

HealthCare Solutions

Use Cases from around the world

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Lessons Learnt from a Coffee Machine



Clinical Problems



Medication Errors

- Antibiotics Resistance
- Overuse / Misuse
- Cross interactions



Public Health Problems

- Surveillance / Communicable disease management
- Chronic Disease Monitoring
- Disconnected Social Care vs Medical care



Re-admissions

- 30 day InPatient Readmission
- Re-Operate within 48 hrs



Patient Condition Management



Newly diagnosed Hypertension

Reduce rate of hypotensive episodes and hospitalization

- Reminder for Rx, blood pressure check daily
- Education for weight management and exercise plus monitoring
- Triggers when hypotensive / hypertensive for follow up appointment



Pregnant Patients

Minimize complications, decrease C-Section chances

- Patient education and exercise monitoring (including diet)
- Medication reminder and warning for cross interactions
- regular self check for symptoms (headaches, dizziness)
- Triggers for consultation



Post Surgery Care

Avoid post surgical infections and readmissions

- wound management check and reminders
- fever, swelling, redness check
- ambulation and preventative medication reminder
- Triggers for consultation



Chronic Disease Management

Diabetes



Risk Identification

- AI to predict new diagnosis risk for healthy individuals
- Cohort of diabetics with risk score of mis management



Care Planning

- Universal plan for home monitoring, diet monitoring
- Reminder for follow up, regular blood checks, retina examination
- Personal quarterly self check for signs of neuropathy, vessel disease or retina problems
- Triggers to escalate or request adhoc testing according to overall well being



Data Utilization



Resources Utilization cost reduction

- Messaging portal between patient / clinician
- Identify missed care
- Identify duplicate care (xrays, blood tests)
- Frequent visits to same specialty



Research data Improve quality Decrease negative impact

- Monitor and compare treatment plan vs outcome for better recommendation or plan inclusions / exclusions
- Background surveillance to identify elevated symptoms trends and early detection of epidemic / pandemic



Use Case Examples



MERIT: a high-profile murder involving a patient with mental health problems highlighted the need for information sharing between health and social care stakeholders as a top priority

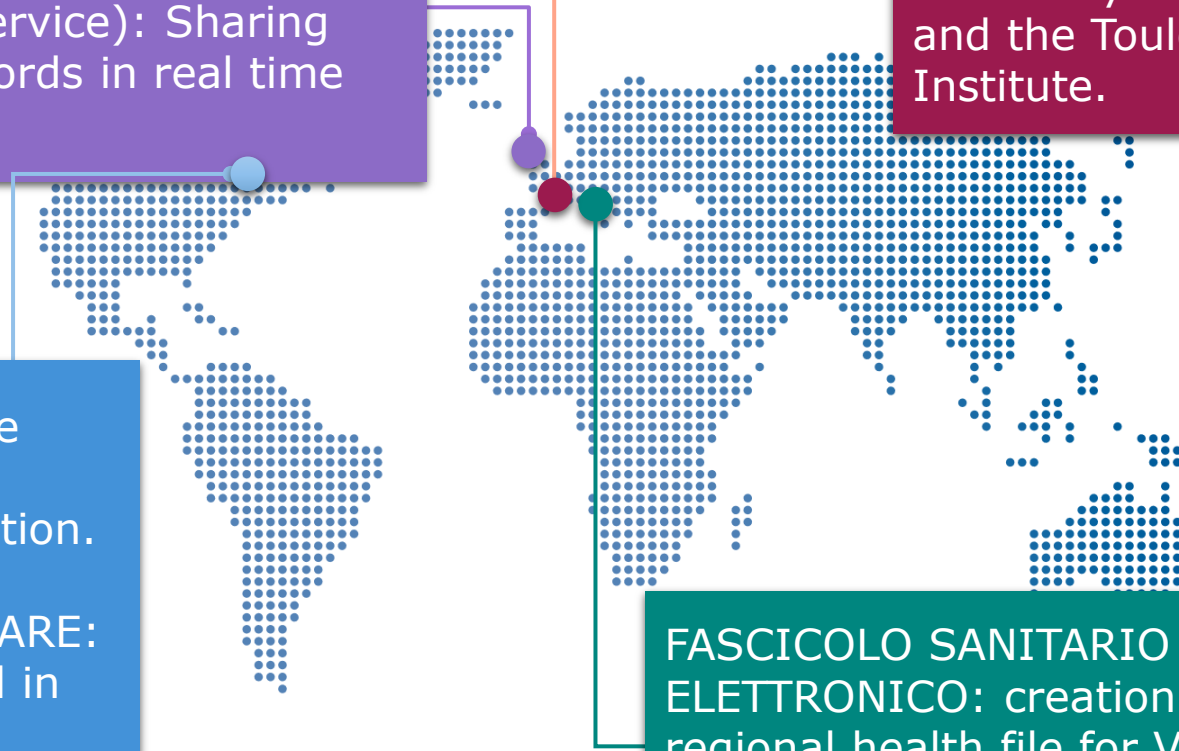
EMAS (East Midlands Ambulance Service): Sharing comprehensive health and care records in real time for patients in emergencies

CARE TOOL: Expanding care coordination and increasing efficiency in resource allocation.

INTEGRATED OBSTETRIC CARE: over 100 providers involved in information sharing.

ONCOLOGY PATIENT CARE RECORD: need to coordinate the care of oncology patients between the University Hospital of Toulouse and the Toulouse Cancer Institute.

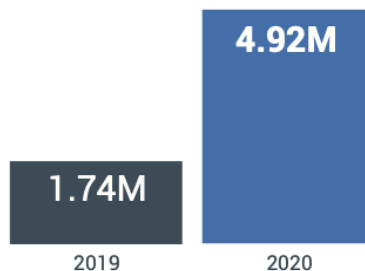
FASCICOLO SANITARIO ELETTRONICO: creation of the regional health file for Veneto as part of the Italian national health file (similar to the ePA in Germany).



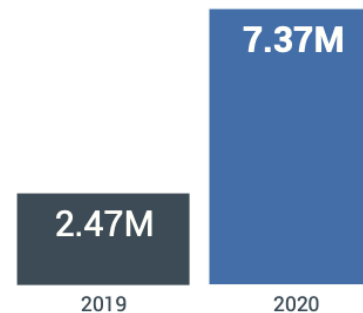


Largest public health information network in the US

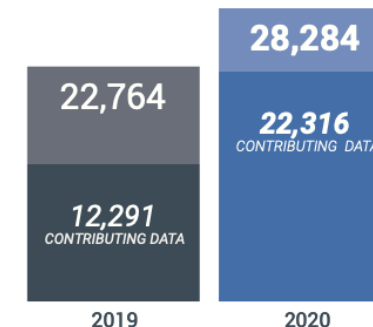
PATIENT RECORDS VIA EHR (MONTHLY AVERAGE)



ALERTS (MONTHLY AVERAGE)



HEALTHIX PARTICIPATING CUSTOMERS



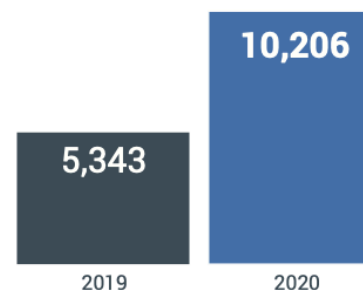
	2019	2020
Hospitals	65	81
OREs	448	731
Physicians	22,065	27,246
CBOs/BHOs	128	159
Health Plans	16	19
IPA, ACO, PPS	15	15
Other	27	33
TOTAL	22,764	28,284

* ORE includes articles 28, 36, 40
** Other includes Public Health, EMS, Pharmacies, etc.

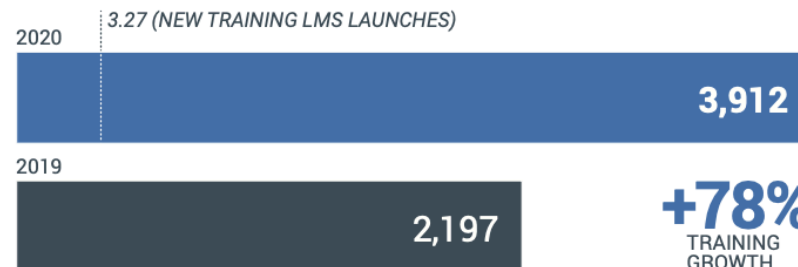
GROWTH IN NUMBER OF PATIENTS



PATIENT RECORDS VIEWED IN PORTAL (MONTHLY AVERAGE)



HEALTHIX CORE TRAINING COMPLETIONS



+78%
TRAINING
GROWTH

PATIENTS IN HEALTHIX

STATE RESIDENCY	TOTAL NUMBER
New York	29,490,323
New Jersey	1,912,045
Florida	471,941
Connecticut	386,511
Texas	324,887
California	318,727
Pennsylvania	199,932
Ohio	86,713
Nevada	79,254
Massachusetts	69,951

*Data for top 10 states collected 2019-2020

DATA DELIVERY

Real-time encounter alerts & clinical updates

ALERTS

Healthix Alerts

Healthix Alerts allow you to follow all or just selected patients for a series of event triggers.

SMART ALERTS

Healthix SMART Alerts

Healthix SMART Alerts are triggered by analyzing a change in a patient's condition, lab result or characteristics.

CIU

Healthix Clinical Information Update

Healthix CIU provides instant and continuous information on all aspects of a person's medical record delivered right into your IT system.

DATA RETRIEVAL

Patient health records, CCDs, CCDAs, summaries and more

QUERY

Healthix Query

Patient information queried through the Healthix Portal complete with filters to enhance usability.

QUERY+

Healthix Query+

Healthix data accessed through single sign-on (SSO) to Portal and full medical documents received via CCD Query right from your EHR.

SMART QUERY

Healthix SMART Query

Healthix provides SMART Query so you can access patient information from your EHR using APIs, FHIR and filtered CCD.

DATA DISCOVERY

Analytics, Research, Reporting

ANALYTICS

Healthix Analytics

Determine a patient's risk of an event or of developing a chronic disease. Reach out before an event or condition occurs.

RESEARCH EXCHANGE

Healthix Research Exchange

Healthix provides de-identified and identified data on a vast and richly diverse population with 8+ years of medical history.

INSIGHTS

Healthix Insights

Healthix Insights provides an in-depth overview of your patients across geography, providers and facility type. This is essential in today's value-based care environment.

DATA DELIVERY

Delivering real-time 24/7 patient information, with alerts and advanced updates.



Healthix Alerts fall into two broad categories. The first are triggered by an event, such as an admission or discharge from an emergency department and the second by advanced alerts that require analysis to determine the status of the patient.

Types/Triggers

Standard Alerts

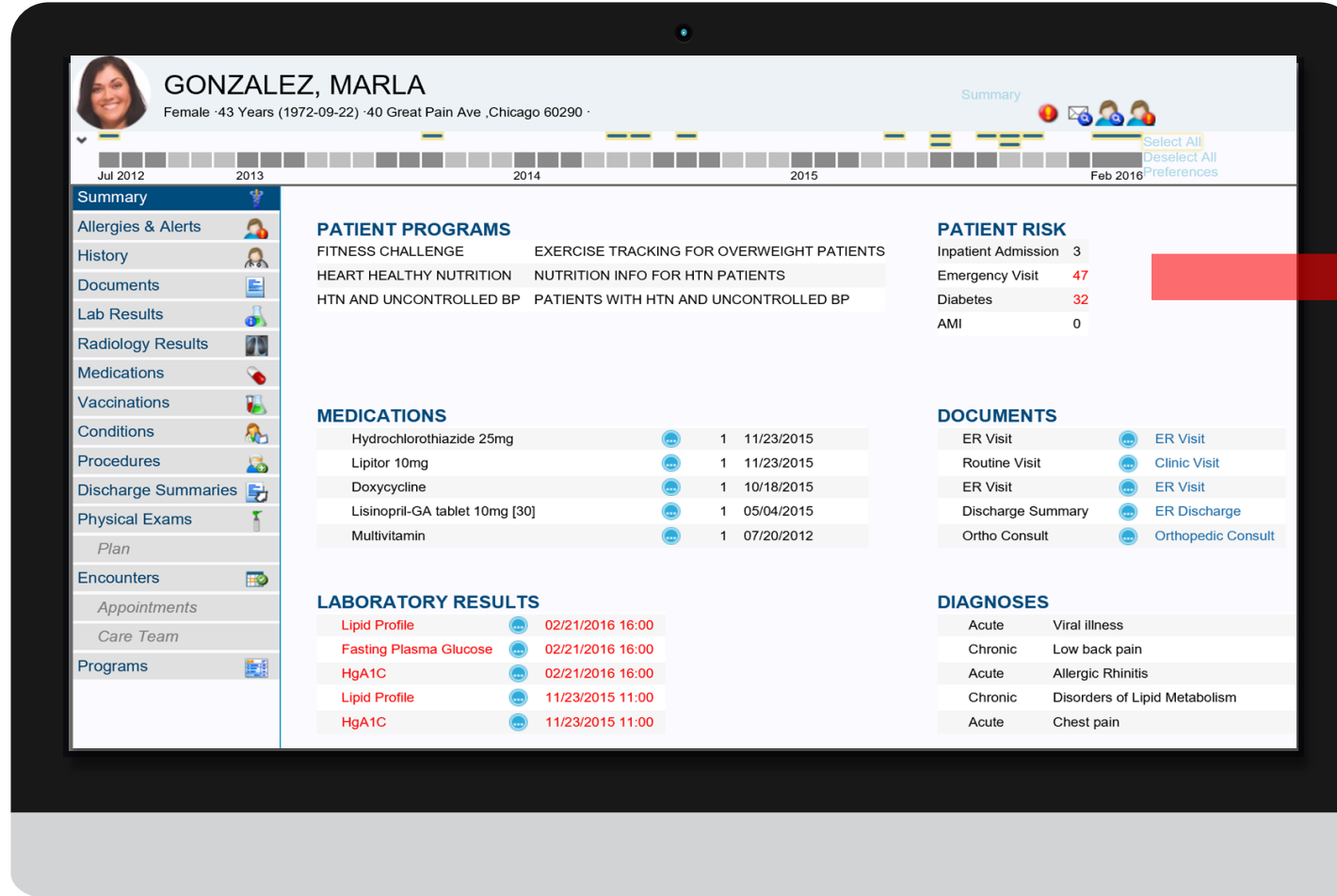
Centers for Medicare & Medicaid Services Alerts (Hospitals Only)
Emergency Room Admit/Discharge
Inpatient Hospital Admit/Discharge
Skilled Nursing & Rehab Admit/Discharge
Patient Death
NY Correctional Incarceration/Release
COVID-19- Test, Result

Advanced Alerts

Physician Note
Elevated Risk (Admission, Illness)
Avoidable re-admission
Homelessness
Lost-to-care
Lab/Clinical
– Viral load levels
– COVID-19
– Pertussis
– C. Auris
– Hep B
– Hep C
– TB
– Herpes
– Syphilis
– Zika
– Listeria
– HIV
eMOLST
Custom Alerts



Predictive Analytics to Inform Care



PATIENT RISK

Inpatient Admission	3
Emergency Visit	47
Diabetes	32
AMI	0

Elevated risk are indicated in red

- 47% likelihood of ED visit in next 12 months
- 32% likelihood developing diabetes in next 12 months

Operationalizing Analytics



29 connected systems

293 connected
interfaces

64 notification programs and
400,000+ notifications in Q2 2021

14M patients
23 hospitals
830+ outpatient facilities

API users:
33 applications
73 APIs

API volume:
43M over running
90 days

24 application solutions

28,348 users

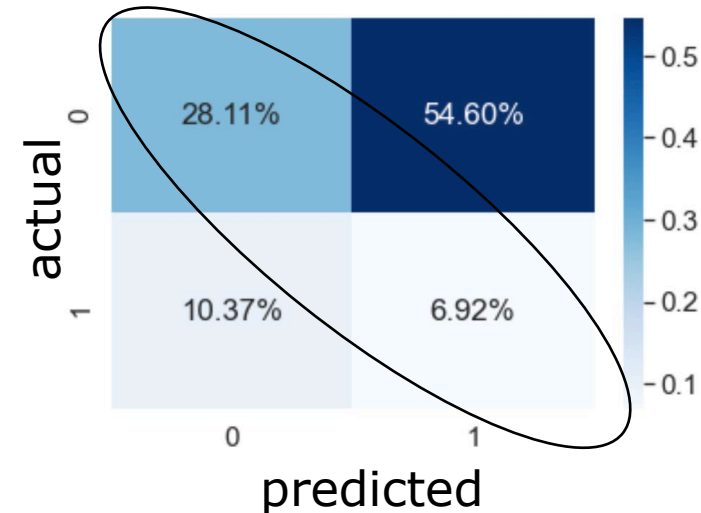
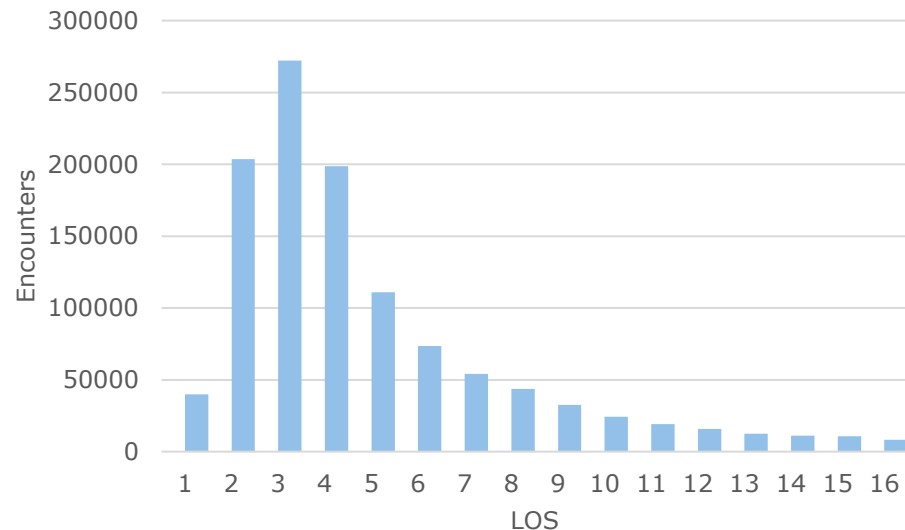
3M clinical viewer searches
(+trends) in 2020
2021 target: **4M+**

“A comprehensive record across our disparate systems ... was just the beginning of what’s strategically possible on our way to democratizing data”

Jim Heiman, AVP, Clinical Information Systems, Northwell Health

Predicting Length of Stay

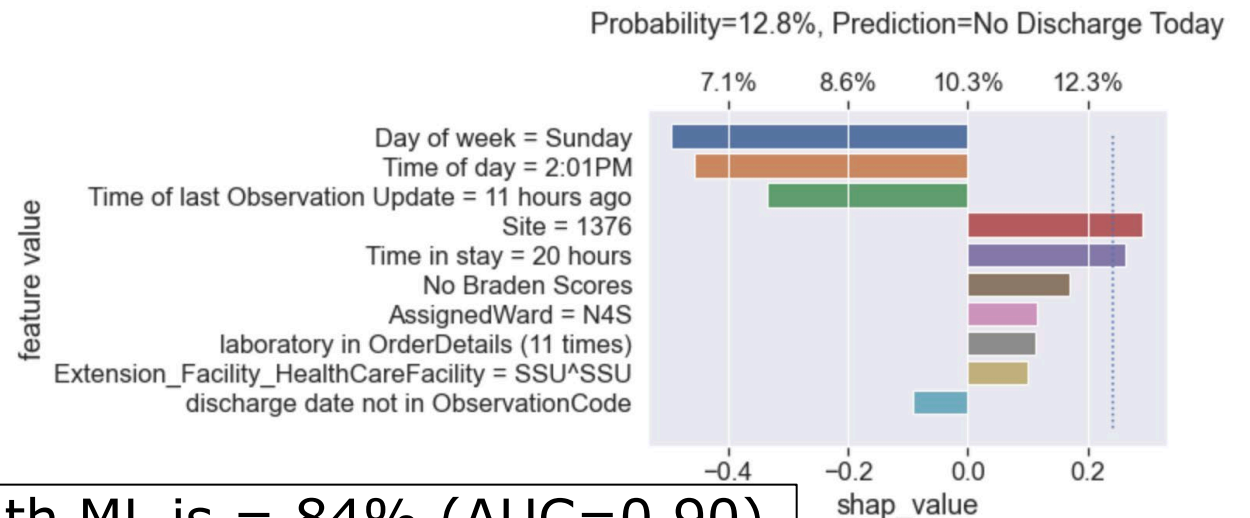
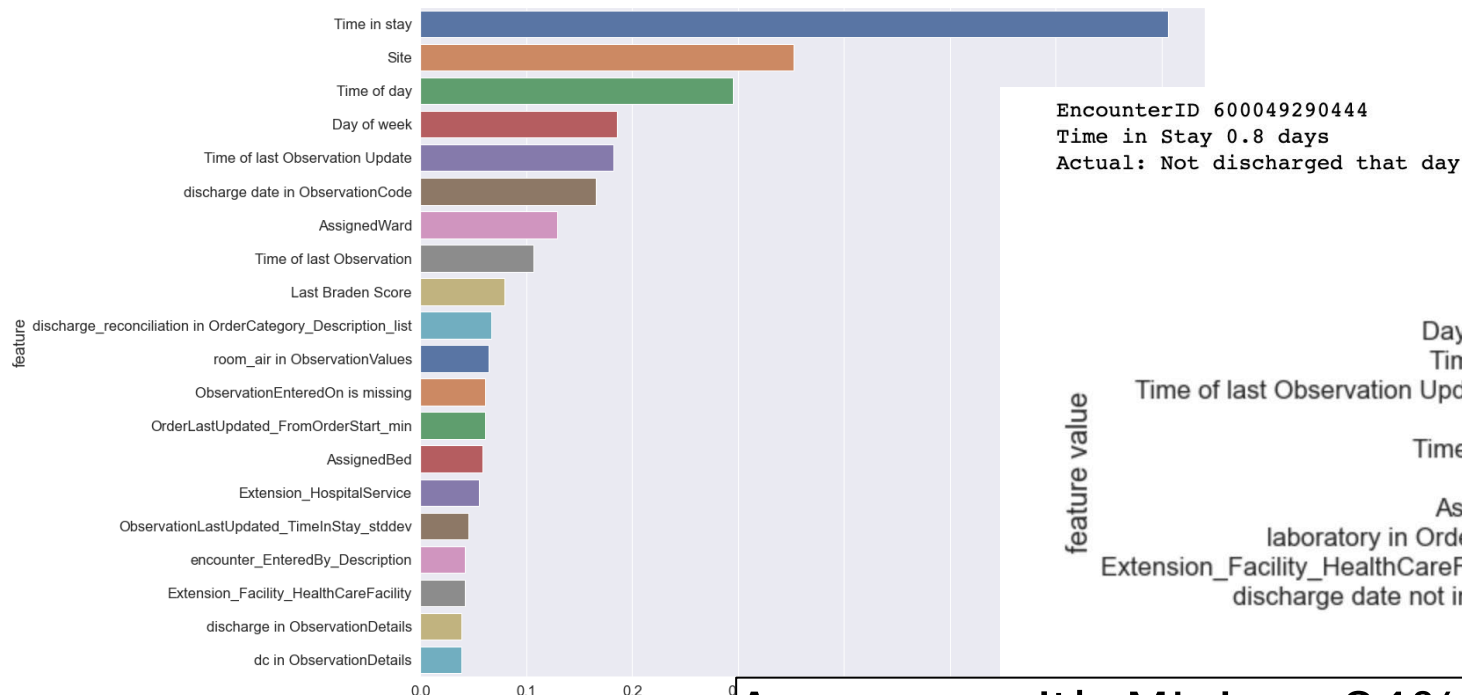
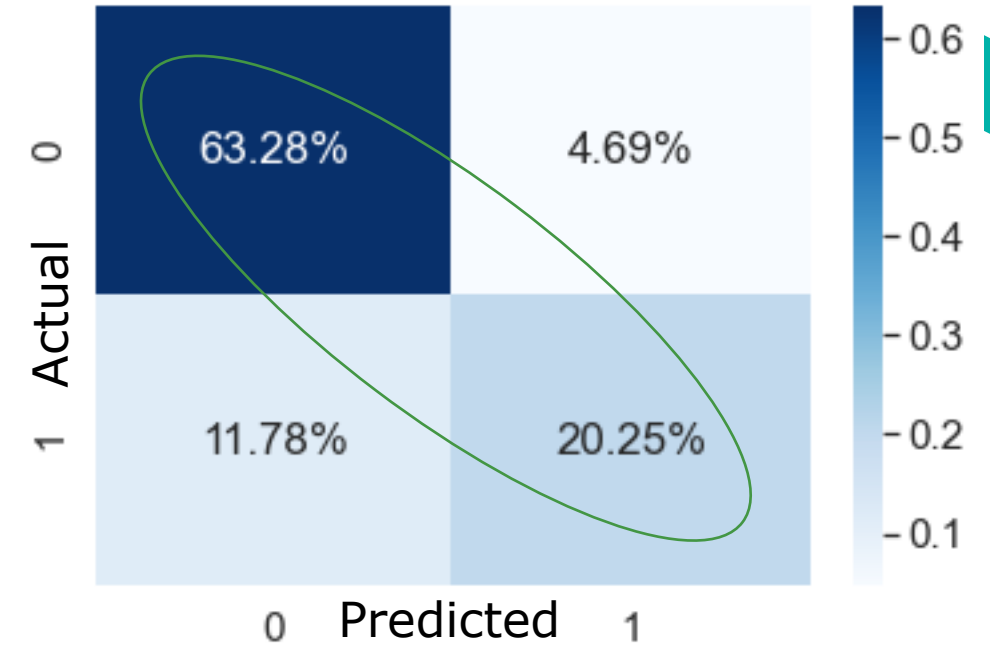
- Excess Days (Patient LOS > CMS DRG-Based LOS) costs \$10M/hospital
- Use ML to more accurately predict LOS
- Enhance Discharge Readiness App with ML Insights (label = is Discharge Today)



CMS DRG-based Prediction is only 35% Accurate on 'Is Discharge Today'

Predicting Length of Stay with ML

- Training dataset is last 4 years of inpatients
- 6 tables : Encounters (1.2M), Patients, Orders (108M), Medications (21M), CareCoordination documents (84K), Observations (745M)
- Multiply by 25 columns each, you have about 22 billion raw data points before ML explosion



Accuracy with ML is = 84% (AUC=0.90)

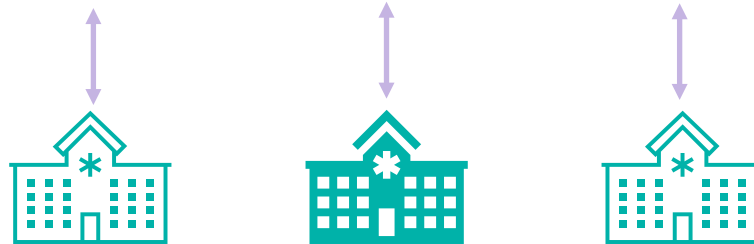
Digital front door: interaction of patients and providers via mobile app of an insurance company



Mobile application
for patients



Digital front door
of an insurance
company based on
InterSystems
HealthShare



Hospital EMRs

Baystate Health (Massachusetts, USA)



- **Goal**

- Partnership between Baystate Health, U Mass Medical Center and Tufts Medical Center to conduct multicenter medical research

Highlights

- Data imports from primary systems consolidated into an Interoperability Platform and then transformed into OMOP CDM (v5.4).
 - OHDSI tools such as USAGI enable mapping of local code to OMOP ontology
 - Nightly update of data in the OMOP repository
- Fully automated data transfer with audit trail
- Digital quality dashboards check data before transformation
- Direct data analysis through ATLAS HADES tools, Python, R

UAE Experience

- Federated HIE
- Disease Registry
- Medication Processing
- Innovation Hub



InterSystems

Population Health Management
Diabetes Use Case



The image displays three overlapping screenshots of a medical viewer interface, showing patient data for BLISS, Loyal. The interface includes a sidebar with navigation options like Chartbook, Diagnoses, Allergies, Medications, and Vital Signs. The main content area displays a table of Lab Results with columns for Lab Test, Result, Units, Flag, Reference Range, Status, Trend, Order, Facility, Collection Date, and Details. The Lab Results table shows various tests such as Basophils, Bicarbonate, Chloride, Eosinophils, Haemoglobin, HCT/PCV, Lymphocytes, MCH, MCHC, MCV, Monocytes, MPV, Neutrophils Abs, Platelet Count, Potassium, RDW, Red Cell Count, Sodium, White Cell Count, and HBA1C. The interface also includes a top bar with Patient Selection, Language (English (US)), and User (hs_clinician).

Decision Support & Care Plan

VIEWER

Patient Selection English (US) hs_clinician

BLISS, Loyal

Not known 35y 10/10/1987 MPI: 100081078

Back to: Chart >

Critical (0)

Warning (1)

Chartbook

CDS-Hook

Clinical Summary

Care Community

Conditions

Allergies

Medications

Documents

Immunizations

Vital Signs

Lab Results

Diagnostic Studies

Procedures

Histories

Encounters

Appointments

Care Team

Cohorts

Claims

Demographics

Insurance

High Risk or Early Diabetic

Source

Patient is at high risk to develop diabetes , or is early diabetic

Suggestions

☐ Please start the patient on a diabetic care plan (recommended)

Comment on Override Reason

Override

Info (0)

CDS-Hook

VIEWER

Patient Selection English (US) hs_clinician

BLISS, Loyal

Not known 35y 10/10/1987 MPI: 100081078

Back to: Chart >

Care Plans

Care Teams

Tasks

Chartbook

CDS-Hook

Clinical Summary

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Histories

Encounters

Appointments

Care Team

Cohorts

Claims

Demographics

Insurance

Active Care Plans

Care Plan Name

Created On

Created By

Last Modified On

Last Modified By

Version

Status

Patient Contribution

Publish

Actions

Type 2 Diabetes Risk Assessment

July 26, 2023 2:52 PM

Clinician Demo

July 26, 2023 2:53 PM

Clinician Demo

1

Drafts Outstanding

Awaiting Patient Response

Finalized Care Plans

Patient Access

9:41

Personal Community

Welcome, Layal

To Do

Care Plans to Complete

[Type 2 Diabetes Risk Assessment](#)

Next Appointment

SPECIALIST CONSULTATION with Dr.Rahul Balkawade

July 27, 2023 at 10:00 AM

[Download to calendar](#)

General Demo Hospital

INTERNAL MEDICINE

Cancel

[View all appointments](#)

Latest Results

9:41

Latest Results

Lab Results

FBC - (FULL BLOOD COUNT)

Performed on July 26, 2023

Ordered by Dr Helen Martin

Basophils

Your test result

0.001 KUL (Normal)

Reference range

0.000-1.000 KUL

Eosinophils

Your test result

0.020 KUL (Normal)

Reference range

0.020-0.500 KUL

Haemoglobin

Your test result

11.0 G/DL (Low)

Reference range

11.5-16.0 G/DL

[View more results from this test](#)

[View all results](#)

Messages

You have no messages

New Message

9:41

Personal Community

Type 2 Diabetes Risk Assessment

Do you usually have daily at least 30 minutes of physical activity at work and/or during leisure time (including normal daily activity)?

☒ Yes

☐ No

How often do you eat vegetables, fruit or berries?

☐ Every day

☐ Not every day

Have you ever taken medication for high blood pressure on regular basis?

☐ Yes

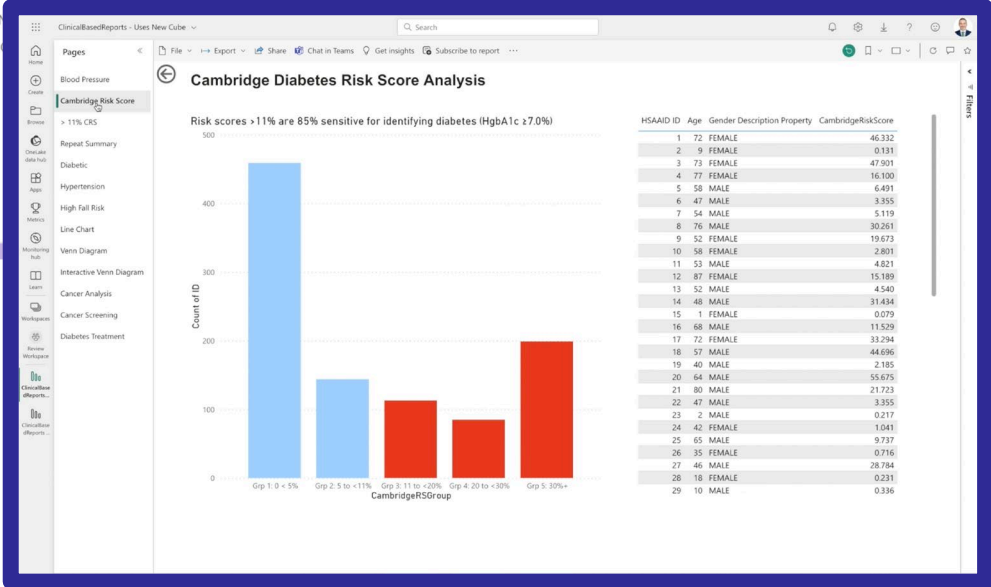
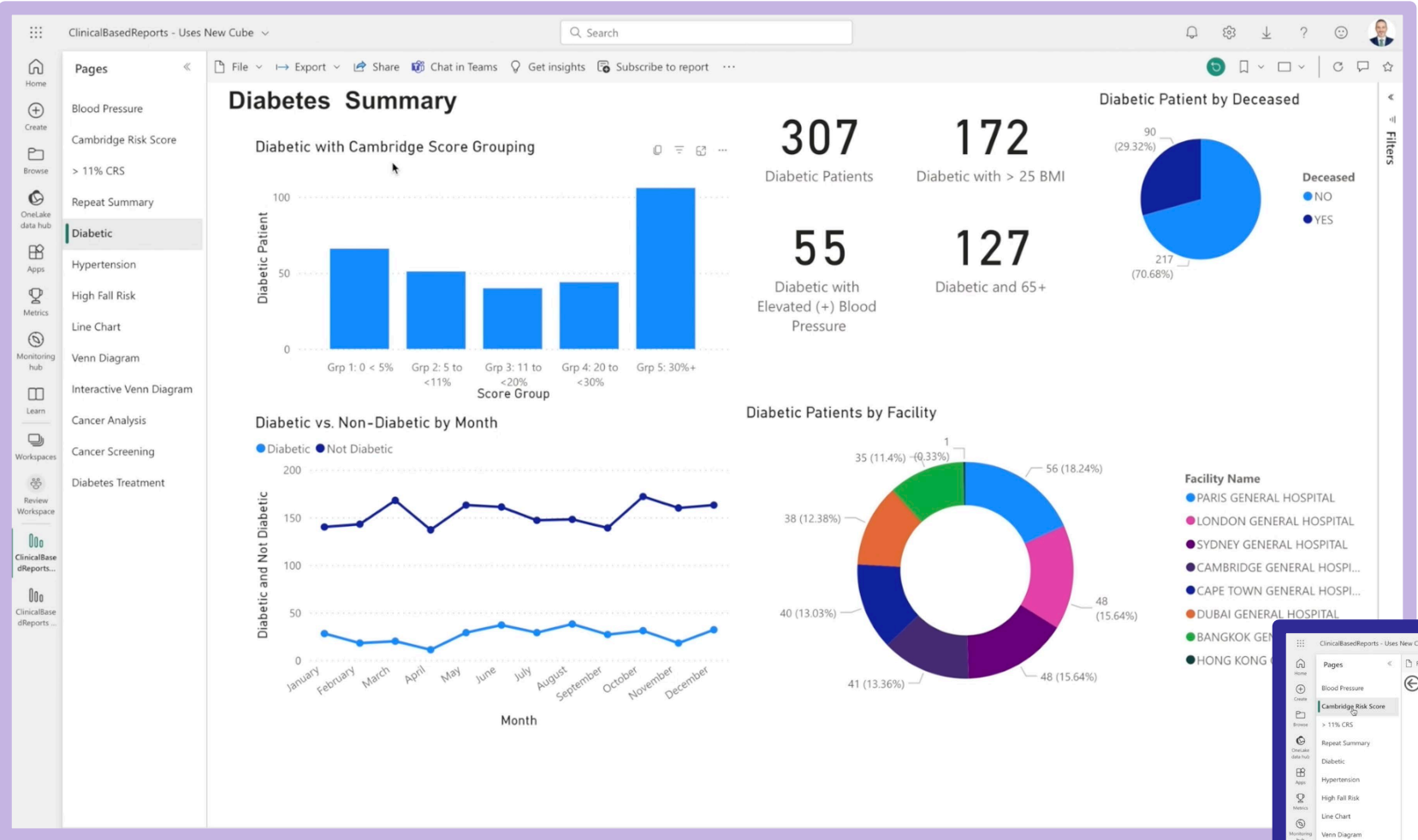
☐ No

Have you ever been found to have high blood glucose (eg in a health examination, during an illness, during pregnancy)?

☐ Yes

☐ No

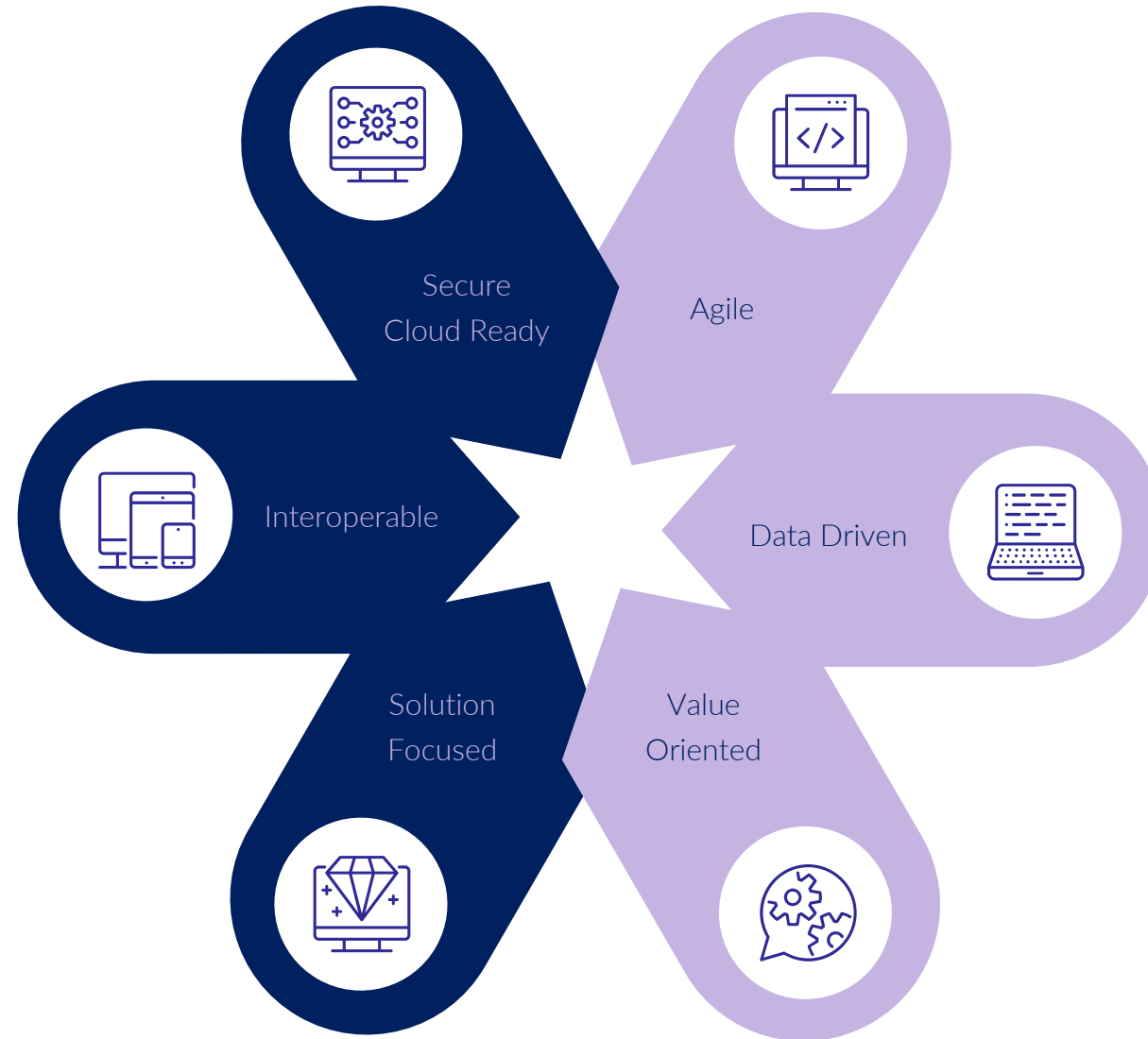
Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or type 2)?



Derive Value Achieve Success



IT Partner



Local Team

In Summary:

By utilizing EMRs, HIEs, AI & Analytics
Healthcare providers can:



Improve patient outcomes



Reduce costs



Improve Healthcare Delivery

Thank you