digitalhealth

AI + DATA

AI-powered decision support for clinicians

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Headline sponsor

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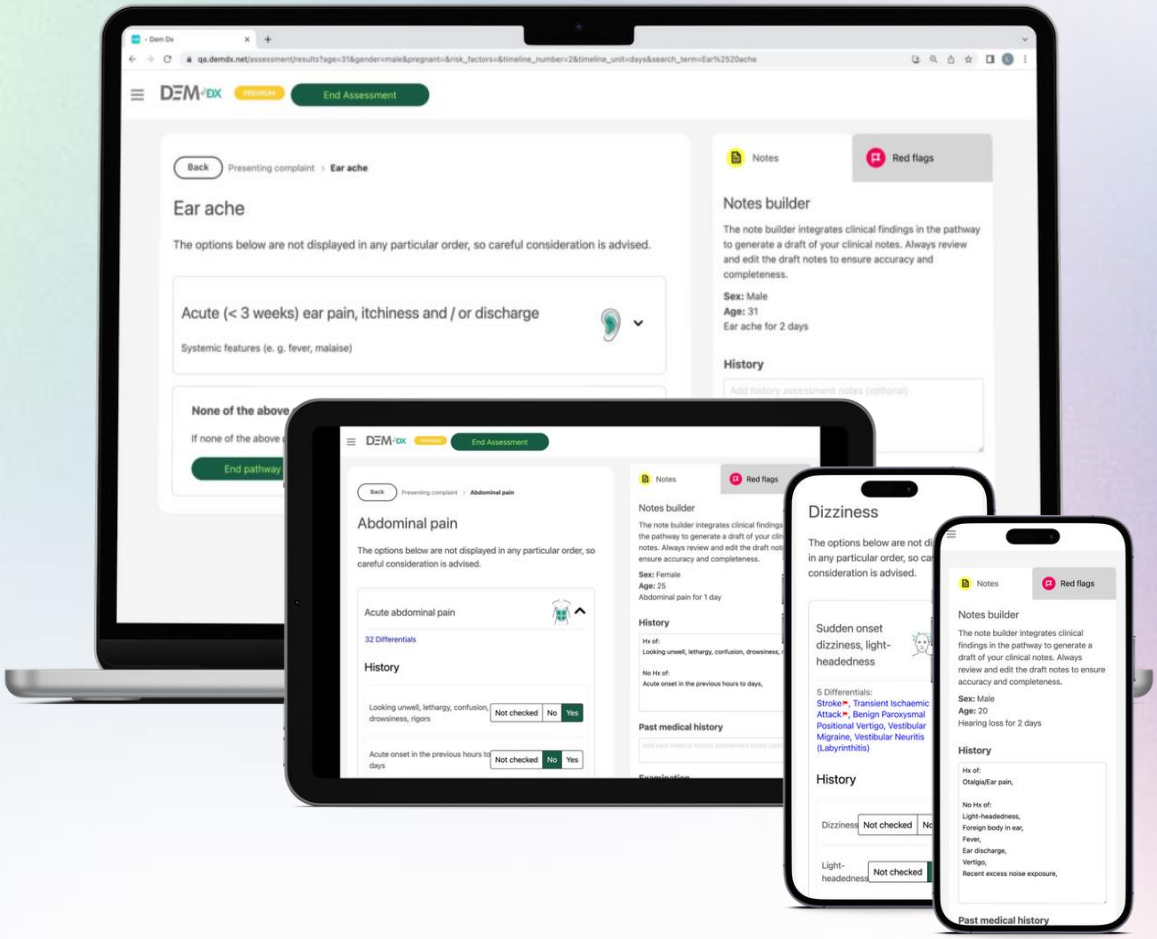
opto

Clinical Reasoning Platform

Solving frontline workforce shortage



Dr Mariane Melo

Chief Medical Officer

DEM DX Clinical Reasoning Platform

Designed to address the critical resource shortages by empowering frontline healthcare professionals to expand their capabilities in assessing patients in primary care.

Structured clinical assessment and red flag prompts

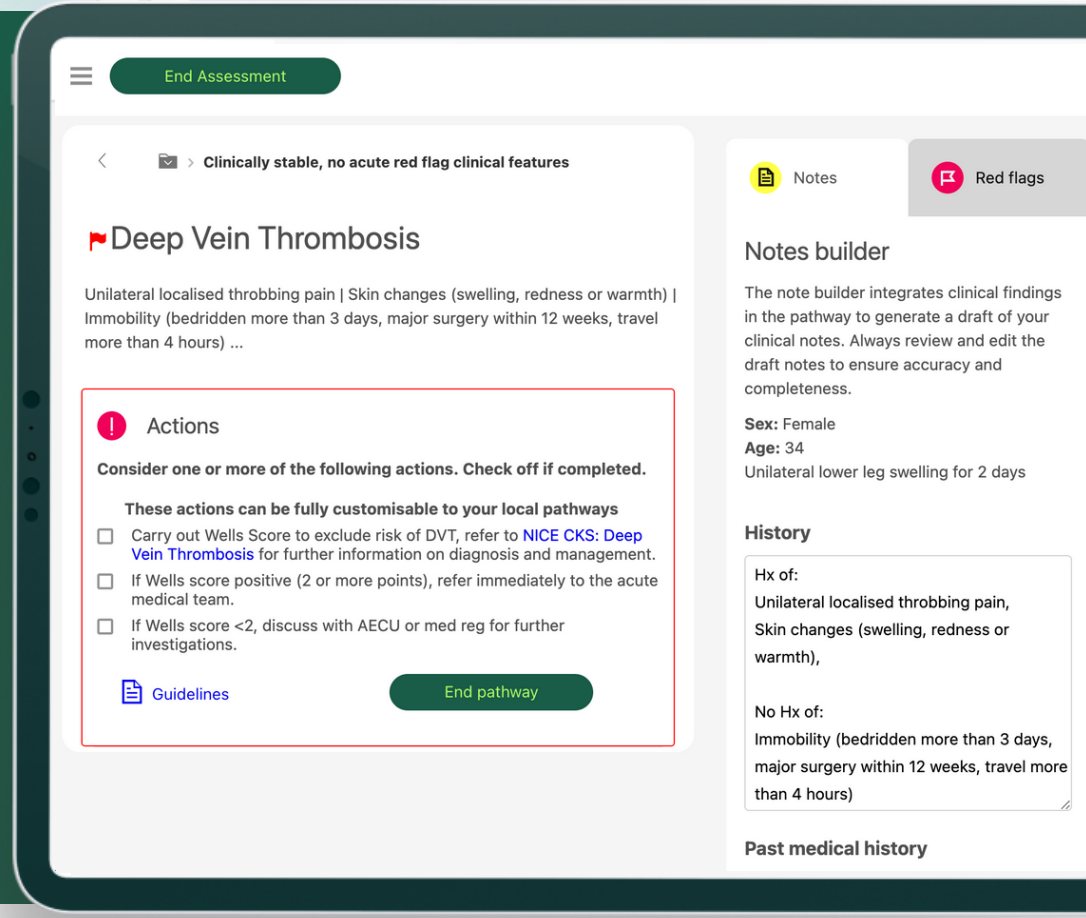
Step–by–step guide from symptoms, red flags examinations to potential conditions

Automated clinical notes

Builds the notes, editable at any time, saving valuable clinician time

Guides next steps

Customised actions to local pathways, access to NICE CKS, calculators and more



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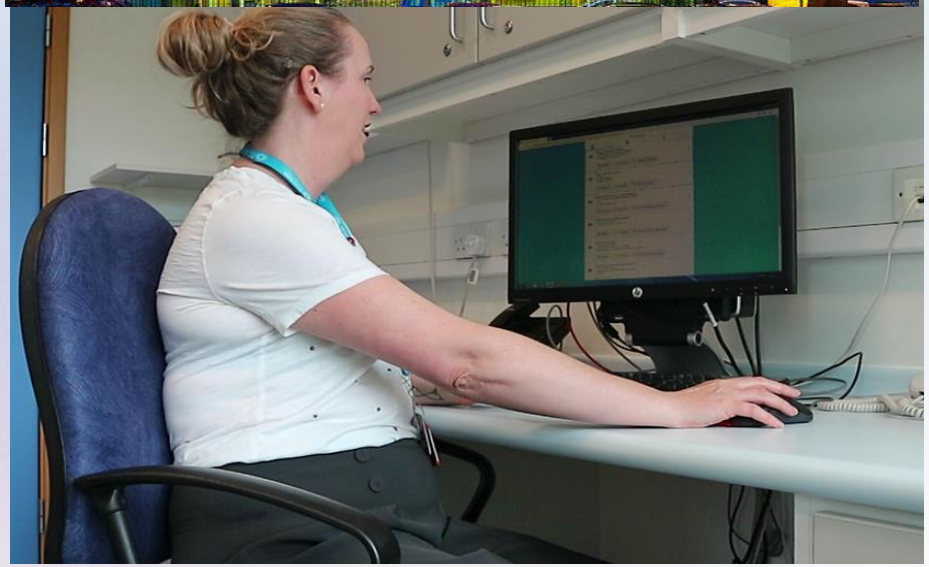
Case study: collaboration with Moorfield's Eye Hospital



Moorfields Eye Hospital NHS Foundation Trust

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Ophthalmology is now the busiest outpatient specialty, with a predicted increase in demand of 30-40% over the next 20 years

Most attendances to A&E are low-risk, highlighting the need for a dedicated ophthalmic triage system to redirect cases to the most appropriate care.

A pilot in the pediatric A&E showed promising results. However, a faster triage system is required for the very busy adult A&E.

DEM DX

DOTS: DemDx Ophthalmology Triage System

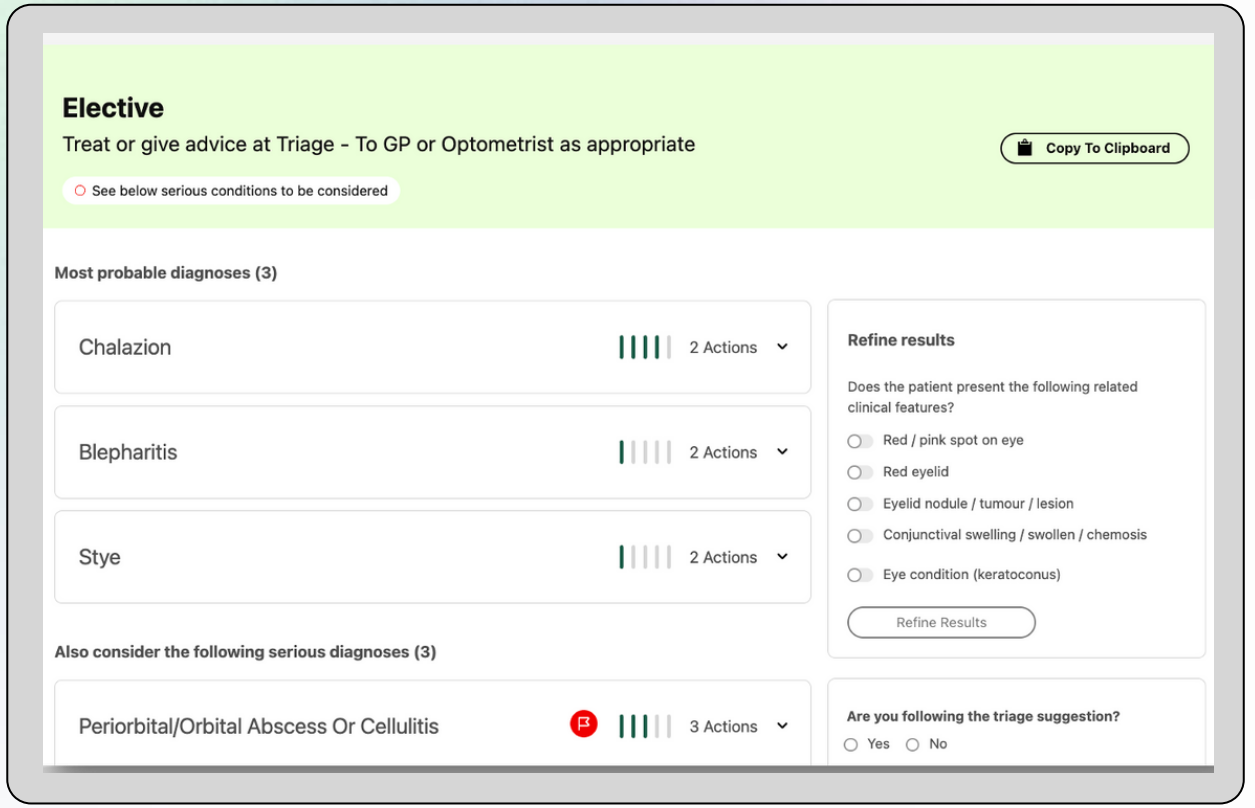
Development and validation of a ML-driven ophthalmology triage tool

Objective:

Facilitate efficient ophthalmic case triage using structured data from triage nurses and provide potential differentials.

Anticipated outcomes:

Optimized resource utilization, reduced A&E patient numbers, streamlined patient referrals to GPs and Optometrists.



Funded by the NIHR AI in Health and Care Awards

ACCELERATED ACCESS COLLABORATIVE

NIHR | National Institute for Health Research

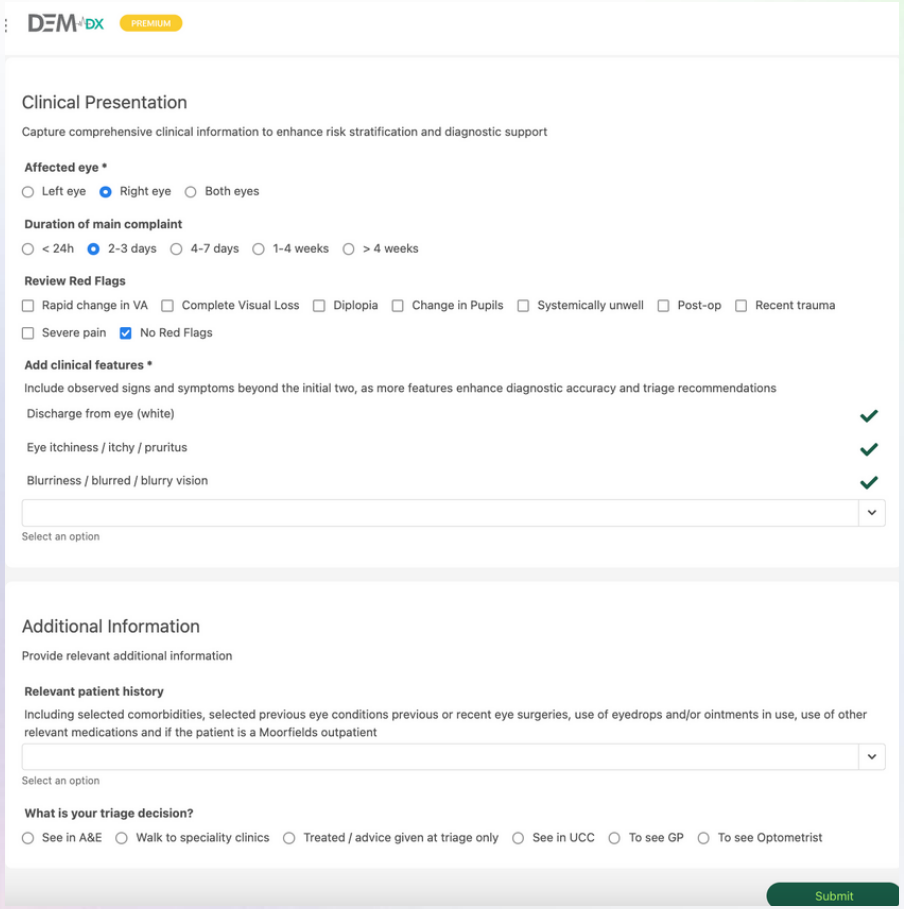
NHS X

DEM DX

Moorfields Eye Hospital NHS Foundation Trust

Built on a unique dataset of 12K+ Cases from Moorfield's A&E Triage Nurses

Data collection form



Data components

Gender: 2 levels

Ethnicity: 4 levels

Age: 4 levels

IMD: 5 levels

Red Flags: 7 levels

Laterality: 2 levels

Duration: 5 levels

Signs & Symptoms: 89 levels

Hx: 55 levels

Outcome: 6 levels

DEM DX

Datasets

Data:

12584 cases, 11733 patients

Train dataset:

8735 cases (69%)

Validation dataset:

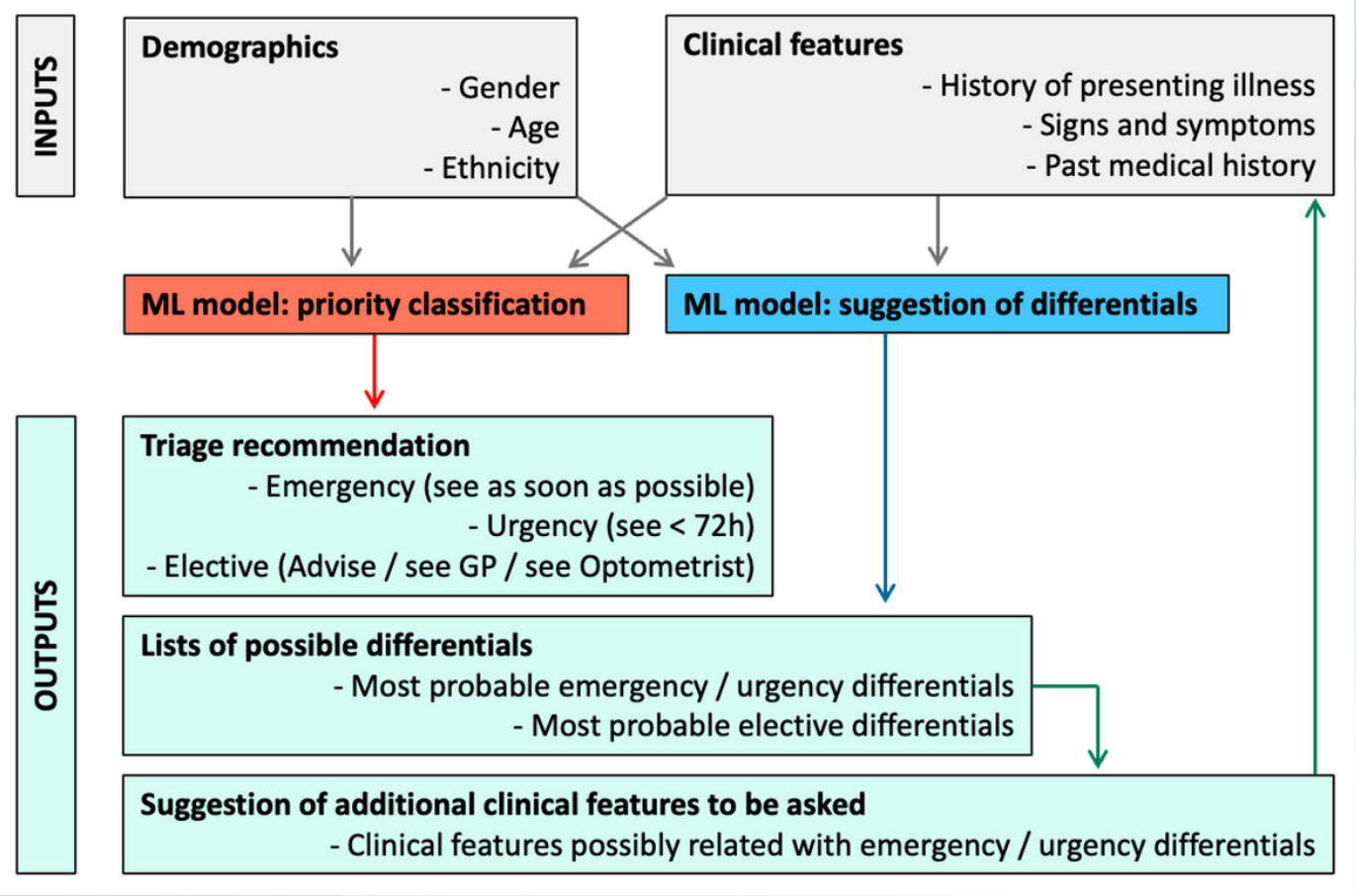
1827 cases (15%)

Test dataset:

2022 cases (16%)

New patients between April 15th and June 15th 2022

Machine Learning Models for Ophthalmic Triage: Development and Validation

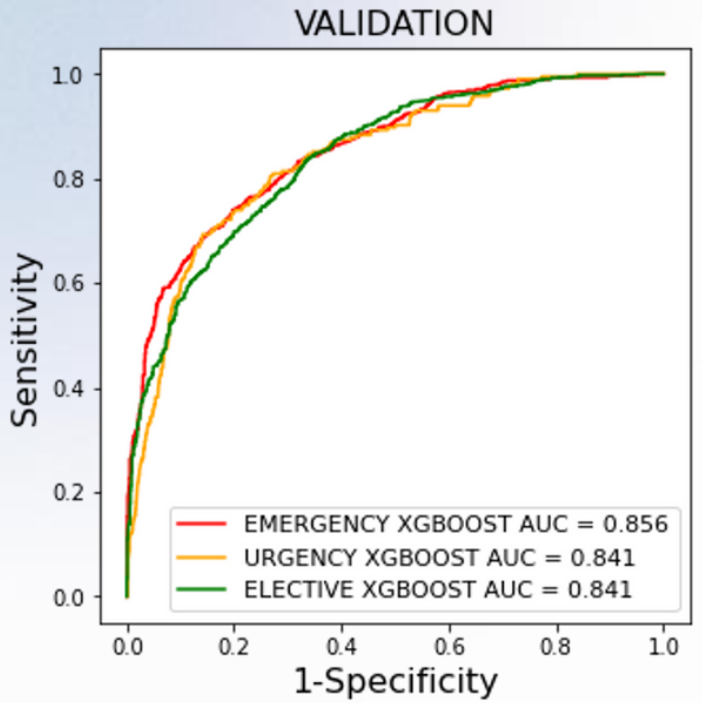


Optimal cutoffs XGBoost

if prob emergency > 0.175 -> emergency

if prob elective > 0.750 -> elective

else-> urgency



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Pre-clinical testing: prospective data compared with expert triage nurses

	Nurses	Model
Emergency /See in A&E	**Sens = 95.9 [94.4, 97.0]** **Spec = 25.5 [23.0, 28.2]**	**Sens = 94.3 [92.6, 95.7]** **Spec = 43.3 [40.8, 46.7]**
Urgency/ See in UCC	Sens = 6.7 [4.1, 10.6] Spec = 96.7 [95.8, 97.5]	Sens = 19.3 [14.7, 24.6] Spec = 93.9 [93.9, 95.0]
Elective / Primary Care	Sens = 24.5 [21.7, 27.5] Spec = 96.9 [95.7, 97.8]	Sens = 37.1 [33.9, 40.4] Spec = 94.5 [93.0, 95.7]
Potential to reduce urgent referrals by 12.8% [10.0% - 15.6%]		

Insights from the usability assessment

- High ease of use (90%+)
- Safety perception (85%)
- Fast processing time (95%)
- Clinicians' willingness to incorporate DOTS (95%)

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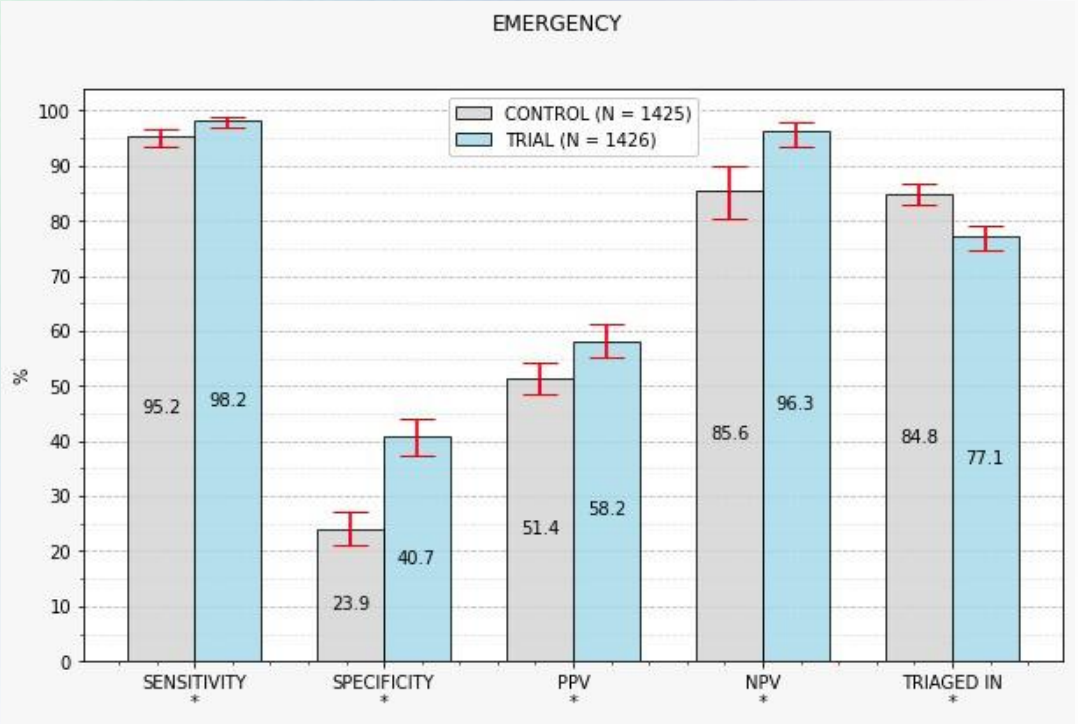
Clinical evaluation: Trial at Moorfield's A&E assessing human-computer interaction



Before and after the study implemented at Moorfield's City Road A&E

Potential savings: £900k/year

Next steps: submit technical file for medical device certification.

DEM DX

Acknowledgements

NIHR | National Institute for Health Research

ACCELERATED ACCESS COLLABORATIVE

UKRI Innovate UK

UCL

Digital Health. London ACCELERATOR

Moorfields Eye Hospital NHS Foundation Trust

- Dr Alex Day
- Dr Gordon Hay
- Dr Anish Jindal
- Dr Johnson Neo
- Dr Priyanka Sanghi
- Dr Peter Thomas
- Triage nurses
- IT team
- Patients from the lay advisory board

DEM DX

- Dr Camilo Resende
- Chris Phillips
- Elsa Lee
- Jovin D'Costa
- Steve Varley
- Lorin Gresser
- Mark Johnson
- Marcus Stow
- Luke Smith

Thank you!

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DEM DX

N-Tidal Diagnose™

Rapid, accurate, point-of-care diagnosis

Dr Gabriel Lambert
Head of Clinical Operations

TidalSense

TidalSense

COPD

63%

Precision of spirometry in diagnosing COPD in primary care (positive predictive value).[1]

2nd

Leading cause of hospital admissions in England.[2]

3rd

COPD is the 3rd leading cause of death in the world.[3]

"We advocate for…disruptive approaches to diagnosis that are not solely based on spirometric airflow limitation"

COPD Lancet Commission

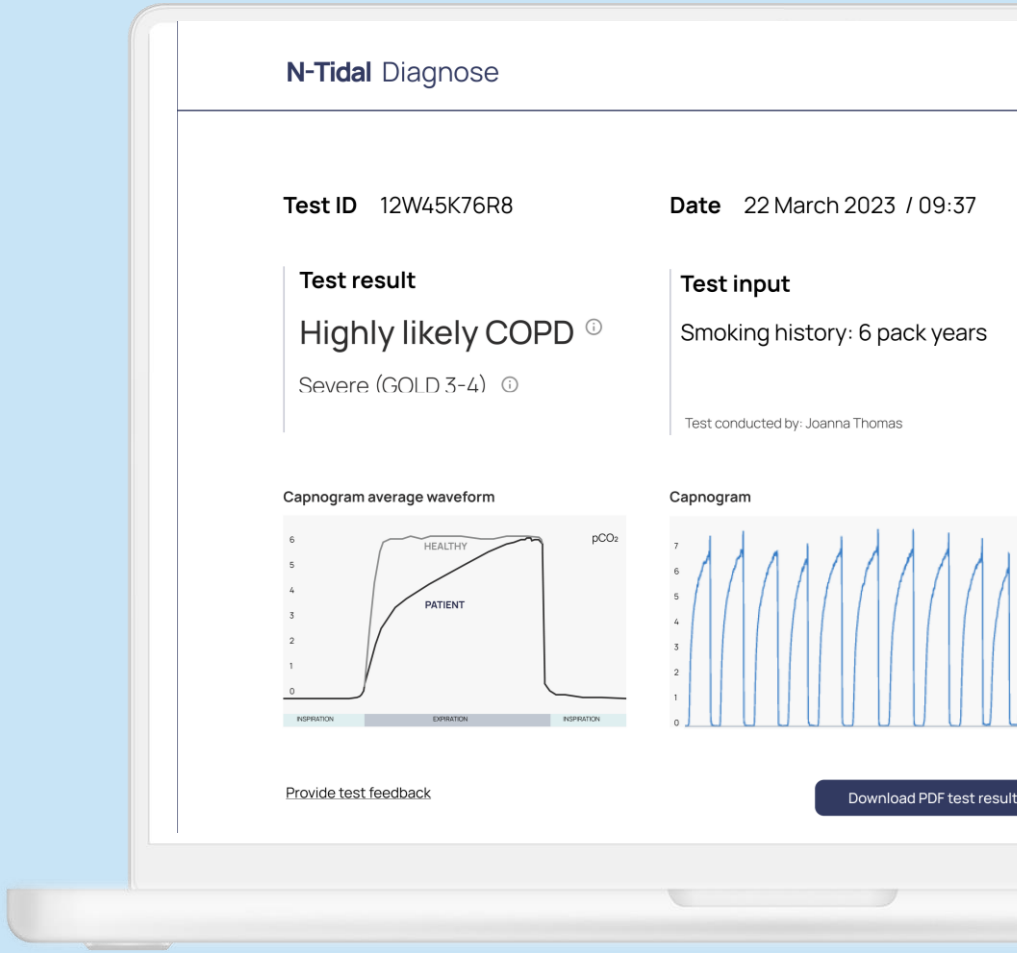
2022

Bev Walton

N-Tidal Diagnose™

A fundamental shift in respiratory diagnostic management driven by machine intelligence

- Relaxed breathing
- Next-generation CO_2 sensor
- Global 4G connectivity
- TidalSense AI engine
- Clinician dashboard
- Breath to result <5min



TidalSense

Thank you

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TidalSense

References

1. Schneider A, Gindner L, Tilemann L, Schermer T, Dinant GJ, Meyer FJ, Szecsenyi J. Diagnostic accuracy of spirometry in primary care. BMC pulmonary medicine. 2009 Dec;9(1):1-0.

2. Stone PW, Osen M, Ellis A, Coaker R, Quint JK. Prevalence of Chronic Obstructive Pulmonary Disease in England from 2000 to 2019. International Journal of Chronic Obstructive Pulmonary Disease. 2023 Dec 31:1565-74.

3 Organization WH. The top 10 causes of death. 2020. https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death Accessed 12 May 2022

Our solution
Minuteful for Wound

A digital, AI-powered wound management solution

- **CE certified** and **NHS DTAC** compliant digital wound management technology
- Aligned with the **NWCSP** best practice pathways
- **Directly integrated** to EMIS and SystmOne EPRs

National Wound Care Strategy Programme
Excellence. Every Patient. Every Time.

systmone EMIS

minuteful for wound

What we are doing is transforming wound care …

Analogue wound care

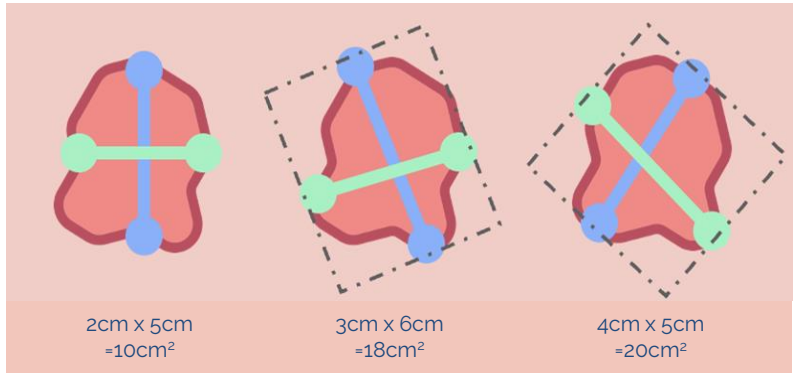
Digital wound care

Healthy.io

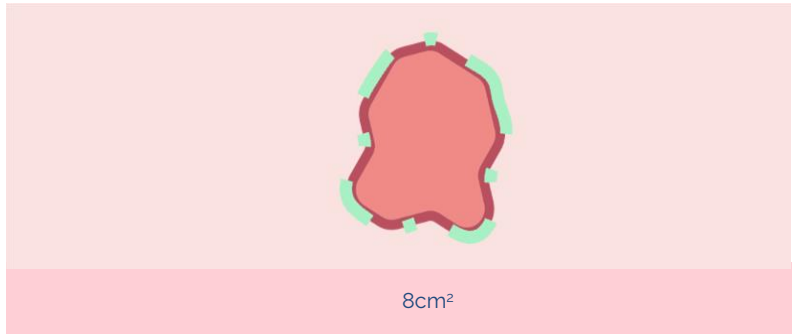
Why AI?

Our technology enhances the accuracy, quality and consistency of wound measurements

Same wound, different measurements



Consistent and comparable



MfW AI technology ensures **quality of imagery**: distance, orientation, blur, lighting conditions, colour recognition.

MfW AI technology detects the outline of a wound to give a **consistent** and **comparable** surface area measurements.

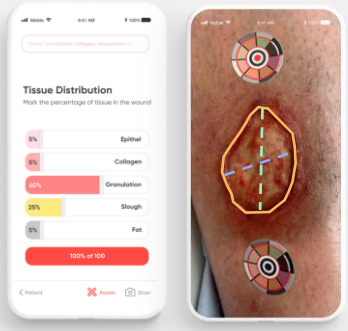
These AI generated measurements are used to **identify and flag deteriorating and static wounds** focusing scarce specialist resources on the right people at the right time.

Our AI-powered digital solution focuses on the root causes across the care continuum

Capture

Clinician records wound images using smartphone, making it accessible at the point of care. App creates 3D model of wound using AI for **accurate, consistent** measurements

50%
reduction in documenting time



Assess

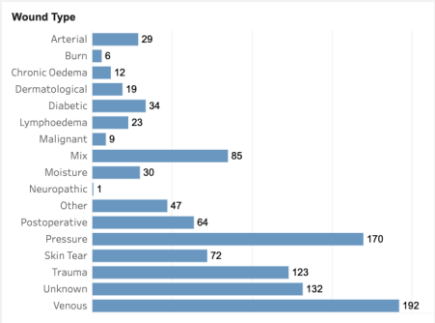
Clinician adds notes using templates that are in-line with clinical guidelines (including measurement, location and tissue distribution), **standardising assessments**

230%
more patients reviewed by a senior nurse

Oversee

Information centralised to portal and synced with electronic patient record, so the whole team has visibility of all wounds and progress from anywhere

66%
reduction in visits due to virtual oversight



Intervene

Clinical insights enable leadership to **intervene at the first sight** of complication or variation in care; identify operational efficiencies and skill/resource mix requirements

64%
reduction in wound care incidents

Benefits to the system and patients

Healing patients faster

January 2022 - May 2023					May 2023 - June 2023			
16 Months					Less than 1 month			2 weeks
94 year old male with a lower limb ulceration referred by GP to our INT service	Weekly INT visits commenced No assessment is conducted for compression therapy	Wound deteriorates due to suboptimal treatment plan	Twice weekly INT visits commenced No assessment is conducted for compression therapy	Wound deteriorates due to suboptimal treatment plan	**In May 2023 patient's wound is flagged as deteriorating by MfW**	In May 2023 TVN reviews the patients due to the deteriorating flag and admits the patient to the wound service caseload	Patient has a doppler and lower limb assessment, wound is diagnosed and treatment is optimised to include gold standard compression therapy	Just **2 weeks later** the patient's wound **healed** and the patient is discharged

Lack of caseload visibility - meant the patient was not identified as being in sub-optimal treatment or that the wound was continuing to deteriorate

No specialist input - The Sirona wound care service relies on referrals from INT teams in the identification of patients that can benefit from the service. This patient was not referred

Thank you

For more information please contact

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debbie.foley@healthy.io

PSYRIN

At the DIGITAL HEALTH AI & DATA conference October 2023

Raheem Chaudhry MBBS
Co-Founder, Psyrin

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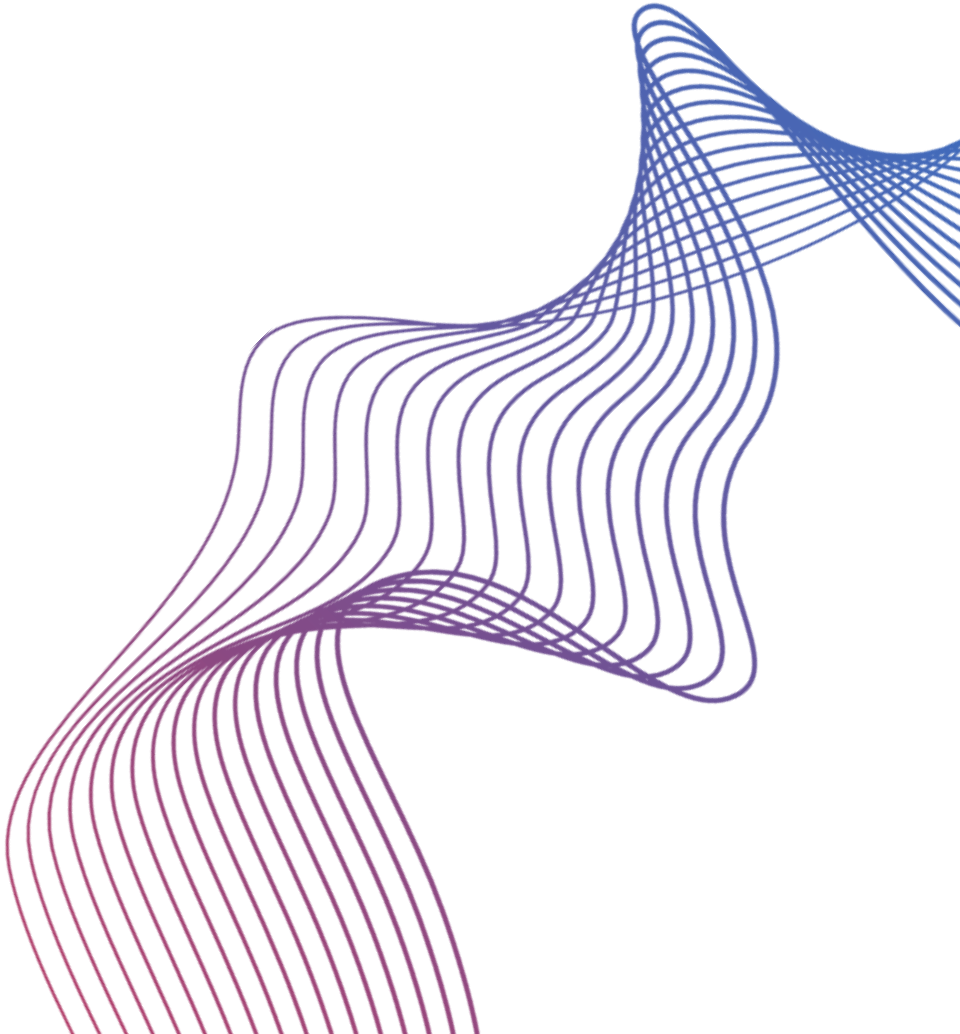


02

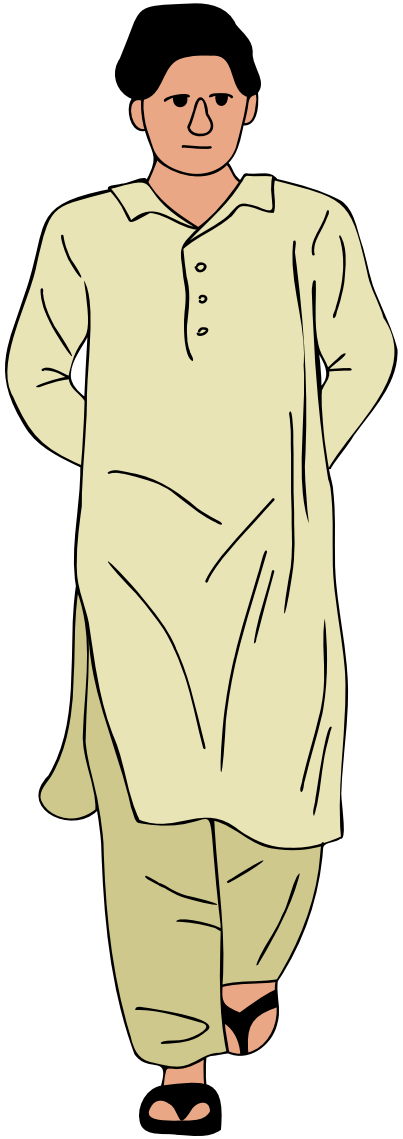
What we do

Psyrin uses speech and AI to detect serious mental illness early, enabling preventive interventions

Imran*

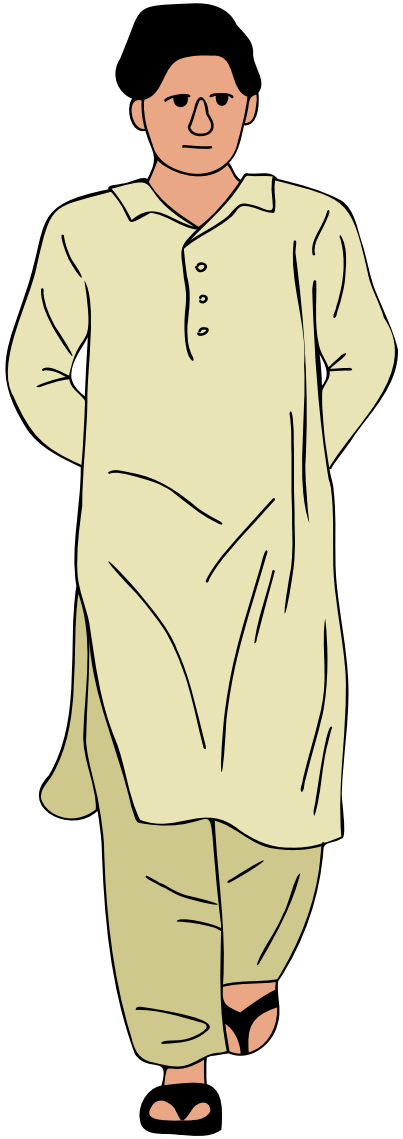
Name and certain details have been changed for privacy reasons

Imran*



Imran’s dad

Name and certain details have been changed for privacy reasons



“An odd man...

“He saw jinn...

“He refused food and water...

Died at 45

Fled to the UK as a refugee

Family history of psychosis

At Risk Mental State

Had a social worker

Help-seeking

Stuck on a waiting list with only a single phone call

Eventually developed psychosis

Picked up by police, lost his job

Hospitalised and treated

Clinical care for serious mental illnesses (SMI) is broken...

145 MILLION

people globally suffer from an SMI

£398 BILLION

global societal spend on SMI care

£180 BILLION

global payor payout for SMI care

...because clinical diagnosis is lengthy, late & subjective

Gold-standard clinical interview takes 90 minutes

Leads to lengthy delays in care

Average 9.5 years to receive diagnosis of bipolar

Everything from initial phone call is subjective

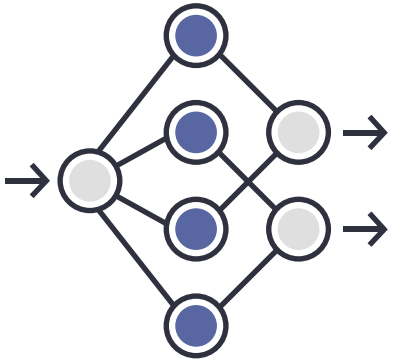
Accuracy of initial SMI diagnosis between 0% - 54%

Our tech lets clinicians make quick, early & objective diagnoses

1

VOICE RECORDED VIA APP

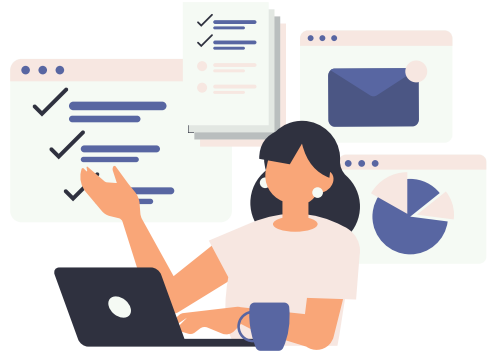
5-minutes of voice recordings (starting with prompted tasks)



2

PSYRIN ANALYSIS

Linguistic & acoustic analysis via proprietary ML models

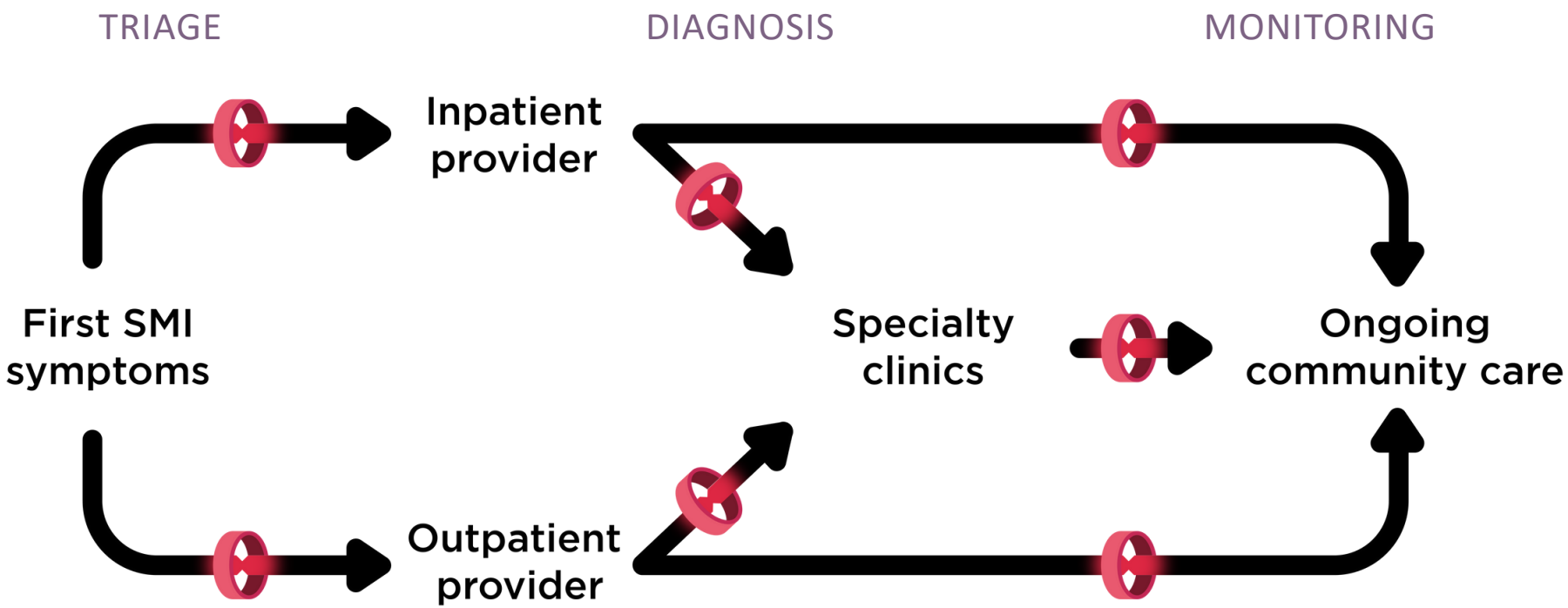


3

CASE REPORT FORM, DIAGNOSIS & SUGGESTIONS

Enables preventive & personalised interventions

...with multiple applications across the clinical workflow



In and out of facilities

On benefits and council care

Episodes of health and relapse

We've built the largest proprietary speech-SMI dataset

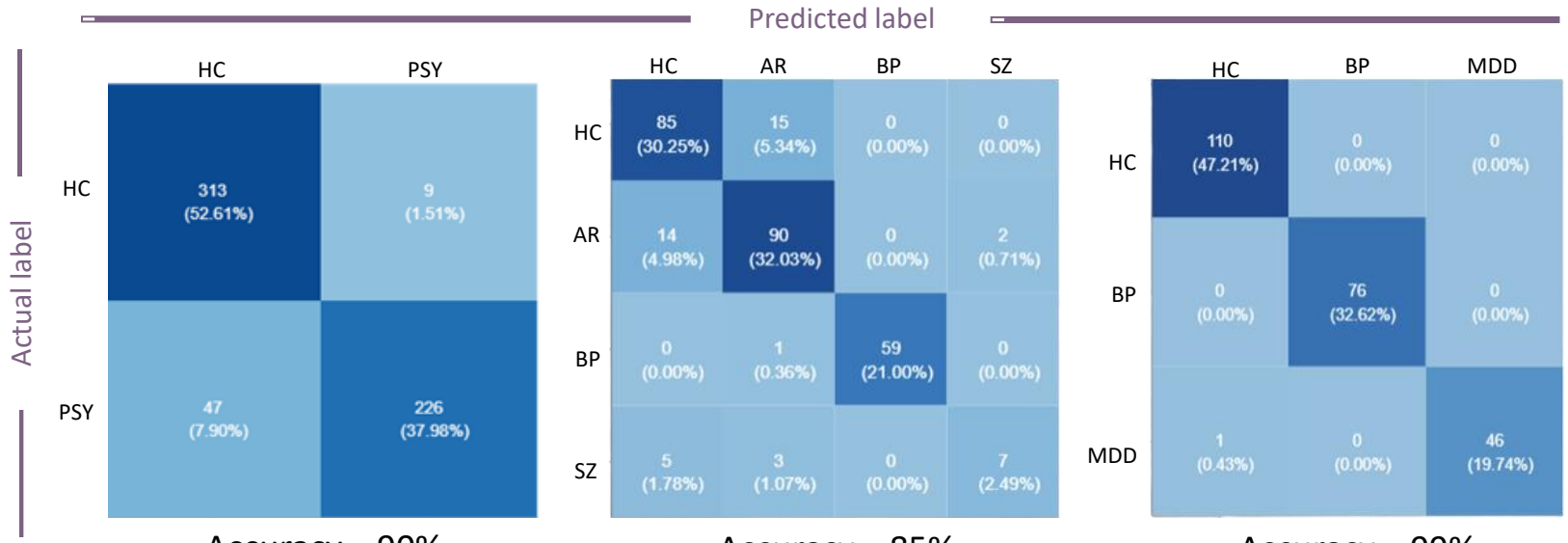
1150 individuals (> 22,000 mins of labelled speech)

160+ features extracted with just 5 minutes of speech

Across NLP (coherence, tangentiality, syntactic complexity, connectivity etc.) and signal processing (acoustic analysis)

The most accurate ML algorithms in psychiatry

No other group has achieved classification across >2 psychiatric categories



HC: healthy control | PSY: psychosis | AR: at-risk | BP: bipolar | SZ: schizophrenia | MDD: depression

leading to 9 partnerships to develop a deep research & product development portfolio

Clinical (FDA pivotal) & research partnerships

the brookline center for COMMUNITY MENTAL HEALTH

The Resilience and Prevention Program
Mass General Hospital

NUS National University of Singapore

UFRJ Universidade Federal do Rio de Janeiro

Penn University of Pennsylvania

Collaborative partners for grant applications

NHS Central and North West London NHS Foundation Trust

NHS East London NHS Foundation Trust

NHS Solent NHS Trust

NHS Avon and Wiltshire Mental Health Partnership NHS Trust

Get in touch

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BUILD THE FUTURE OF MENTAL HEALTH WITH

PSYRIN

the technology enabling preventive care for serious mental illness

Supported by industry leaders in deeptech & AI

conceptionx

[XTX] VENTURES

digitalhealth

AI + DATA

AI-powered decision support for clinicians

Sami Nur

CEO & Co-Founder
Opto Health

Debbie Foley

Head of Commercial
Healthy.io

Raheem Chaudhry

Co-Founder & COO
Psyrin

Dr Ameera Patel

CEO
TidalSense

Dr Mariane Melo

Founder & Chief Medical Officer
Dem Dx

Chair: Karla Richards

Senior Innovation Project Manager, Health Innovation Network and NHS Navigator, DigitalHealth.London

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