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BRUSSELS 2026
25-26 MARCH 



Keynote: From Silos to Shared Imaging: Real-World Lessons in Regional Interoperability



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Patrick Mangesius is Head of Product Management and Senior Product Architect eHealth at Siemens Healthineers, based in Austria. He brings deep expertise in international interoperability standards such as IHE and HL7 FHIR, and has actively contributed to the global interoperability community through numerous Connectathons and events since 2006. He combines technical leadership with strategic business insight to advance seamless, patient-centered health data exchange.



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Keynote

**From silos to shared imaging:
Real-world lessons in regional
interoperability**

01 Introduction & Statistics and Problem Statement

02 Patient journey

03 Challenges

04 Technologies and Standards

05 User Perspective and Conclusion

Our connections



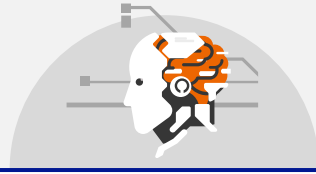
20,000+

syngo sites worldwide

40,000+

Connected devices on teamplay digital health platform

Our solutions



100+

Advanced interoperability, visualization and AI applications

>500

Enabled scanners for remote scanning

Our employees



>2,500

Employees working for D&A worldwide

8

Countries with R&D development sites



49%

of their time physicians spend on searching for patient information, only 27% with patients¹



42%

reported data access challenges along with other barriers like incomplete information and poor coordination²



72.5%

of physicians' on-call time is spent searching and looking for information compromising the time spent for direct patient care³



18%

of medical errors are estimated to be due to inadequate availability of patient information⁴



70%

Hospitals report challenges exchanging patient information with other systems⁵



Up to 25%

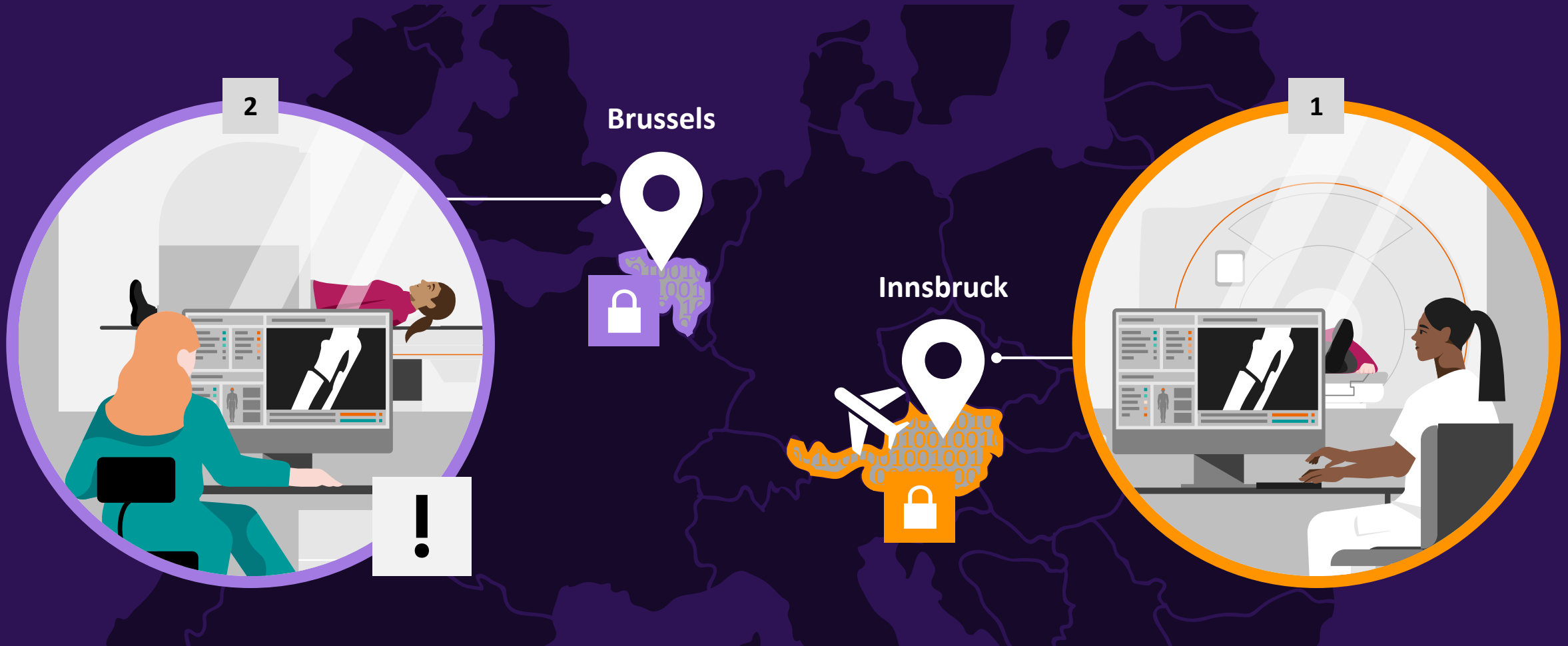
reduction in the odds of repeat imaging when prior results were access via shared data systems⁶

¹ Study: Physicians spend nearly twice as much time on EHR/desk work as patients | AHA News
² Advancing Health Equity Through Substance Use Medical Record Data Sharing: Insights from Healthcare Providers – PubMed
³ Issues: E.S. Endocrinology/Healthcare Information Systems, September 2018
⁴ Development of an Ontology to Model Medical Errors, Information Needs, and the Clinical Communication Space – PMC
⁵ Healthcare's Data Challenge: Why Fragmented Systems Are Holding Back Patient Outcomes | Mutually Human
⁶ Healthcare Fragmentation and the Frequency of Radiology and Other Diagnostic Tests: A Cross-Sectional Study – BMC

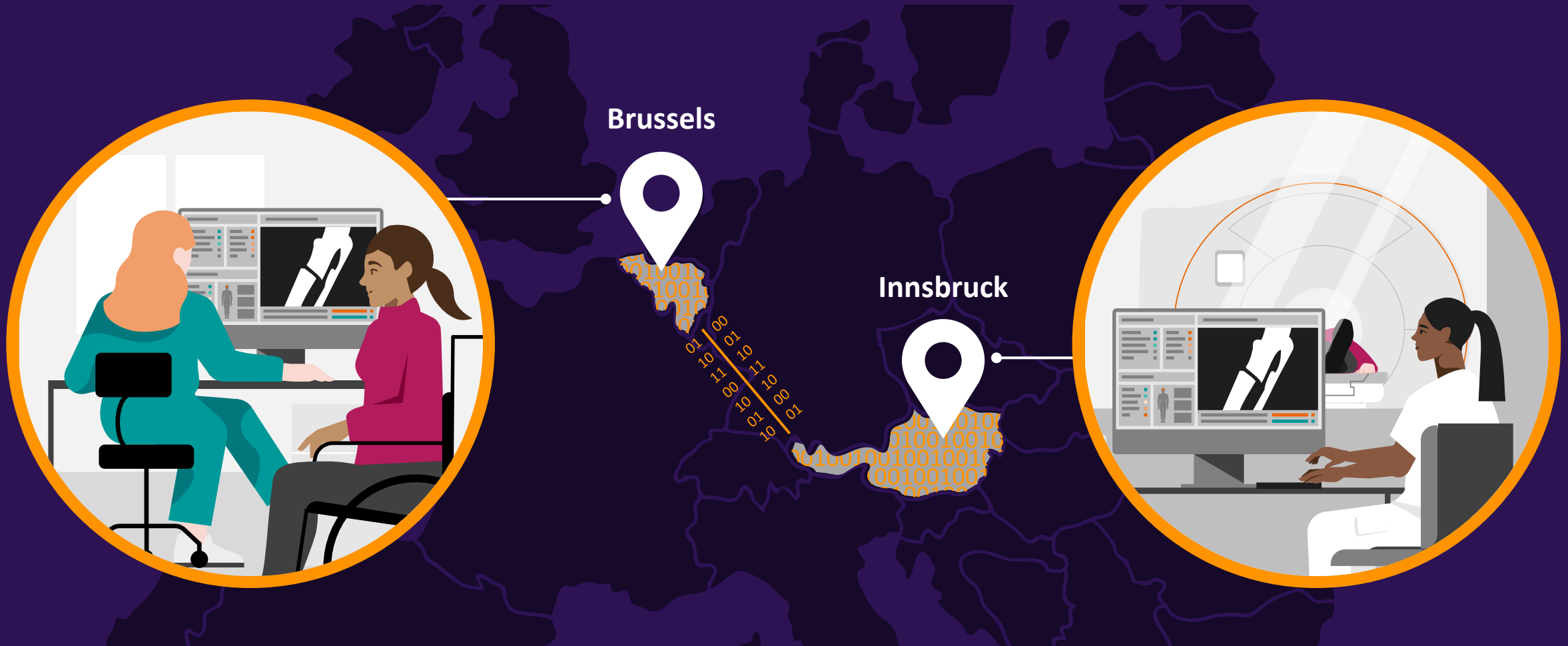
When patient information is not available for exchange across countries, examinations have to be repeated



When patient information is not available for exchange across countries, examinations have to be repeated



Information exchange between countries prevents the duplication of examinations



Interoperability & standardization



Patient consent



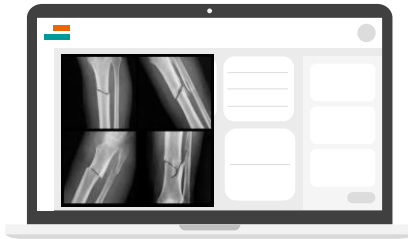
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Referring physician

Specialist

Patient portal



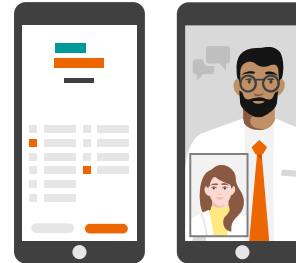
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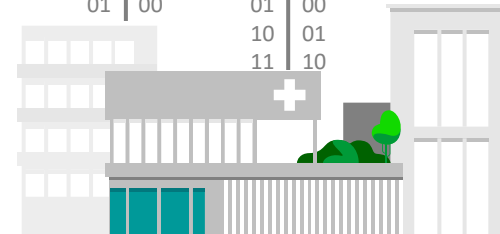
Hospital

Heart center

Virtual visit



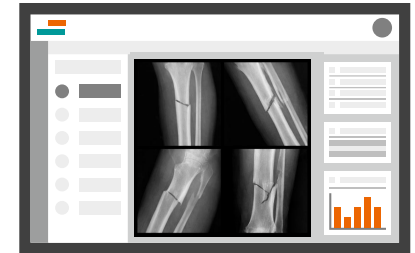
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Long term acute care facility

Hospital II

Physician portal



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Pharmacy





Institutional interoperability and standardization

Accelerate patient engagement & patient experience with digital healthcare services.

Regional interoperability and standardization

Brought **Digital Transformation** into reality as an enabler for outstanding patient and physician experience.

National interoperability and standardization

Created the foundation for **nationwide digital health infrastructure and enabler for image exchange.**

EHDS - European Union designed to create secure and standardized system for sharing health data across Europe

Empower patient with **access to their health data, improve healthcare delivery and enable health research and innovation.**





Primary use

Use of data for the delivery of healthcare

- Empower individuals to control their health data
- Ensure interoperability and security of health data



Secondary use

Use of data for research

- Ensure a consistent and efficient framework for the reuse of health data for research, innovation, policy-making and regulatory activities



Economic impacts

- Foster a single market for digital health services and products
- Unleash the power of the health data economy



Priority 1

- Patient summaries
- ePrescriptions
- eDispensations



Priority 2

- Medical results: lab, diagnostics and other
- Medical imaging
- Discharge reports
- Additional data categories





Cloud readiness

Providers seek for cloud-native architectures with standardized apis make cross-institutional image sharing significantly easier and cheaper to implement than traditional point-to-point integrations.



AI & analytics support

to reduce radiologist workload — automating triage, flagging anomalies, and enabling consistent reads across shared imaging pools, so providers can focus on complex cases and deliver faster, more accurate diagnoses.

IHE



- **DICOM:** Digital Imaging and Communications in Medicine
- **XDS.b-I:** Cross-Enterprise Document Sharing for Imaging
- **WIA:** Web-based Image Access
- **FHIR Imaging:** Fast Healthcare Interoperability Resources – Imaging
- **MADO:** Manifest-Based Access to DICOM Objects

Feature	DICOM (DIMSE)	XDS.b-I	WIA	FHIR Imaging	MADO
Full Name	Digital Imaging and Communications in Medicine	Cross-Enterprise Document Sharing for Imaging	Web-based Image Access	Fast Healthcare Interoperability Resources – Imaging	Manifest-Based Access to DICOM Objects
Primary Purpose	Acquisition, storage, display & exchange of medical images	Enterprise-level sharing of imaging documents across institutions	Web-based access to DICOM objects	RESTful access to imaging resources within FHIR ecosystem	Manifest-driven retrieval of DICOM objects across communities
Feature	DICOM (DIMSE)	XDS.b-I	WIA	FHIR Imaging	MADO
Data Format	DICOM objects (.dcm)	DICOM + XDS documents	DICOM (via DICOMweb)	FHIR Resources (JSON/XML) + DICOMweb	FHIR ImagingStudy Bundle or DICOMweb
Cloud Readiness	Low (traditionally on-premise)	Low–Moderate	High	High	High
Maturity	Very mature (since 1993)	Mature (2000s)	Evolving	Emerging / Rapidly growing	Very new
AI/Analytics Support	Limited natively	Limited	Moderate (via DICOMweb)	Strong (structured data + FHIR workflows)	Moderate (structured manifests support downstream AI access)
Cloud Readiness	Low (traditionally on-premise)	Low–Moderate	High	High	High
Typical Use Case	PACS ↔ Modality, PACS ↔ PACS	Hospital ↔ Hospital, HIE image sharing	Cloud viewers, mobile access	EHR-embedded imaging, AI pipelines, population health	Cross-border imaging exchange (EHDS), multi-community retrieval
AI/Analytics Support	Limited natively	Limited	Moderate (via DICOMweb)	Strong (structured data + FHIR workflows)	Moderate (structured manifests support downstream AI access)
Image Rendering	Requires DICOM viewer	Requires DICOM viewer	Browser-native possible	Browser-native possible	Browser-native possible (via DICOMweb endpoints in manifest)



Technical

Large file sizes & bandwidth limits.

Vendor-specific DICOM implementations.

Lossy compression & quality loss.

Legacy PACS not web-ready.



Identity & matching

Patient ID mismatches across institutions.

No universal patient identifier.

Duplicate studies from multiple pathways.



Governance & policy

Varying consent & privacy frameworks.

Cross-border data sovereignty rules.

Differing retention policies by jurisdiction.



Workflow & operations

Prior studies unavailable at point of care

Reports & images travel separately

CD/physical media still widely used



Standards & interoperability

Fragmentation: DICOM, XDS, WIA, FHIR, MADO

Inconsistent vendor implementation

Structured reports poorly adopted



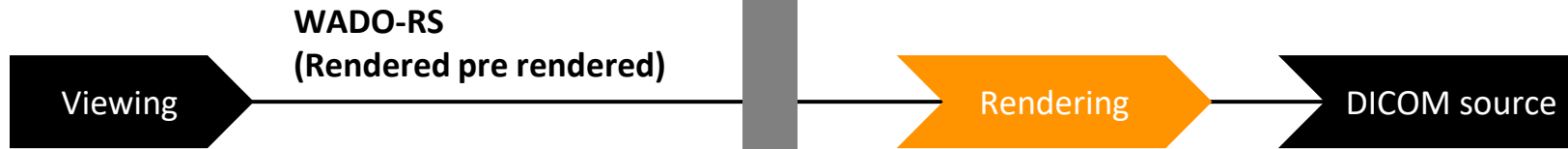
Cost & resources

VNA & exchange node infrastructure costs

Cloud egress costs at scale

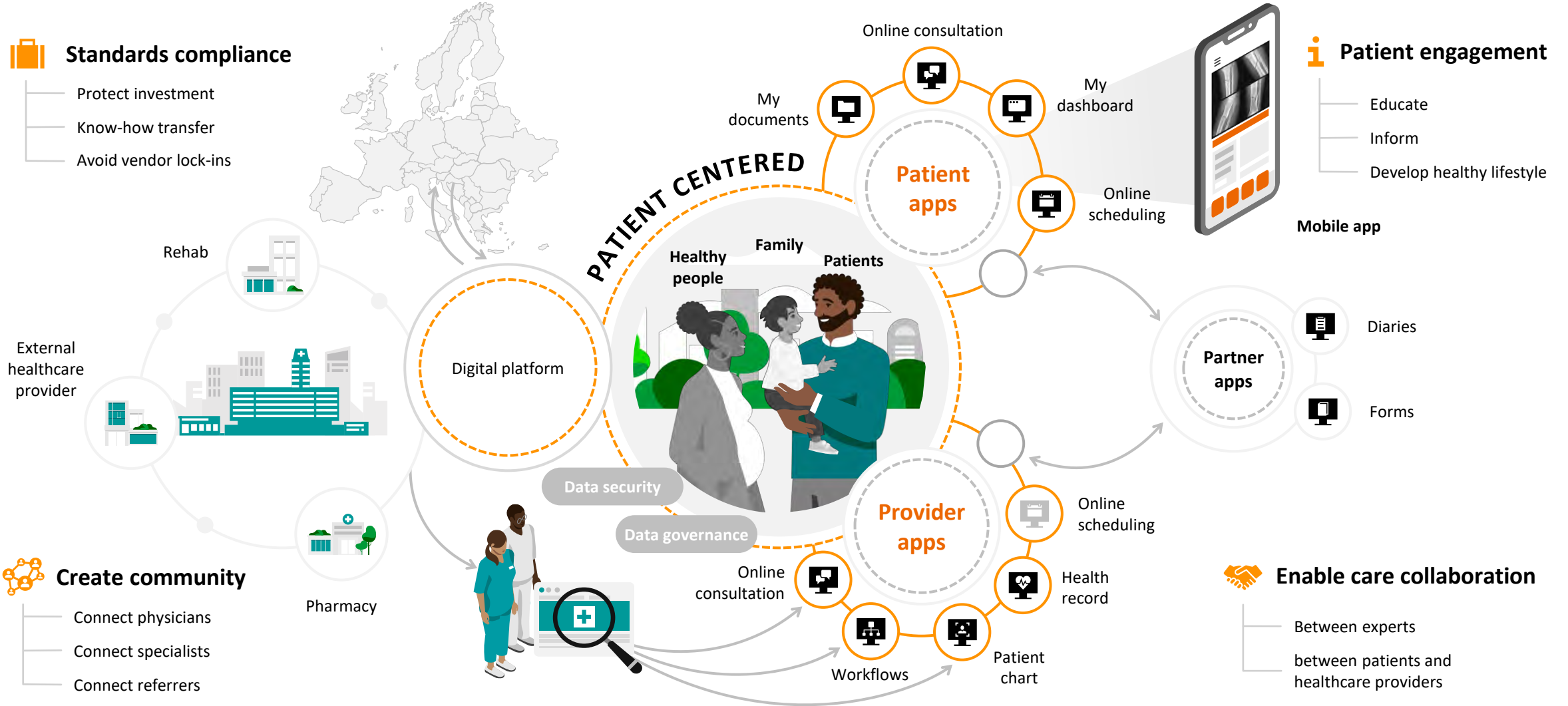
Scarce radiology informatics expertise

Institution Border

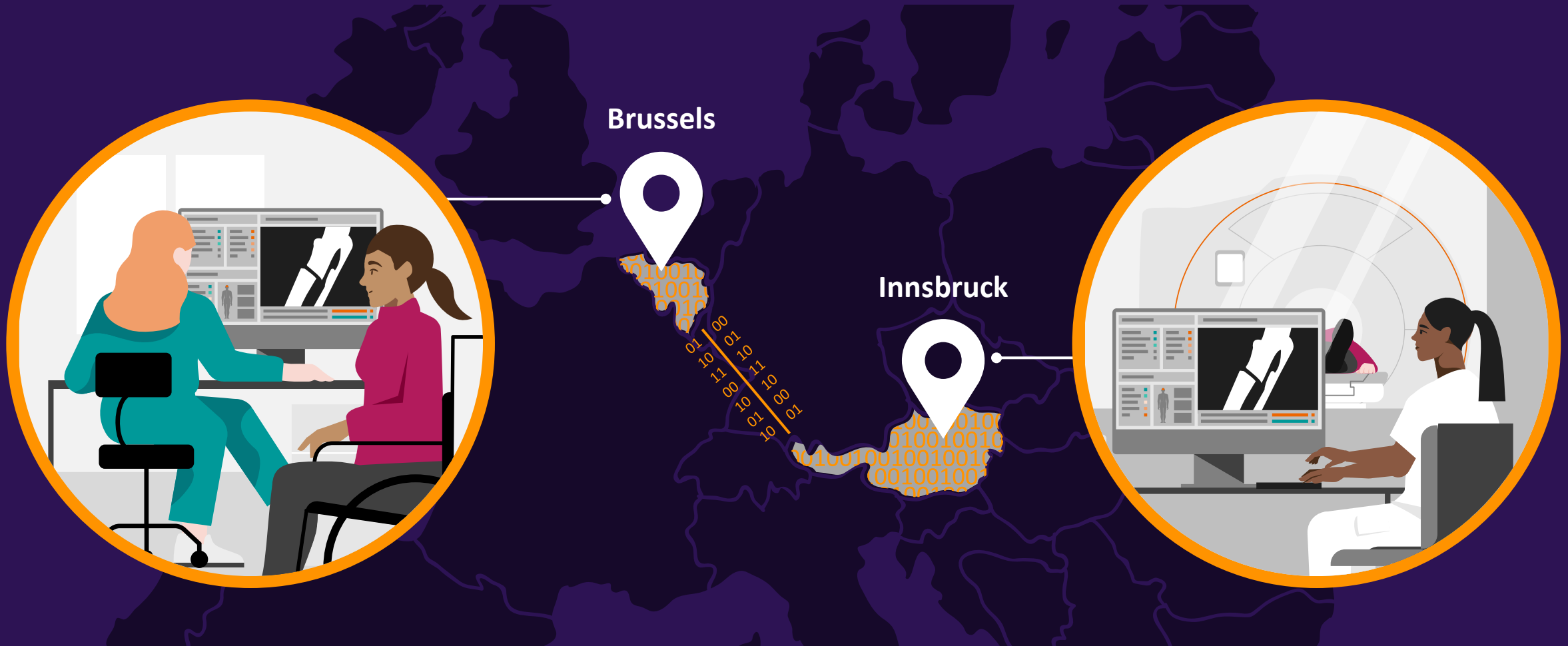


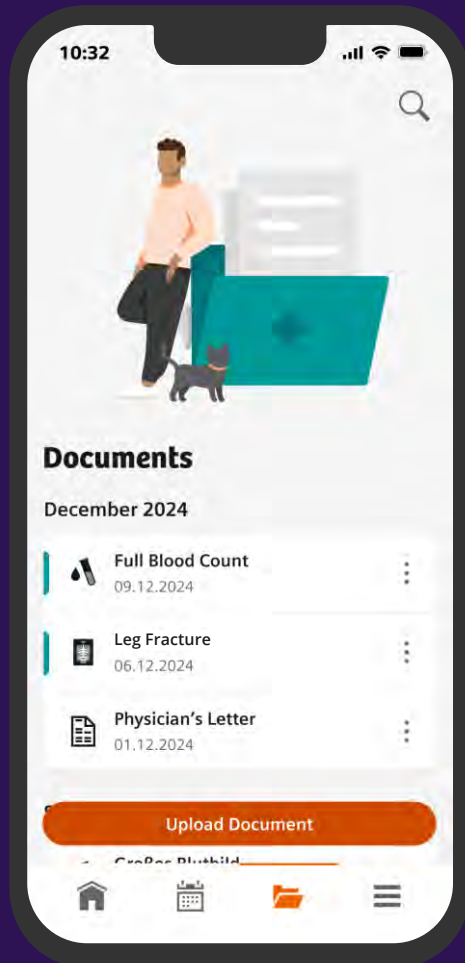
WADO (Web Access to DICOM Objects) supports two fundamentally different retrieval strategies, each suited to different use cases:

- 1 Native DICOM retrieval (application/DICOM)**
You request the raw .dcm file directly from the WADO server, exactly as it was stored in the PACS.
- 2 Pre-rendered image retrieval (image/jpeg, image/png, ...)**
The WADO server renders the DICOM pixel data server-side and returns a consumer image format.



Information exchange between countries prevents the duplication of examinations





Continuity of care

Specialist needs prior imaging from a different hospital system — instead of repeating the scan, images are retrieved quickly across systems.



Avoiding redundant imaging

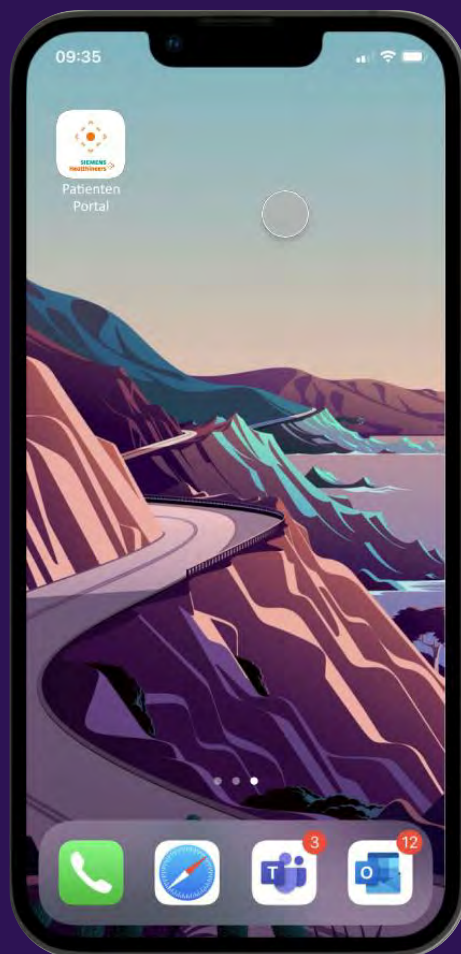
reducing cost, time, and unnecessary radiation exposure.



Cross-border / Cross-region care

Patients traveling, expats, or those receiving care in another country or region can have imaging accessed by treating clinicians without administrative delays.

Patient-centric medical imaging: A mobile-first approach



Always-on availability

A smartphone is the only device patients have at hand during hospital visits, emergencies, or sudden referrals — making mobile the only reliable access point.



Patient-controlled sharing

Patients can quickly authorize or revoke access to their imaging data on the go, without depending on administrative processes.



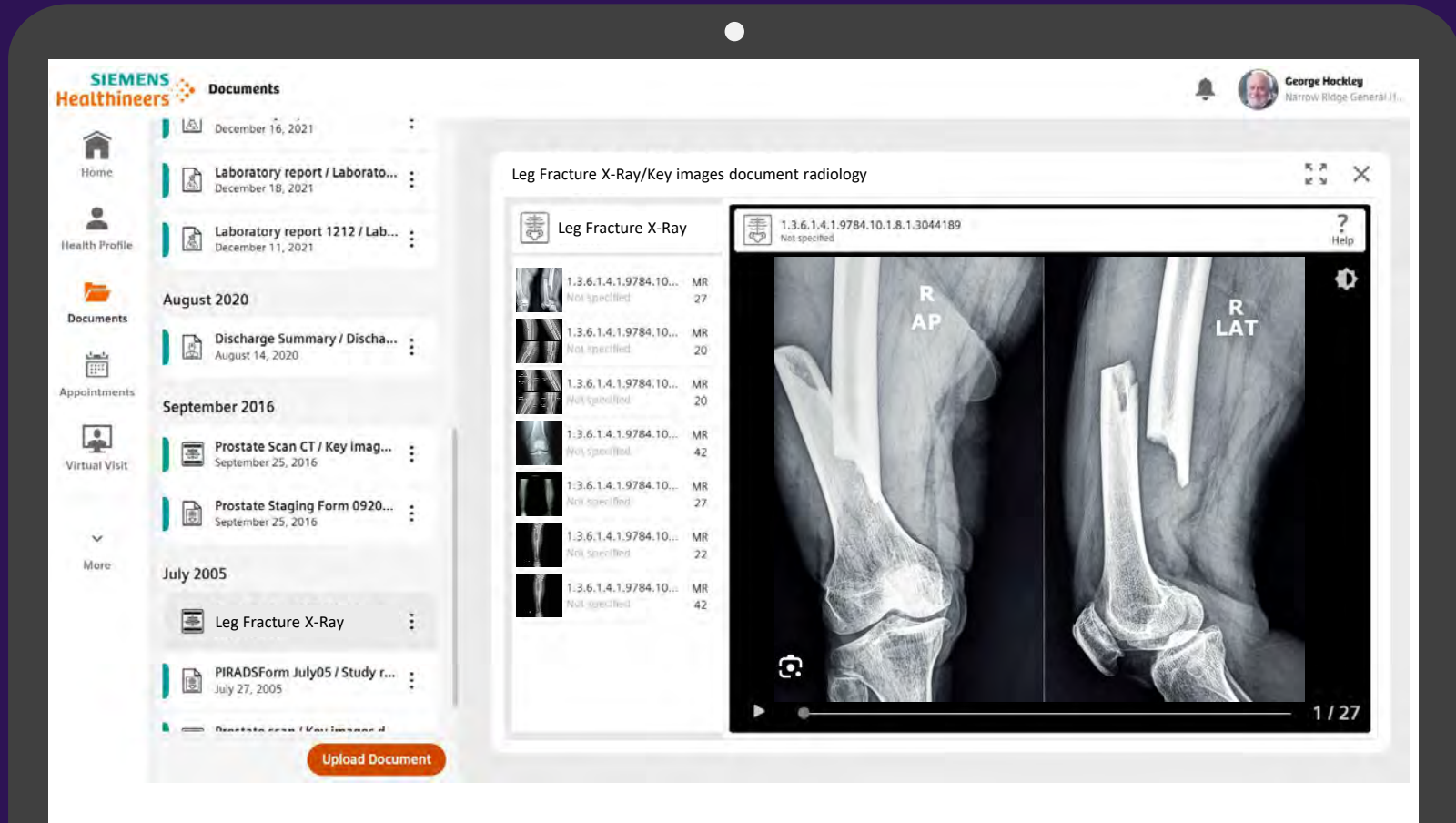
Bridging the digital divide

For many patients, a smartphone is their only connected device — mobile-first design ensures no one is left behind.



Faster decisions in emergencies

Patients presenting prior imaging on their phone can help to accelerate diagnosis and reduce dangerous delays or redundant scans.



The screenshot displays the Siemens Healthineers patient data interface for George Hockley (DOB: 04/13/1972, Age: 53). The interface includes a navigation bar with tabs for Patient Overview, Laboratory, Documents, Patient Chart (PREVIEW), and Laboratory Reports (PREVIEW). A filter sidebar on the left allows for searching, sorting (By date descending), and time range selection. The main area shows 16 documents, including teleconsultations, workflow documents, visit information, and laboratory reports. A summary sidebar on the right highlights visits to Narrow Ridge General Hospital (2) on 05/28/2024 and Westchester Clinic (2) on 09/07/2023, with a further breakdown for Westchester Clinic (2) from 12/16/2021 to 12/18/2021.

Document Title	Date
Teleconsultation / Consultation	May 28, 2024
Teleconsultation / Workflow Document	May 28, 2024
Teleconsultation / Workflow Document	September 7, 2023
Teleconsultation / Consultation	September 7, 2023
Visit Information / Patient documentation	September 7, 2022
Laboratory report 1812 / Laboratory report	December 16, 2021
Laboratory report / Laboratory report	December 18, 2021
Laboratory report 1212 / Laboratory report	December 11, 2021
Discharge Summary / Discharge summarization note (physician)	August 14, 2020

Narrow Ridge General Hospital (2)
05/28/2024

Westchester Clinic (2)
09/07/2023

Westchester Clinic (2)
12/16/2021 - 12/18/2021

The screenshot displays the Siemens Healthineers 'Documents' interface for patient George Hockley (DOB: 04/13/1972, Age: 53). The interface is divided into three main sections:

- Left Panel (Documents List):** A list of 16 documents is shown, including 'Leg Fracture Report', 'Leg Fracture X-Ray', and 'PIRADS Form July05 / Study report (radiology)'. A 'Filter' sidebar is visible on the far left.
- Center Panel (X-Ray):** Titled 'Leg Fracture X-Ray', it displays four radiographic images of a leg. A scale bar indicates '100 mm'. Below the images, there are technical details: 't1_tse_fast_dlxo...', '06/03/2015 04:0...', and 'MR | 42'.
- Right Panel (Medical Report):** Titled 'Leg Lecture Report', it shows a 'GENERAL HOSPITAL MEDICAL REPORT' form. The form includes fields for Patient Name, Age/Gender, Date of Examination, and Patient ID. Below these are sections for 'Chief Complaint', 'History of Present Illness', 'Physical Examination', 'Imaging Findings', 'Diagnosis', 'Treatment Plan', and 'Prognosis'. A signature line is at the bottom.

Real-world lessons:

Isolated data systems across Europe create many challenges for both physicians and patients

→ EURIDICE and Xt.EHR are aligning existing standards to support the European Health Data Space, fostering sustainable interoperability across regional and cross-European imaging and healthcare exchange networks.

Standardized frameworks such as IHE, DICOM, FHIR, etc. are the foundation of connected care

→ Consistent adoption enables cross-border and cross-institution image exchanges. The focus is not the lack of standards, but on the need for harmonized, interoperable implementations across regions and institutions

Interoperability and standardization provides patients with safer and more efficient healthcare

→ As a result, regional and cross-border interoperability is no longer optional. Cross-region and cross-country care scenarios have become real, recurring use cases rather than rare exceptions.

Next generation healthcare is cloud-ready, AI-enabled, and patient-centric

→ Cloud-native architectures, structured data, and AI workflows simplify image sharing, reduce radiologist workload, and support a more accessible, digital, patient experience.

Thanks for your attention!



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DISCLAMIER

eHealth Solutions consist of several products. eHealth Virtual Visit and eHealth Stroke are manufactured by Siemens Healthineers AG, Forchheim, Germany. eHealth EHR, eHealth Master Patient Index (MPI), eHealth Adaptor Set (AS), eHealth Healthcare Provider Directory (HPD), eHealth Health Data Repository (HDR), eHealth Patient Portal, eHealth Physician Portal, eHealth Patient Access and eHealth Result Notifier are manufactured by ITH icoserve technology for healthcare GmbH – A Siemens Healthineers Company, Innsbruck, Austria. Products of eHealth Solutions are not intended for diagnostic purposes. The product offerings are not commercially available in all countries. Please contact your local Siemens Healthineers organization for further information.