advanced analytics, AI and personalised medicine at scale.

For example, the promise of AI to predict deteriorating patients or optimise pathways will remain limited if the algorithms can't access comprehensive, high-quality data across settings. By investing in interoperability today, the NHS is building the digital rails on which future breakthroughs will ride. In that sense, integration is an investment in innovation capacity.

A moral imperative

At the end of the day, interoperability is about doing right by patients. We should not accept that a patient is put at risk because two systems couldn't communicate or two teams didn't have a shared view. Ensuring seamless data flow is an ethical duty to provide safe, effective care. The NHS, founded on principles of equity and excellence, cannot fully uphold those values in a modern context without treating information as a vital part of the care continuum that must be available wherever needed. As this paper has shown, the technology exists, the exemplars exist and the benefits are real. The task now is scaling these successes across the entire health and care system.

In conclusion, the journey to a truly interoperable NHS is underway and picking up pace. The EPR Network and its members are committed to supporting this journey, sharing insights, aligning efforts, and amplifying what works across the ecosystem. If there is one overarching message from this paper, it is that interoperability is a system-wide enabler. When done right, it makes every other initiative more achievable. Whether it's improving cancer pathways, achieving net zero goals, or deploying AI decision support, it turns disparate investments into a cohesive digital foundation.

The vision of "one patient, one record, one system of care" is bold, but it is achievable step by step. By following the frameworks and lessons outlined here – focusing on maturity, enabling

infrastructure, practical use cases and collaborative culture – NHS organisations can make tangible progress today. The reward is well worth the effort. A safer, smarter, more efficient NHS that truly operates as One NHS, delivering integrated care to all.

Together, through shared commitment and smart interoperability, we can ensure that every pound invested in digital health yields maximum value for patients and staff and that the NHS's digital backbone is strong enough to support the future of healthcare.

Members of the EPR Network

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About Healthcare Innovation Consortium (HIC)

HIC is a leading independent digital health consultancy that helps organisations design, implement, and scale healthtech solutions that improve patient outcomes and system efficiency. With a mission to put people at the heart of digital transformation, HIC works across the public and private sector to drive meaningful innovation.

To learn more about HIC's EPR consultancy services, visit:
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About Capgemini

Capgemini is a global consulting and digital transformation leader, serving as the Strategic Technology Partner and Founding Sponsor of HIC's EPR Network. Together, they will provide strategic expertise and help drive EPR adoption, interoperability, and digital maturity across NHS Trusts through collaboration and Specialist Interest Groups.



About the Electronic Patient Record Network

This whitepaper is brought to you by the Electronic Patient Record (EPR) Network, an industry-funded community founded by Hadleigh Stollar, Chief Executive at Healthcare Innovation Consortium (HIC). Recognising the need for a unified platform, Hadleigh launched the EPR Network to bring together EPR vendors, suppliers, and health innovators

— building stronger partnerships with each other and with the NHS to accelerate progress in digital healthcare. The network's mission is to shape and influence policy around EPRs, while fostering meaningful collaboration that improves patient care through better use and integration of digital systems across the health ecosystem.

If you're interested in learning more or joining the network, visit:
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