ECHO IDAHO

Managing Heart Failure in Primary Care

Primary Care as Primary Defense in PREVENTing Heart Failure

9/18/25

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University of Idaho
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Project ECHO®

Learning Objectives

1 Review the growing burden of heart failure morbidity and mortality, particularly in rural communities

2 Discuss the role of risk prediction in heart failure prevention and available risk prediction tools for heart failure

3 Define strategies for evidence -based prevention of heart failure in those individuals at -risk for heart failure

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Increasing HF Mortality in Rural US
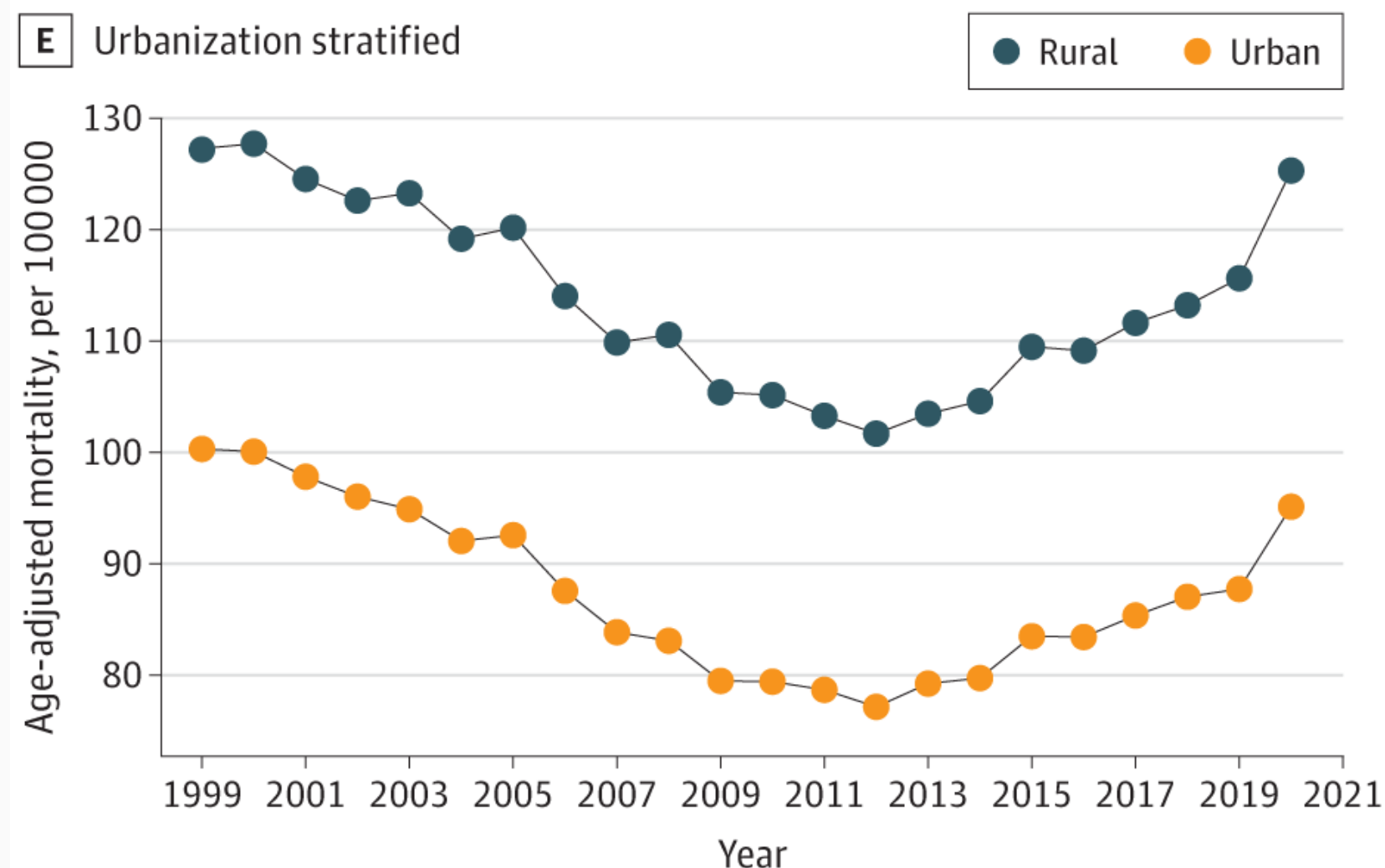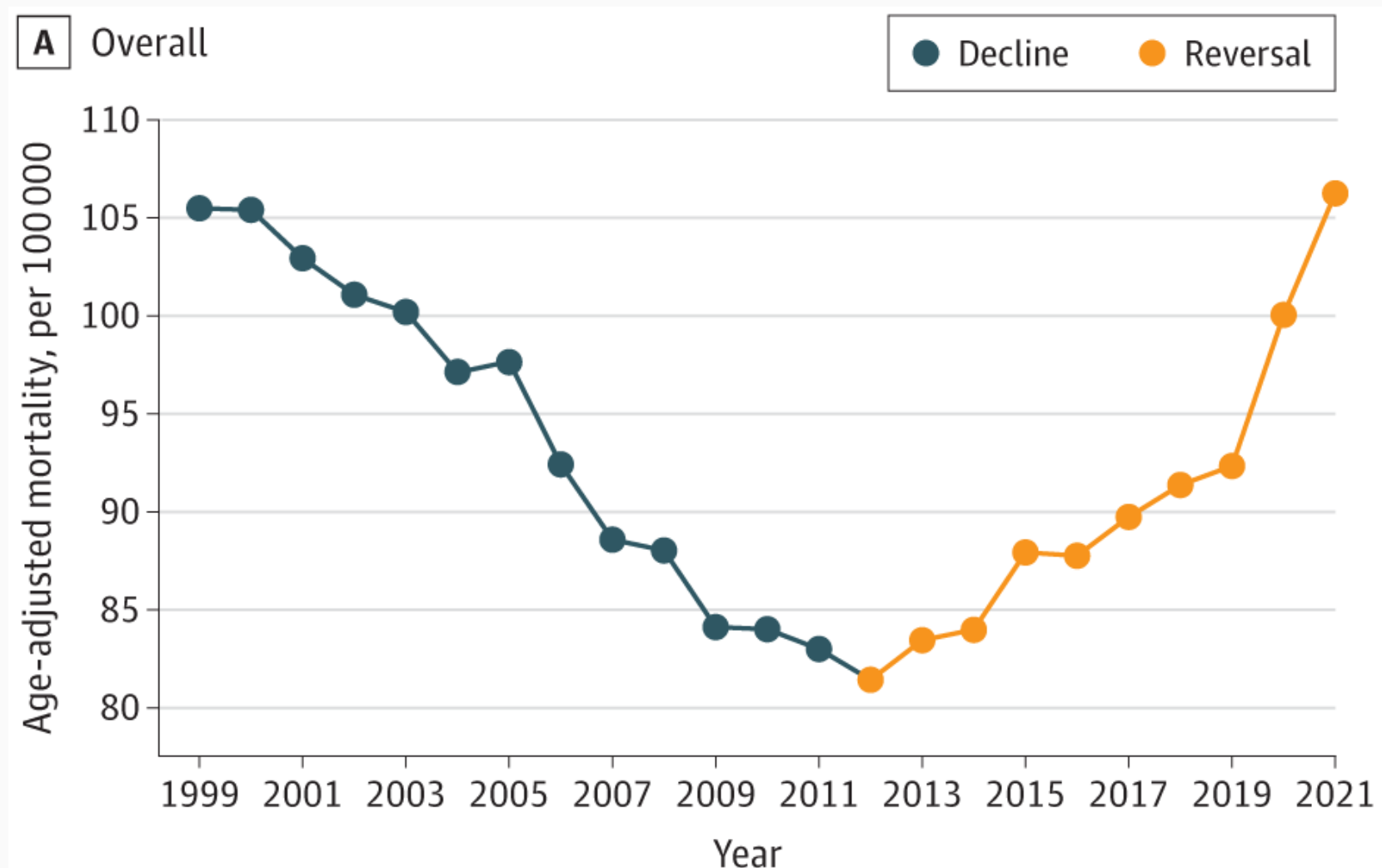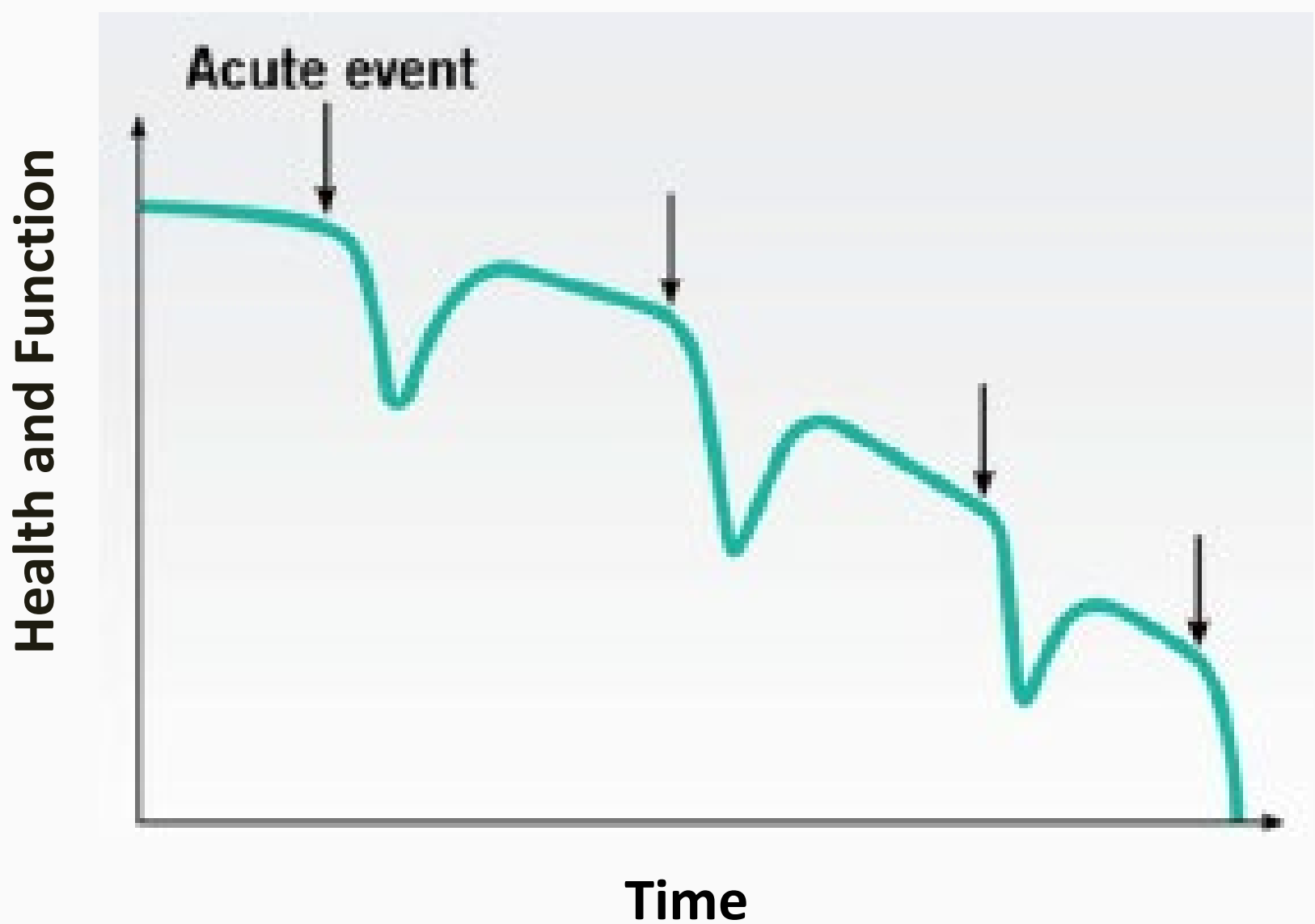

While HF mortality declined from 1999 to 2005, HF mortality rates **increased** from 2012 -2019 with greater absolute burden in rural areas

Sayed A. et. al. *JAMA Cardiol*. 2024
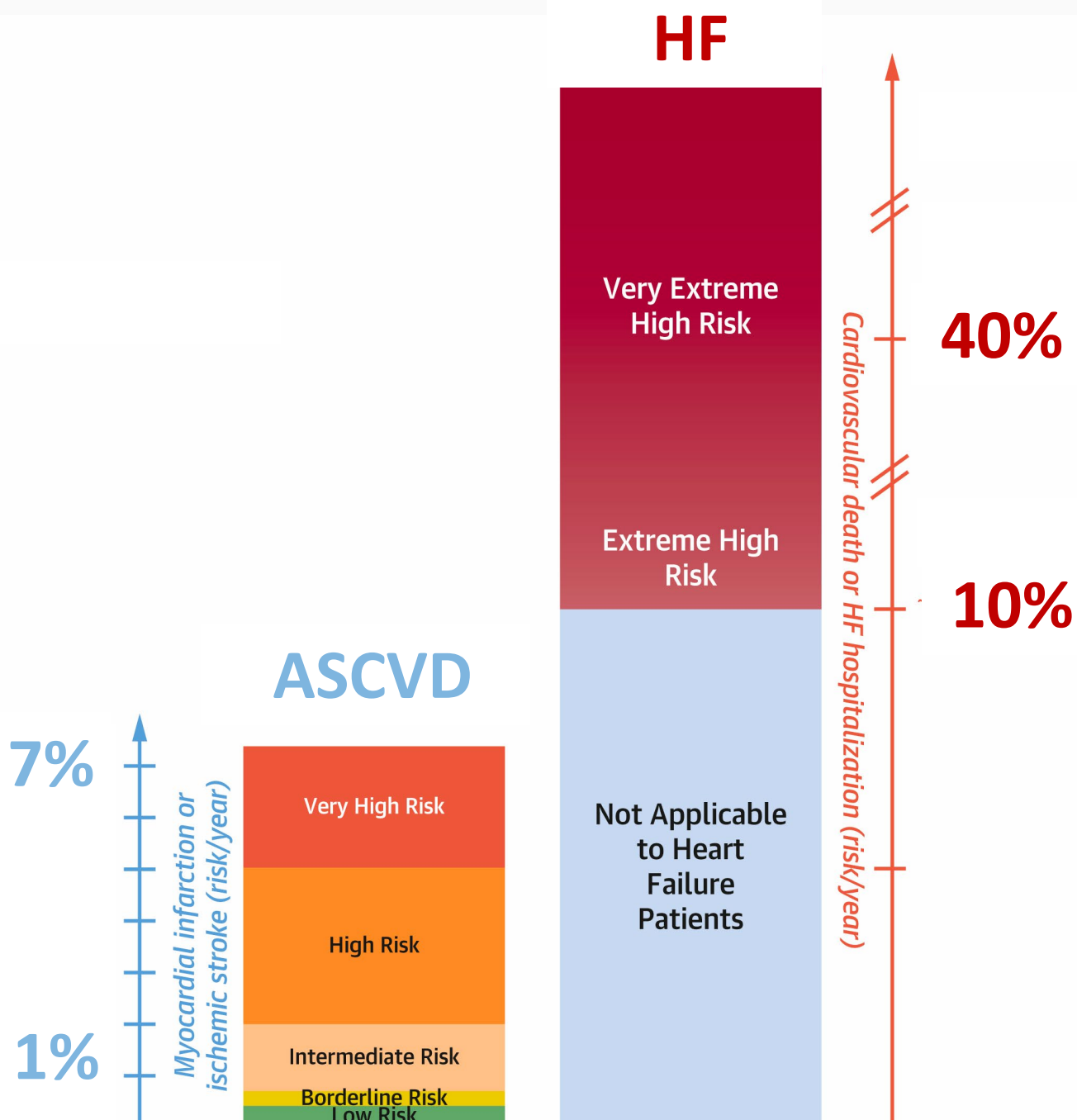
HF is Relapsing, Remitting, and Risky

Proposed Disease Trajectory of HF

Adapted from Gheorghiade M et. al. *Am J Cardiol.* 2005

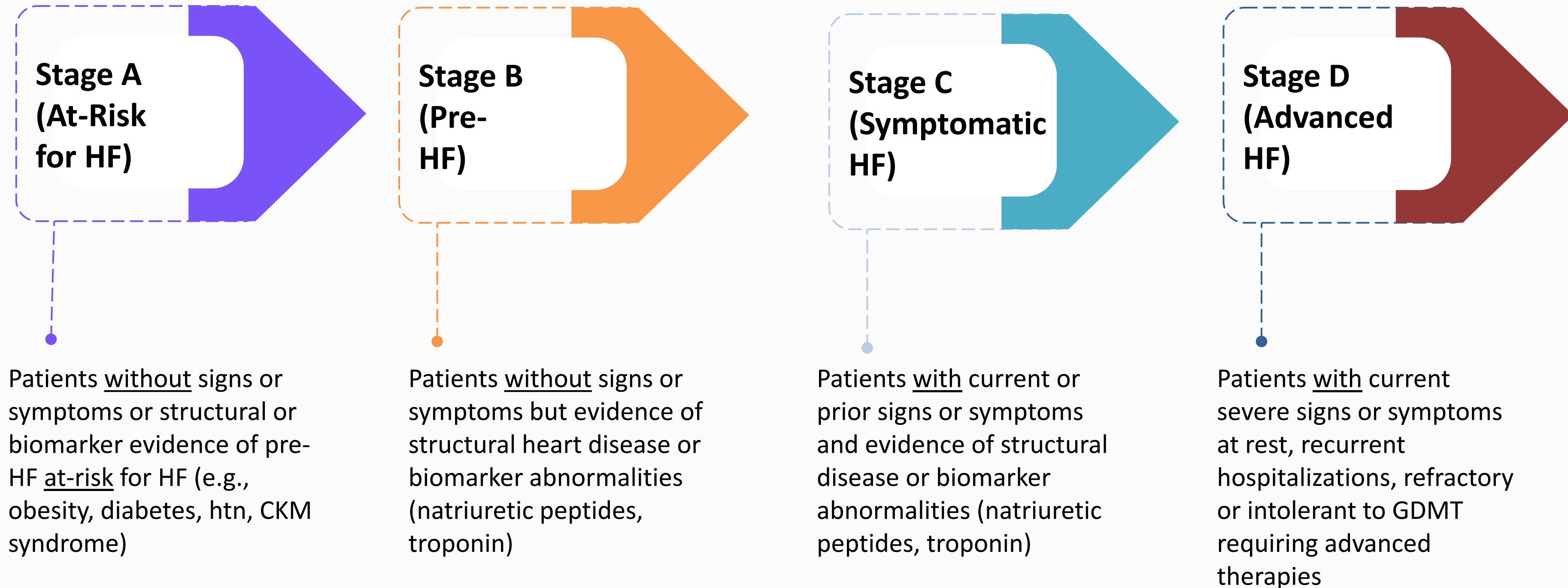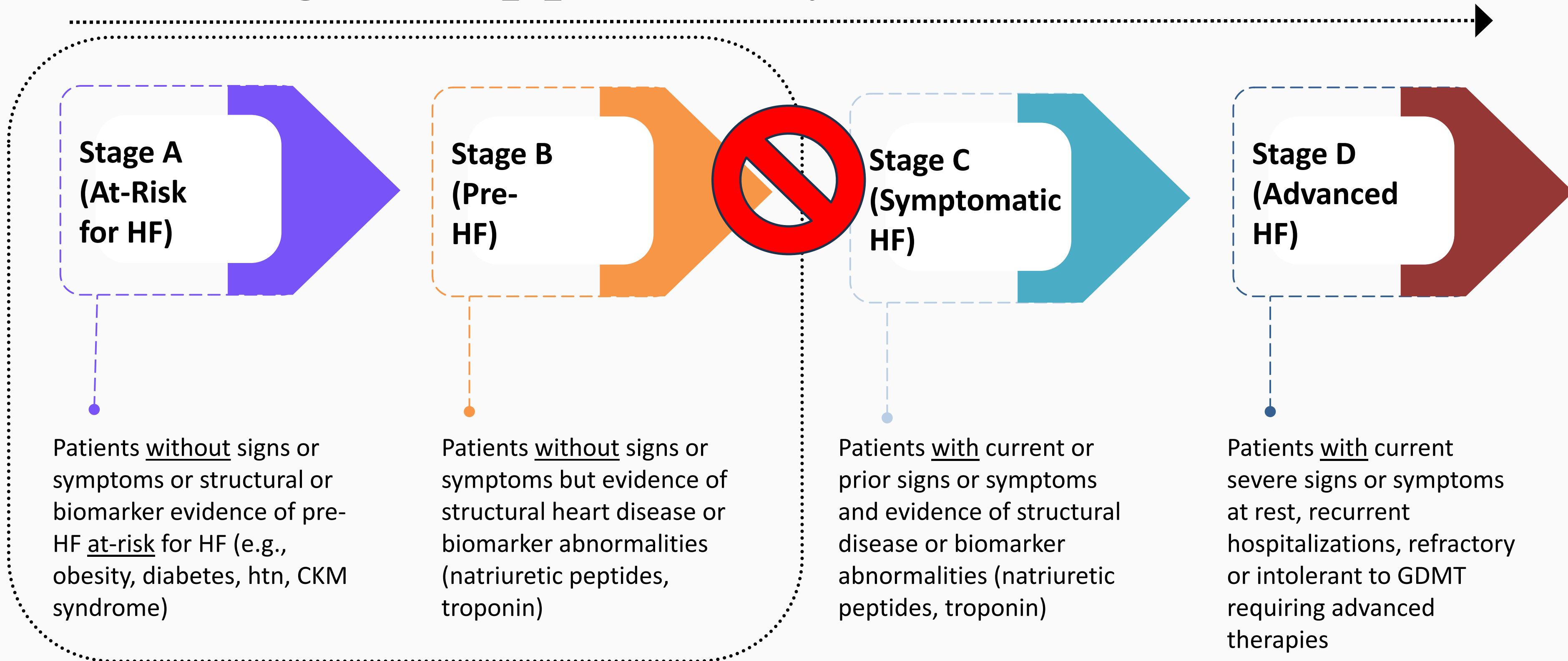**Worsening HF is "Very Extreme High Risk"**

Greene SJ et. al. *JACC* 2023

HF Stages: Opportunity for Prevention

Stage A (At-Risk for HF)

Stage B (Pre-HF)

Stage C (Symptomatic HF)

Stage D (Advanced HF)

Patients <u>without</u> signs or symptoms or structural or biomarker evidence of pre-HF <u>at-risk</u> for HF (e.g., obesity, diabetes, htn, CKM syndrome)

Patients <u>without</u> signs or symptoms but evidence of structural heart disease or biomarker abnormalities (natriuretic peptides, troponin)

Patients <u>with</u> current or prior signs or symptoms and evidence of structural disease or biomarker abnormalities (natriuretic peptides, troponin)

Patients <u>with</u> current severe signs or symptoms at rest, recurrent hospitalizations, refractory or intolerant to GDMT requiring advanced therapies

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Bozkurt B. et. al.   *JCF* 2020
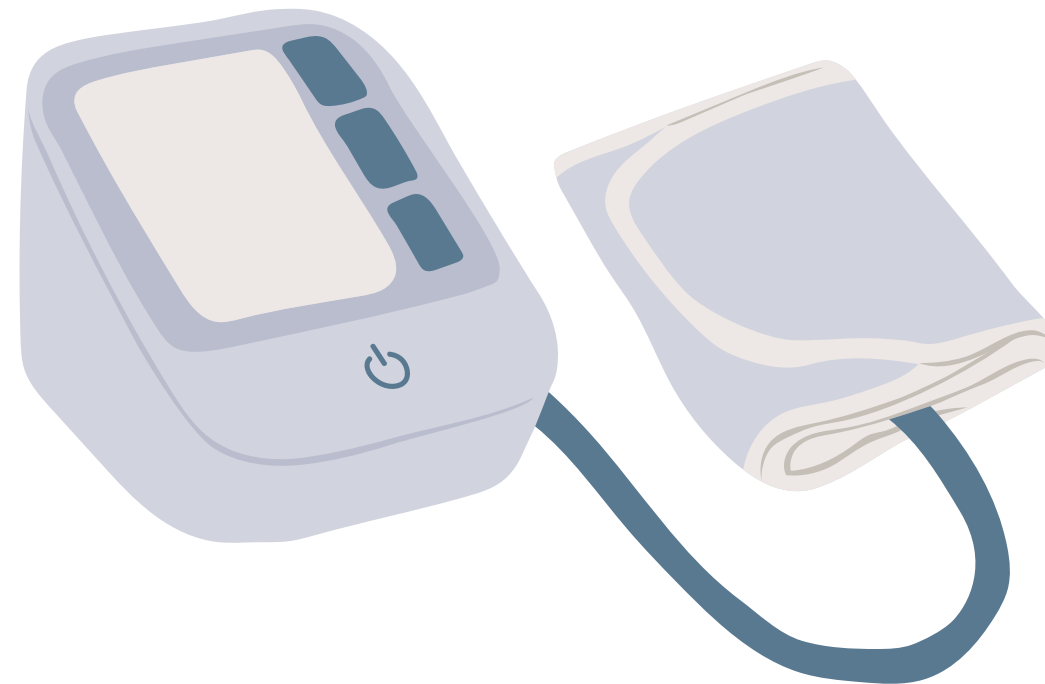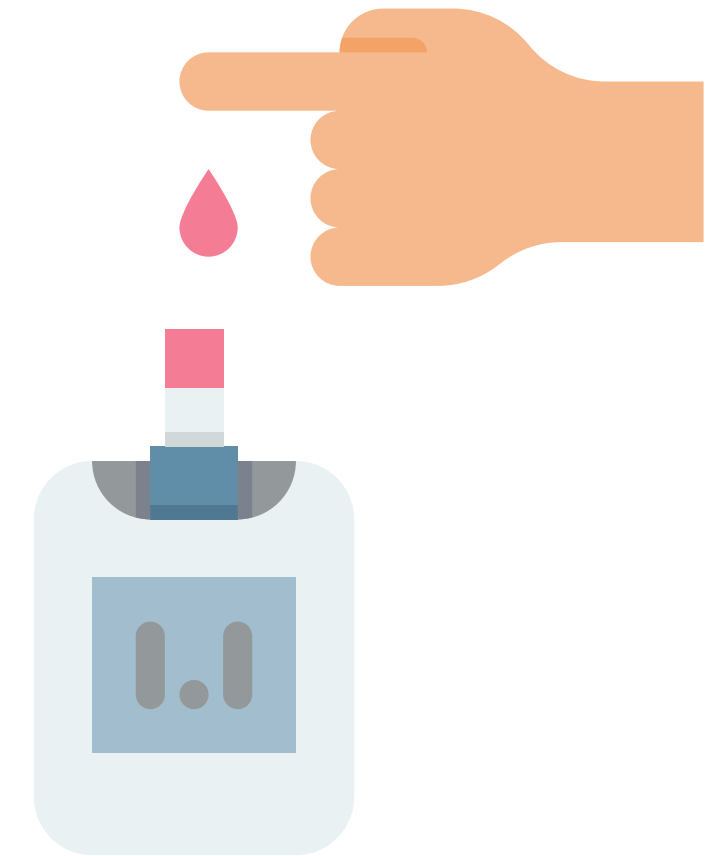
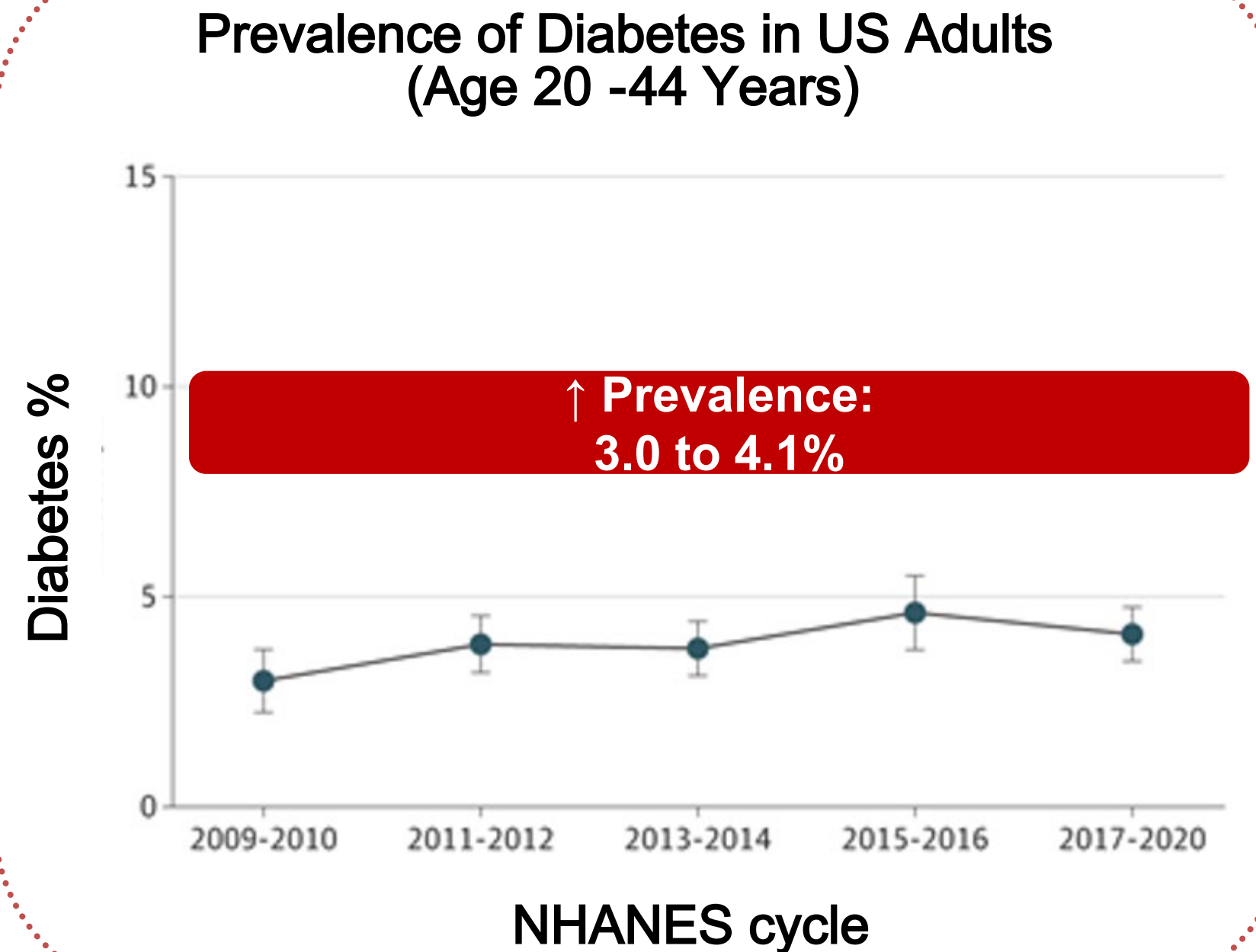# Increasing Burden of HF Risk Factors
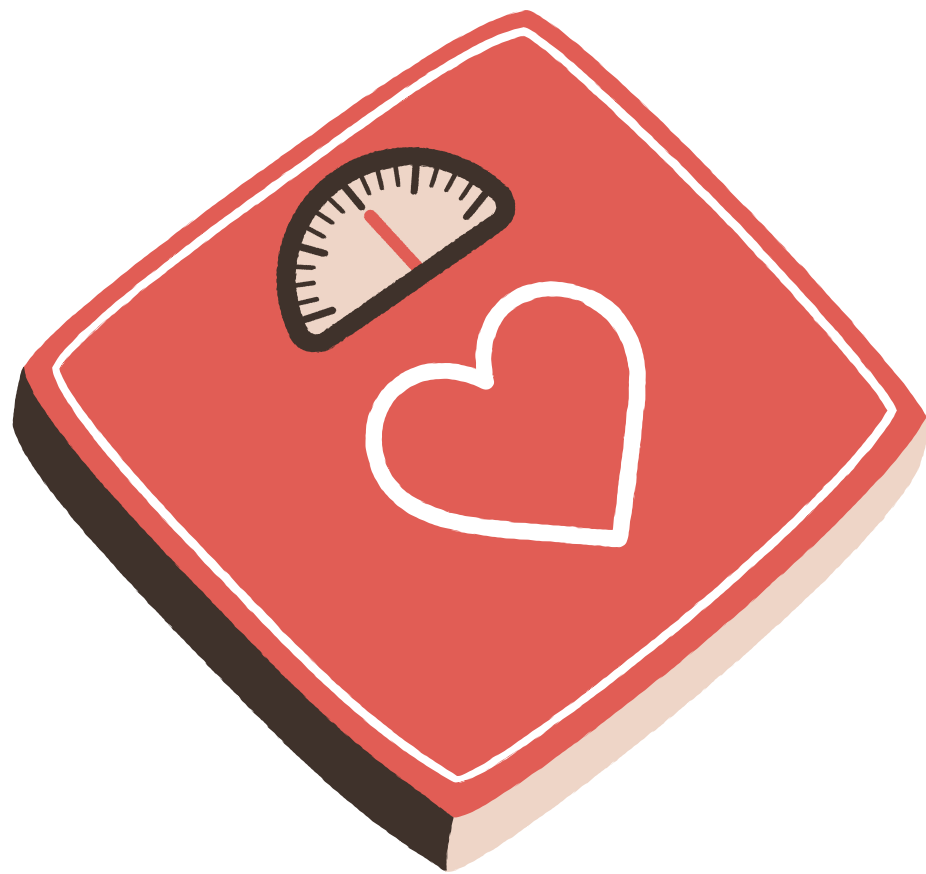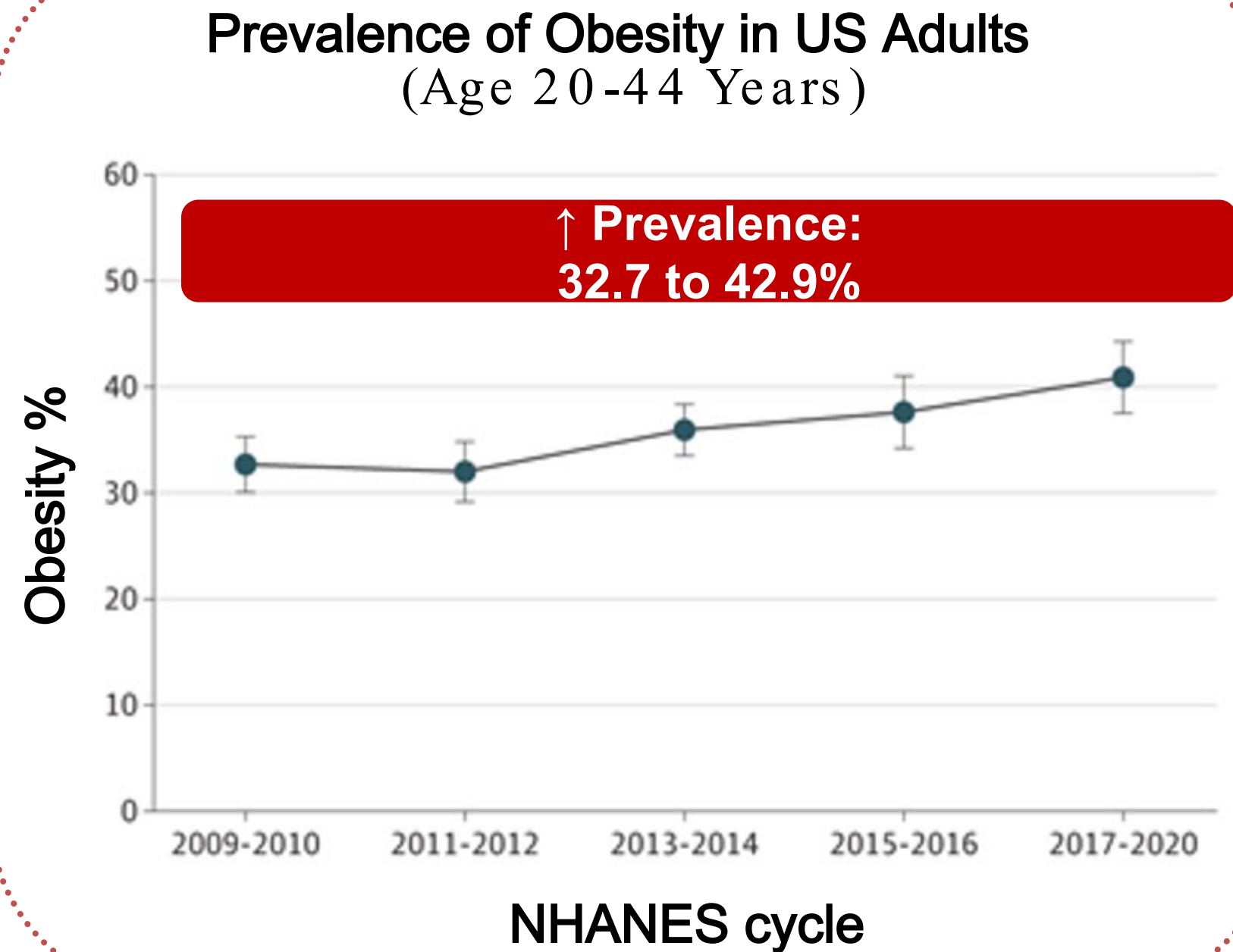

Rates of overweight and obesity are on the rise

Rates of HTN are on the rise

Rates of pre-diabetes and diabetes are on the rise

Growing RF Burden in Young Adults

Prevalence of Obesity in US Adults
(Age 20-44 Years)

↑ Prevalence:
32.7 to 42.9%

Prevalence of Diabetes in US Adults
(Age 20 -44 Years)

↑ Prevalence:
3.0 to 4.1%

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Risk Prediction

Risk Prediction

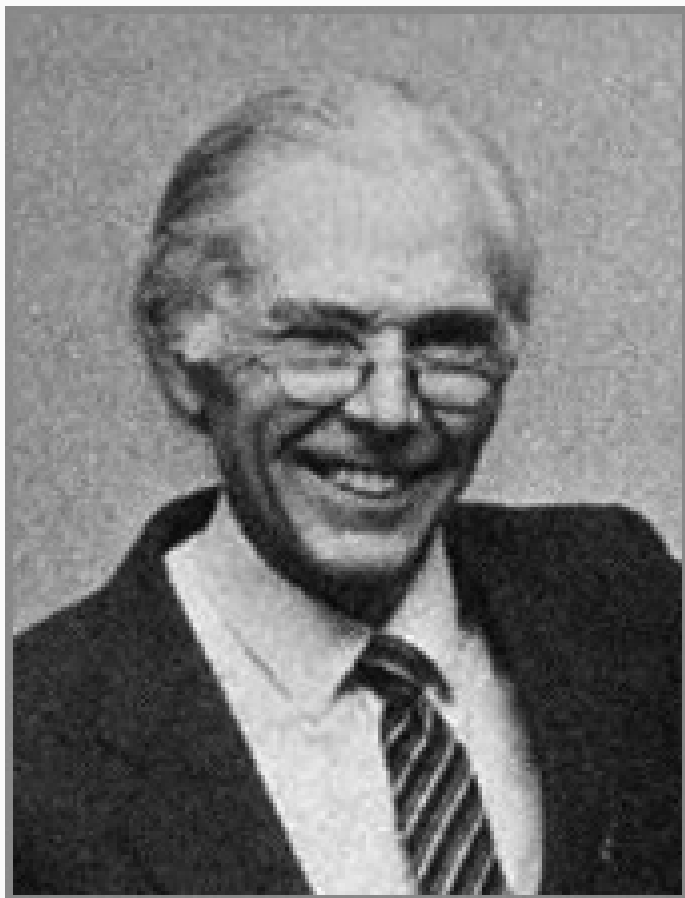Goal to match the intensity of preventive efforts to the predicted risk of the individual to personalize care

Risk-Based Strategy for Prevention
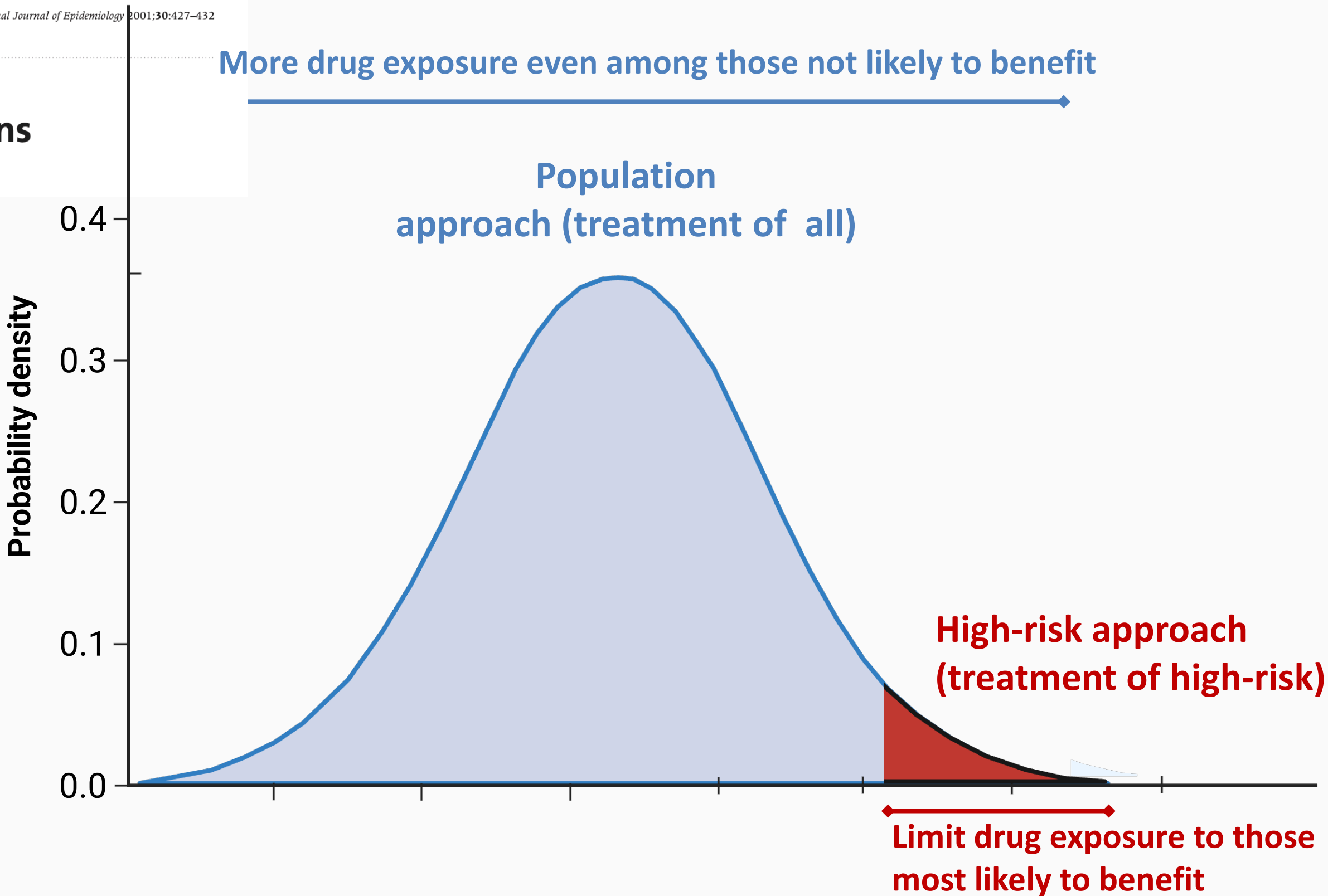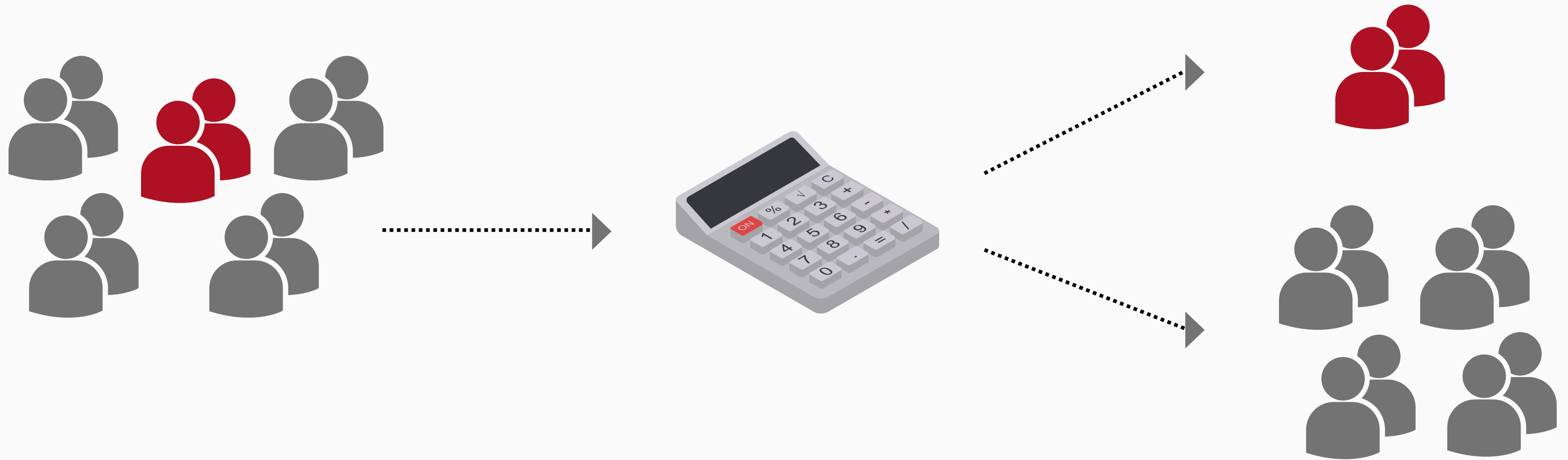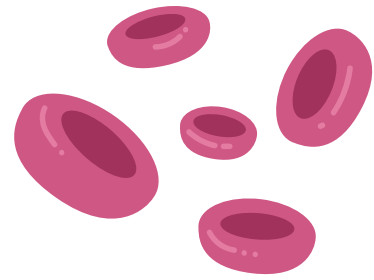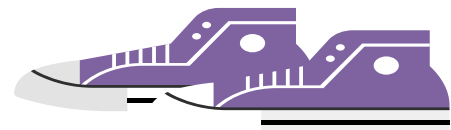
Match Risk and Intensity of Therapy

Target preventive interventions or therapies in those at increased risk of CVD with prioritization of type and intensity according to absolute risk
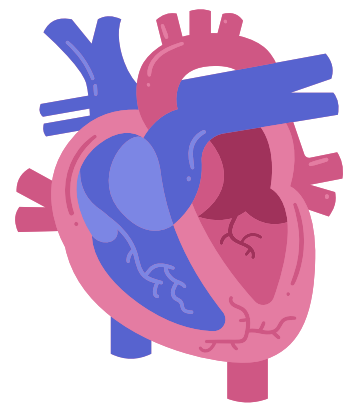
Widespread Adoption of Risk-Based Prevention in CVD Guidelines

2018 AHA/ACC/Multi-Society Guideline on the Management of Blood Cholesterol

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular disease

2022 ACC/AHA/HFSA Guideline for the Management of **Heart Failure**

AHA SCIENTIFIC STATEMENT

Circulation

AHA SCIENTIFIC STATEMENT

Novel Prediction Equations for Absolute Risk Assessment of Total Cardiovascular Disease Incorporating Cardiovascular-Kidney-Metabolic Health: A Scientific Statement From the American Heart Association

Sadiya S. Khan, MD, MSc, FAHA, Chair; Josef Coresh, MD, PhD, FAHA, Vice Chair; Michael J. Pencina, PhD; Chiadi E. Ndumele, MD, PhD, FAHA; Janani Rangaswami, MD, FAHA; Sheryl L. Chow, PharmD, FAHA; Latha P. Palaniappan, MD, MS, FAHA; Laurence S. Sperling, MD, FAHA; Salim S. Virani, MD, PhD, FAHA; Jennifer E. Ho, MD, FAHA; Ian J. Neeland, MD, FAHA; Katherine R. Tuttle, MD, FAHA; Radhika Rajgopal Singh, PhD, FAHA; Mitchell S.V. Elkind, MD, MS, FAHA; Donald M. Lloyd-Jones, MD, ScM, FAHA; on behalf of the American Heart Association

PREVENT METHODS MANUSCRIPT

Circulation

ORIGINAL RESEARCH ARTICLE

Development and Validation of the American Heart Association PREVENT Equations

Sadiya S. Khan, MD, MSc; Kunihiro Matsushita, MD, PhD; Yingying Sang, MSc; Shoshana H. Ballew, PhD; Morgan E. Grams, MD, PhD; Aditya Surapaneni, PhD; Michael J. Blaha, MD, MPH; April P. Carson, PhD; Alexander R. Chang, MD, MS; Elizabeth Ciemins, MPH, PhD; Alan S. Go, MD; Orlando M. Gutierrez, MD; Shih-Jen Hwang, PhD; Simerjot K. Jassal, MD, MAS; Csaba P. Kovesdy, MD; Donald M. Lloyd-Jones, MD, ScM; Michael G. Shlipak, MD, MPH; Latha P. Palaniappan, MD, MS; Laurence Sperling, MD; Salim S. Virani, MD, PhD; Katherine Tuttle, MD; Ian J. Neeland, MD; Sheryl L. Chow, PharmD; Janani Rangaswami, MD; Michael J. Pencina, PhD; Chiadi E. Ndumele, MD, PhD; Josef Coresh, MD, PhD; For the Chronic Kidney Disease Prognosis Consortium and the American Heart Association Cardiovascular-Kidney-Metabolic Science Advisory Group*
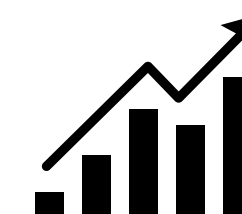
Overview of the PREVENT Equations
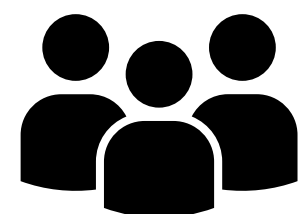
Population

Predictors

Outcomes
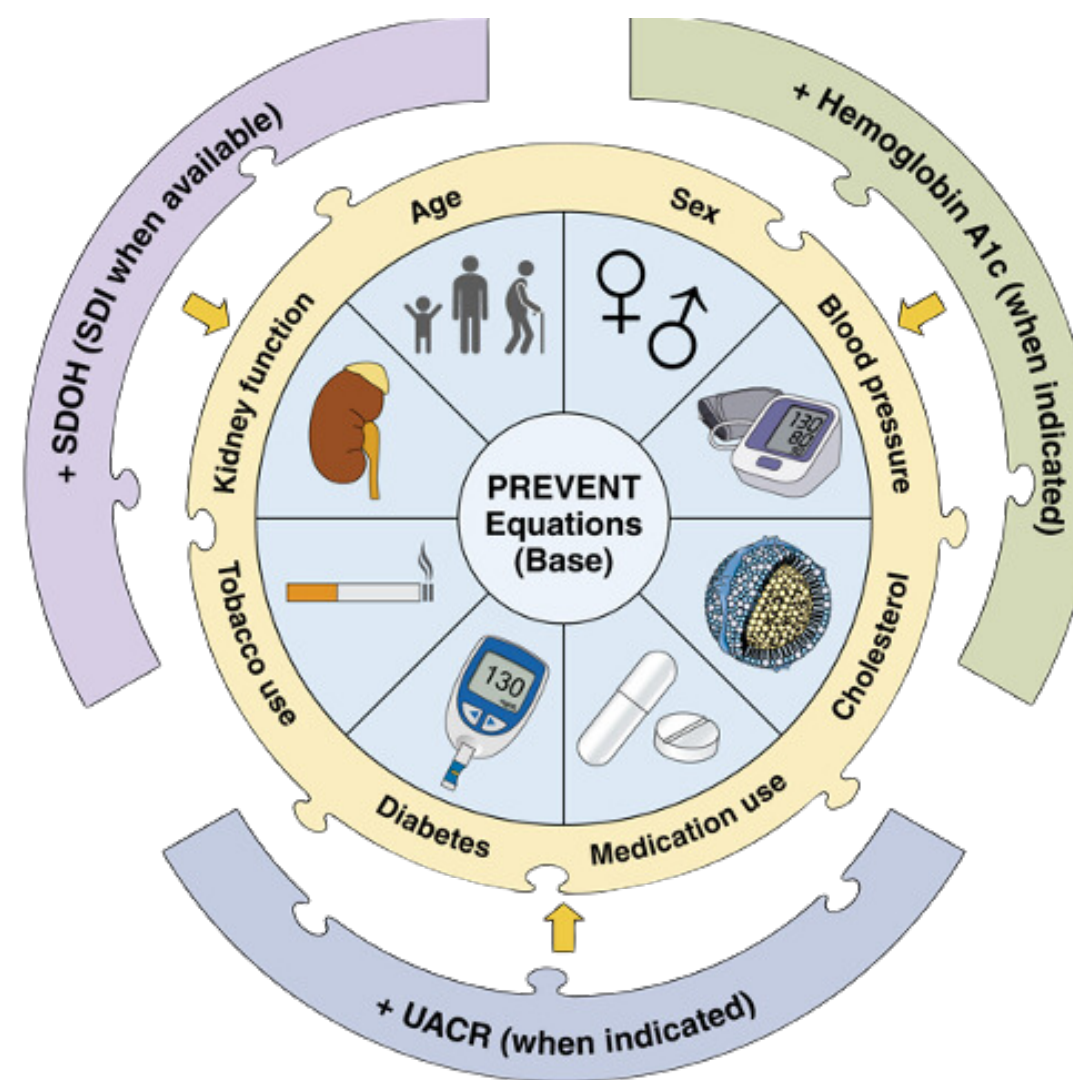
- CVD: composite of ASCVD (nonfatal MI or CHD death, fatal or nonfatal stroke) and HF
- ASCVD, HF

Overview of the PREVENT Equations

Population

CKD Prognosis Consortium

ARIC Optum

Geisinger
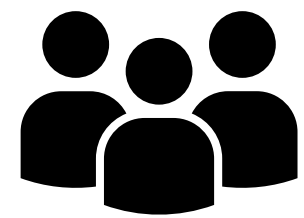
Large, contemporary sample size for development to-date N>6 million

Predictors

Combines clinical risk factors and new predictors of CKM health

Outcomes

- CVD: composite of ASCVD (nonfatal

Inclusion of new HF outcome for comprehensive CVD risk assessment

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PREVENT Equations are Accurate and Precise

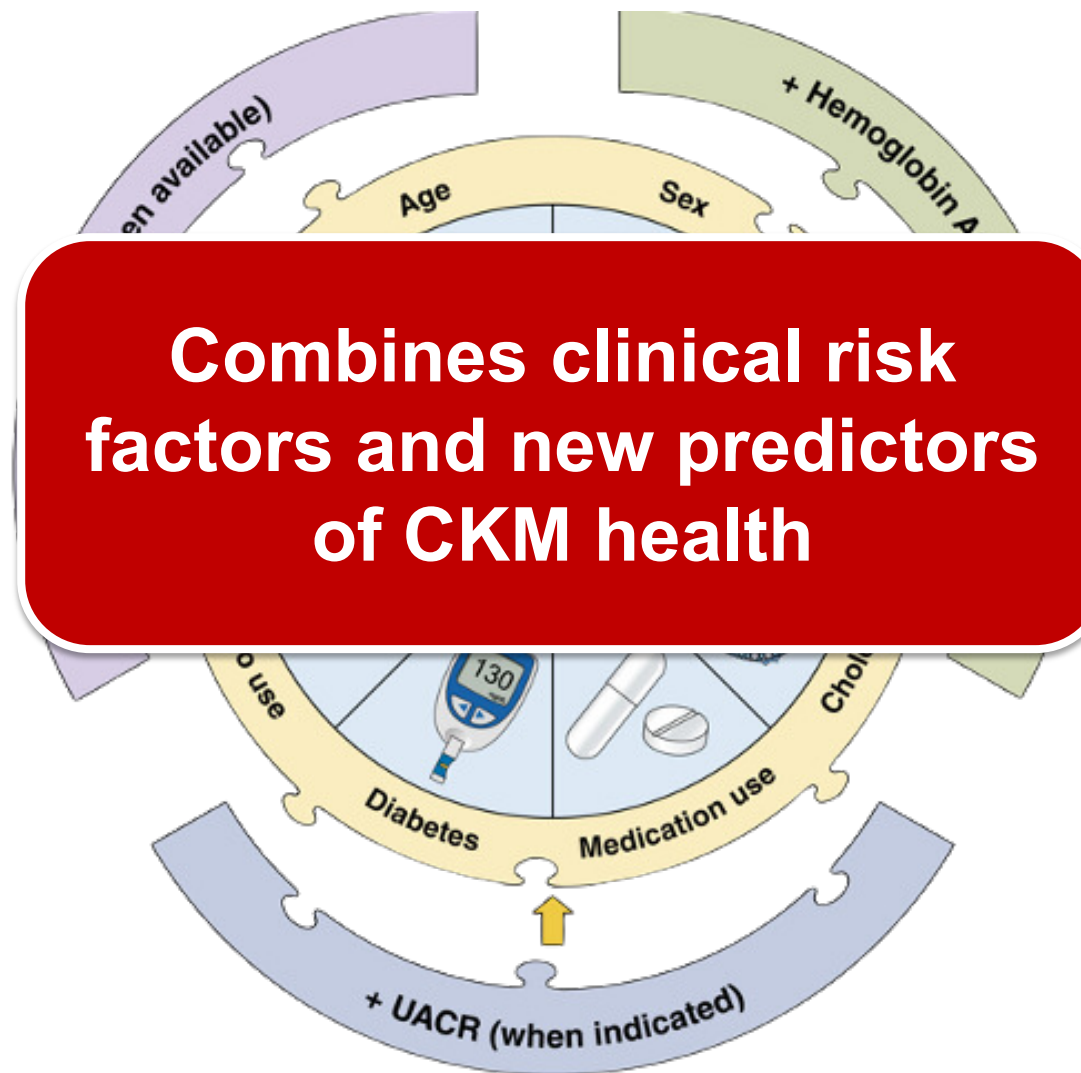|	Total CVD		ASCVD		HF	
	Females	**Males**	**Females**	**Males**	**Females**	**Males**
Events	50,324	46,804	31,277	31,328	27,931	23,707
C-Statistic	0.794 (0.763, 0.809)	0.757 (0.727, 0.778)	0.774 (0.743, 0.788)	0.736 (0.710, 0.75)	0.830 (0.816, 0.850)	0.809 (0.777, 0.827)
Calibration Slope (IQI)	1.03 (0.81, 1.16)	0.94 (0.81, 1.13)	1.09 (0.93, 1.33)	1.04 (0.95, 1.19)	1.00 (0.55, 1.15)	0.89 (0.49, 1.07)

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External Validation in the VA (N=2.5 million)

Calibration plot for Base AHA PREVENT by Race

Calibration plot for Base AHA ASCVD by Race

Calibration plot for Base AHA PCE by Race

Key:
- Asian/Native Hawaiian/Pacific Islander
- Hispanic
- Non-Hispanic Black
- Non-Hispanic White
- Other/Unknown
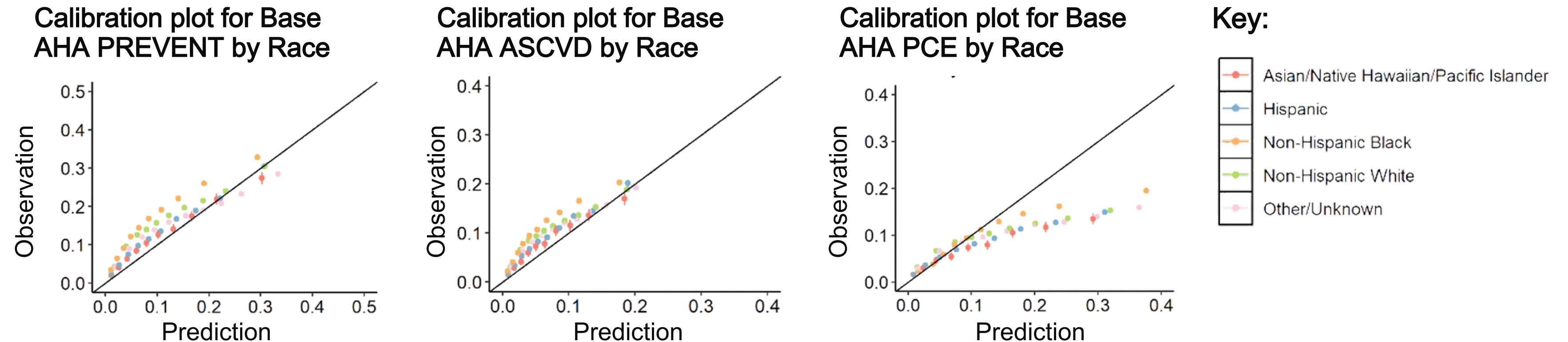
N=2,500,291 veteran adults

Mean age was 60.3 years

- 1.2% were Asian/Native Hawaiian/Pacific Islander (AANHPI)
- 5.2% Hispanic
- 15% non -Hispanic Black (NHB)
- 70% non -Hispanic White (NHW)

PREVENT Calculator is Online

PREVENT™ Online Calculator

Welcome to the American Heart Association **Predicting Ri[...] cardiovascular disease EVENTs** (PREVENT™). This app sho[...] primary prevention patients (those without atheroscleroti[...] disease or heart failure) only.

Sex ○ Male ○ Female

Age
30-79 years ⓘ

Total Cholesterol
130-320 mg/dL ⓘ

HDL Cholesterol
20-100 mg/dL ⓘ

SBP
90-200 mmHg ⓘ

BMI
18.5-39.9 ⓘ

eGFR

professional.heart.org/prevent

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AHA SCIENTIFIC STATEMENT

Risk-Based Primary Prevention of Heart Failure: A Scientific Statement From the American Heart Association

Sadiya S. Khan, MD, MSc, FAHA, Chair; Khadijah Breathett, MD, MS, FAHA; Lynne T. Braun, PhD, CNP, FAHA; Sheryl L. Chow, PharmD, FAHA; Deepak K. Gupta, MD, MSCI, FAHA; Carolyn Lekavich, PhD; Donald M. Lloyd-Jones, MD, ScM, FAHA; Chiadi E. Ndumele, MD, PhD, FAHA; Carlos J. Rodriguez, MD, MPH, FAHA; Larry A. Allen, MD, MHS, FAHA, Vice Chair; on behalf of the American Heart Association Prevention Science Committee of the Council on Epidemiology and Prevention; Council on Cardiovascular and Stroke Nursing; Council on Basic Cardiovascular Sciences; Council on Clinical Cardiology; Council on Hypertension; and Council on Quality of Care and Outcomes Research

THE LANCET

Series

Heart Failure Prevention 1

Prioritising the primary prevention of heart failure

Sadiya S Khan, Otavio Berwanger, Mona Fiuzat, John JV McMurray, Jagat Narula, Dorairaj Prabhakaran, Karen Sliwa, Jasper Tromp, Muthiah Vaduganathan

"This Lancet Series serves as a call to action for clinicians, health systems, and governments to prioritise the primary prevention of heart failure."

Perspectives	Correspondence	Articles	Articles	Articles
Creative challenges to misinformation	Humility and curiosity in human-AI systems for health care	New therapy for metabolic dysfunction-associated steatohepatitis	Community-led mental health care: Strong Minds-Strong Communities trial	Single-anastomosis duodeno-ileal bypass versus Roux-en-Y gastric bypass
See page 798	See page 804	See page 821	See page 832	See page 846

Current Guidelines for HF Risk Assessment

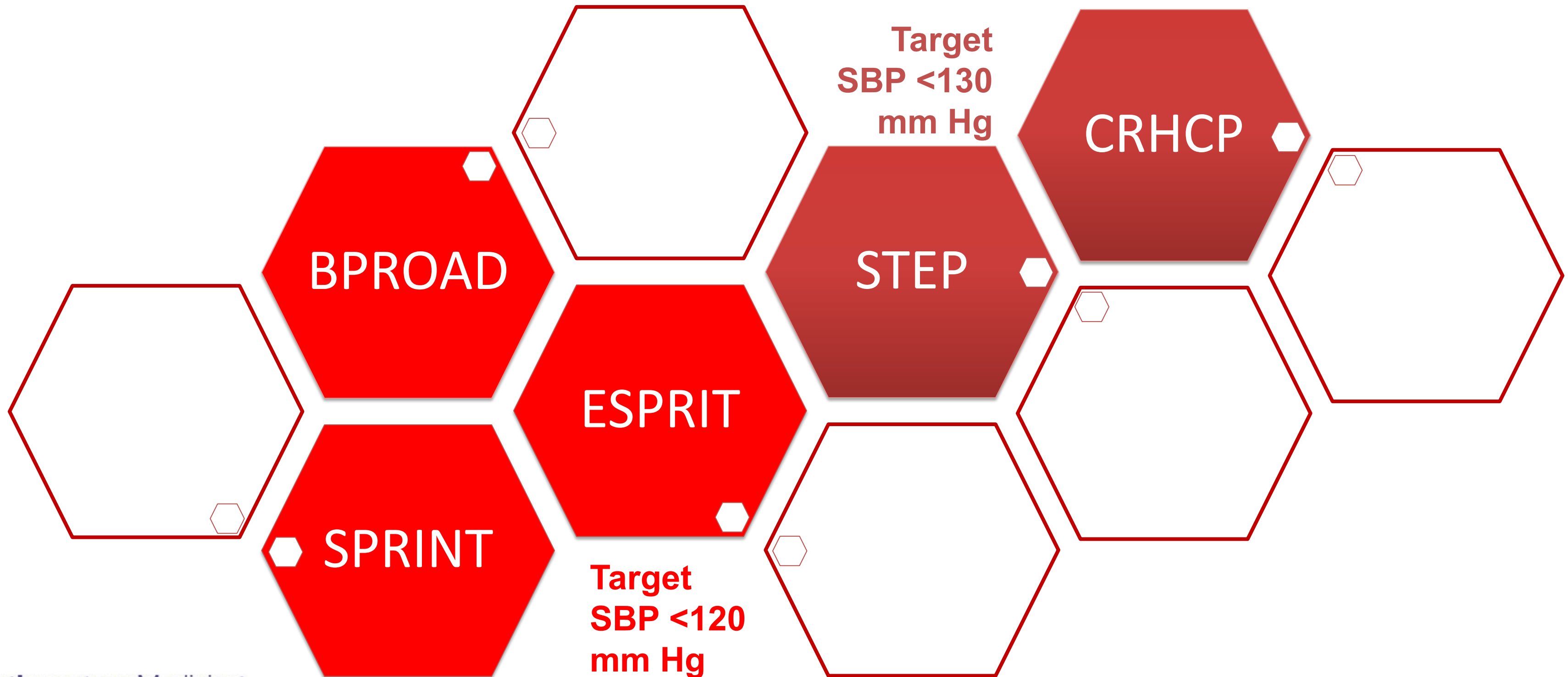| COR	LOE	Recommendation
2a	**B-NR**	In the general population, validated multivariable risk scores can be useful to estimate subsequent risk of incident heart failure (HF).
2a	**B-R**	In patients at risk of developing HF, BNP or NT-proBNP-based screening followed by team-based care, including a cardiovascular specialist, can be useful to prevent the development of LV dysfunction or new-onset HF.

SPRINT: Lower BP = Lower HF

Primary and Secondary Outcomes in the Intensive and Standard Treatment Groups

Outcome	Intensive Treatment		Standard Treatment		Hazard Ratio (95% CI)	P Value
	no. of patients (%)	% per year	no. of patients (%)	% per year		
All participants	(N = 4678)		(N = 4683)			
Primary outcome†	243 (5.2)	1.65	319 (6.8)	2.19	0.75 (0.64–0.89)	<0.001
Secondary outcomes						
Myocardial infarction	97 (2.1)	0.65	116 (2.5)	0.78	0.83 (0.64–1.09)	0.19
Acute coronary syndrome	40 (0.9)	0.27	40 (0.9)	0.27	1.00 (0.64–1.55)	0.99
Stroke	62 (1.3)	0.41	70 (1.5)	0.47	0.89 (0.63–1.25)	0.50
Heart failure	62 (1.3)	0.41	100 (2.1)	0.67	0.62 (0.45–0.84)	0.002
Death from cardiovascular causes	37 (0.8)	0.25	65 (1.4)	0.43	0.57 (0.38–0.85)	0.005
Death from any cause	155 (3.3)	1.03	210 (4.5)	1.40	0.73 (0.60–0.90)	0.003
Primary outcome or death	332 (7.1)	2.25	423 (9.0)	2.90	0.78 (0.67–0.90)	<0.001

Growing Evidence for Lower BP = Lower HF

Target SBP <130 mm Hg

CRHCP

STEP

BPROAD

ESPRIT

SPRINT

Target SBP <120 mm Hg

Jones DW et. al. *Circulation* 2025

2025 HBP GL to PREVENT HF

COR	LOE	Recommendation
1	A	In adults with hypertension with diabetes, CKD, or at increased short-term CVD risk (estimated 10-year risk≥7.5% based on PREVENT-CVD), initiation of medications to lower BP is recommended when average SBP is ≥130 mm Hg.
1	A	In adults with hypertension who have CVD, diabetes, CKD, or increased risk of CVD, an SBP goal of at least <130 mm Hg, with encouragement to achieve SBP<120 mm Hg, is recommended to reduce the risk of cardiovascular events and total mortality.

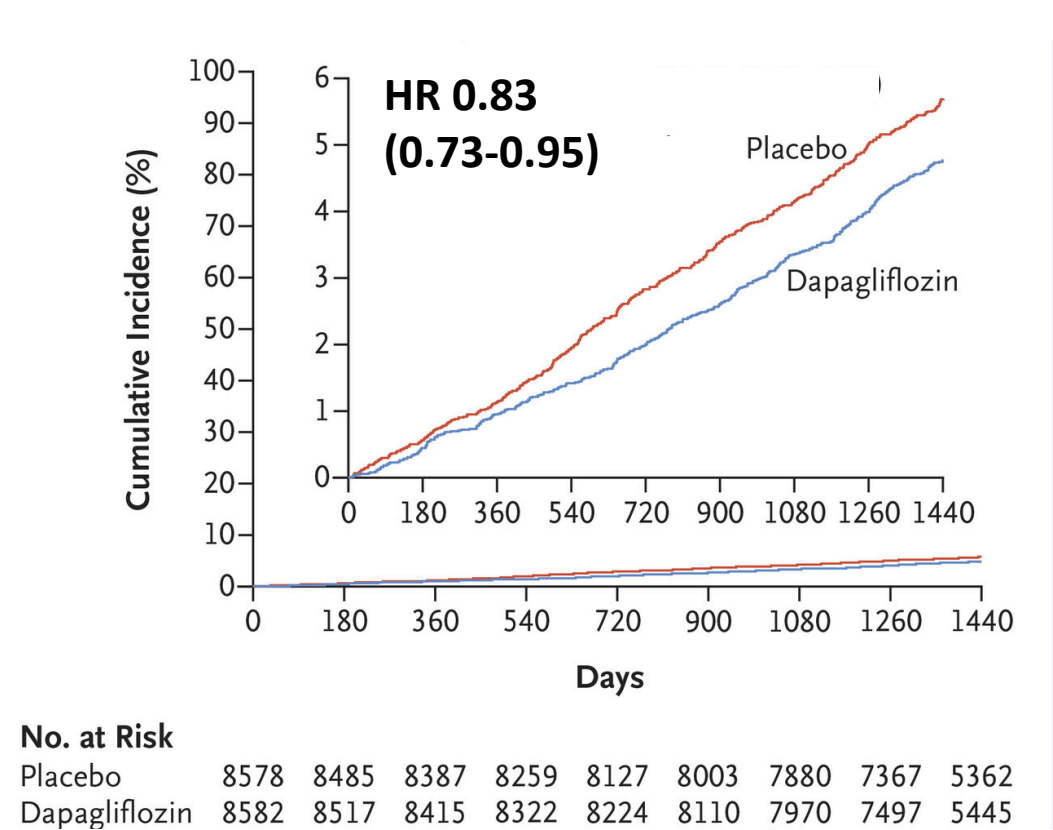# Novel Therapies that Address Obesity, Diabetes, CKD, and HF Risk
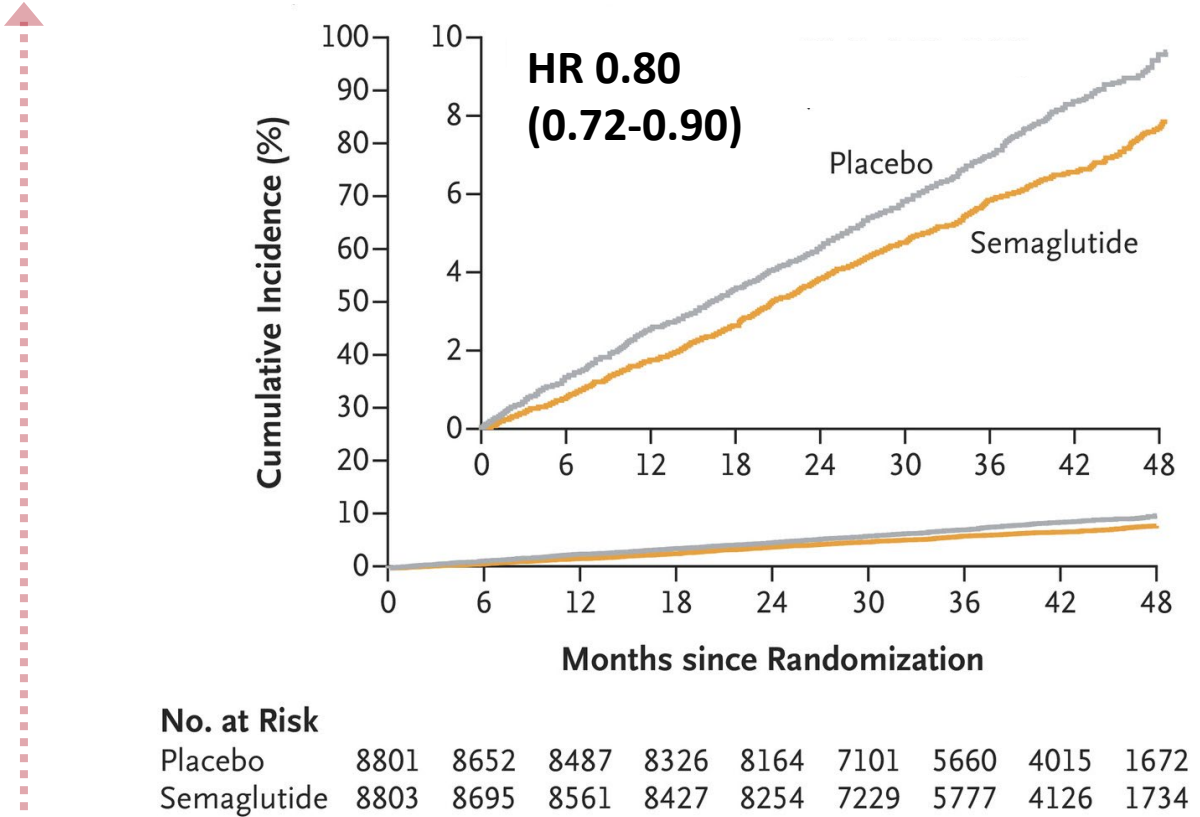

SGLT2i

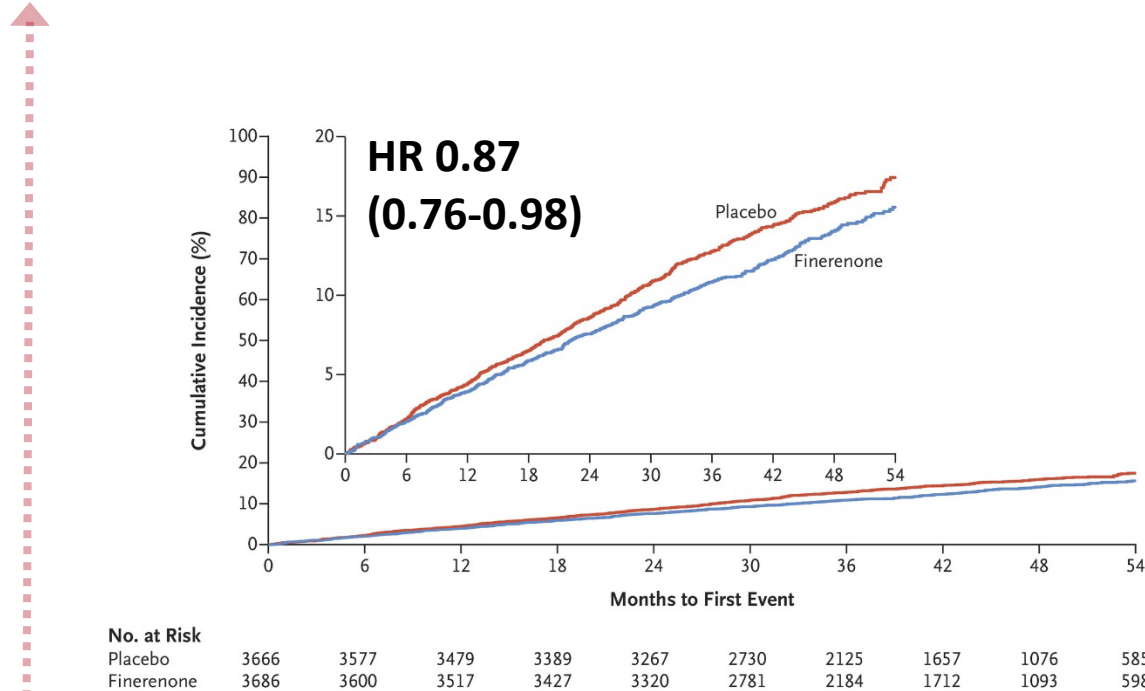Long-acting high -potency
GLP-1 RA or GLP/GIP

Non-steroidal MRAs

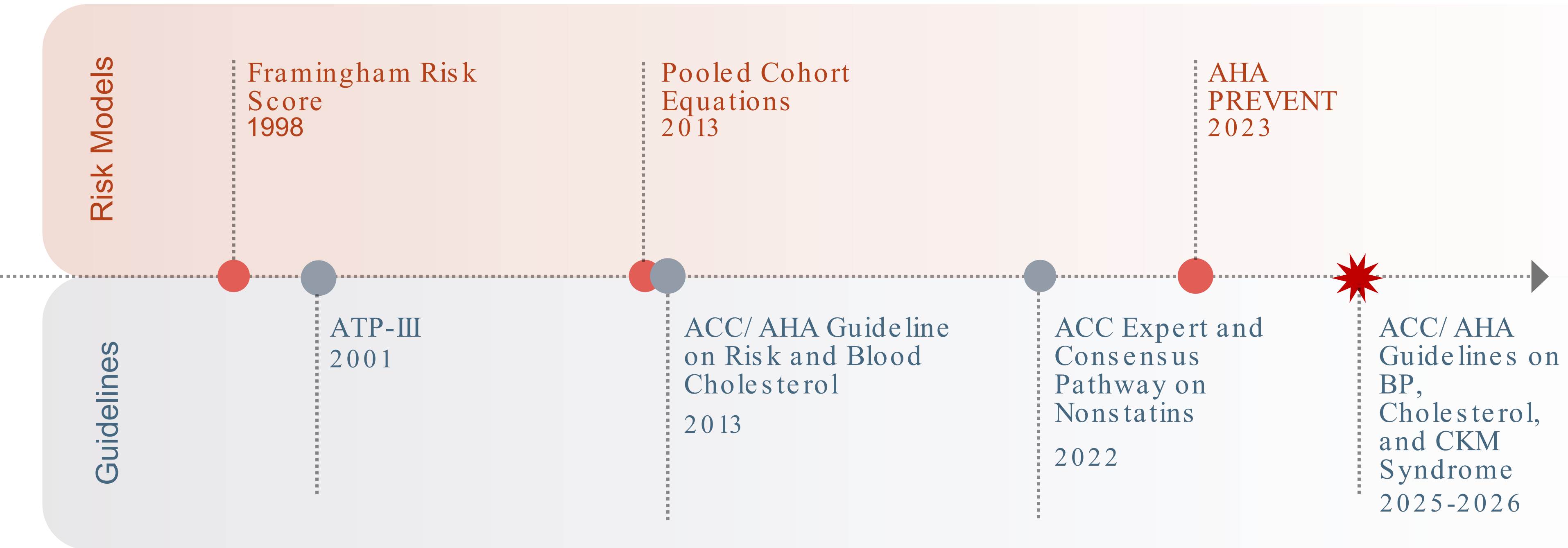# Novel Therapies that Address Obesity, Diabetes, CKD, and Prevent HF

SGLT2i

Long-acting high -potency GLP-1 RA or GLP/GIP

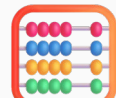Non-steroidal MRAs

Wiviott SD et. al. *N Engl J Med.* 2018
Lincoff AM et. al. *N Engl J Med.* 2023
Pitt B et. al. *N Engl J Med.* 2021

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Clinical Implications of AHA PREVENT-HF: New Guidelines and Coming Soon!

Risk Models

Framingham Risk Score
1998

Pooled Cohort Equations
2013

AHA PREVENT
2023

Guidelines

ATP-III
2001

ACC/AHA Guideline on Risk and Blood Cholesterol
2013

ACC Expert and Consensus Pathway on Nonstatins
2022

ACC/AHA Guidelines on BP, Cholesterol, and CKM Syndrome
2025-2026

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American Heart Association.

Key Takeaways to PREVENT Heart Failure

1. 📈 Burden of heart failure is increasing with growing burden of antecedent risk factors, particularly in young adults

2. 🧮 PREVENT-HF equations accurately and precisely estimate risk for heart failure (and CVD) with similar calibration across groups

3. 🎯 Risk prediction enables prevention of heart failure with evidence-based treatments (e.g., BP-lowering, SGLT2i)

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University of Idaho
School of Health and Medical Professions

Project ECHO®

"We spend far too much on treating disease after it happens and far too little on preventing it in the first place. By the time illness arrives, we are already too late."

Sandro Galea, Within Reason