

UNO SGUARDO AL FUTURO

Stefano Del Prato – Interdisciplinary Research Center "Health Science", Sant'Anna School of Advanced Studies, Pisa, Italy

Presenter Disclosures

Advisory board -

Abbott, Altimune, Amarin Corporation, Applied Therapeutics, AstraZeneca, Biomea Fusion, Eli Lilly & Co., Eva Pharma, Menarini International, Novo Nordisk, Roche, Sanofi, Sun Pharma

Speaking Engagements -

Abbott, AstraZeneca, Boehringer Ingelheim, Eli Lilly & Co., Laboratori Guidotti, Menarini International, Merck Sharpe & Dohme, Novo Nordisk, Sanofi

Institutional roles -

Past-President EASD/EFSD
President European Diabetes Forum
President Fondazione Menarini

Presenter Disclosures

Il Prof. Andrea Giaccari è un mio fraterno amico e continua ad invitarmi al G-Meta Open Forum affidandomi temi "particolari" prima che io tiri la porta



EARLY DETECTION

Still too enough not @ target

More efficacious treatment available

Cost of diabetes sky rocketing

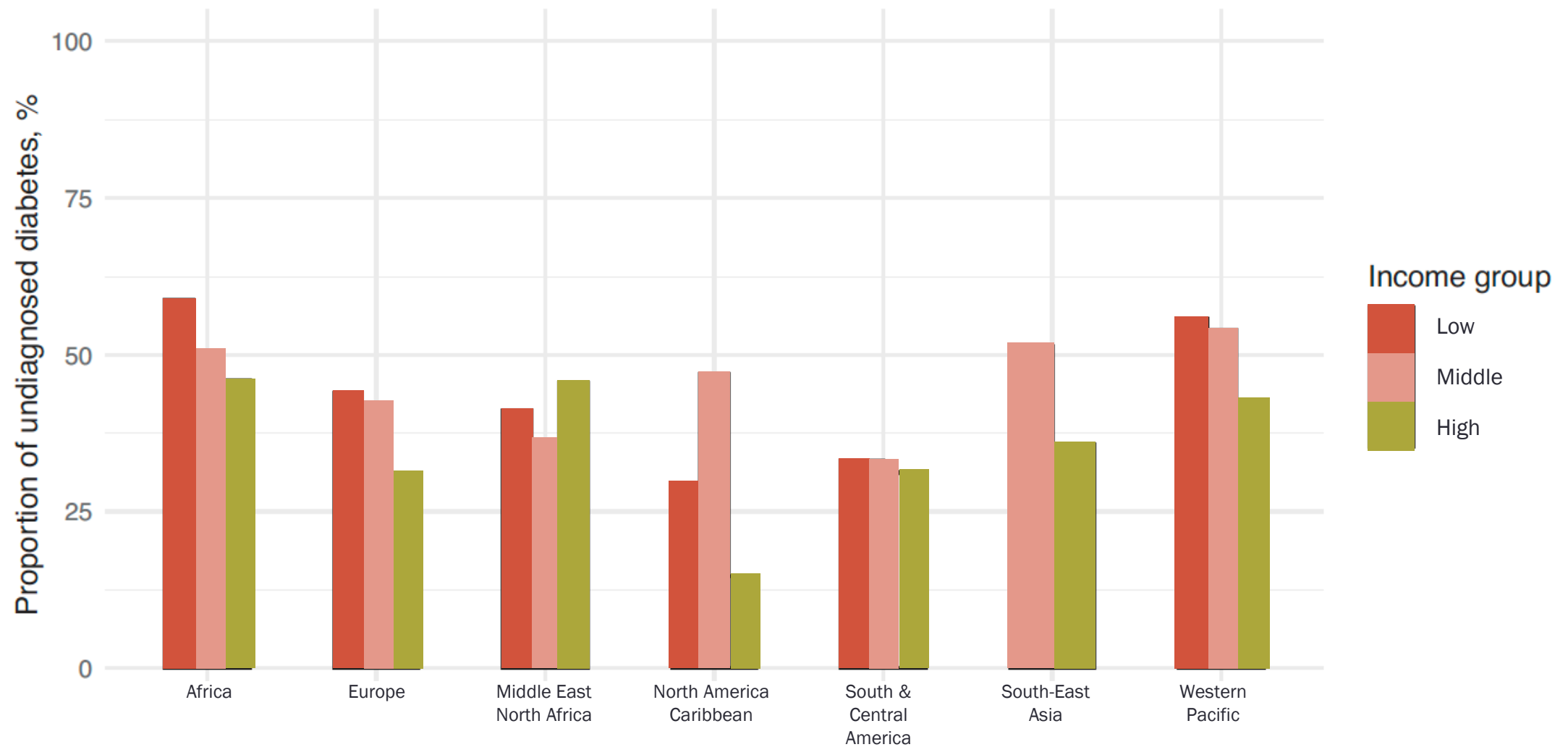
New complications
emerging

Complications' rate
not dropping

Too many people undiagnosed

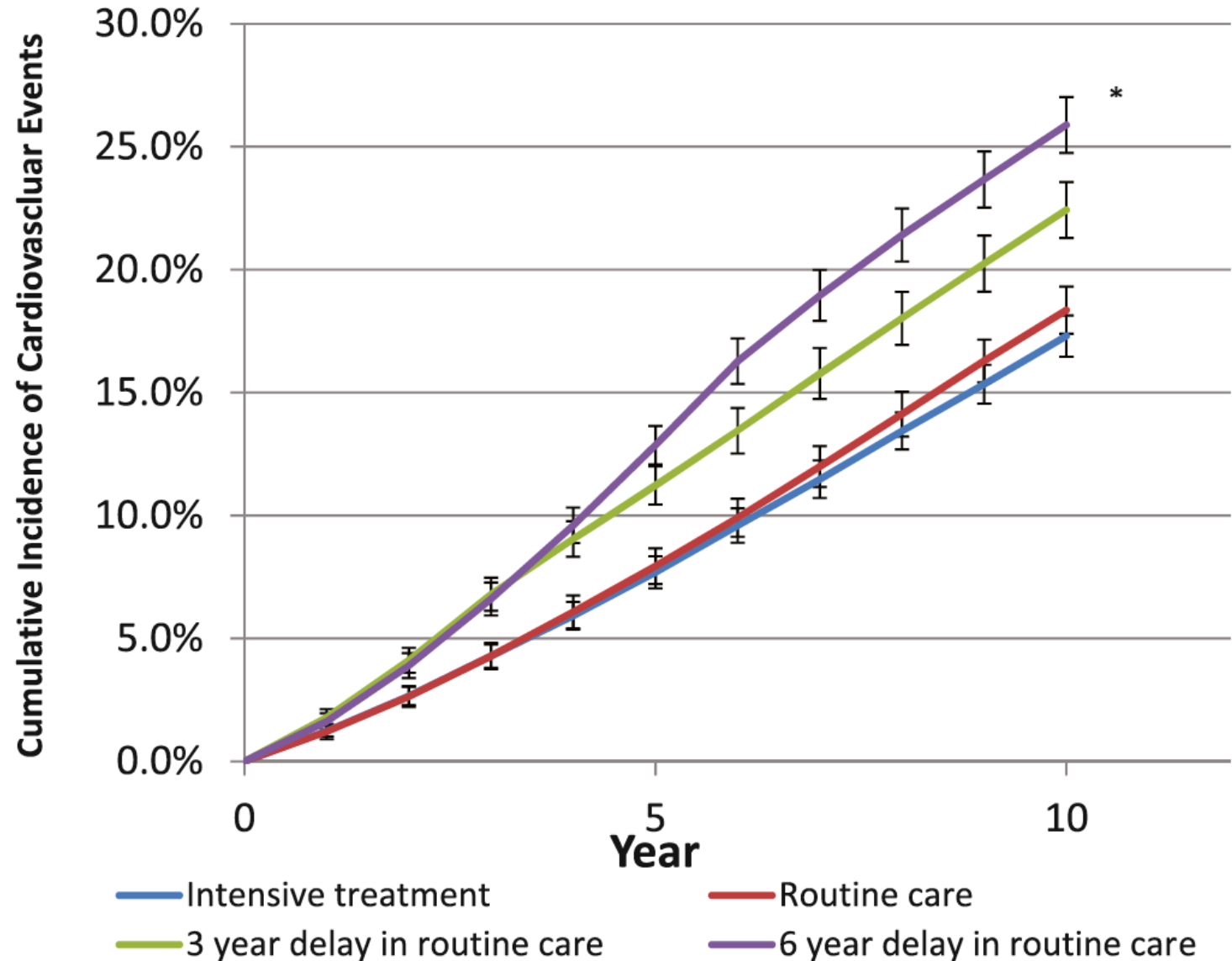
DM prevalence growing worldwide

Regional Proportion of Undiagnosed Diabetes



Early Detection and Treatment of T2DM Reduce CV Morbidity and Mortality

Harman WH et al. *Diabetes Care*
2015;38:1449–1455





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EMPOWERING PEOPLE WITH DIABETES

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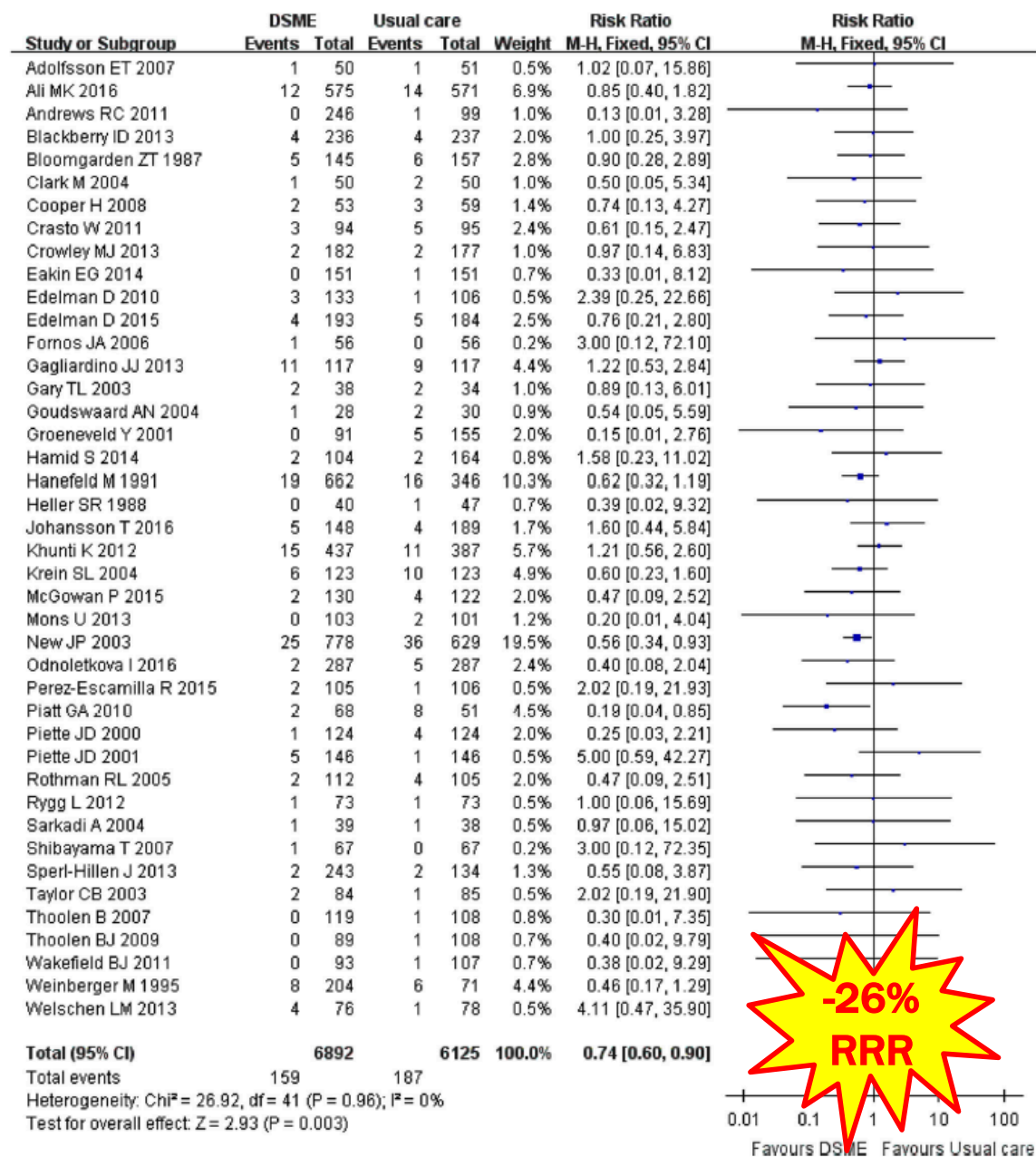
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Diabetes Self-management Education Reduces Risk of All-cause Mortality in T2DM Patients

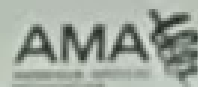
He X et al *Endocrine* 2017;
55:712–731



OUTFRONT

**84 MILLION AMERICANS
HAVE PREDIABETES.
EVEN PUPPY LOVERS.**

DoIHavePrediabetes.org





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**ENSURE
SAFE &
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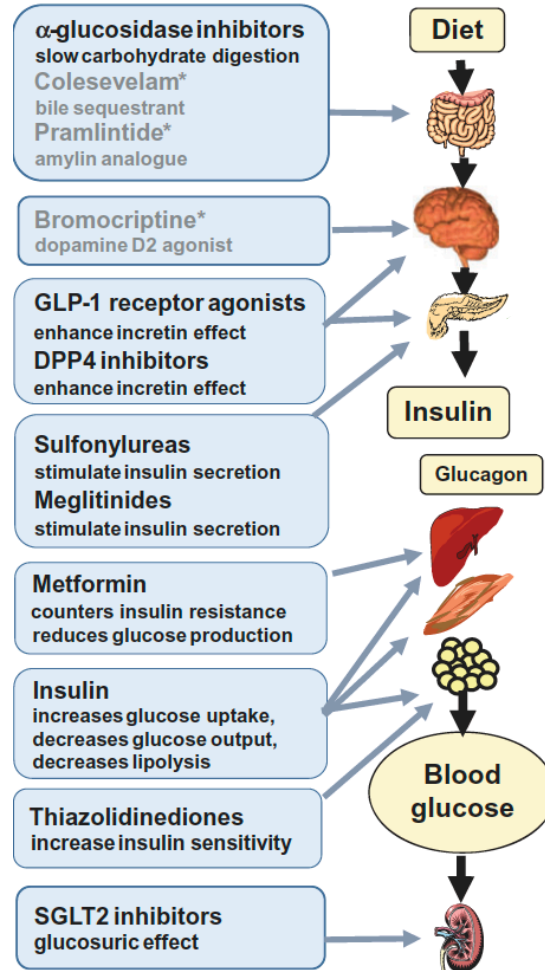
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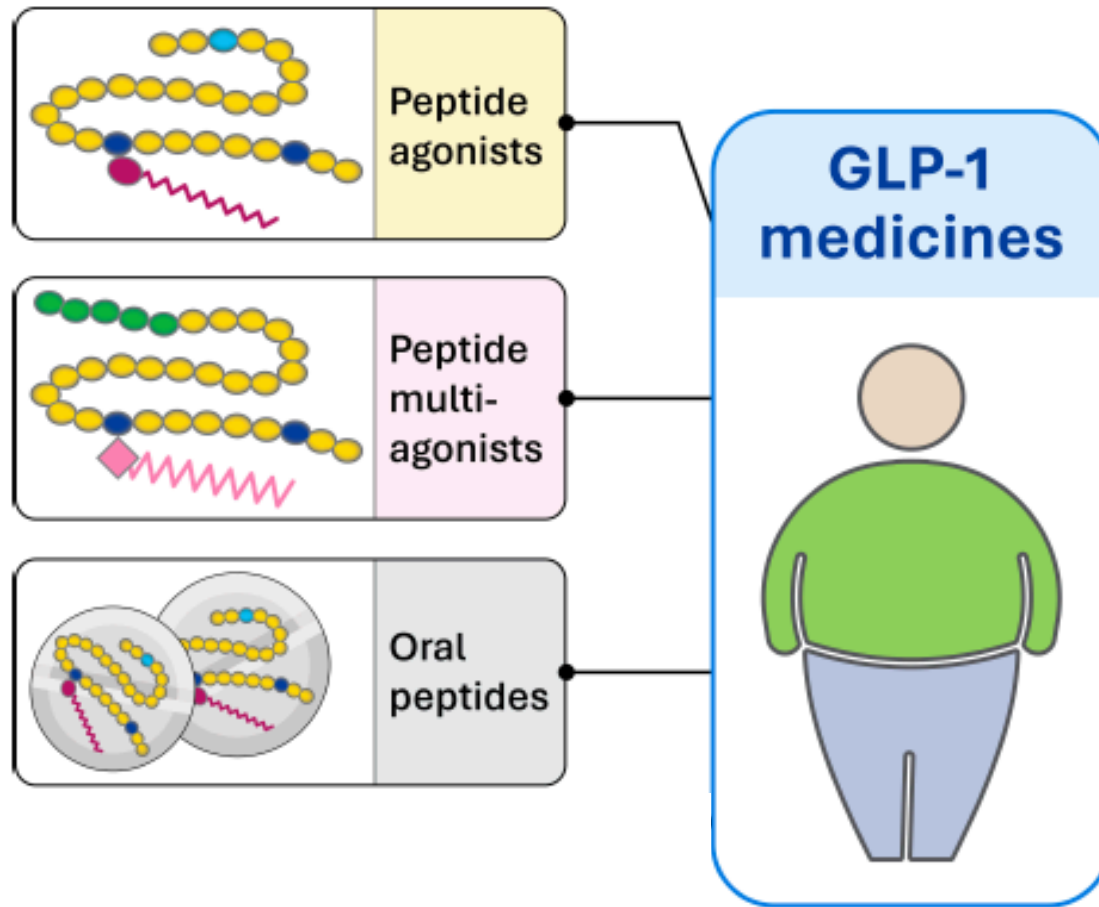
DM prevalence growing worldwide

Ensure Safe & Effective Treatment

Present therapies



Technology for Developing Pharmacologic Therapy

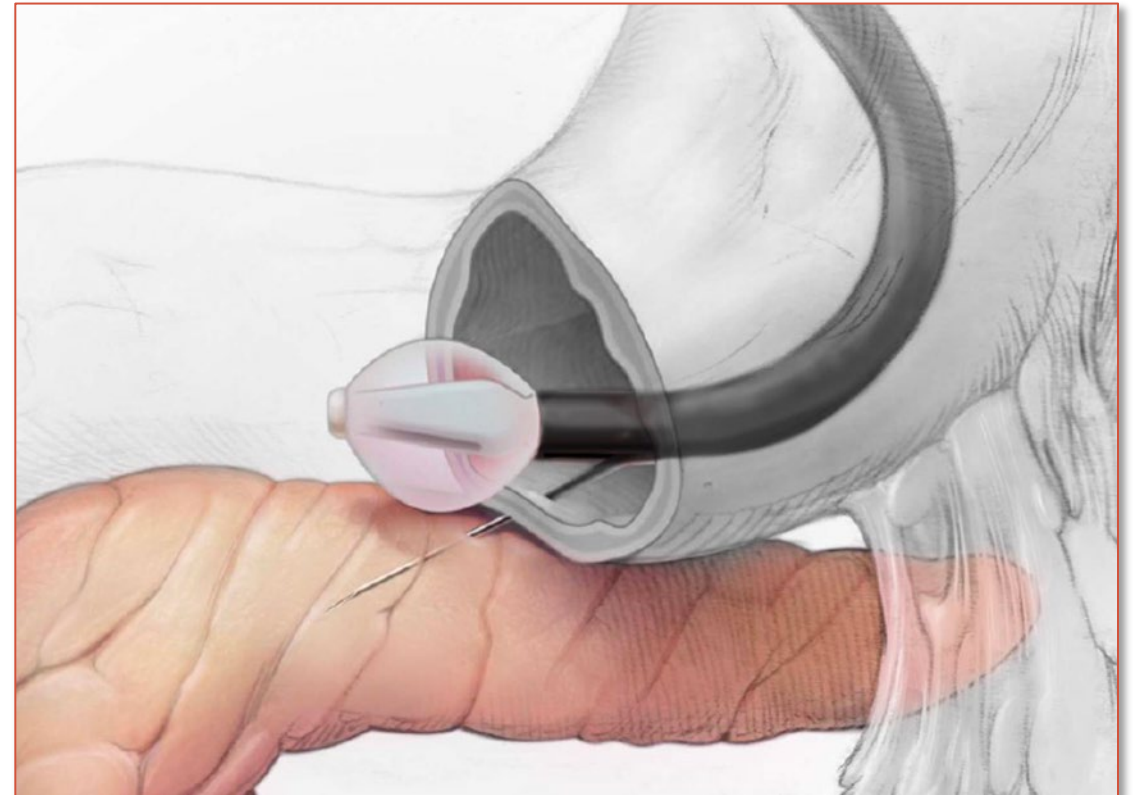
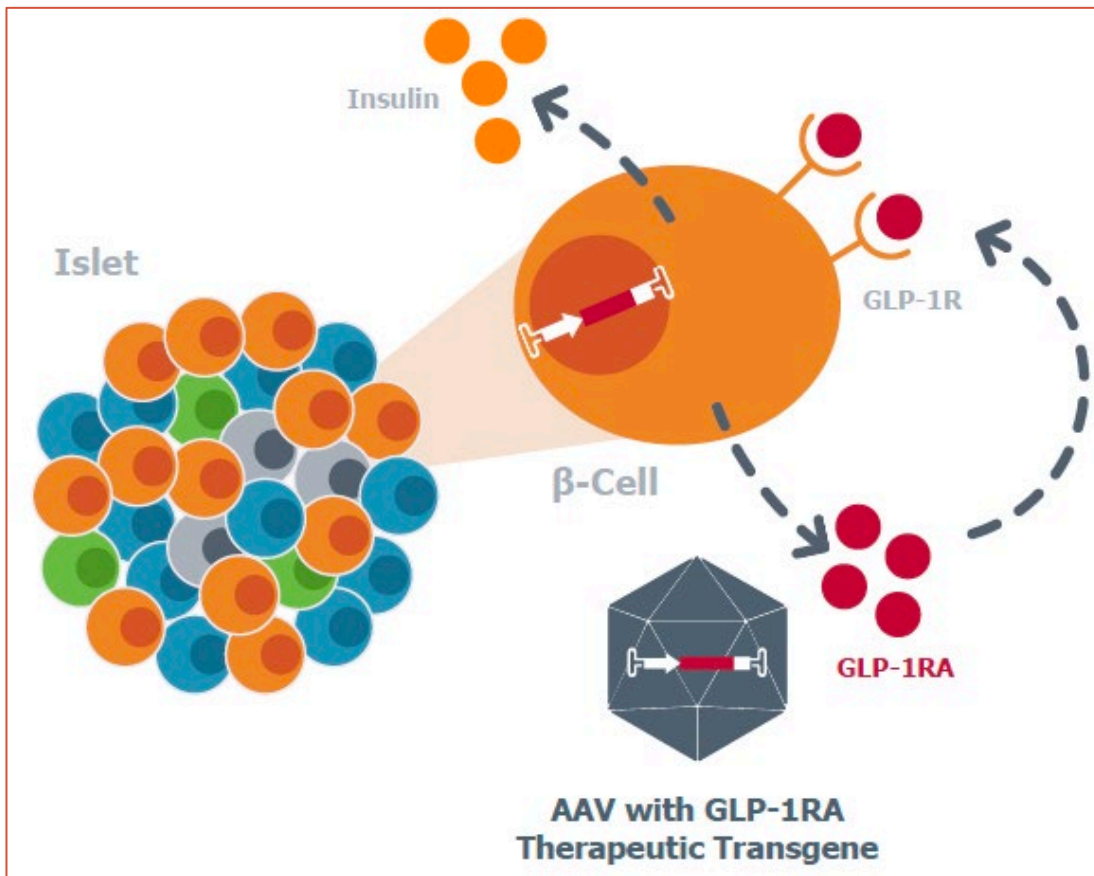


Pancreatic Gene Therapy (PGTx) to Modify Islet Function

Potential for durable improvement in metabolic health

GLP-1RA PGTx, driven by the insulin promoter, may offer differentiated benefit via durable local production of GLP-1RA

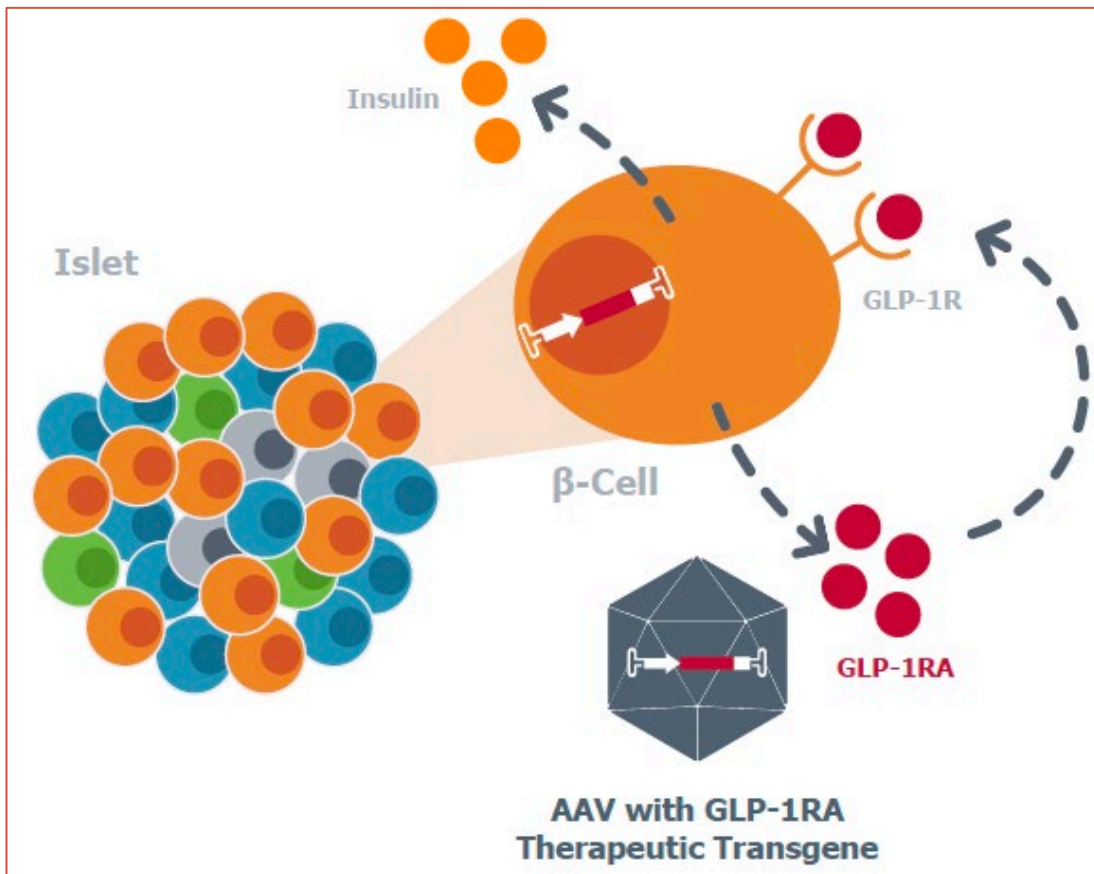
Pancreas is readily accessible via endoscopic ultrasound, and local delivery enables PGTx feasibility and safety



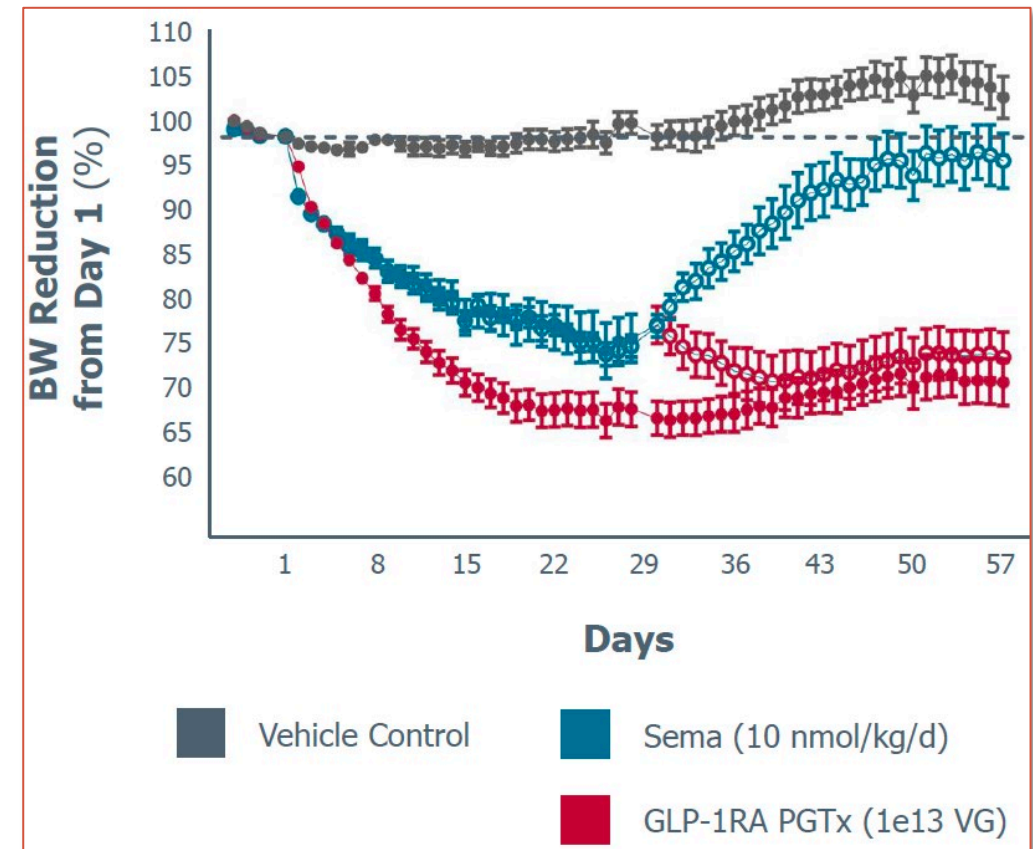
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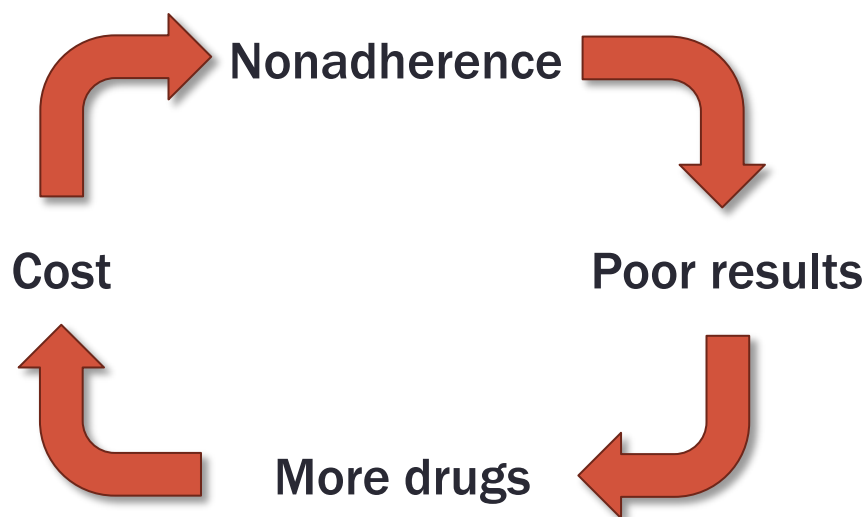
Change in BW Over Time in DIO murine model



Ensure Safe & Effective Treatment

Improving Treatment Adherence

Diabetic patients take 40-50% of what they are prescribed

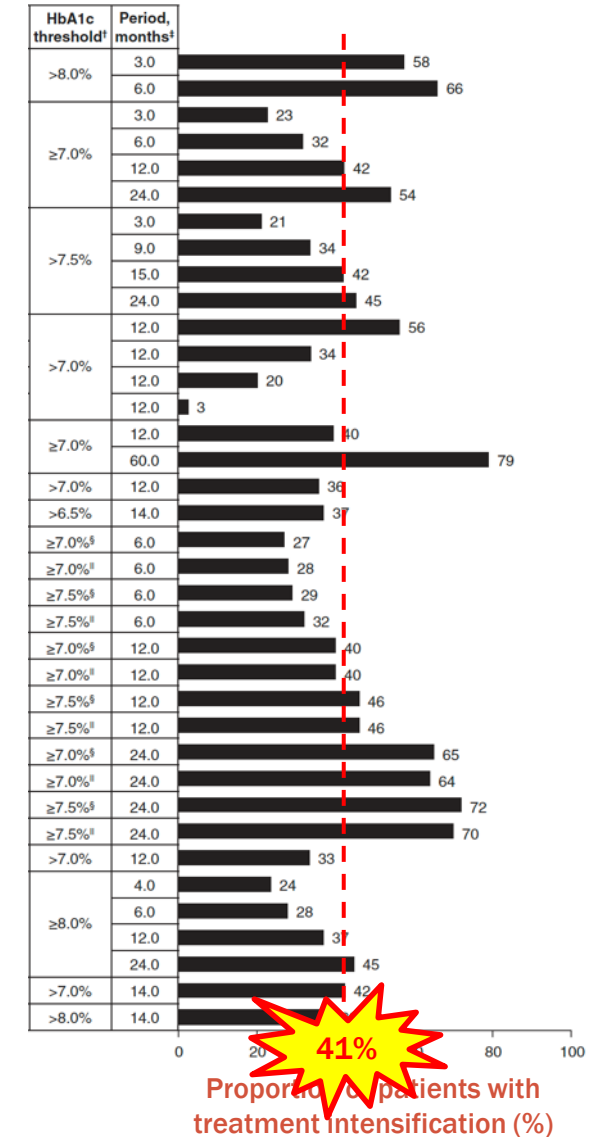
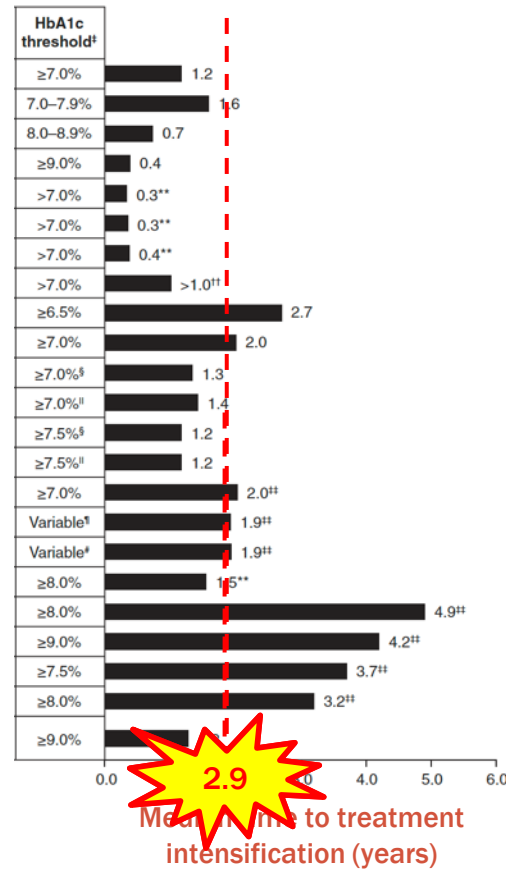


Factors contributing to drug adherence:

- Socio-economic
- Condition/co-morbidity related
- Therapy related
- Patient related
- Health care provider/System

Ensure Safe & Effective Treatment

Improving Treatment Adherence



Ensure Safe & Effective Treatment

Improving Data Collection & Monitoring

A data-to-action framework aimed at enabling attainment of multiple goals through:

1. patient empowerment
2. early intervention
3. with ongoing data collection

to influence practice and policies

Attainment of multiple goals
HbA_{1c} <6.5-7% (48-53 mmol/mol)
BP <130-140/80-90 mmHg
LDL-C <1.8-2.6 mmol/L (70-100 mg/dL)
Essential medications (e.g. statins, RASi)
Reduced complications, hospitalizations, and pre

Monitor trends and dise

Registry is part of the integrated care model

Linkage to EMR
Benchmark performance
Identify care gaps
Evaluate effectiveness
Track secular trends

Nonphysician staff
Evaluation
Engagement
Empowerment

Finances and resources
Capacity building
Incentives and policies

Ensure Safe & Effective Treatment

Improving Data Collection & Monitoring

Diabetes Registries

Enabling high quality diabetes care



European
Diabetes Forum



JACARDI

Joint action
cardiovascular diseases
and diabetes

WP07

Data availability, quality, accessibility and sharing

Accurately monitoring risk factors, prevalence and progress of diseases is essential to identify health challenges and disparities.

The pilot projects in this focus area aim to improve data quality, collection methods and analysis for cardiovascular diseases and diabetes. This is achieved through standardization and harmonization of the data, which allows for better comparisons between countries and helps to pinpoint opportunities for improving quality care from the patient's perspective.

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**EXPLOIT
SCIENCE &
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Technology for the More Efficient Early Diagnosis

SCIENTIFIC REPORTS | (2020) 10:11981

www.nature.com/scientificreports

**SCIENTIFIC
REPORTS**

nature research



OPEN

Early detection of type 2 diabetes mellitus using machine learning-based prediction models

Leon Kopitar¹✉, Primoz Kocbek², Leona Cilar², Aziz Sheikh^{4,5} & Gregor Stiglic^{2,3}

Technology for the More Efficient Early Diagnosis

Pyrros A et al *Nat Commun.*
2023;14:4039

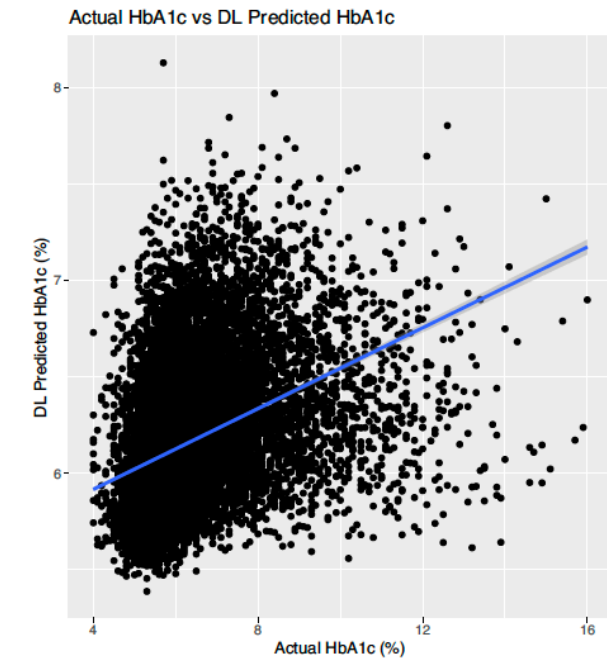
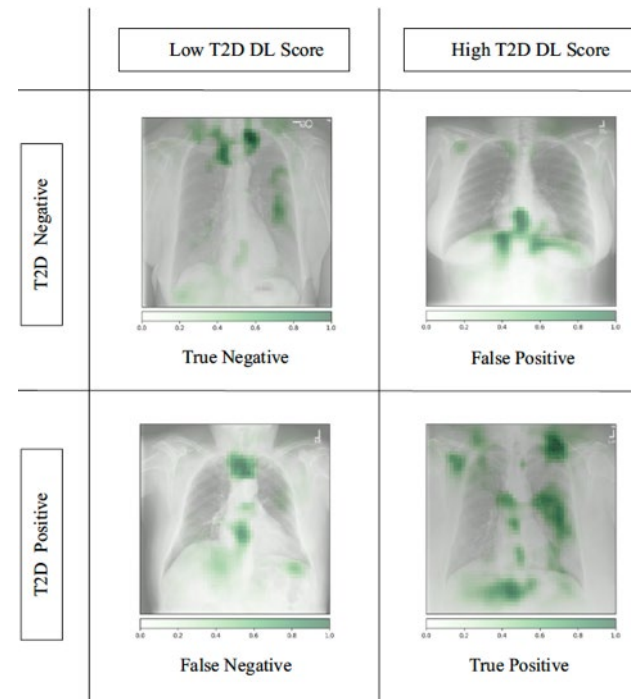
nature communications



Article

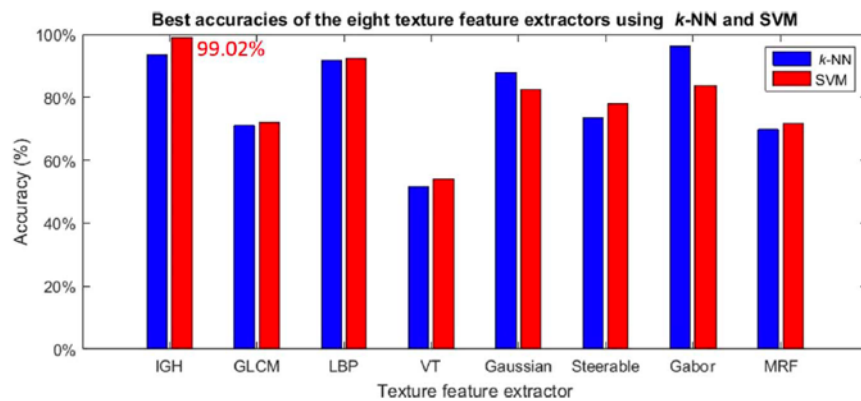
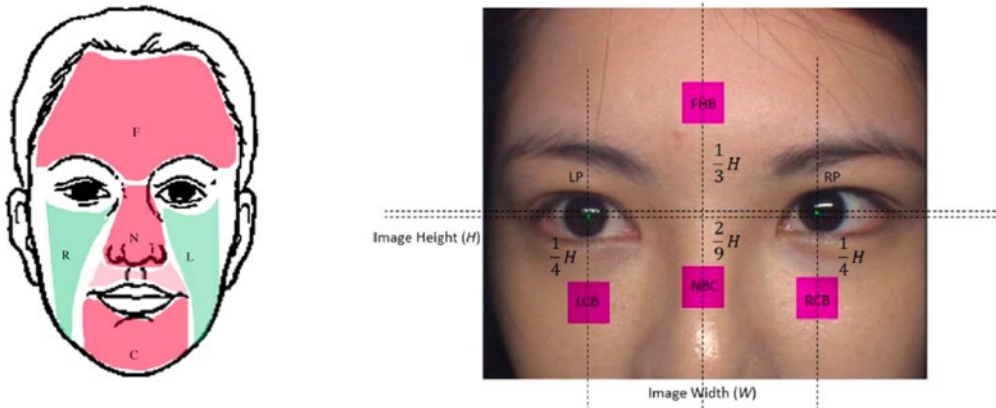
<https://doi.org/10.1038/s41467-023-39631-x>

Opportunistic detection of type 2 diabetes using deep learning from frontal chest radiographs



Technology for the More Efficient Early Detection of Diabetes

An extensive Analysis of Texture Feature Extractors to Detect Diabetes Using Facial Specific Regions



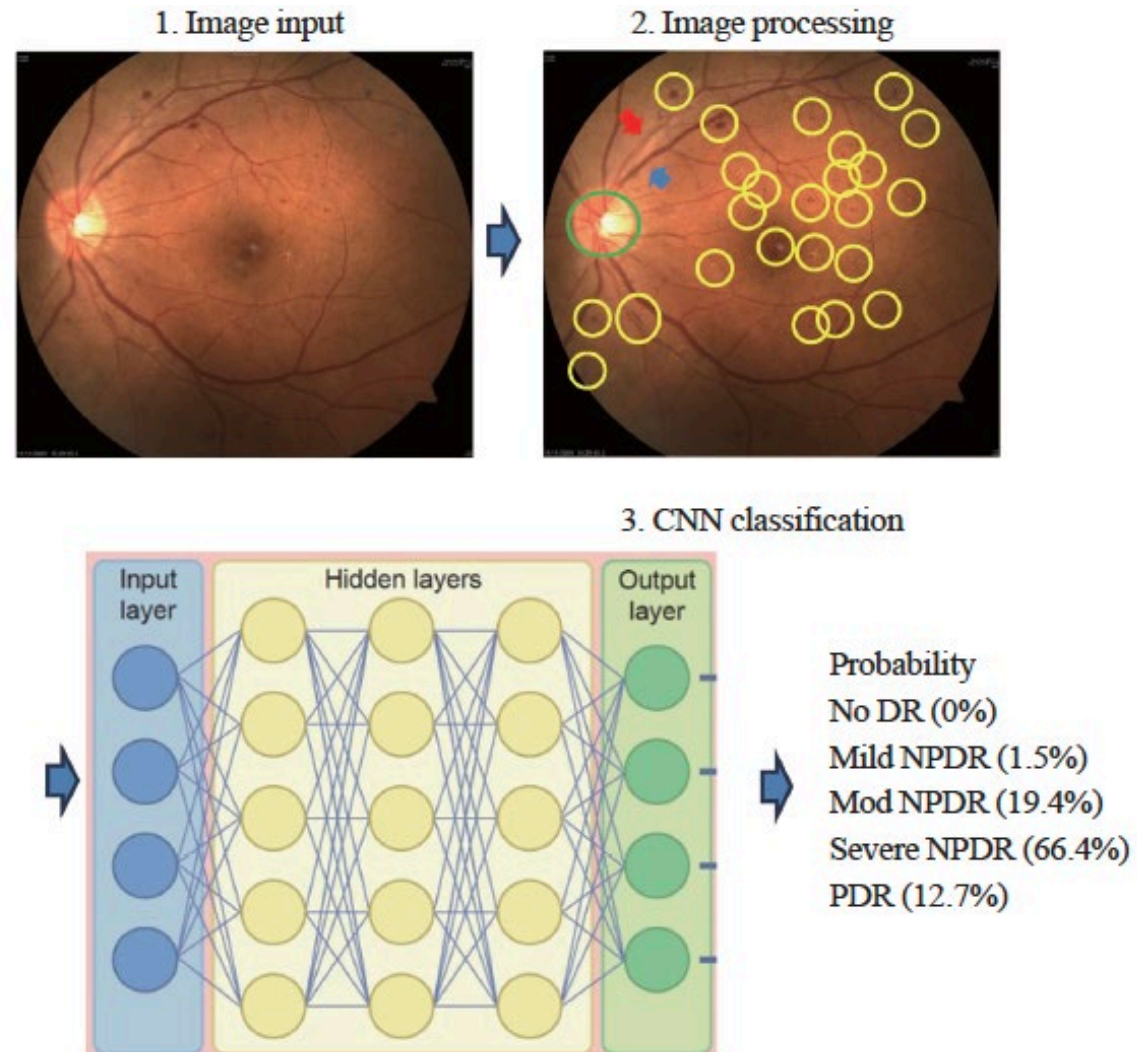
A Tongue Feature Extraction Method for Early Detection of Prediabetes



Technology for the More Efficient Early Diagnosis of Diabetic Retinopathy

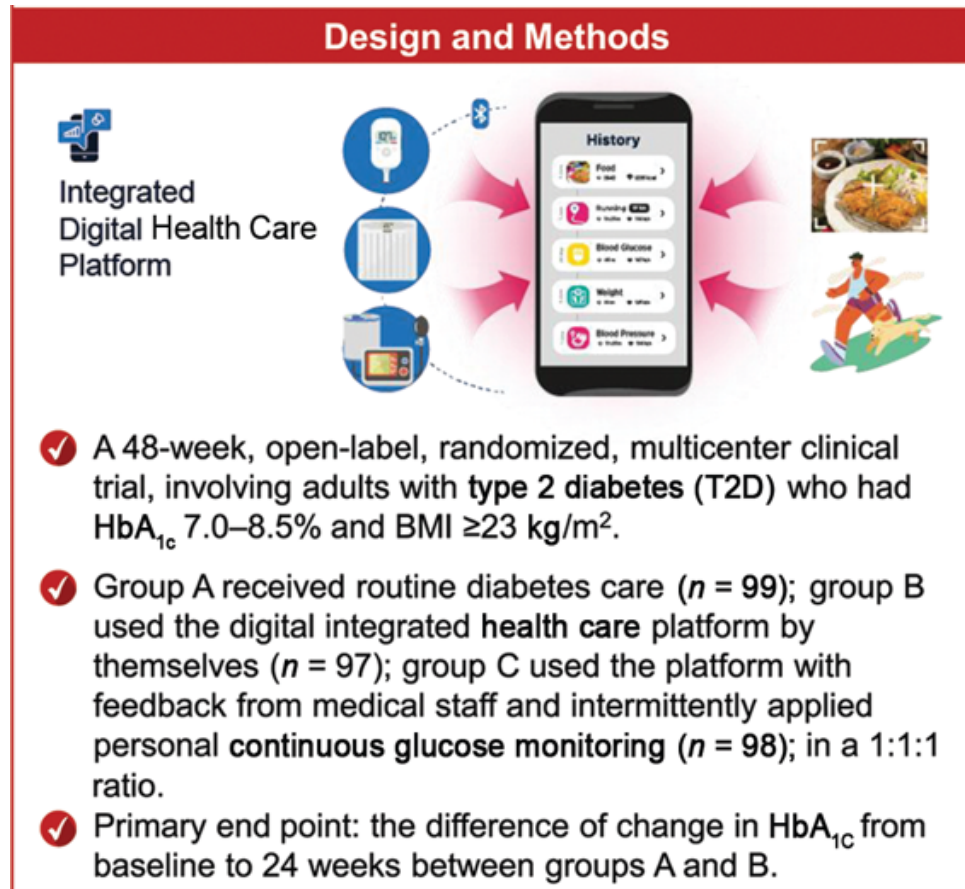
Kong M et al *Endocrinol Metab*
2024;39:416-424

Classification of Diabetic Retinopathy using Convolutional Neural Network

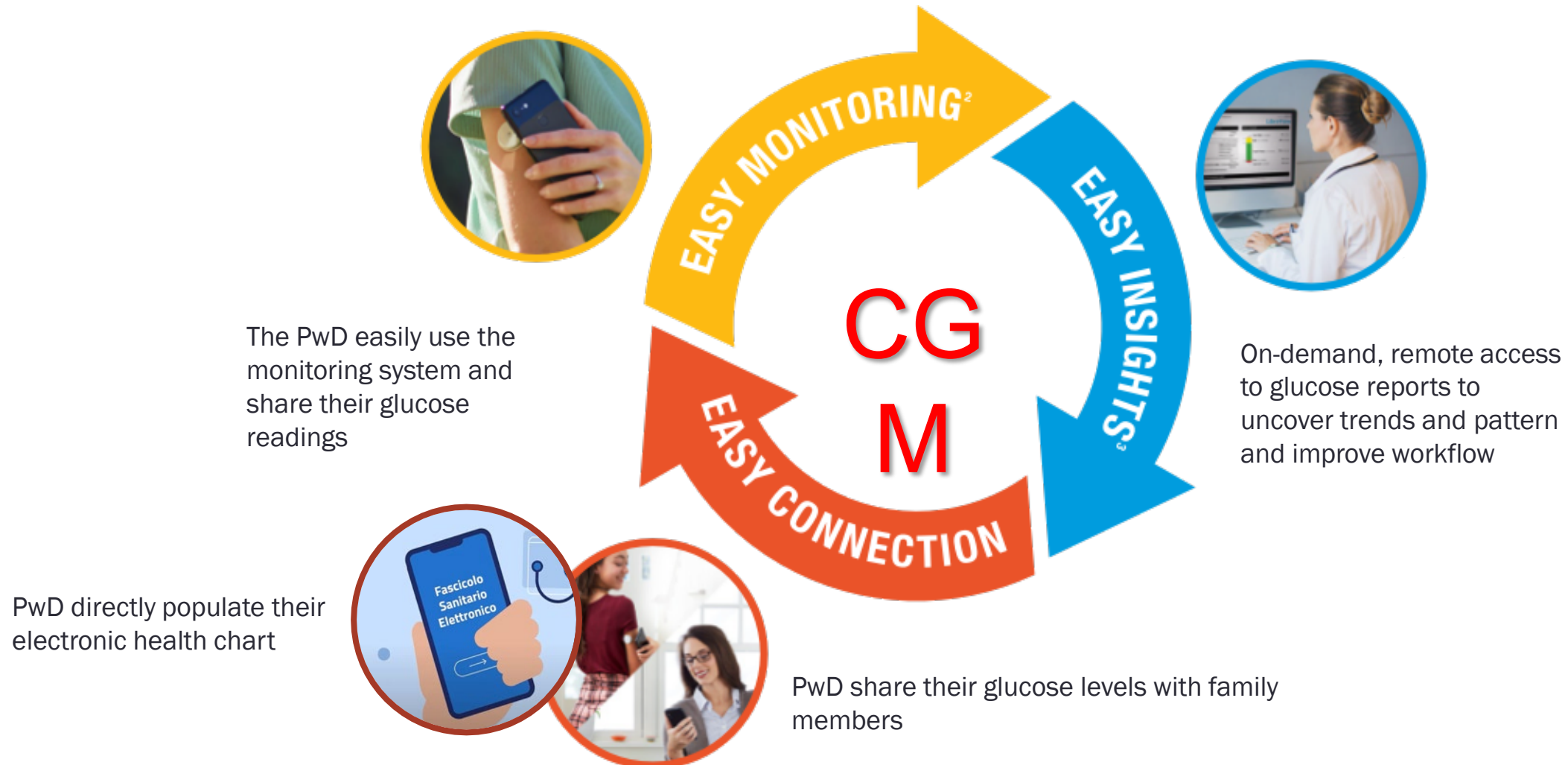


Technology to Support Patient's Empowerment

An Integrated Digital Health Care Platform for Diabetes Management With AI-Based Dietary Management - : 48-Week Results From a Randomized Controlled Trial

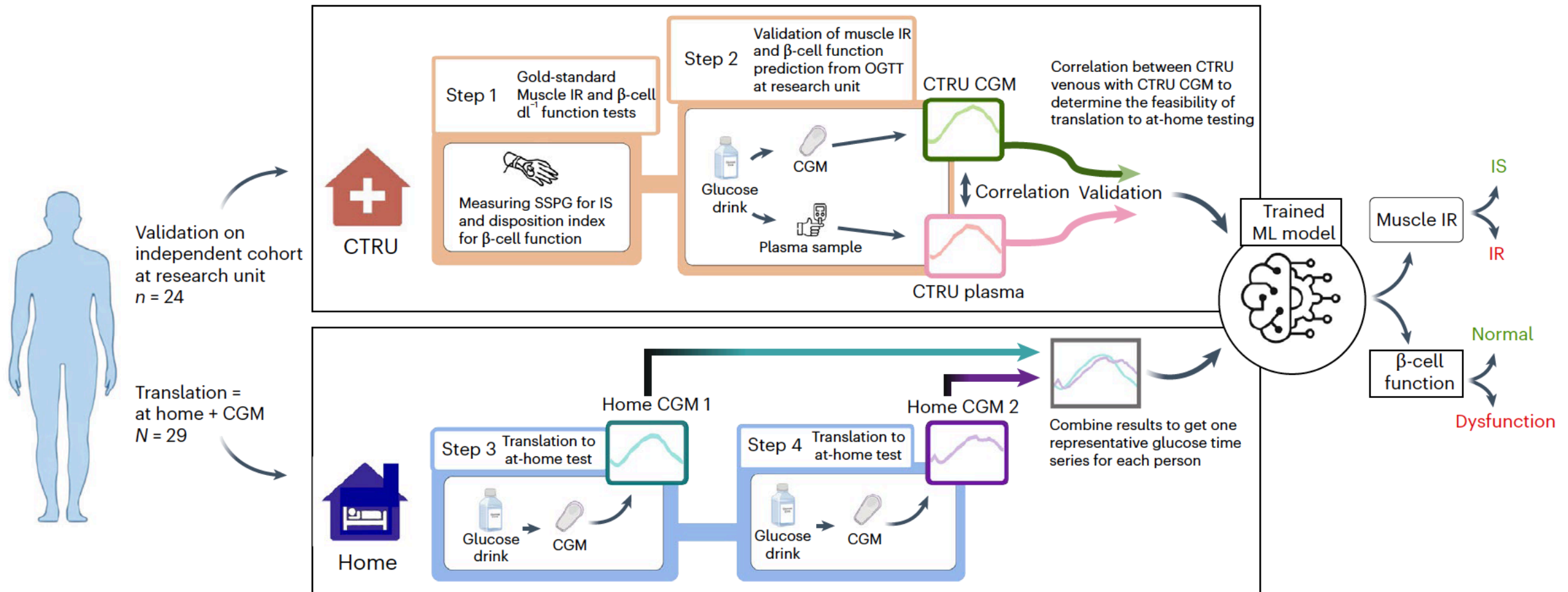


Technology to Ensure Safe & Effective Treatments

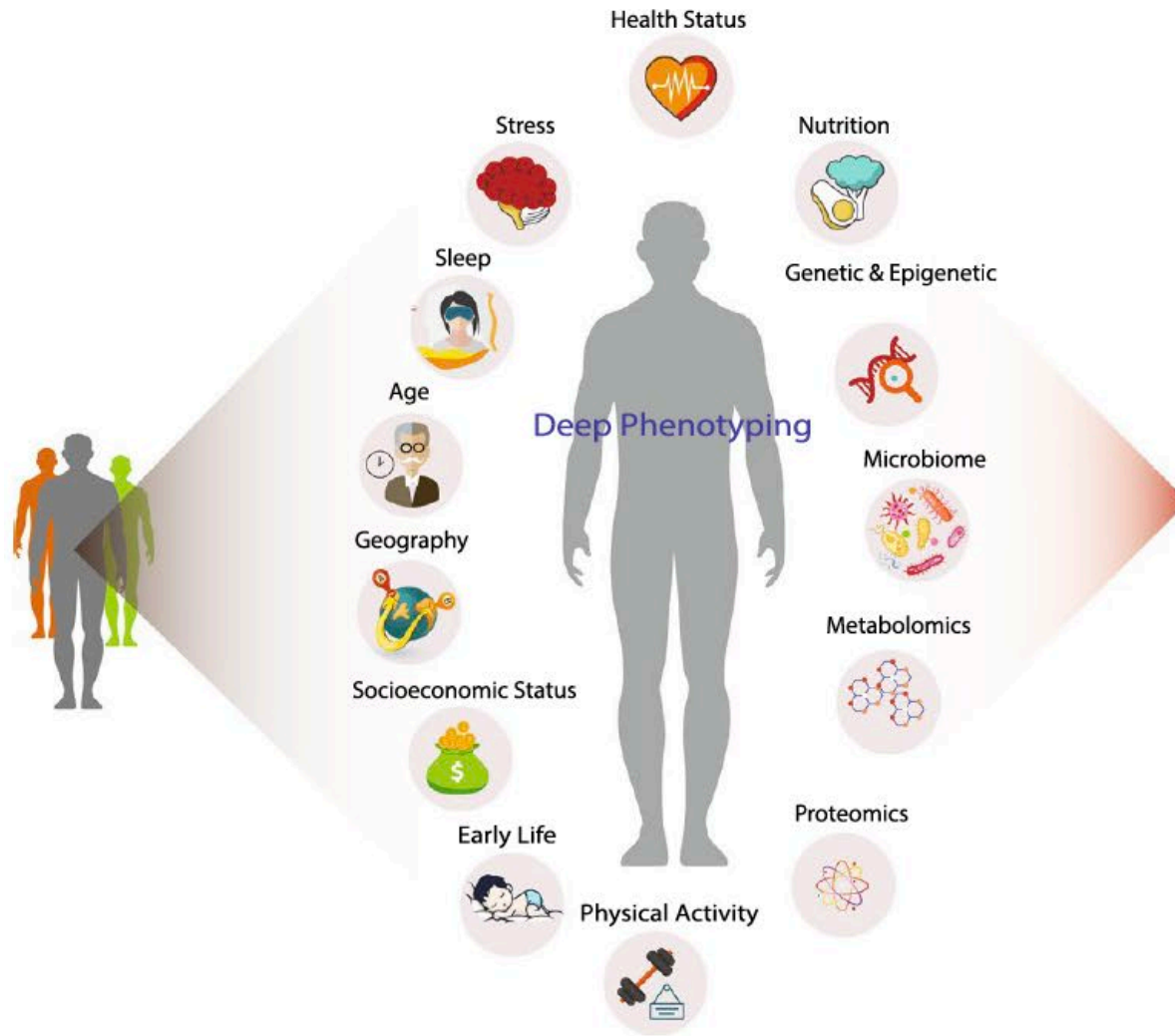


Technology to Ensure Safe & Effective Treatments

Prediction of Metabolic Subphenotypes of T2DM via Continuous Glucose Monitoring and Machine Learning



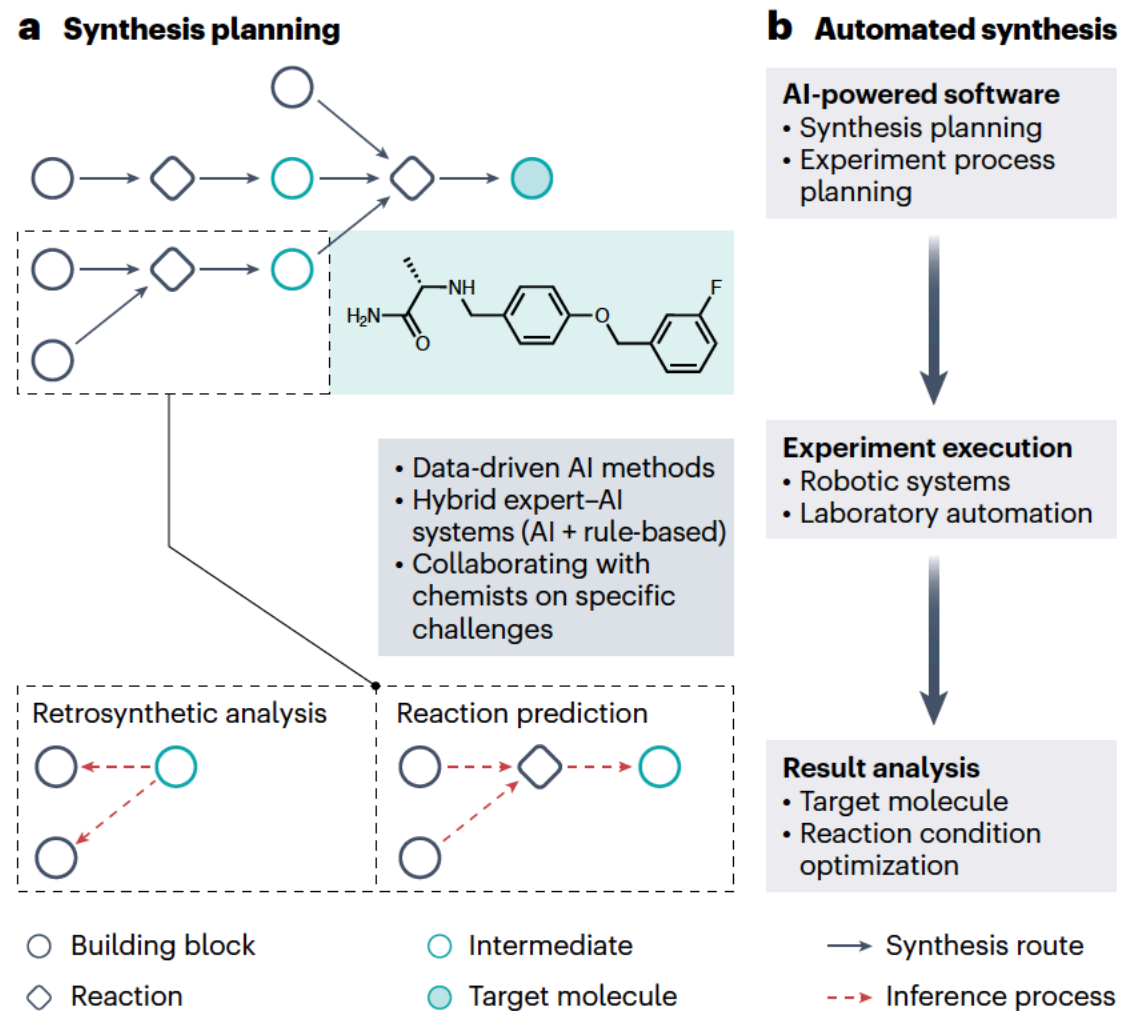
Technology to Drive Precision Diabetes Medicine



Technology to Ensure Safe & Effective Treatments

Zhang K et al *Nature Medicine*
2025;31:45–59

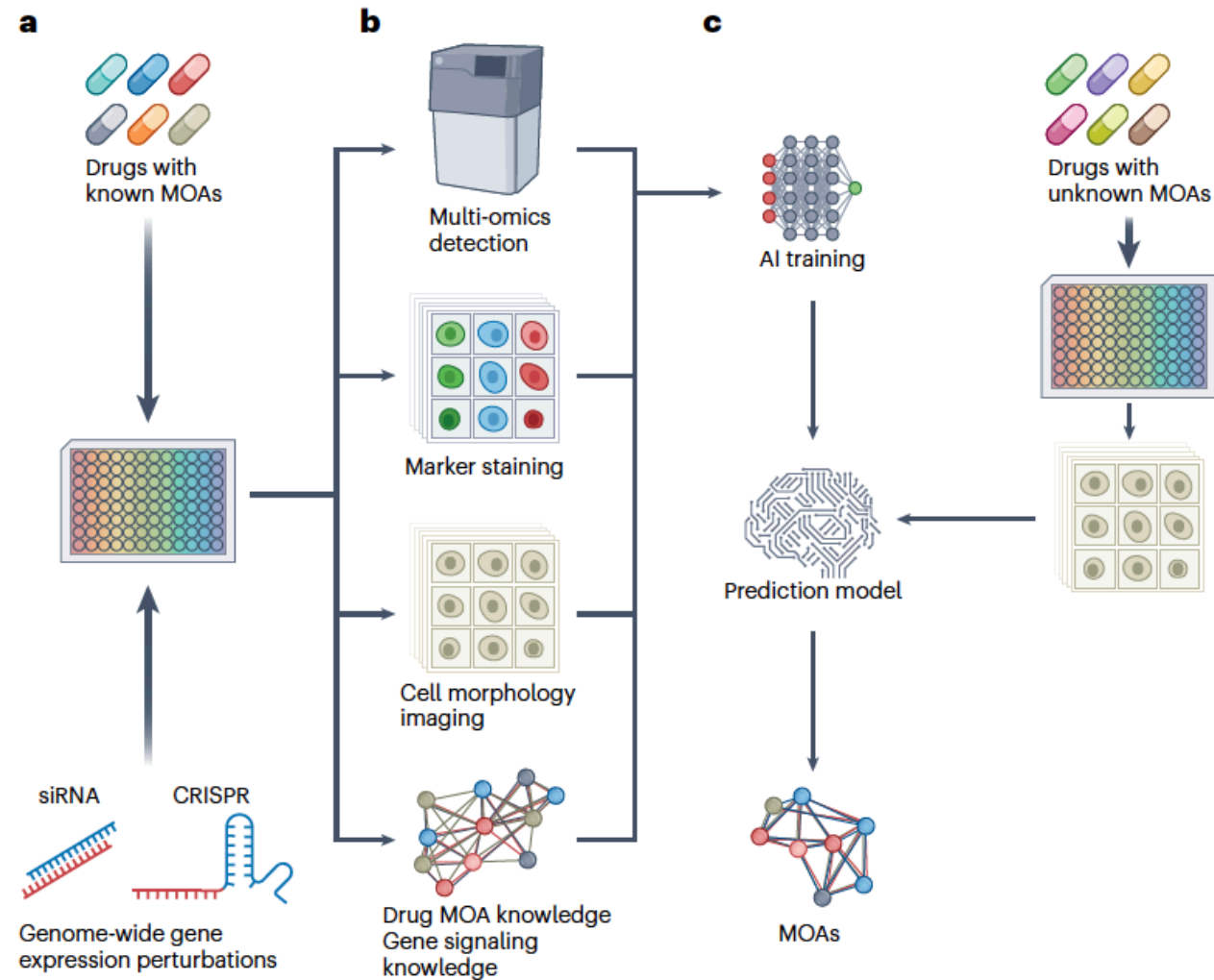
AI-driven synthesis planning and automation in drug discovery



Technology to Ensure Safe & Effective Treatments

Zhang K et al *Nature Medicine*
2025;31:45–59

AI-driven MOA prediction using high-content screening and multiomics data

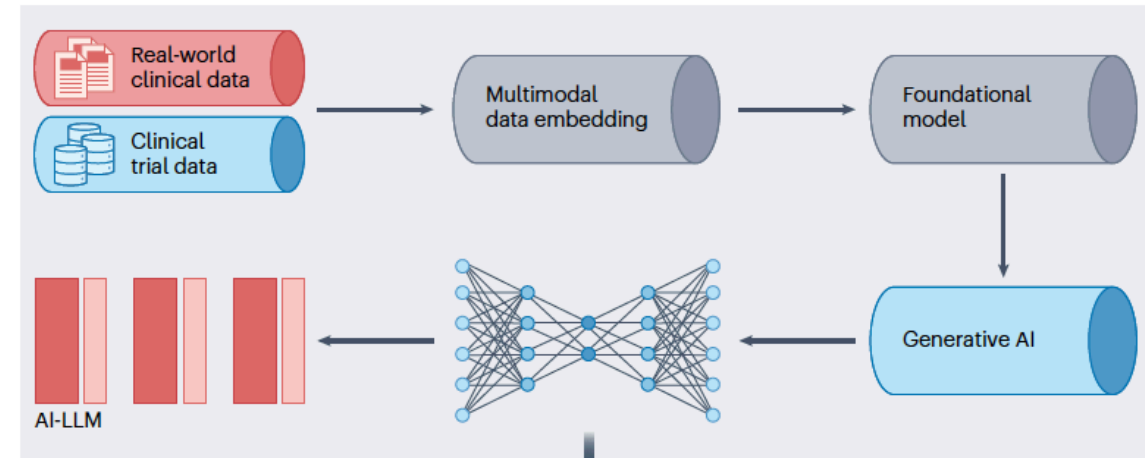


Technology to Ensure Safe & Effective Treatments

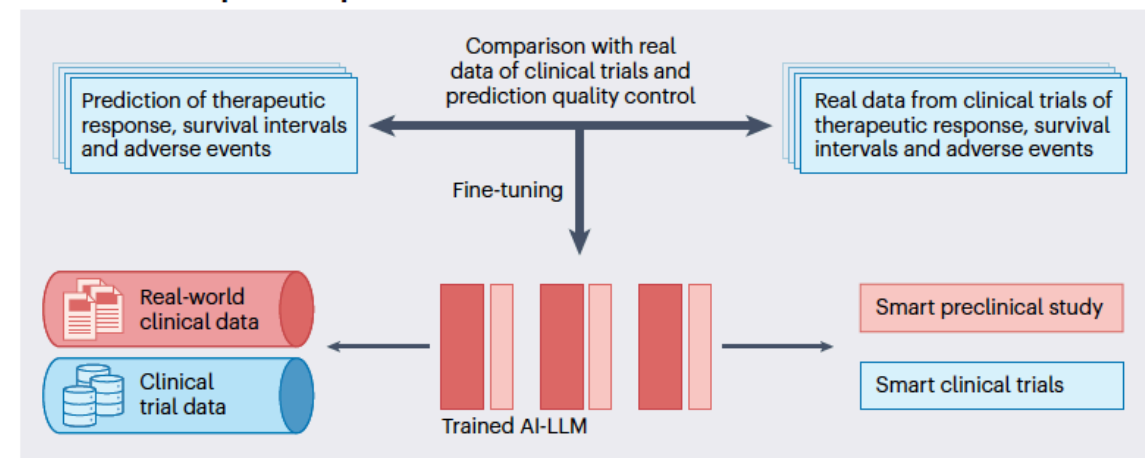
Zhang K et al *Nature Medicine*
2025;31:45–59

AI to enhance both clinical trial processes and real-world medical practice

a Training process



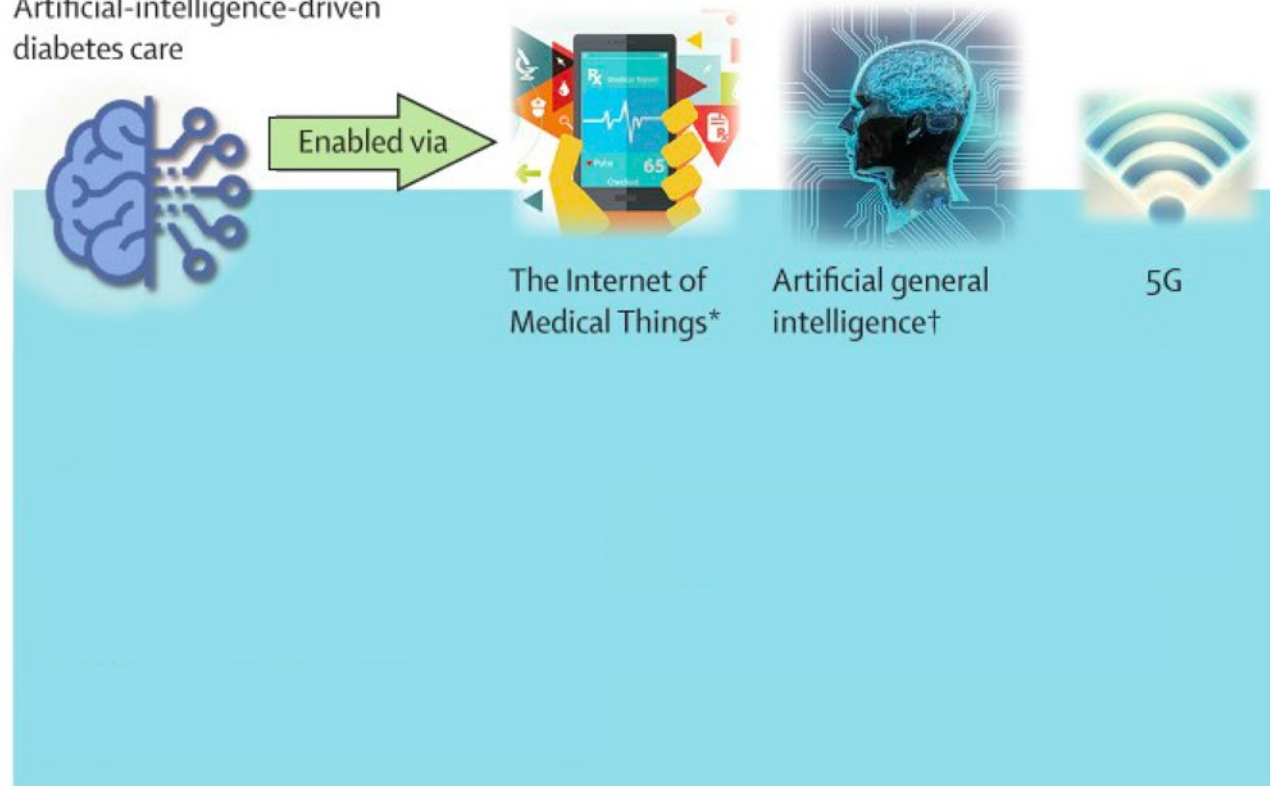
b Validation and prediction process



Artificial Intelligence for Diabetes Care

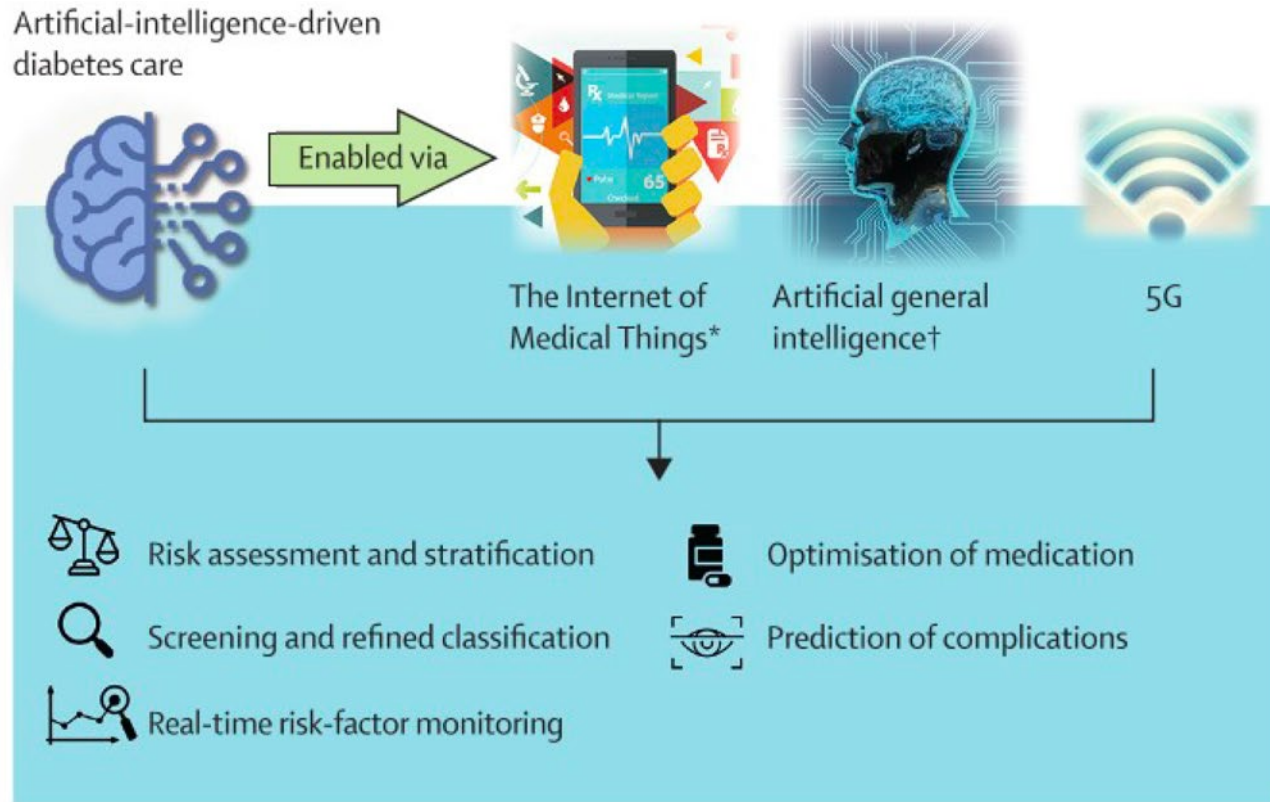
OPPORTUNITIES

Artificial-intelligence-driven
diabetes care

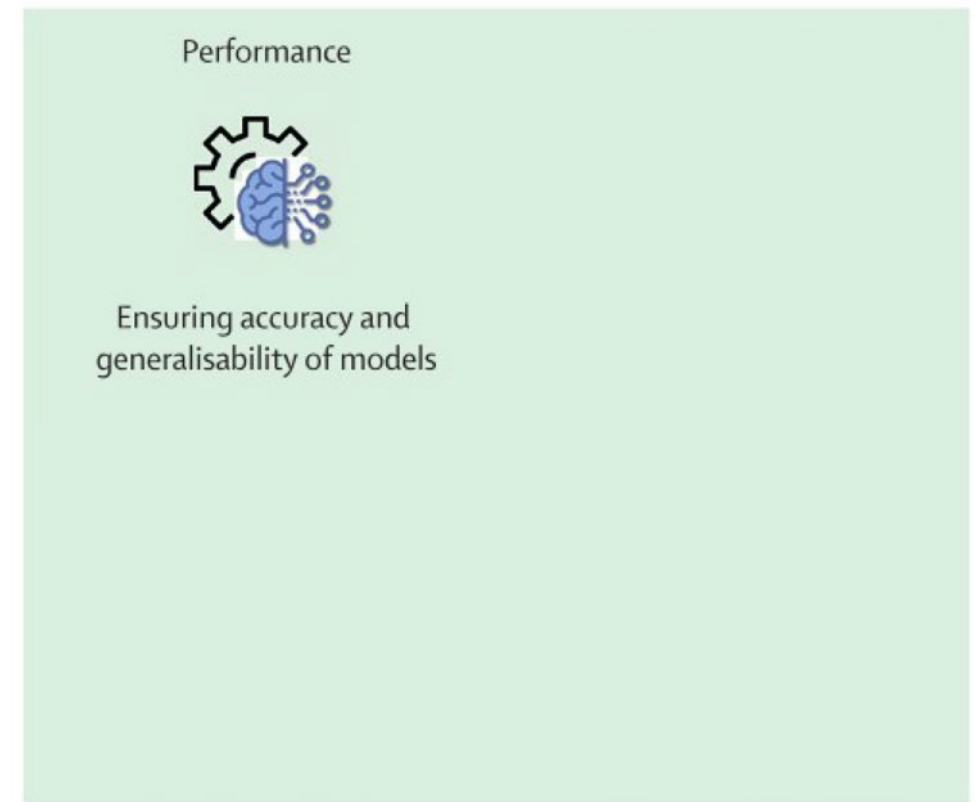


Artificial Intelligence for Diabetes Care

OPPORTUNITIES



CHALLENGES





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