

# Open Source, Model-Driven Electronic Health Records with Interactive Graphics



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# Health Records at the Mayo Clinic, 1907

The use of properly organised patient records, or case notes, has a surprisingly short history, having first been introduced at the Mayo Clinic by Dr Henry S. Plummer in 1907.

These 'patient dossiers' provided the first model for the organisation of patient information and key features of that model can still be seen in today's electronic records.

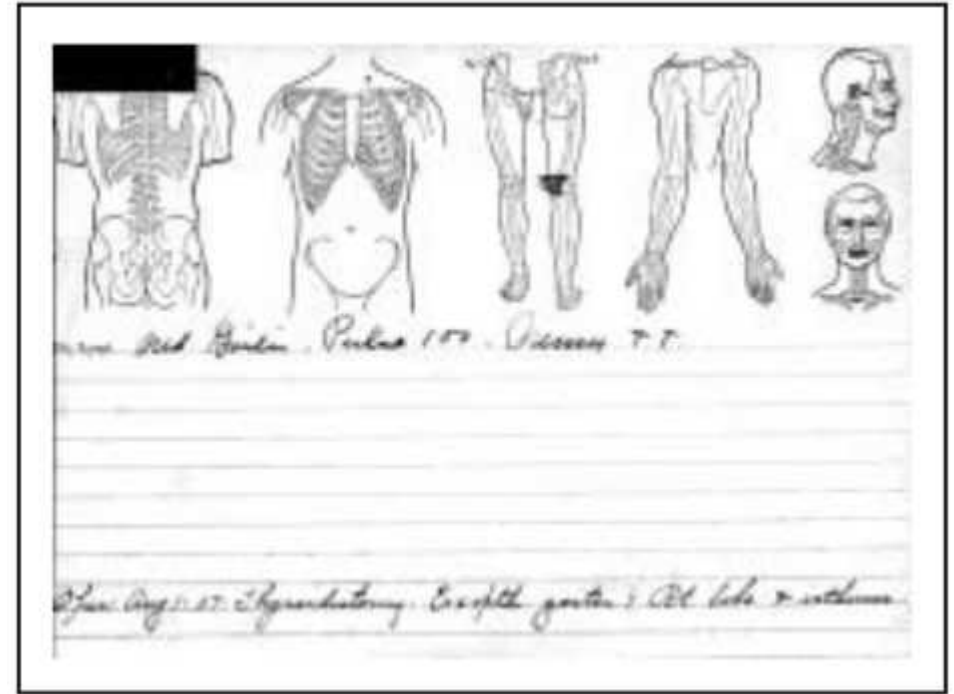


FIGURE 2. Back of 1907 patient chart documenting objective symptoms and operative note.

Camp, C.L., Smoot, R.L., Kolettis, T.N., Groenewald, C.B., Greenlee, S.M. and Farley, D.R., 2008, December. Patient records at Mayo Clinic: lessons learned from the first 100 patients in Dr Henry S. Plummer's dossier model. In Mayo Clinic Proceedings (Vol. 83, No. 12, pp. 1396-1399). Elsevier.

# Mayo Clinic, 1968

Which of the following bring you to see the doctor now?

<input type="checkbox"/> Muscles or joints	<input type="checkbox"/> Overweight
<input type="checkbox"/> Back (spine) and neck	<input type="checkbox"/> Fever
<input type="checkbox"/> Skin trouble	<input type="checkbox"/> Headaches
<input type="checkbox"/> Brain	<input type="checkbox"/> Allergy
<input type="checkbox"/> Emotions (nervousness)	<input type="checkbox"/> Swollen glands
<input type="checkbox"/> Kidneys and urine bladder	<input type="checkbox"/> Hernia
<input type="checkbox"/> Glands (thyroid or others)	<input type="checkbox"/> None of the above bring me to see the doctor now.
<input type="checkbox"/> Sex organs	

← Go back       Erase       Continue →

Experiments with electronic health records at the Mayo Clinic in the 1960's.

Patients completed questionnaires as they waited for the consultation with their physician.

Their answers were made using a light pen and recorded electronically.

The physician was able to view the electronic responses during the clinic consultation.



Weksel, W., Sholtz, P.N. and Mayne, J.G., 1968, December. The automated medical history. In Proceedings of the December 9-11, 1968, fall joint computer conference, part I (pp. 371-379).

# Needs met by Major EPR Vendors

[www.epic.com](http://www.epic.com)  
[www.nextgen.com](http://www.nextgen.com)  
[www.cerner.com](http://www.cerner.com)  
[www.allscripts.com](http://www.allscripts.com)  
[www.eclinicalworks.com](http://www.eclinicalworks.com)



The screenshot shows a patient's medication list in an EPR system. The patient's name is Charles Adams, DOB: 12/21/1972, Age: 40 years, Weight: 187 lbs., Sex: Male, MRN: 200365448, and FN: 1009-63251. The interface is titled "medication RS GP7XAJNA" and includes a "Med List" tab. The medication list table is as follows:

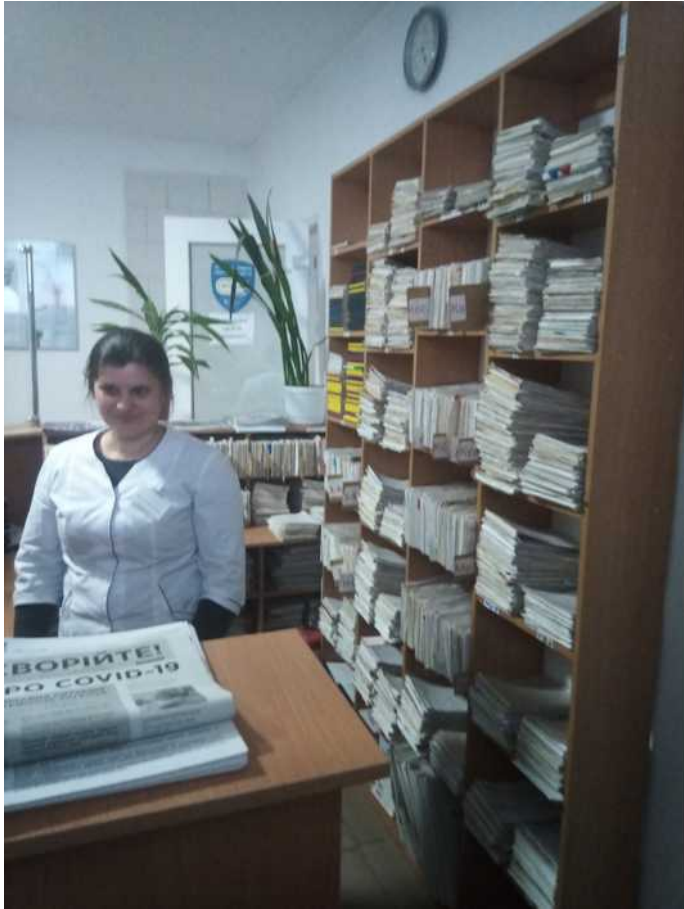
Drug Name	SIG Instructions	Links	Category	Cal	Prin
24 HR Niacin 500 MG / Simvastatin 40 MG Extended Release Oral Tablet [Simcor]	1 once daily (bedtime) for cholesterol, high		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Aspirin Enteric Coated Tablet 81 mg	1 once daily for heart		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bumetanide 1 MG Oral Tablet	2 twice daily for CHF		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Carvedilol 25 MG Oral Tablet [Coreg]	1 twice daily for CHF		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clonazepam 0.5 MG Oral Tablet	1 twice daily as needed for anxiety/nervousness		PRN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clonidine HCl Tablet 0.1 mg	2 twice daily for hypertension		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ergocalciferol 50000 UNT Oral Capsule	Day of week schedule		Day of Week	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Escitalopram 20 MG Oral Tablet [Lexapro]	1 once daily for depression		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Levemir FlexPen 100 IU/mL	50 units once daily (morning) for diabetes		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Losartan Potassium 100 MG Oral Tablet [Cozaar]	1 once daily for hypertension		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Minoxidil 2.5 MG Oral Tablet	1 twice daily for hypertension		Daily	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Novolog Insulin Solution 100 IU/mL	Sliding scale		Special	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Legend:

- Red SIG: SIG not recognized
- Red Drug: Medicine not recognized
- Edit unrecognized data
- Modify SIG instructions
- View PMI (Personal Med Instructions)
- Med instruction unavailable
- View demonstration
- View FDA Med Guide



# Paper Based Health Records



Ambulatory Center, Rivne Oblast, Ukraine

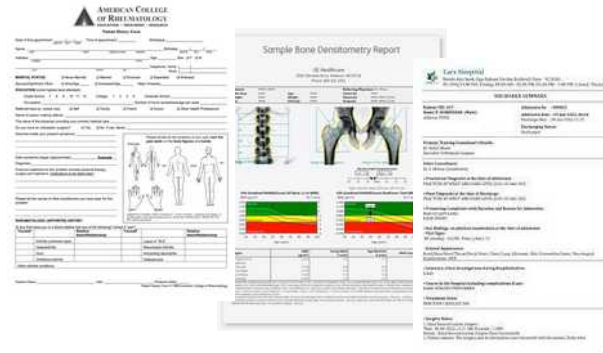


Health records stored in filing cabinet

Each patient record in a suspension file



Each record a set of documents, sorted into folders



The folders contain the patient record as a set of documents



# ISO 13606 Reference Model

**EHR\_EXTRACT** - The electronic health record for one person

**FOLDER** - High-level organisation of the EHR e.g. per episode, per clinical specialty

**COMPOSITION** - A clinical care session, encounter or document e.g. test result, letter

**SECTION** - Clinical headings reflecting the workflow and consultation process

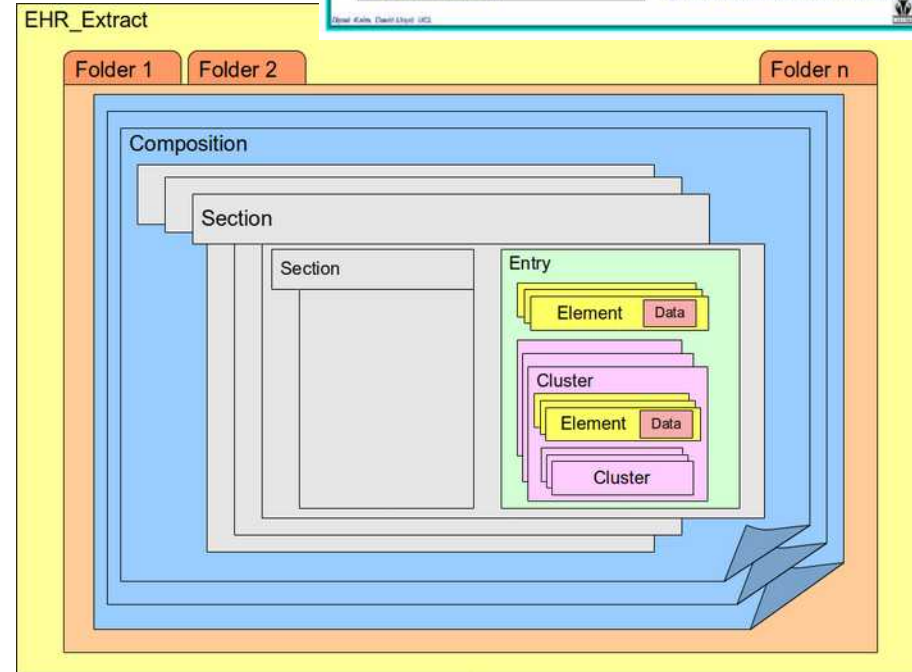
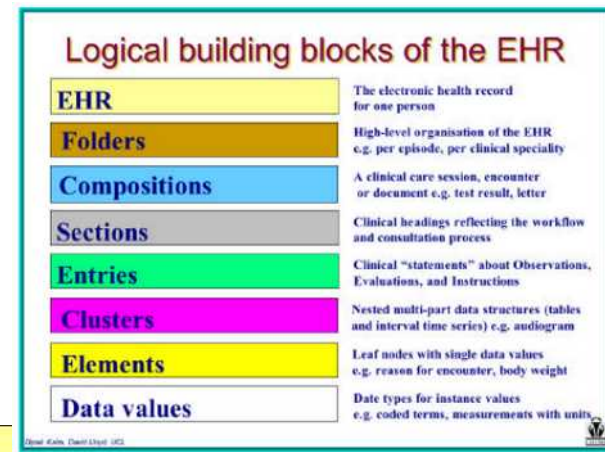
**ENTRY** - Clinical statements about Observations, Evaluations and Instructions

**CLUSTER** - Nested multi-part data structures (tables and interval time series) e.g. audiogram

**ELEMENT** - nodes with single data values e.g. reason for encounter, body weight

**DATA** - Data types for instance values e.g. coded terms, measurements with units

Kalra, D., 2006. Electronic health record standards. Yearbook of medical informatics, 15(01), pp.136-144.



# Open Source, Open Standards

cityEHR is an open source Electronic Health Record, built using open standards

The screenshot displays the cityEHR patient record for Jermaine HOLLMAN. The patient's information includes: HOLLMAN, Jermaine (Mr) Born: 19-Apr-1973 (51 years) Gender: Male. Patient Id 47842134 NHS Number 25525252. The interface features a navigation bar with options like In Progress, New, Events, Summaries, Forms, Letters, Pathways, Booking, and Ordering. A sidebar on the left lists various medical categories, with 'Hospital Anxiety and Depression Scale' selected. The main content area shows the '16-Aug-2024 - Hospital Anxiety and Depression Scale' assessment. It includes a summary table and a list of 15 items with corresponding response options.

Item	Response
Anxiety Score	14 Moderate
Depression Score	14 Moderate
I feel tense or 'wound up'	Most of the time
I still enjoy the things I used to	Not quite as much
I get a sort of frightened feeling as if something awful is about to happen	Yes, but not too badly
I can laugh and see the funny side of things	Not quite so much now
Worrying thoughts go through my mind	A lot of the time
I feel cheerful	Not often
I can sit at ease and feel relaxed	Definitely
I feel as if I am slowed down	Nearly all the time
I get a sort of frighened feeling like 'butterflies' in the stomach	Occasionally
I have lost interest in my appearance	I don't take as much care as I should
I feel restless as if I have to be on the move	Very much indeed
I look forward with enjoyment to things	Hardly at all
I get sudden feelings of panic	Very often indeed
I can enjoy a good book or radio or TV program	Not often



# Document-Based Using ISO 13606

cityEHR uses the reference model of EHR defined by the ISO 13606 standard

**HOLLMAN, Jermaine (Mr)** Born: 19-Apr-1973 (51 years) Gender: Male  
Patient Id 47842134 NHS Number 25525252

Quit Administration  
Dashboard Patient Search Patient Cohorts In-Tray Clinics Orders Registration

cityEHR

In Progress New Hide Events Summaries Forms Letters Pathways Booking Ordering Show

▼ cityEHR Feature Demo (26)

- Current Observations
- Acid Base Disorders
- Allergies and Warnings
- Bone Chemistry
- Hospital Anxiety and Depression Scale
- Laboratory Test Results
- Update Patient Demographics
- Feature Demonstration
- DAS 28
- DAS 68
- Diagnosis
- Family History
- Fracture History
- Fracture Record

16-Aug-2024 - Hospital Anxiety and Depression Scale \* Page load time: 0.000s Show ISO-13606  Show Ids  Highlight Entries -- None --

Anxiety Score	14	Moderate
Depression Score	14	Moderate
I feel tense or 'wound up'		Most of the time
I still enjoy the things I used to		Not quite as much
I get a sort of frightened feeling as if something awful is about to happen		Yes, but not too badly
I can laugh and see the funny side of things		Not quite so much now
Worrying thoughts go through my mind		A lot of the time
I feel cheerful		Not often
I can sit at ease and feel relaxed		Definitely
I feel as if I am slowed down		Nearly all the time

# Document-Based Using HL7 CDA

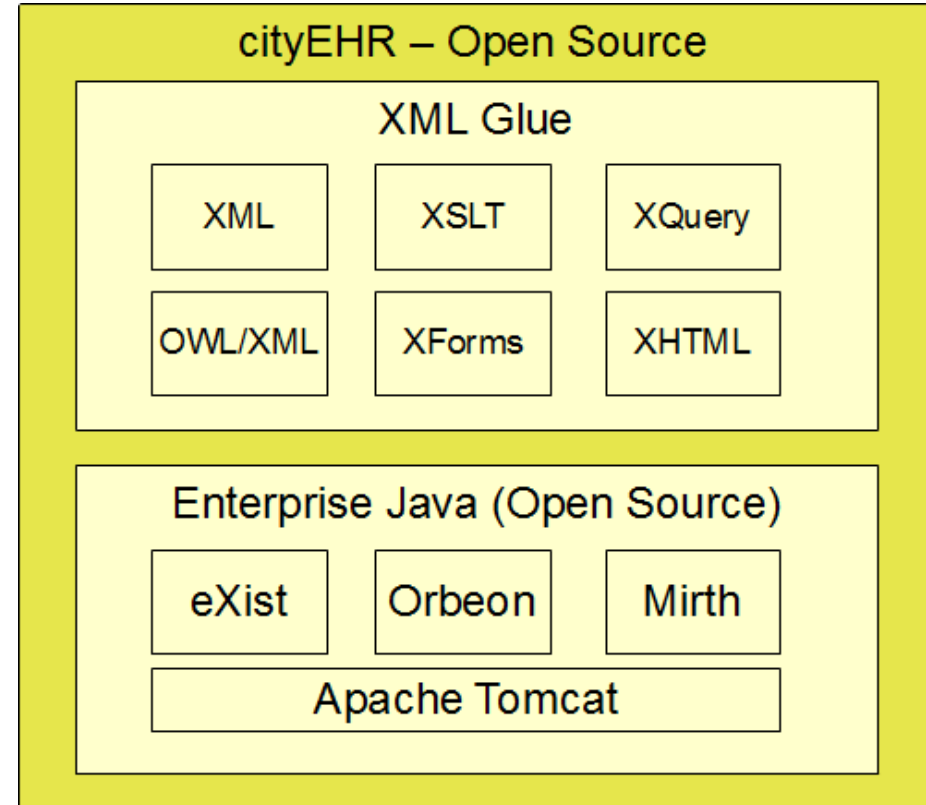
cityEHR stores the health record as XML documents using the HL7 CDA standard

The screenshot displays the cityEHR XML Document Viewer interface. At the top left, patient information is shown: "HOLLMAN, Jermaine (Mr) Born" and "Patient Id 47842134 NHS Number". The interface includes a sidebar with navigation options such as "In Progress", "New", "cityEHR Feature Demo (26)", "Current Observations", "Acid Base Disorders", "Allergies and Warnings", "Bone Chemistry", "Hospital Anxiety and Depression Scale", "Laboratory Test Results", "Update Patient Demographics", "Feature Demonstration", "DAS 28", "DAS 68", "Diagnosis", "Family History", "Fracture History", and "Fracture Record". The main area displays the XML document content, which is a ClinicalDocument for a Hospital Anxiety and Depression Scale. The XML includes patient details like name (Mr Jermaine Hollman), gender (Male), and birth date (1973-04-19). The document is authored by the cityEHR system. The interface also features a "Download" button, a "Close" button, and a "Show" button. The top right corner contains navigation links for "Quit Administration", "Orders", and "Registration", along with the cityEHR logo.

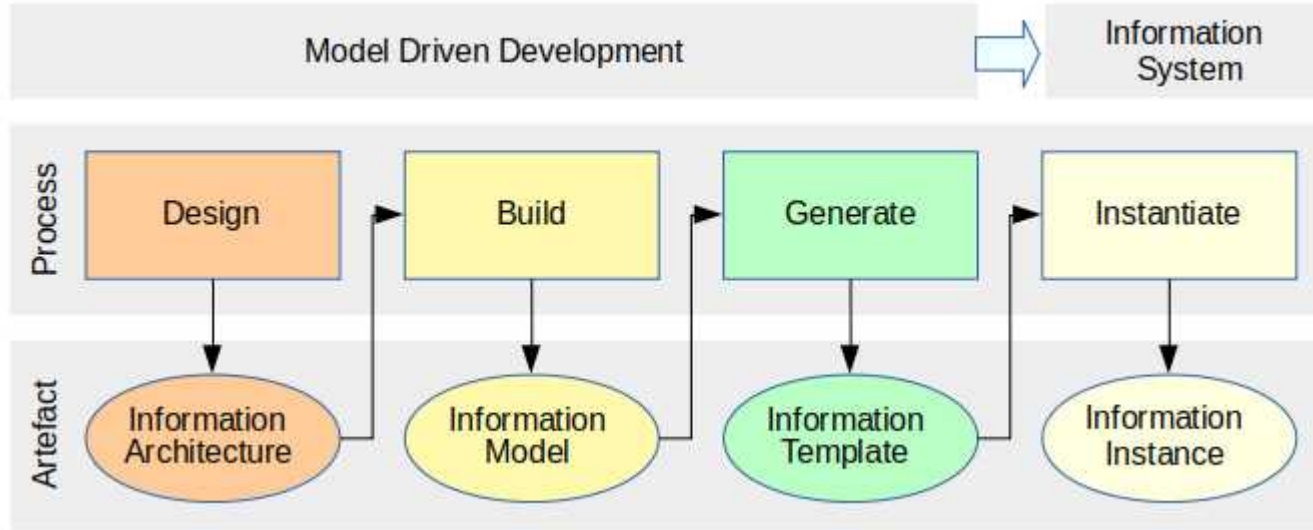
```
<ClinicalDocument xmlns:cityEHR="http://openhealthinformatics.org/ehr" xmlns:math="http://exslt.org,
<typeId root="#CityEHR:Form" extension="#CityEHR:Form:HADS"/>
<templateId root="#ISO-13606:EHR_Extract:cityEHR" extension="#ISO-13606:Folder:FeatureDemo"/>
<id root="cityEHR" extension="#CityEHR:Form:HADS"/>
<code code="" codeSystem="cityEHR" displayName="Hospital Anxiety and Depression Scale"/>
<effectiveTime value="2024-08-16T06:25:33.604+01:00"/>
<recordTarget>
  <patientRole>
    <id extension="47842134"/>
    <patient>
      <name>
        <prefix>Mr</prefix>
        <given>Jermaine</given>
        <family>Hollman</family>
      </name>
      <administrativeGenderCode code="" codeSystem="" displayName="Male"/>
      <birthTime value="1973-04-19"/>
    </patient>
    <providerOrganization>
      <id extension="cityEHR" root="#ISO-13606:EHR_Extract:cityEHR"/>
      <name/>
    </providerOrganization>
  </patientRole>
</recordTarget>
<author>
  <time value=""/>
  <assignedAuthor>
    <id extension="" root="#ISO-13606:EHR_Extract:cityEHR"/>
    <assignedPerson>
      <name/>
```

# Open Source for cityEHR

- cityEHR is built using open source software
- An enterprise-scale health records system
- An XRX application – XForms – REST – XQuery
- Initial research at City University, London
- Distributed under the LGPL license



# Architecture and Models



Agreement (national) on the Design of a Clinical Information Architecture allows for...

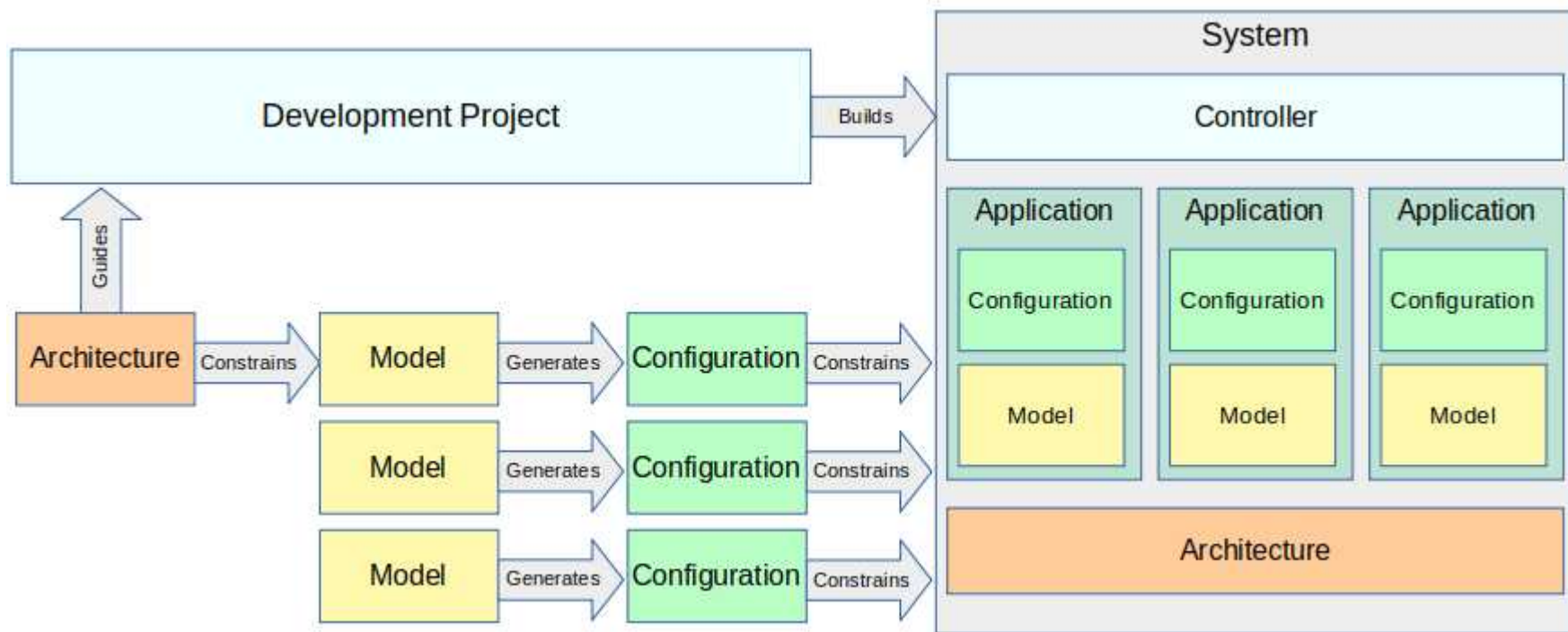
Information Models to be developed locally, which then generate the templates used to...

instantiate the Clinical Information gathered and used for clinical care and research

# Model-Driven Clinical Systems

Using the EHR framework, clinicians can develop their own clinical information models.

Then deploy them as enterprise-scale EHR, conforming to the architectural standards

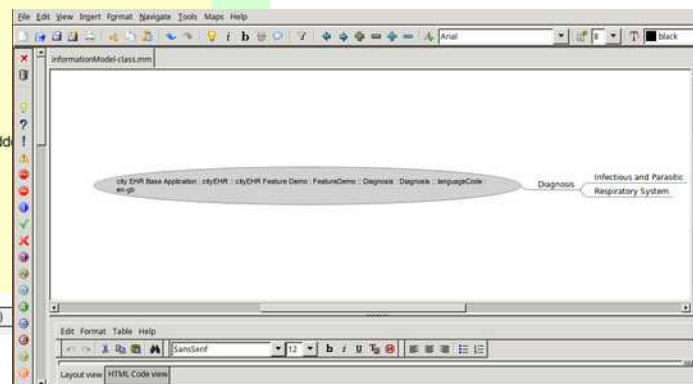
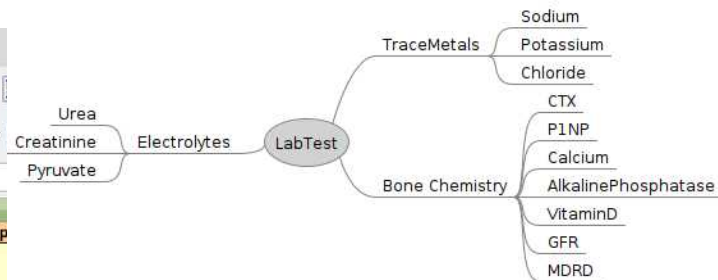




# Clinical Information Models Created by Clinicians

Clinicians use familiar tools to create information models that meet their needs

ElementId	DisplayName	Hint	Root Of	Element Type	Data Type	Value Required	Scope
27	ConfigLookupGP			simpleType	string	Optional	
29	Title	Title		enumeratedValue	string	Optional	
30	Forename	Forename		simpleType	string	Optional	
31	Surname	Surname		simpleType	string	Optional	
32	Sex	Sex Assigned at Birth		enumeratedValue	string	Optional	
33	Gender	Gender Identity		enumeratedValue	string	Optional	
34	DateOfBirth	Date of Birth		simpleType	date	Optional	
36	StreetAddress	Address		simpleType	string	Optional	
37	TownCity	Town/City		simpleType	string	Optional	
38	PostCode	Postcode		simpleType	string	Optional	
40	GPName	Dr		simpleType	string	Optional	
41	GPCode	Code		simpleType	string	Optional	
42	GPPractice	Practice		simpleType	string	Optional	
44	GPLookupKey			calculatedValue	string	Optional	
45	LookUpGP	Find GP		simpleType	boolean	Optional	
47	ClinicCode	Clinic Code		enumeratedDirectory	string	Optional	
48	ClinicLocation	Location		simpleType	string	Optional	
50				enumeratedValue	string	Optional	



# Ontology Models to Feed Artificial Intelligence

The underlying models are represented as ontologies, using the OWL/XML standard

Ontology models are a one of the foundational models for Artificial Intelligence

Enabling AI tools such as Description Logic Reasoners to mine data for clinical research

The screenshot displays an ontology editor interface for 'Ontology1300280377354'. The main window is divided into several panes:

- Class hierarchy:** A tree view showing the hierarchy starting from 'owl:Thing' and including classes like 'CityEHR:Class', 'CityEHR:DataType', 'CityEHR:ElementProperty', 'CityEHR:EntryProperty', 'CityEHR:Error', 'CityEHR:Patient', 'CityEHR:Property', 'CityEHR:Term', 'CityEHR:Unit', 'CityEHR:Value', 'CityEHR:Warning', and 'ISO-13606:Cluster'.
- Property assertions:** A list of object property assertions for the class 'CityEHR:Form:FeatureDemo', including 'hasContent' with values like 'ISO-13606:Section:Lifestyle', 'ISO-13606:Section:Medication', 'ISO-13606:Section:BuiltInVariables', 'ISO-13606:Section:CurrentObservations', 'CityEHR:Term:FeatureDemonstration', 'ISO-13606:Section:LabData', 'ISO-13606:Section:Diagnosis', 'ISO-13606:Section:BMDData', and 'ISO-13606:Section:MedicalHistory'.
- Data property assertions:** A list of data property assertions for the same class, including 'hasContentsList' with a complex URI and 'hasRank' with the value '2'.
- Direct instances:** A list of instances for the class 'CityEHR:Form', including 'CityEHR:Form:CurrentObservations', 'CityEHR:Form:DAS28', 'CityEHR:Form:DAS68', 'CityEHR:Form:Diagnosis', 'CityEHR:Form:DietExercisePlan', 'CityEHR:Form:Familyhistory', 'CityEHR:Form:FeatureDemo' (highlighted), 'CityEHR:Form:FractureHistory', 'CityEHR:Form:Fractures', and 'CityEHR:Form:HADS'.

# Interactive Graphical Data Entry

Support for graphical data entry

HOLLMAN, Jermaine (Mr) Born: 19-Apr-1973 (51 years) Gender: Male  
Patient Id 47842134 NHS Number 25525252

Quit Administration  
Dashboard Patient Search Patient Cohorts In-Tray Clinics Orders Registration

city EHR

In Progress New Hide Events Summaries Forms Letters Pathways Booking Ordering Show

▼ cityEHR Feature Demo (26)

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DAS 28

Disease Activity Score (DAS 28)

DAS 68

Diagnosis

Family History

Fracture History

16-Aug-2024 - DAS 28 \* Page load time:  Show ISO-13606  Show Ids  Highlight Entries -- None --

### Disease Activity Score (DAS 28)

Count	Swollen Joints	Tender Joints
ESR	2	4
Visual Analogue Scale	4	
DAS Score	2.65	

# SVG Graphics Linked to the Information Model

Any SVG (XML Scalable Vector Graphics) can be linked to the information model

HOLLMAN, Jermaine (Mr) Born: 19-Apr-1973 (51 years) Gender: Male  
Patient Id 47842134 NHS Number 25525252

Quit Administration  
Dashboard Patient Search Patient Cohorts In-Tray Clinics Orders Registration

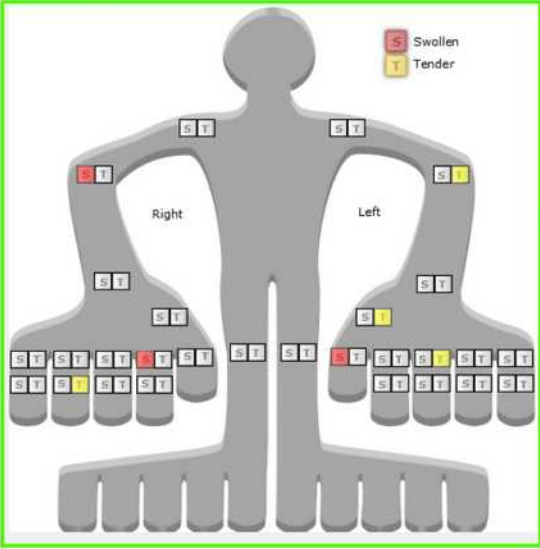
city EHR

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▼ cityEHR Feature Demo (26)  
Current Observations  
Acid Base Disorders  
Allergies and Warnings  
Bone Chemistry  
Hospital Anxiety and Depression Scale  
Laboratory Test Results  
Update Patient Demographics  
Feature Demonstration

16-Aug-2024 - DAS 28 \* Page load time:  Show ISO-13606  Show Ids  Highlight Entries -- None --


### Disease Activity Score (DAS 28)



Count	Swollen Joints	3	Tender Joints	4
ESR		2		
Visual Analogue Scale		4		
DAS Score		2.65		

# Interactive Graphical Data Entry

Support for graphical data entry

HOLLMAN, Jermaine (Mr) Born: 19-Apr-1973 (51 years) Gender: Male  
Patient Id 47842134 NHS Number 25525252 

Quit Administration 

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In Progress New Hide Events Summaries Forms Letters Pathways Booking Ordering Show

▼ cityEHR Feature Demo (26)

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DAS 28




DAS 68

Diagnosis


Family History

Family History

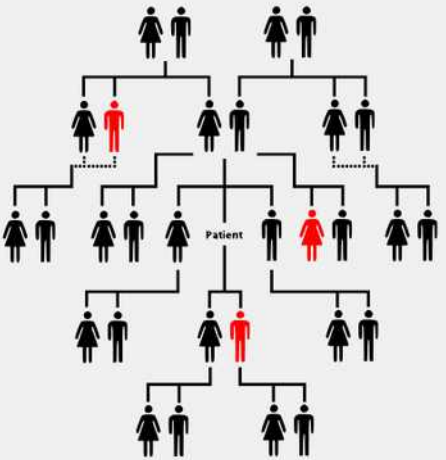
Fracture History

16-Aug-2024 - Family History \* Page load time:  Show ISO-13606  Show Ids  Highlight Entries -- None --   

Family History

Family history 


Year of Diagnosis	Relation	General Diagnosis
<input checked="" type="checkbox"/> <input type="text"/>	Maternal Uncle	<input type="text"/>
<input checked="" type="checkbox"/> <input type="text"/>	Paternal Half Sister	<input type="text"/>
<input checked="" type="checkbox"/> <input type="text"/>	Son	<input type="text"/>






# SVG Graphics Linked to the Information Model

Any SVG (XML Scalable Vector Graphics) can be linked to the information model

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DAS 68


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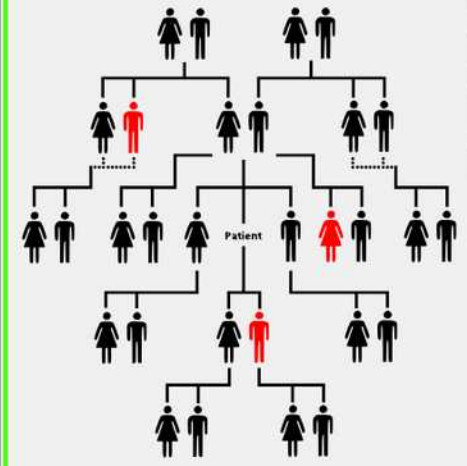
Fracture Record

16-Aug-2024 - Family History \* Page load time: 

### Family History

Family history 

Year of Diagnosis	Relation	General Diagnosis
<input checked="" type="checkbox"/> <input type="text"/>	Maternal Uncle	<input type="text"/>
<input checked="" type="checkbox"/> <input type="text"/>	Paternal Half Sister	<input type="text"/>
<input checked="" type="checkbox"/> <input type="text"/>	Son	<input type="text"/>



# Patient-centred care

The concept of patient-centred care can be traced back to the work of influential psychologist Carl Rogers.

The patient involved in the decision making about their own healthcare

The healthcare process focussed on the needs of the patients, rather than the clinicians



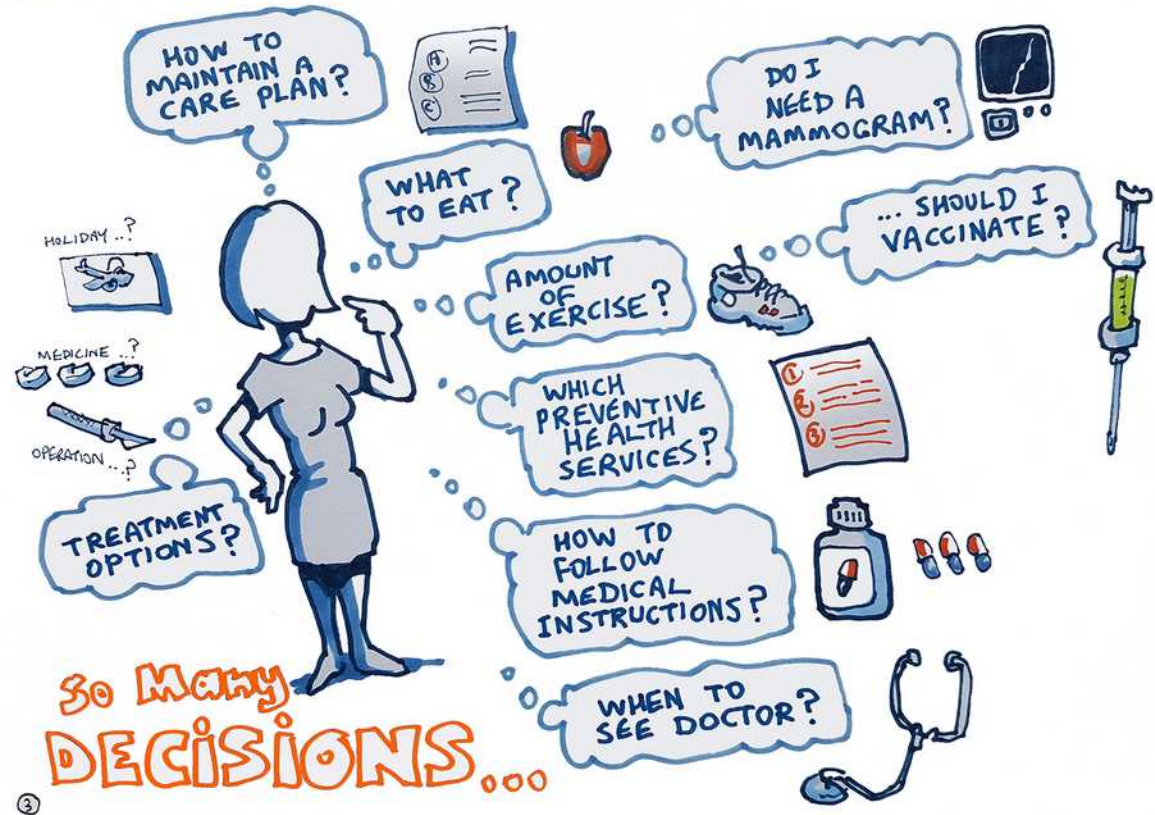
Rogers, C.R., 1959. A theory of therapy, personality, and interpersonal relationships: As developed in the client-centered framework (Vol. 3, pp. 184-256). New York: McGraw-Hill.

# Health Literacy

The term “health literacy” refers to a set of skills that people need to function effectively in the health care environment.

These skills include the ability to read and understand text and to locate and interpret information in documents (print literacy); use quantitative information for tasks, such as interpreting food labels, measuring blood glucose levels, and adhering to medication regimens (numeracy); and speak and listen effectively (oral literacy).

Approximately 80 million U.S. adults are thought to have limited health literacy, which puts them at risk for poorer health outcomes. Rates of limited health literacy are higher among elderly, minority, and poor persons and those with less than a high school education.



<https://www.compare-phc.unsw.edu.au>

Berkman, N.D., Sheridan, S.L., Donahue, K.E., Halpern, D.J. and Crotty, K., 2011. Low health literacy and health outcomes: an updated systematic review. *Annals of internal medicine*, 155(2), pp.97-107.

# Addressing Health Literacy Issues



## HEALTH LITERACY IN THE UNITED STATES Enhancing Assessments and Reducing Disparities

A report from the Milken Institute has seven recommendations for addressing issues in health literacy, in three areas:

Lopez, C., Kim, B. and Sacks, K., 2022. Health Literacy in the United States: Enhancing Assessments and Reducing Disparities. Milken Institute. Available at SSRN 4182046.

## Technology: Keep It Simple

### Recommendation 3:

The sixth-grade reading level rule should apply to overall content to improve usability, readability, and accessibility of technology.

### Recommendation 4:

Access to and use of technology can work hand-in-hand to improve health literacy; focusing on the patient will help tailor the information and share it.



# Kiosk Systems

Self-contained hardware and (single) software application

Touch Screen

End-to-end workflow

Uncluttered user interface

Graphical, where possible

Intuitive

No training required

Any user, any language

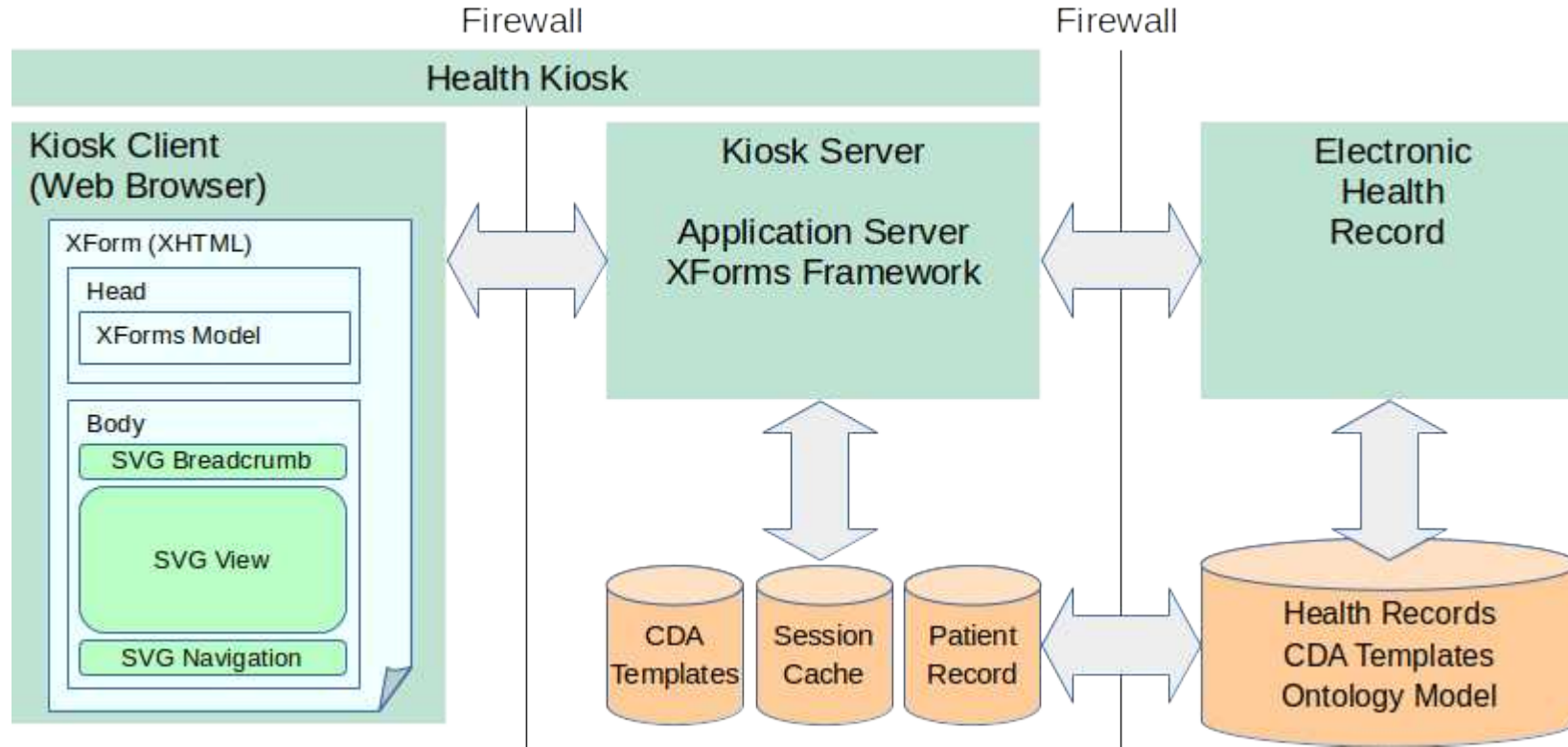


<https://www.businessinsider.com>



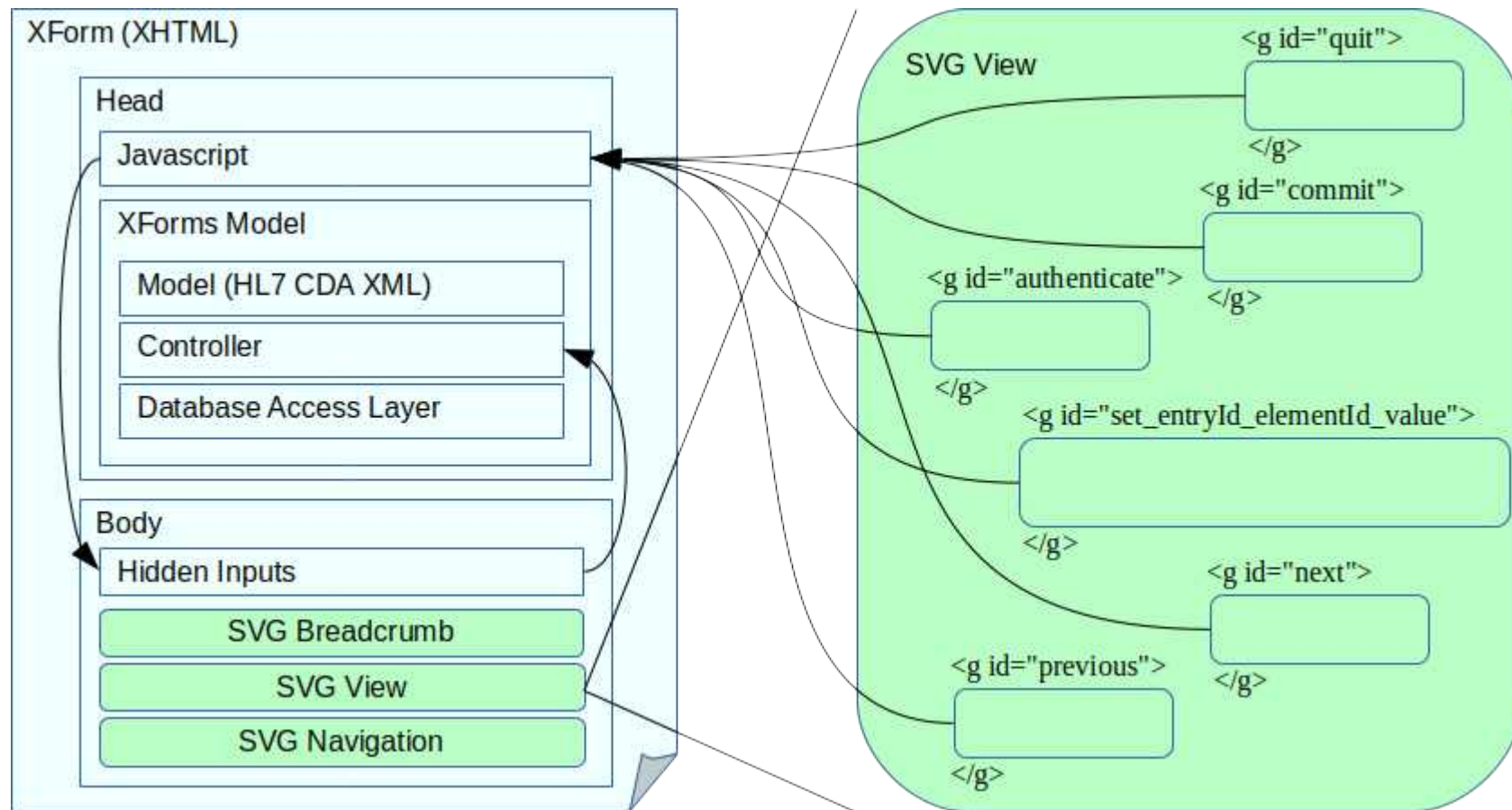
# Health Kiosk Using cityEHR

Kiosk style interface for patient access to their electronic health record  
The clinical information model can generate a health kiosk system.

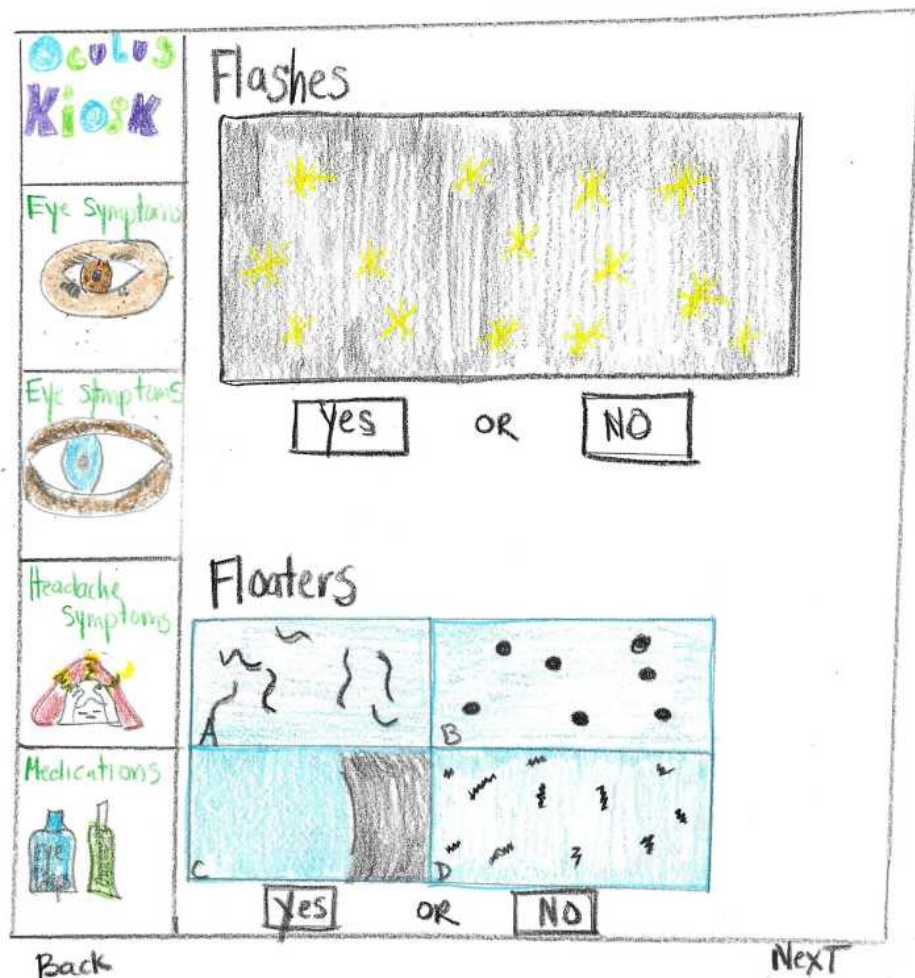


# Kiosk Built Using SVG Images

Any SVG can be used as the kiosk interface, linked using a simple API



# Original Prototype Using Hand Drawn Graphics



Hand drawn images made on paper

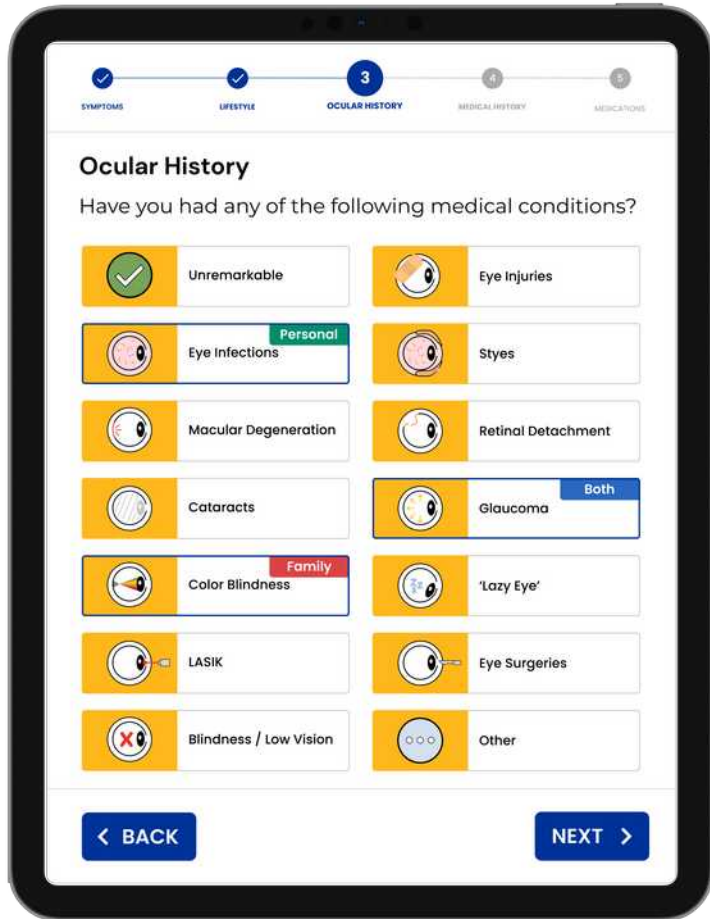
Scanned to bitmap graphic

Imported to SVG as Base64 background image

Hotspots as transparent SVG shapes

Hotspots linked to the information model

# Equivalent Kiosk Using Designer Graphics



Graphic designer creates SVG of each kiosk screen

SVG shapes linked to the information model

Ongoing research project is assessing the best style of kiosk interface to address problems of low health literacy amongst patient users.

# Rural Telemedicine in Ukraine

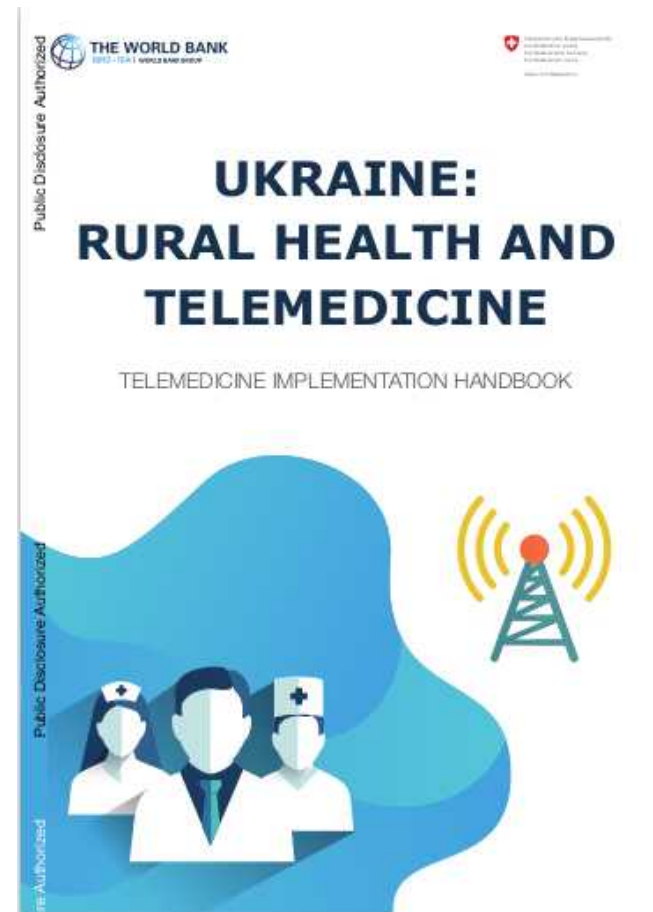
John Chelsom first visited Ukraine in 2018 to work on the World Bank's Handbook for Rural Telemedicine, published in 2020.

## SUMMARY

This Handbook provides practical guidance and recommendations of best practice for the implementation of Rural Telemedicine. It covers the Technical Architecture, Functional Profiles, Standards, Infrastructure, Products (hardware and software), Implementation Procedures, Organisation, operational procedures and methods for Evaluation of Rural Telemedicine Services, with guidance for requirements at national, regional, district and local level.

This report has been tailored to the specific priorities, needs and capabilities of Ukraine and the points at which information specific to Ukraine should be considered during implementation of Telemedicine Services is shown in boxes such as this one.

World Bank. 2020. Ukraine - Rural Health and Telemedicine : Telemedicine Implementation Handbook, <https://documents.banquemoniale.org/curated/fr/877101591354302267/Ukraine-Rural-Health-and-Telemedicine-Telemedicine-Implementation-Handbook>





# Telemedicine in Rivne Oblast

World Bank funded telemedicine in Rivne oblast, one of three pilot implementations (the others were Odesa and Poltava oblasts)



# Workshops at NUWEE, Rivne

The telemedicine kits supplied by the World Bank have not been widely used, due to problems with integration with the health record systems.



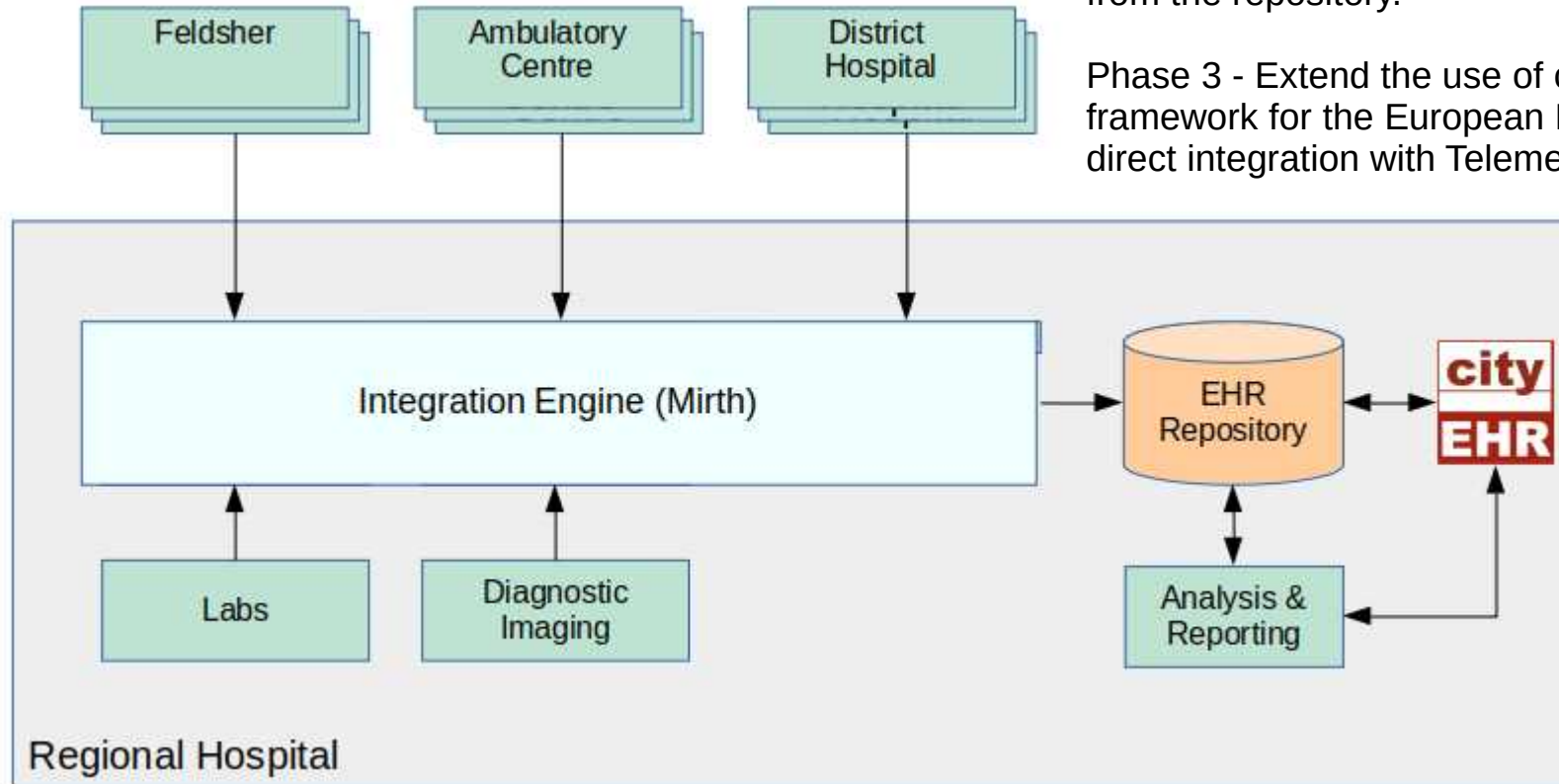
August 2024, workshop to create a pilot telemedicine integration with EHR

# Project in Rivne, Ukraine

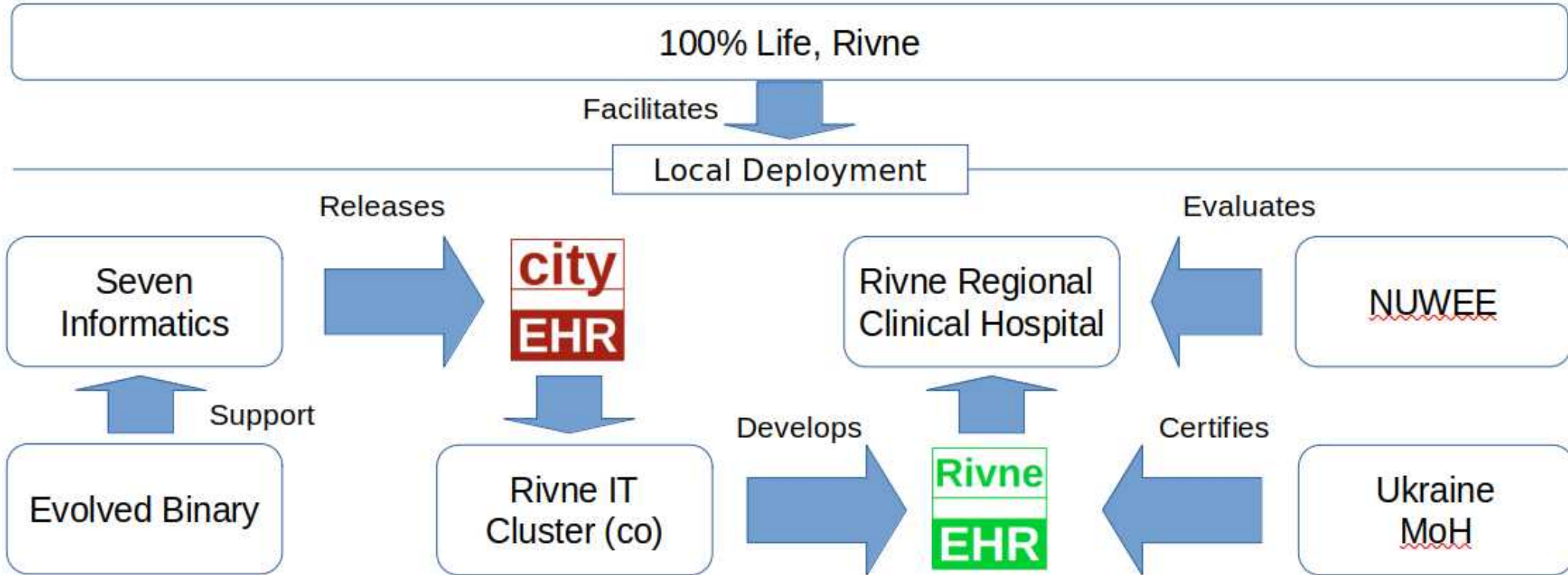
Phase 1 - Use Mirth to create an EHR repository of patient information using HL7 CDA.

Phase 2 - Use cityEHR for analysis and reporting from the repository.

Phase 3 - Extend the use of cityEHR to provide a framework for the European Patient Summary and direct integration with Telemedicine services.



# Open Source Telemedicine Integration Project





# Global Open Source Electronic Health Records

GOSEHR was launched with the financial support of Seven Informatics and the support for Academic Research and Education Programs from Fordham University.

Partners include leading universities in the UK, Canada, Norway and Ukraine together with the African Digital Health Research Institute.



<https://gosehr.org>





## Global Open Source Electronic Health Records

The objective of the Global Open Source Electronic Health Records initiative is to create a sustainable program for the deployment of open source EHR in participating countries, with the ultimate aims of improving patient outcomes and delivering better healthcare, within existing budget constraints.

The Initiative is bringing the benefits of open source, structured EHR systems to low-income countries, through engagement, education and research with local communities.

Partners include leading universities, healthcare providers, open source software developers, NGOs and local community companies.

## Paths Towards GOSEHR

### Education

Run by Fordham University, developing the local IT skills needed to deploy and support the installations.

### Deployment

Using the open source cityEHR system through locally-based Non Government Organisations, Community Companies and Healthcare Providers.

### Financial Aid

Supporting the IT infrastructure required for deployment in lower income countries.

### Research

Led by Fordham University, with international collaborators, establishing needs and evaluating outcomes.



Open Health Informatics

Standards Open Source Interfaces Processes Resources Workshops GOSEHR Summit

## Informatics Delivering Better Healthcare Outcomes

Open Health Informatics brings together Open Standards, Open Source Software, Open Systems Interfaces and Open Development Practices with the aim of delivering better healthcare outcomes.

Open Standards  
Open Source Software  
Open Systems Interfaces  
Open Development Processes

# Get Involved

openhealthinformatics.org

Register 8th – 13th September 2024, St Edmund Hall, Oxford.

Presented by:

FORDHAM UNIVERSITY



This one-week residential workshop will bring together participants from around the world, to learn how to configure and deploy an open source, model-driven, health electronic records system. We will use the open source cityEHR system, initially configured with example ontology models for a range of clinical services, which have been created by students at Fordham University, the University of Oxford and the University of Victoria, Canada.

## GOSEHR Summit

**An annual summit, bringing together academics, healthcare professionals, engineers and investors from around the world, presented in association with Fordham University.**

**Next Date: Saturday 5th April 2025, St Edmund Hall, Oxford.**

Register

FORDHAM UNIVERSITY

