

Accelerating HealthCare Insights

Rapidly Unlocking Value from Data

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HealthCare Problems

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

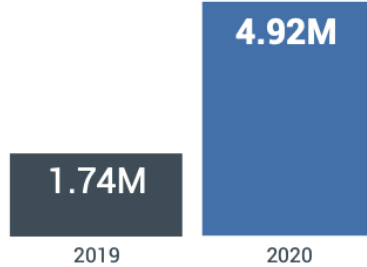
- Monitor and compare treatment plan vs outcome for better recommendation or plan inclusions / exclusions
- Background surveillance to identify elevated symptoms trends and early detection of epidemic / pandemic

Successful Use Cases

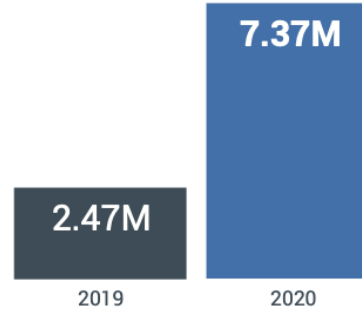


Largest public health information network in the US

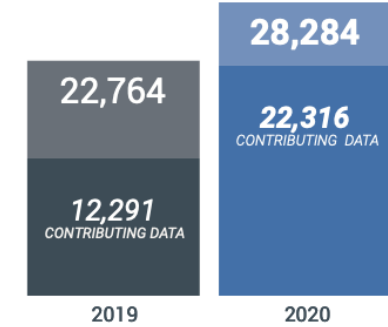
PATIENT RECORDS VIA EHR (MONTHLY AVERAGE)



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

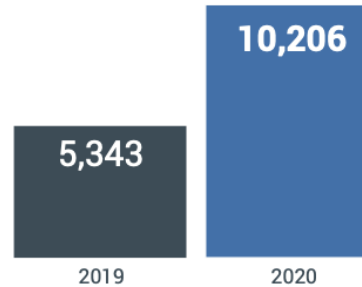
* ORE includes articles 28, 36, 40

** Other includes Public Health, EMS, Pharmacies, etc.

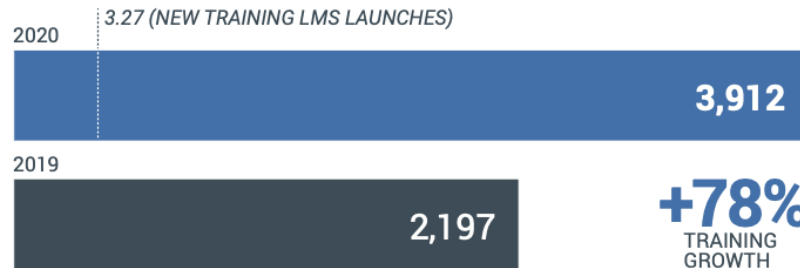
GROWTH IN NUMBER OF PATIENTS



PATIENT RECORDS VIEWED IN PORTAL (MONTHLY AVERAGE)



HEALTHIX CORE TRAINING COMPLETIONS



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

Predictive Analytics to Inform Care



GONZALEZ, MARLA
Female · 43 Years (1972-09-22) · 40 Great Pain Ave., Chicago 60290

Summary

Jul 2012 2013 2014 2015 Feb 2016

Select All
Deselect All
Preferences

PATIENT PROGRAMS

FITNESS CHALLENGE	EXERCISE TRACKING FOR OVERWEIGHT PATIENTS
HEART HEALTHY NUTRITION	NUTRITION INFO FOR HTN PATIENTS
HTN AND UNCONTROLLED BP	PATIENTS WITH HTN AND UNCONTROLLED BP

PATIENT RISK

Inpatient Admission	3
Emergency Visit	47
Diabetes	32
AMI	0

MEDICATIONS

Hydrochlorothiazide 25mg	1	11/23/2015
Lipitor 10mg	1	11/23/2015
Doxycycline	1	10/18/2015
Lisinopril-GA tablet 10mg [30]	1	05/04/2015
Multivitamin	1	07/20/2012

LABORATORY RESULTS

Lipid Profile	02/21/2016 16:00
Fasting Plasma Glucose	02/21/2016 16:00
HgA1C	02/21/2016 16:00
Lipid Profile	11/23/2015 11:00
HgA1C	11/23/2015 11:00

DOCUMENTS

ER Visit	ER Visit
Routine Visit	Clinic Visit
ER Visit	ER Visit
Discharge Summary	ER Discharge
Ortho Consult	Orthopedic Consult

DIAGNOSES

Acute	Viral illness
Chronic	Low back pain
Acute	Allergic Rhinitis
Chronic	Disorders of Lipid Metabolism
Acute	Chest pain

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

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).



InterSystems

Population Health Management Diabetes Use Case



Unified Clinical Viewer

The image displays three overlapping screenshots of the Unified Clinical Viewer interface for a patient named BLISS, Loyal. The interface is designed for a clinician (hs_clinician) in English (US). The patient's information includes: Not known, 35y, 10/10/1987, MPI: 100081078.

The interface is divided into several sections:

- Header:** Patient Selection, English (US), and user profile (hs_clinician).
- Left Sidebar (Chartbook):** A navigation menu with categories like Diagnoses, Allergies, Medications, Documents, Immunizations, Vital Signs, Lab Results, Diagnostic Studies, Procedures, Histories, Encounters, Appointments, Care Team, Cohorts, Claims, Demographics, and Insurance.
- Main Content Area:**
 - Top Screenshot:** Shows the patient's name and a "Back to: Chart" button.
 - Middle Screenshot:** Shows the "Vital Signs" section with a list of vital signs and their current values. The "Vital Signs" section is highlighted in the sidebar.
 - Bottom Screenshot:** Shows the "Lab Results" section with a "Lab Results Table". The table lists various lab tests, their results, units, flags, reference ranges, and collection dates. The "Lab Results" section is highlighted in the sidebar.

Lab Results Table:

Lab Test	Result	Units	Flag	Reference Range	Status	Trend	Order	Facility	Collection Date	Details
Basophil	0.001	KUL	Normal	0.000 - 1.000	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Bicarbonate (HCO3-)	28	MMOL/L	Normal	22 - 29	Final	≡	ELECTROLYTE PANEL		07/26/2023 16:32	⋮
Chloride (Cl)	95	MMOL/L	Low	98 - 107	Final	≡	ELECTROLYTE PANEL		07/26/2023 16:32	⋮
Eosinophils	0.020	KUL	Normal	0.020 - 0.500	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Haemoglobin	11.0	G/DL	Low	11.5 - 16.0	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
HCT/PCV	33	%	Low	36 - 46	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Lymphocytes	1.000	KUL	Normal	1.000 - 4.80	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
MCH	28.0	PG	Normal	26.0 - 34.0	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
MCHC	33	G/DL	Normal	31 - 37	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
MCV	90.0	FL	Normal	80.0 - 100.0	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Monocytes	0.200	KUL	Normal	0.200 - 1.000	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
MPV	7	FL	Normal	6.8 - 10.4	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Neutrophils Abs	2.000	KUL	Normal	1.800 - 7.700	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Platelet Count	300	KUL	Normal	150 - 450	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Potassium (k)	3.9	MMOL/L	Normal	3.5 - 5.1	Final	≡	ELECTROLYTE PANEL		07/26/2023 16:32	⋮
RDW	12	%	Normal	11.5 - 17	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Red Cell Count	3.90	MUL	Normal	3.80 - 5.20	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
Sodium (Na)	140.0	MMOL/L	Normal	136.0 - 145.0	Final	≡	ELECTROLYTE PANEL		07/26/2023 16:32	⋮
White Cell Count	6.0	KUL	Normal	4.0 - 11.0	Final	≡	FBC - (FULL BLOOD COUNT)		07/26/2023 16:32	⋮
HBA1C	9.0	%	High	2.0 - 7.0	Corrected	≡	HBA1C		07/13/2023 14:58	⋮

Decision Support & Care Plan

VIEWER Patient Selection English (US) hs_clinician

BLISS, Loyal
Not known 35y 10/10/1987 MPI: 100081078

[Back to: Chart](#)

Chartbook << **Critical (0)**

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

Warning (1)

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 **Ignore**

Info (0)

CDS-Hook

VIEWER Patient Selection English (US) hs_clinician

BLISS, Loyal
Not known 35y 10/10/1987 MPI: 100081078

[Back to: Chart](#)

Chartbook << **Care Plans** Care Teams Tasks

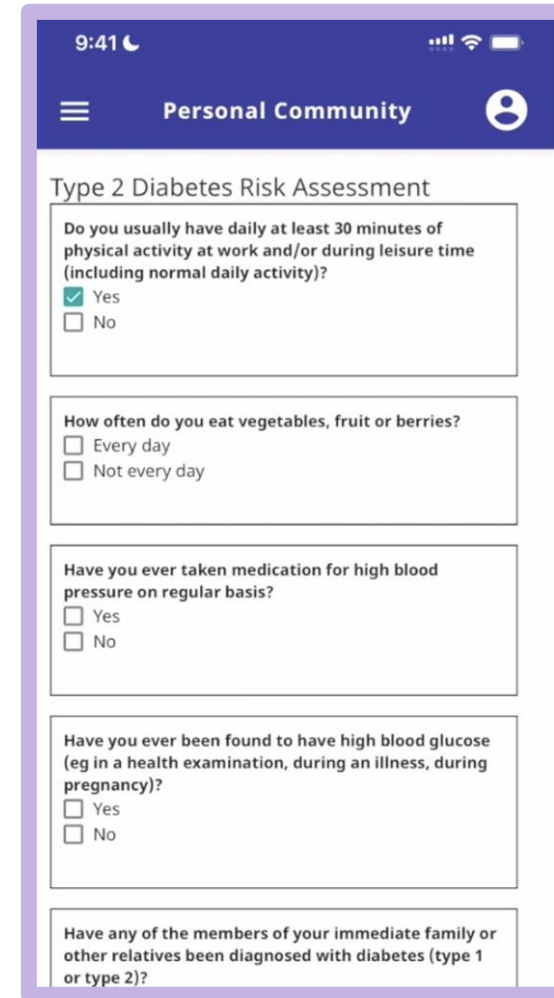
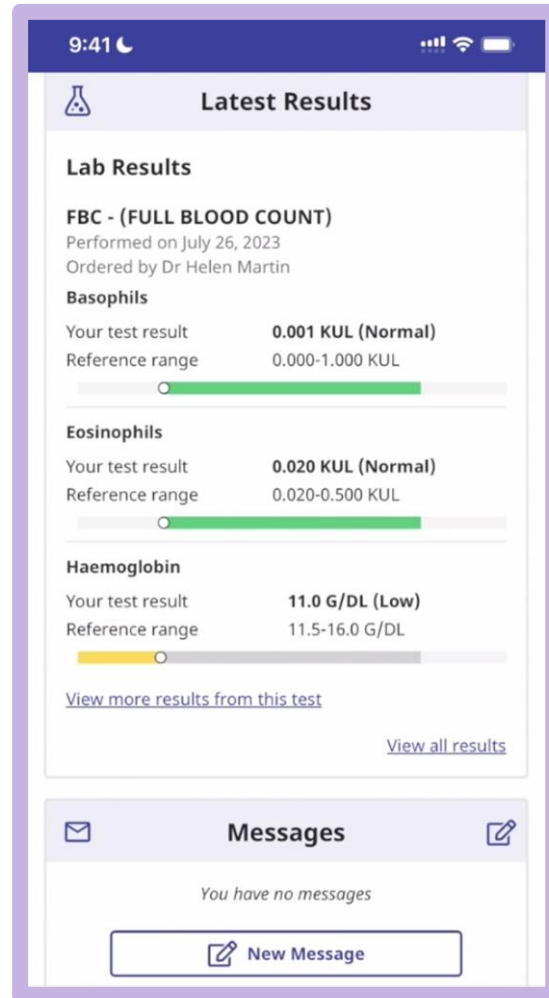
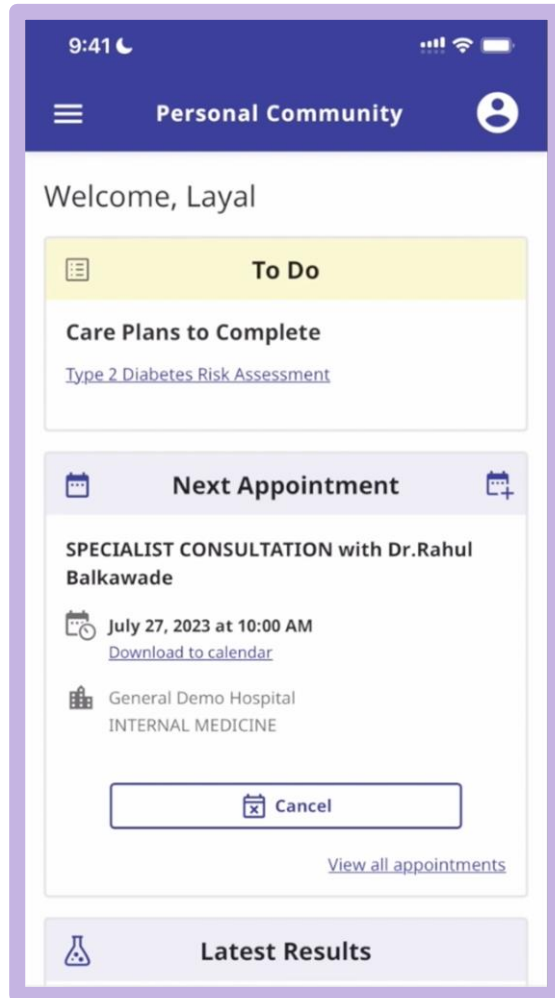
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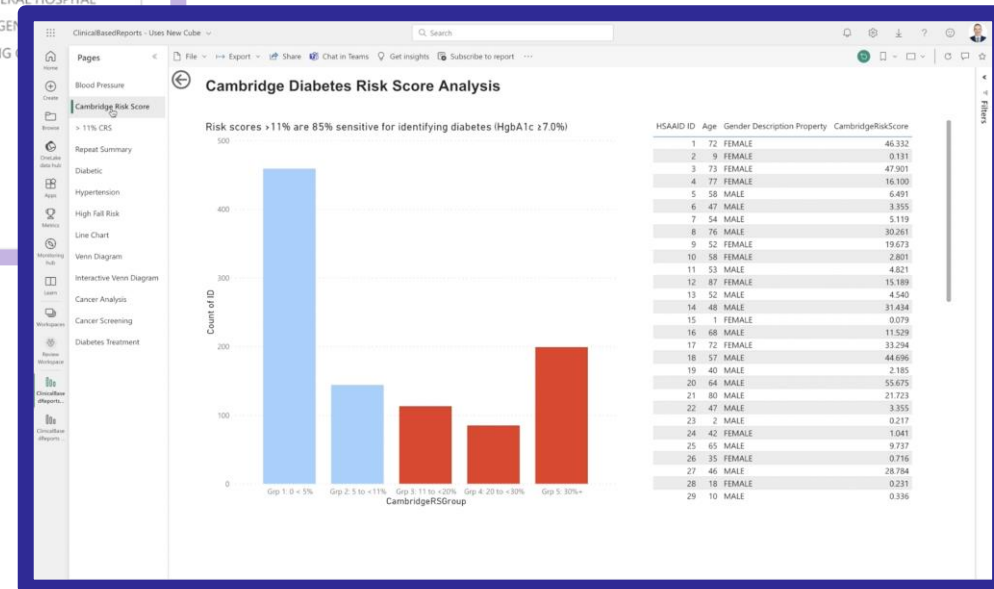
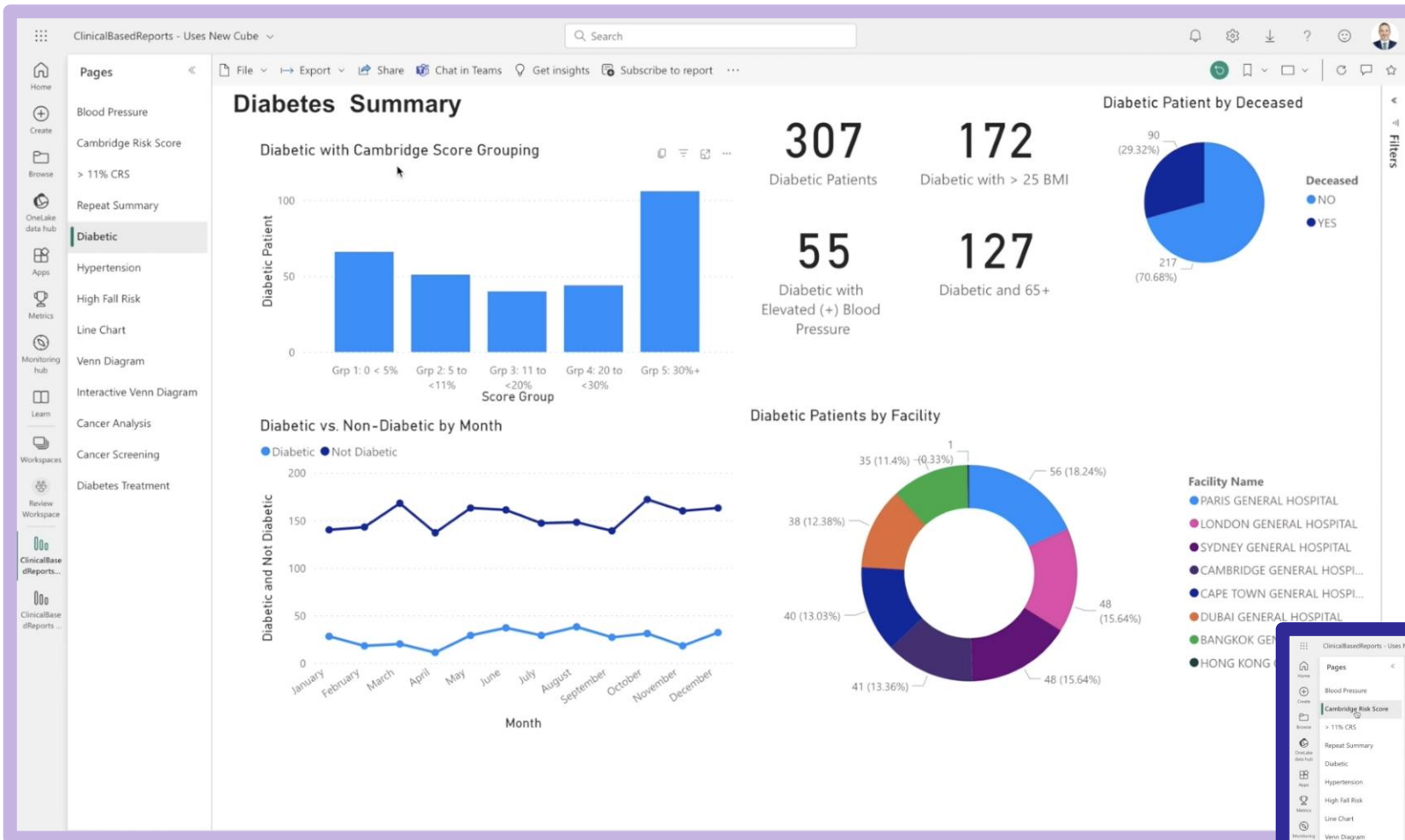
Active Care Plans [Add Care Plan](#)

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



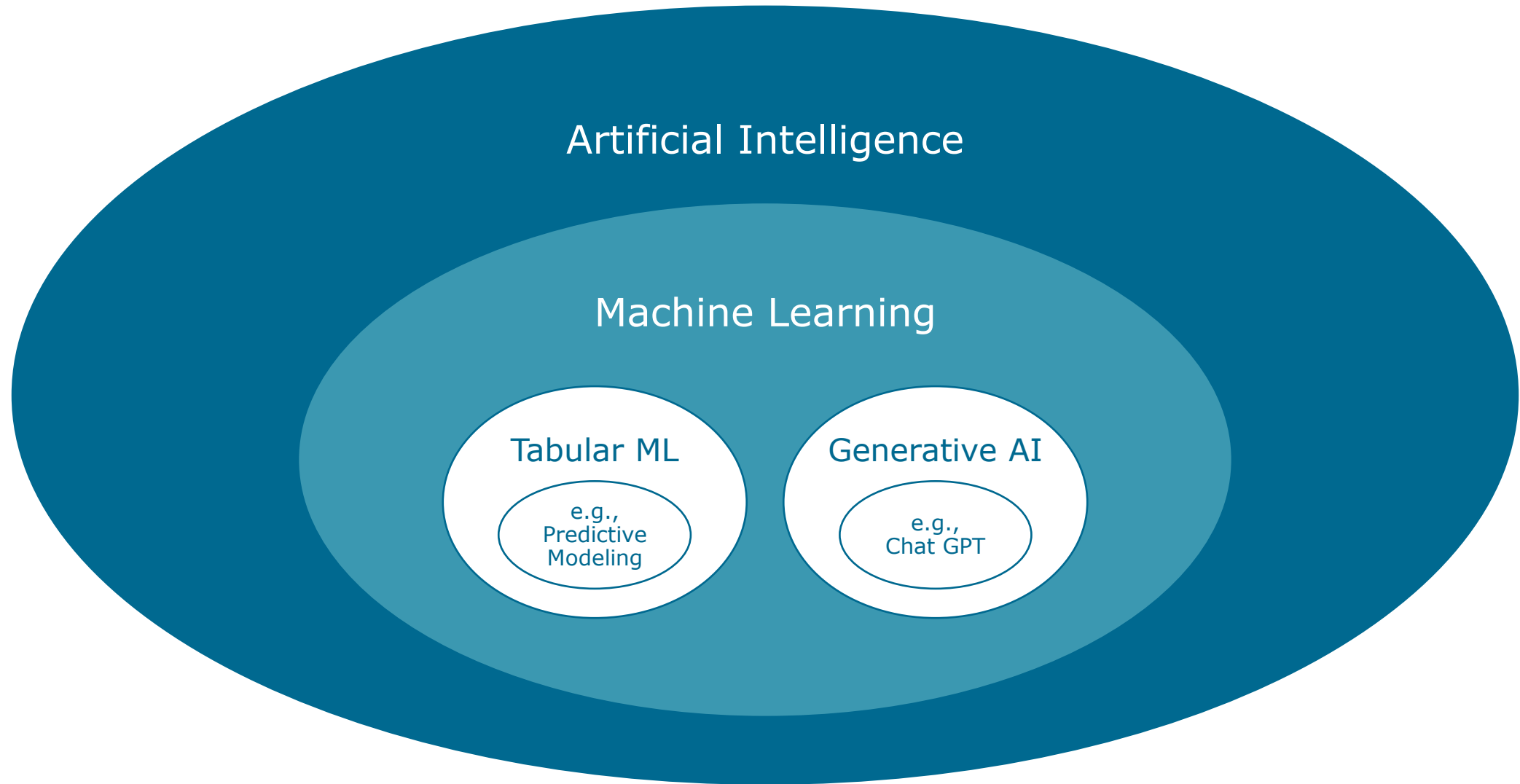


HealthCare AI

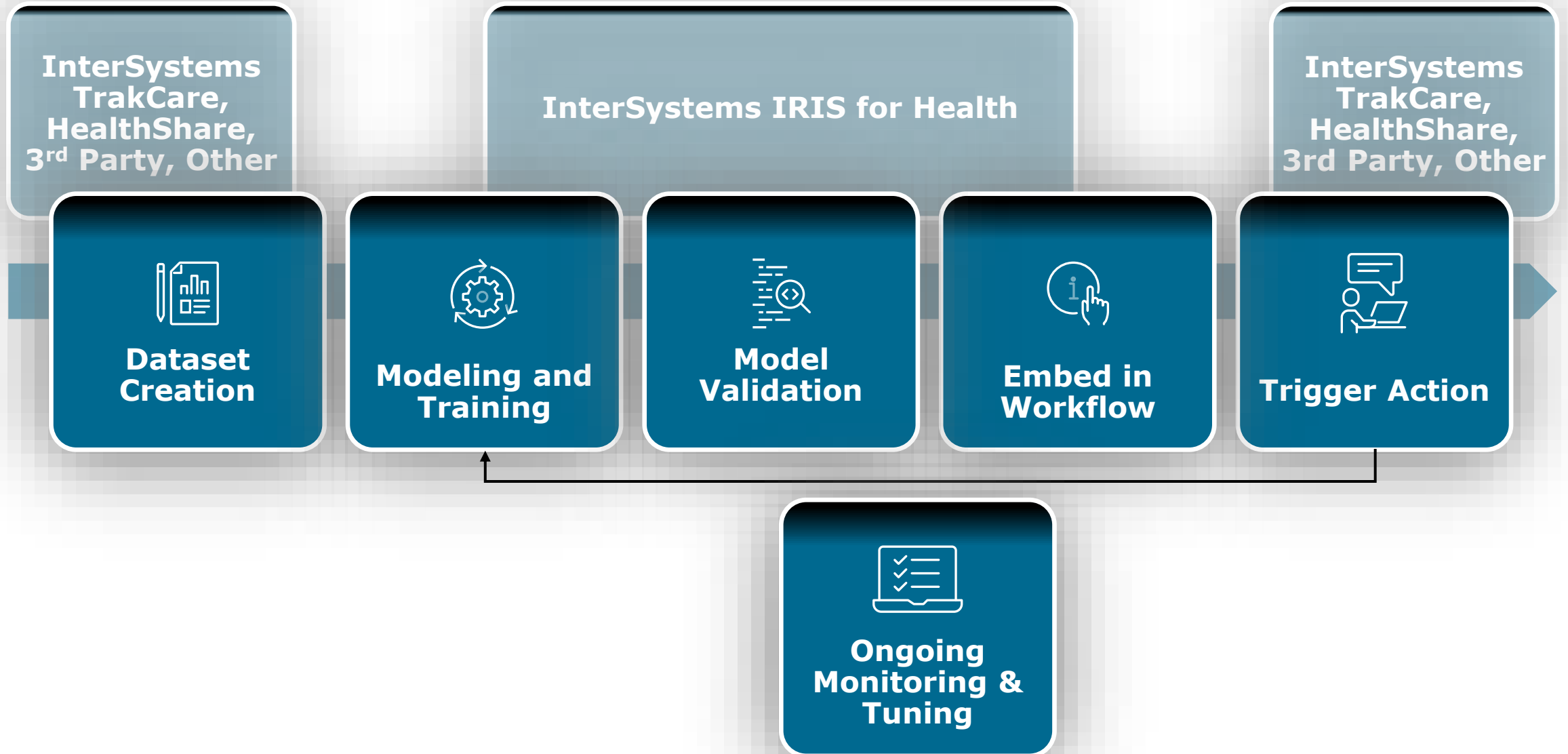
AIaaS value based rapid delivery



Artificial Intelligence Concepts



ML Model Development Process





No Show Rate Reduction

Machine Learning Use Case

Clinic No-Show Rate Reduction



Goal

Improve quality of care and optimize allocation of time, clinical and financial resources

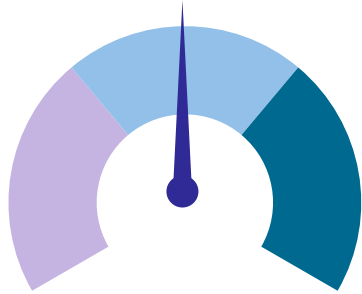
Highlights

- Implemented and already in live operation in KSA
- Predict the probability that an appointment will not be kept, directly in the appointment booking process
 - Currently 18% of appointments are not kept
- Integration of the "no-show" risk score into the user interface of the appointment information system
- No third-party involvement, InterSystems is the sole owner of the rights to the solution
- Easily applied to additional use cases, such as
 - Reduce no-show rates for surgical procedures, radiology sessions, chemotherapy sessions, etc.

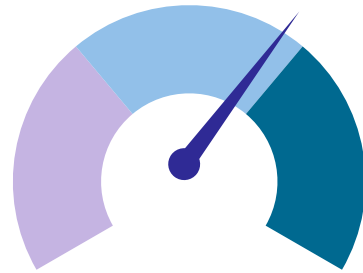
Clinic No-Show Reduction: Results



No-Show Prediction

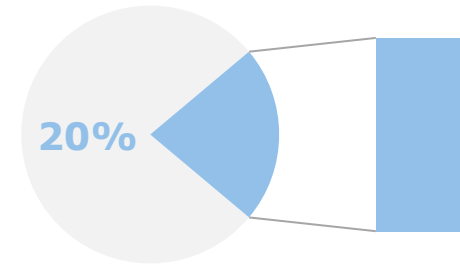


Current
50% (500/day)



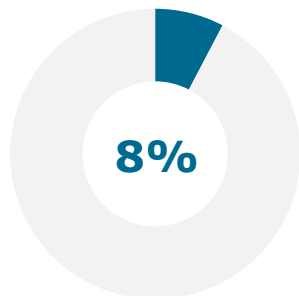
ML logic
65% (650 / day)

No Show Reduction



Call center will call 150 patients
Estimated 30/150 patients appear

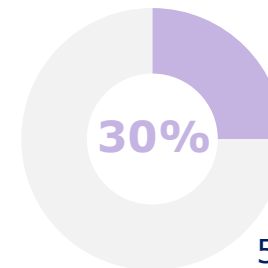
General improvement in the use of resources



8%

Additional 80 appointments per day
used 25 man-hours / day saved

New Appointments



30%

50 new dates added
1/3 of the potentially improved predictions



Diabetes Risk Prediction

Machine Learning Use Case

Diabetes Risk Prediction



Highlights

Uses Survival analyses and modelling time-to-event data

Incorporated as part of a preventative care model within the community

Extended with a full Diabetes care solution to conduct a total care cycle for at risk patients

Goal

Identify patients at higher risk to develop Diabetes

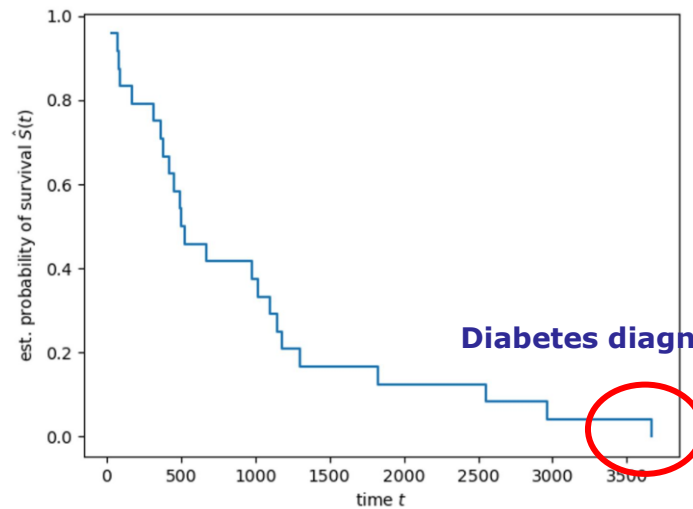




Diabetes Risk Prediction



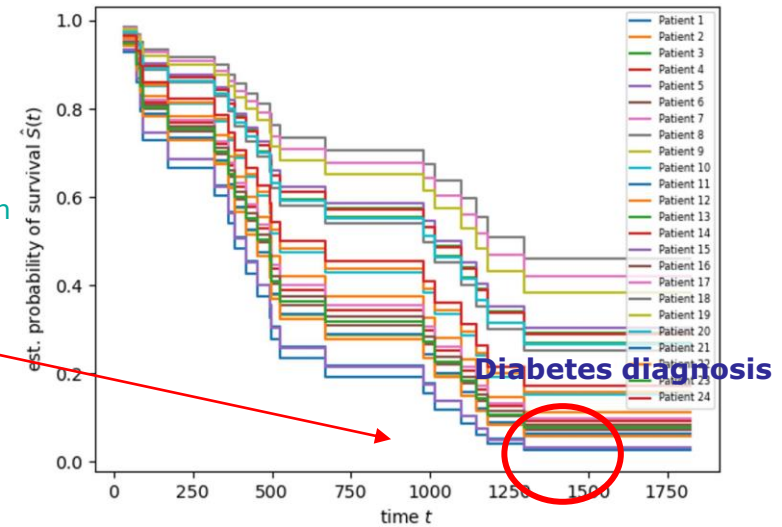
Survival Analysis by entire population



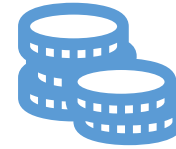
Diabetes diagnosis when the curve reaches 0 on y-axis.

Diabetes diagnosis

Survival Analysis by single patient



Diabetes diagnosis



Clinical

Administrative

RCM

Generative AI

Antibiotic Resistance

Chronic Disease Package Eligibility
(Diabetes, COPD, Cardiac Myopathy, Essential Hypertension, Hyperlipidemia)

Diabetes Risk Prediction

MI Prediction

Osteoporosis Prediction

COPD Exacerbation

Asthma Attack Prediction

Early Microbiology Pathogen Detection

Early Sepsis Detection

Breast Cancer Prediction

Clinic No-Show Prediction

Prediction of Surgical Procedure Time

Prediction of Emergency Waiting Time

Predication of Lab Sample Rejection

Predict the Resources Needed

Predict Waiting List Acceptance Time

Predict OPD Pharmacy Waiting Time

Inpatient LOS Prediction

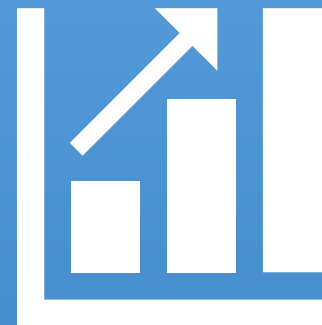
DRG Discrepancy

Inpatient Readmission Prediction

Predict Expensive Stock Utilization

Service Approval / Denial by Insurance

Claims Approvals / Denials



Identify Gaps in Patient Record

Create Claims Report

Generate Handover Lists & Notes

Create Operative Reports

Suggest Evidence-based Protocols

Utilize Dictation Tools to Generate Structured Data

Enhance Medication Compliance

Identify Best Stock to Utilize

Identify Area of Revenue Growth

Identify Time for HW Upgrade

Identify Risk for Security Breach

Issue Recording and Identifying

FRASER, Dianna
URN: RN000000155

DOB: 03/28/1969
Full Age: 54Y 7M 4D - Sex: Female

Care Provider: Dr CHELSEA ZUBIK
Location: General Surgery



Actions Panel

Switch to Timeline View

Patient's History

Active Problems				
Edit	Link Problem to Entry	Text	Status	Encounter Item
		Acute cholecystitis - 2 years ago ,(09/05/2021)	Active	<input type="checkbox"/>
		Nausea and vomiting - 2 years ago ,(09/05/2021)	Active	<input type="checkbox"/>
		Breast tumour - 1 year ago ,(10/08/2022)	Active	<input type="checkbox"/>
		Transient ischemic attack - 2 years ago ,(06/22/2021)	Active	<input type="checkbox"/>
		Endogenous hyperlipidaemia - 2 years ago ,(03/14/2021)	Active	<input type="checkbox"/>

Page 1 Next >

Pertinent Negative Problems				
Edit	Link Problem to Entry	Text	Status	Encounter Item
		No Known History of Obesity	Inactive	<input type="checkbox"/>

Active Diagnosis			
Edit	Text	Principal Diagnosis	
	Agranulocytosis secondary to cancer chemotherapy - Main	Principal Diagnosis: Yes,	<input type="checkbox"/>
	Malignant neoplasm of unsp site of unspecified female breast - Main	Principal Diagnosis: No,	<input type="checkbox"/>

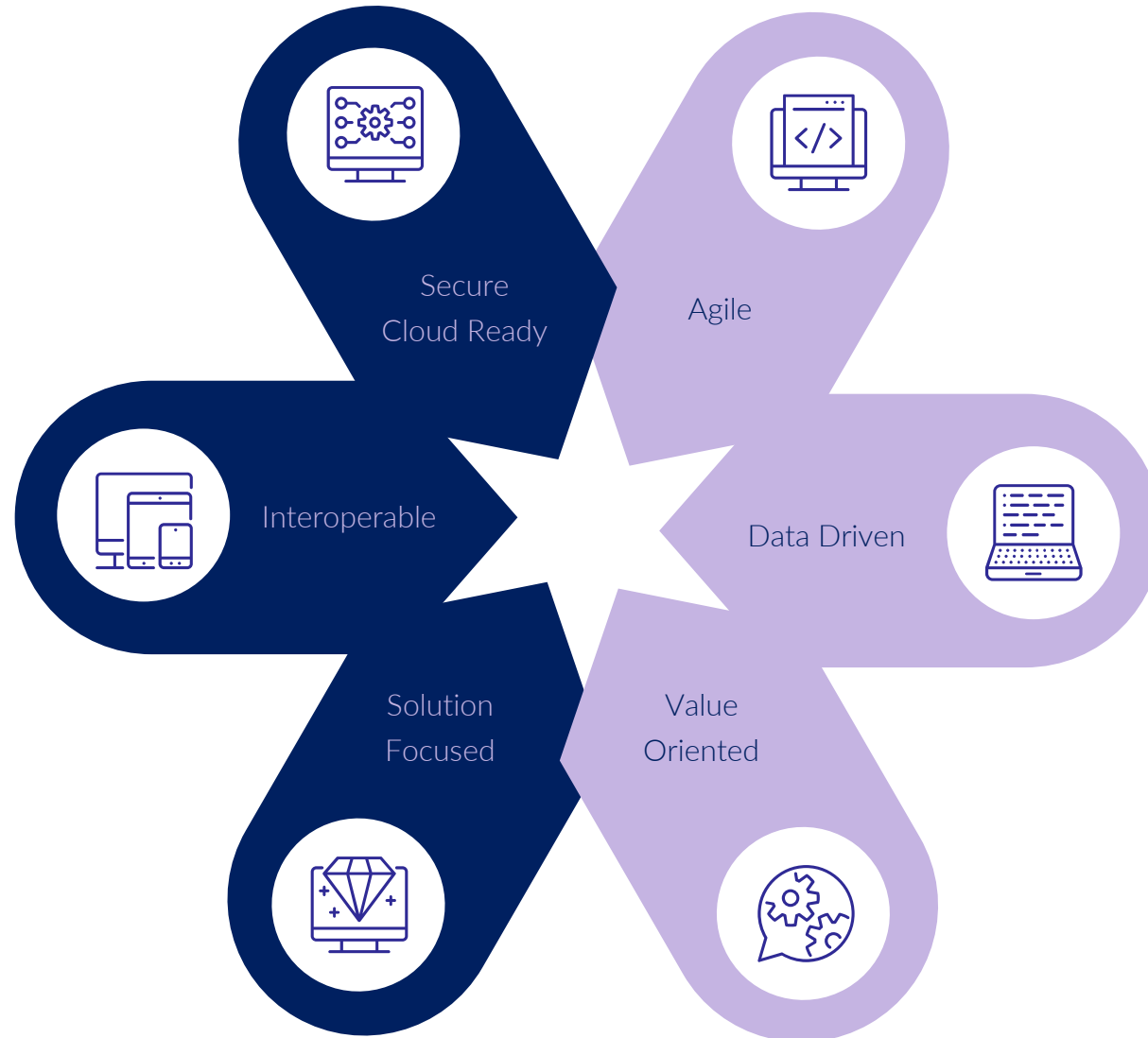
Allergies and Sensitivities			
Edit	Allergy	Nature of Reaction	
	Allergy: Codeine - Moderate	:(09/25/2023) Nature of Reaction: Allergic headache	<input type="checkbox"/>
	Allergy: Meperidine - Mild	Nature of Reaction: Allergic urticaria	<input type="checkbox"/>
	Allergy: Clarithromycin - Severe	Nature of Reaction: Anaphylactic urticaria	<input type="checkbox"/>

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