



# **SGLT2-I e GLP1- RA e la Microangiopatia nel continuum cardiovascolare, dagli studi alla pratica clinica**

Angelo Avogaro

Presidente Fondazione Diabete Ricerca SID

# Conflitti di interesse di Angelo Avogaro

- Dichiaro di aver ricevuto negli ultimi 2 anni compensi dalle seguenti aziende:
  - AstraZeneca, Boehringer Ingelheim, Eli Lilly, Bruno Farmaceutici, Mundipharma, Amgen, Servier, GlaxoSmithKline, Merck Sharp & Dohme, Novo Nordisk, Sanofi.

Controllo della Glicemia

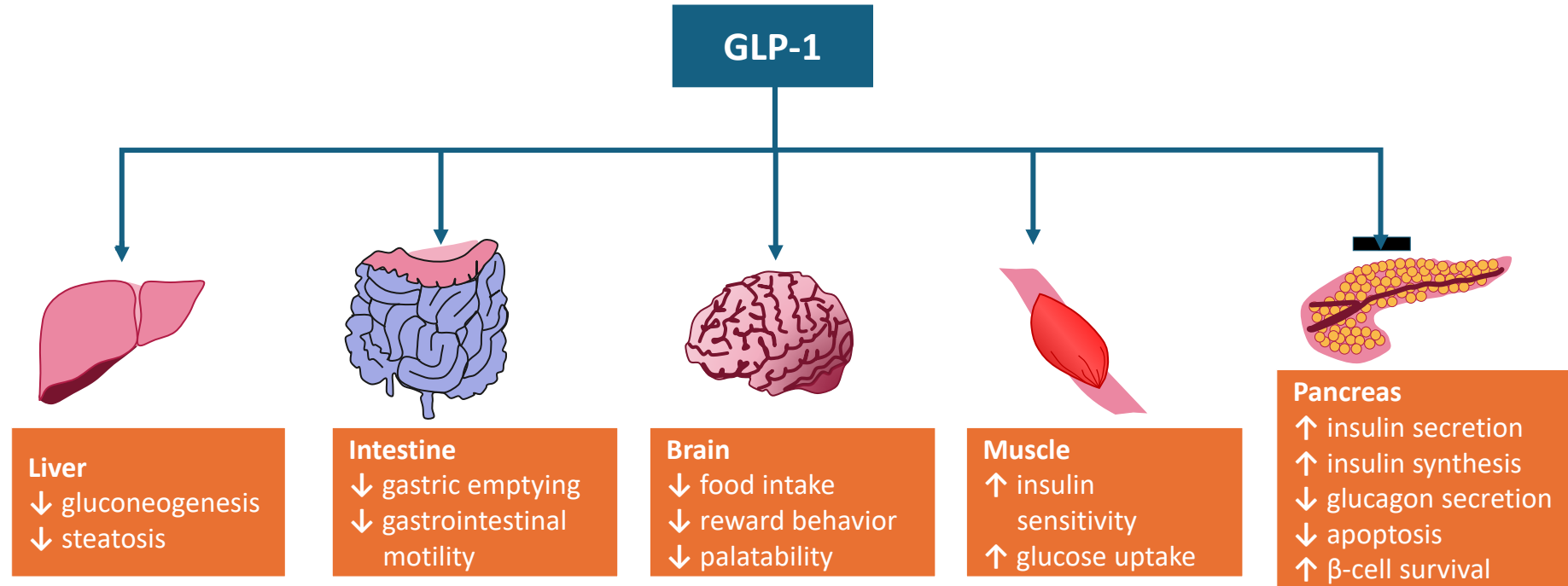
Controllo del Peso

Paziente con  
diabete di tipo 2

Controllo dei fattori di rischio  
CV

Protezione Cardio-renale

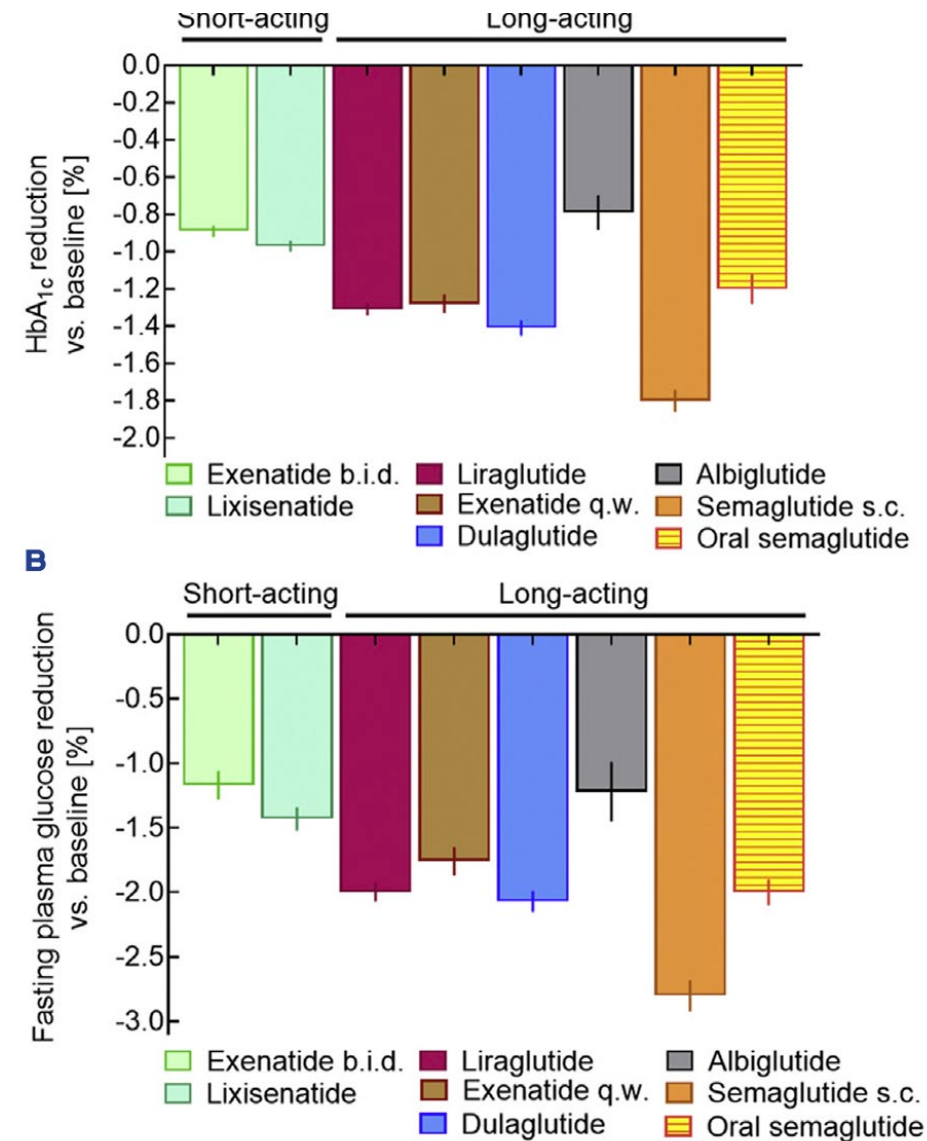
# GLP-1 Regulates Body Weight and Glucose Metabolism



Multifactorial mechanism of action: gut, brain, and systemic improvements in insulin sensitivity contribute to total efficacy

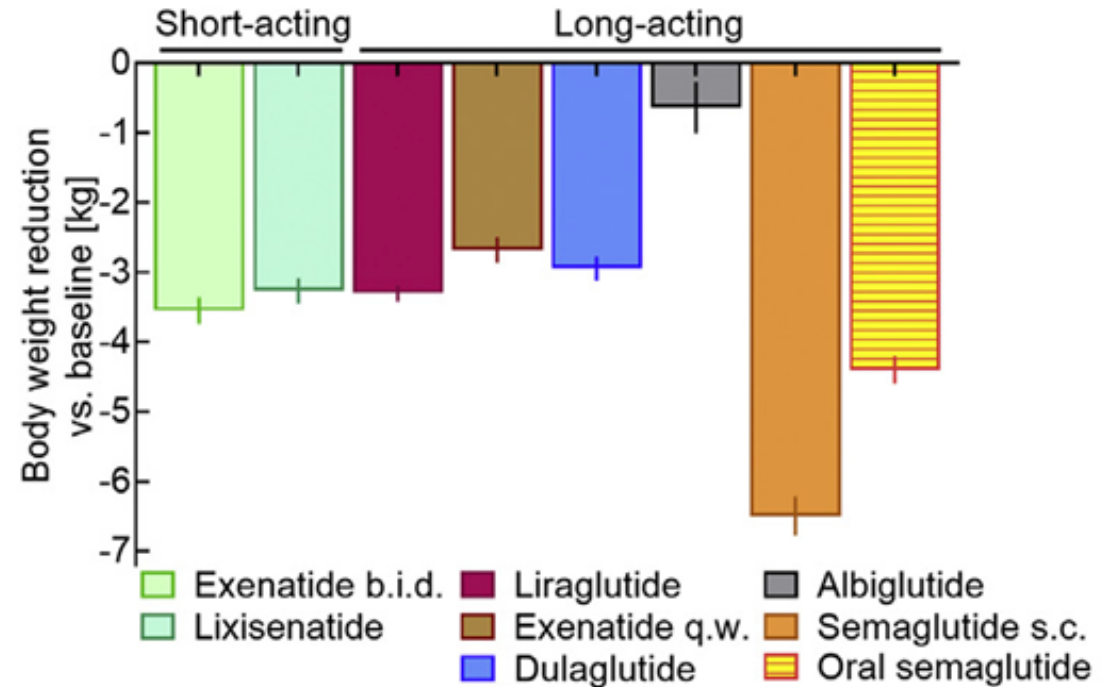
Nauck et al. Mol Metab 2021

# Effect of GLP-1RA on HbA1c



Nauck et al. Mol Metab 2021

# Effect of GLP-1RA on Body weight

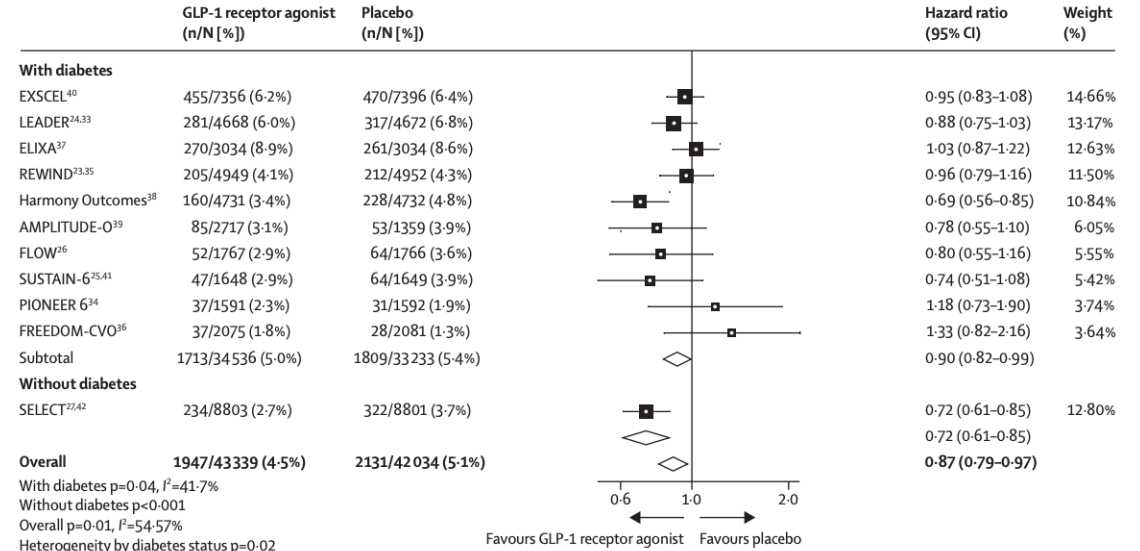


# Effects of GLP-1 receptor agonists on kidney and cardiovascular disease outcomes: a meta-analysis of randomised controlled trials

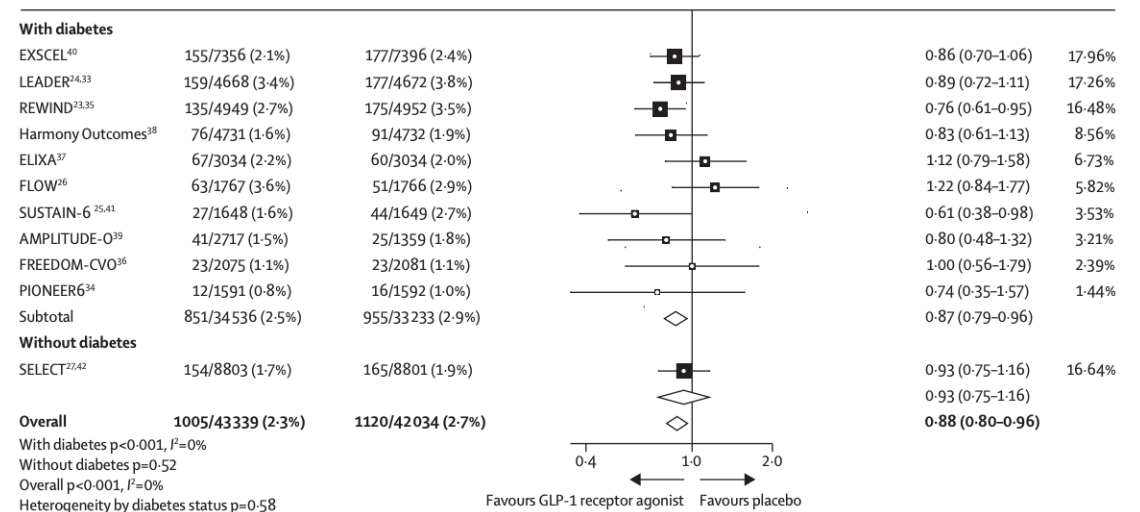
Sunil V Badve, Anika Bilal, Matthew M Y Lee, Naveed Sattar, Hertz C Gerstein, Christian T Ruff, John J V McMurray, Peter Rossing, George Bakris, Kenneth W Mahaffey, Johannes F E Mann, Helen M Colhoun, Katherine R Tuttle, Richard E Pratley, Vlado Perkovic



## C Non-fatal myocardial infarction



## D Non-fatal stroke

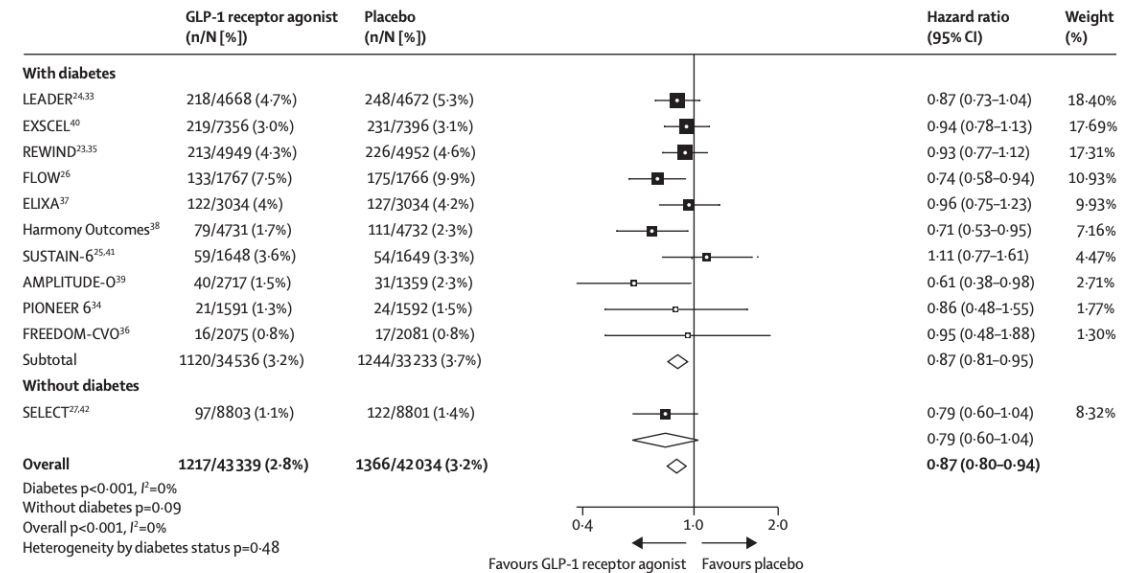


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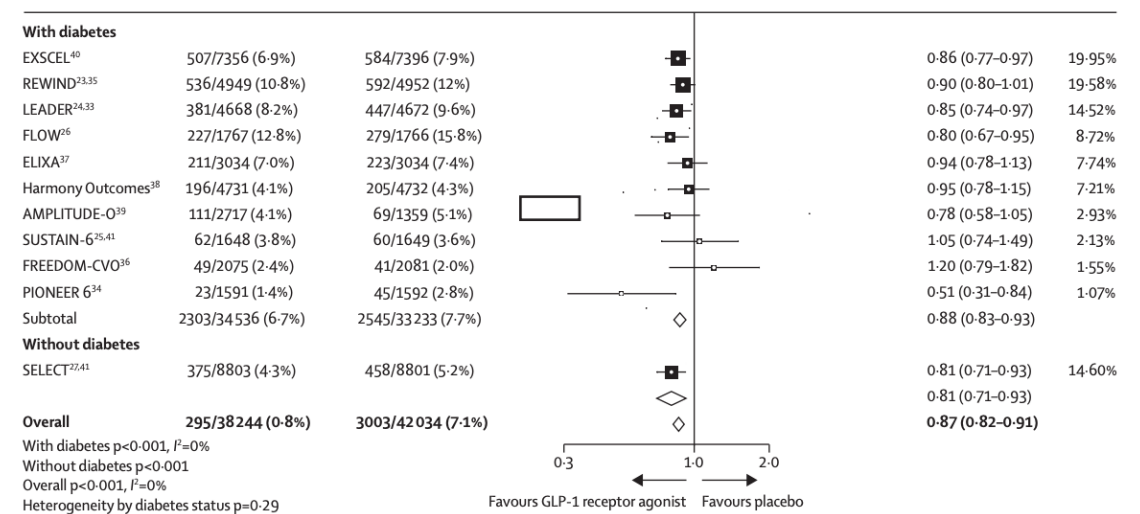
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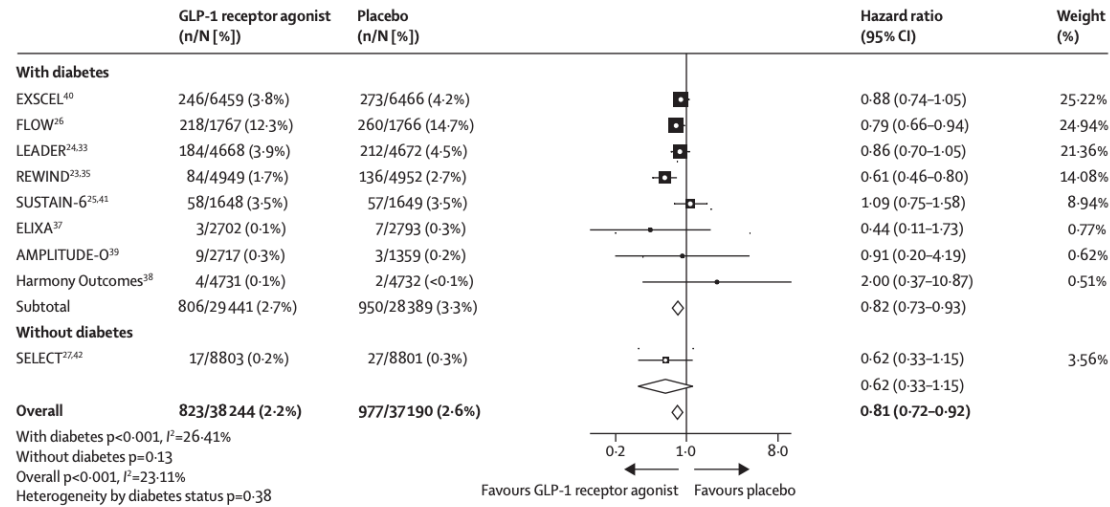
## A Hospitalisation for heart failure



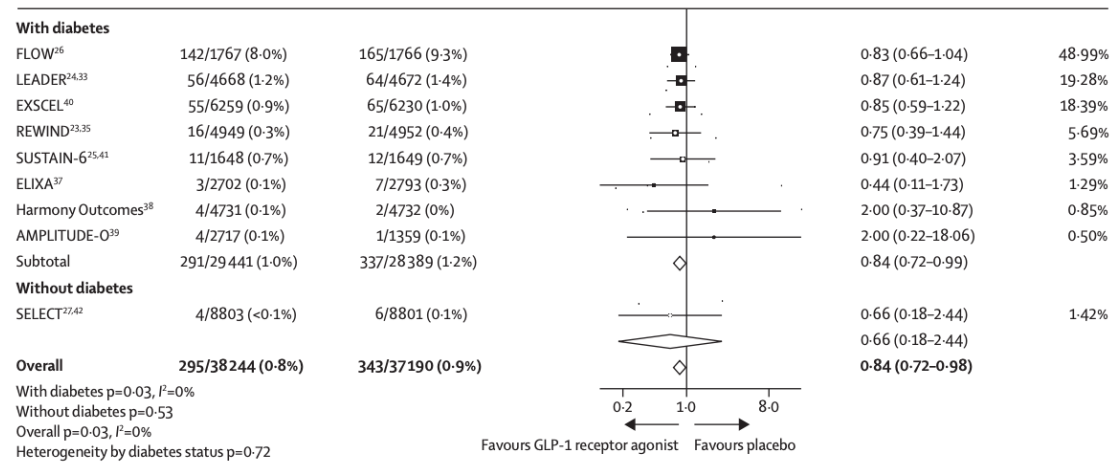
## B All-cause death



## A Composite kidney outcome



## B Kidney failure

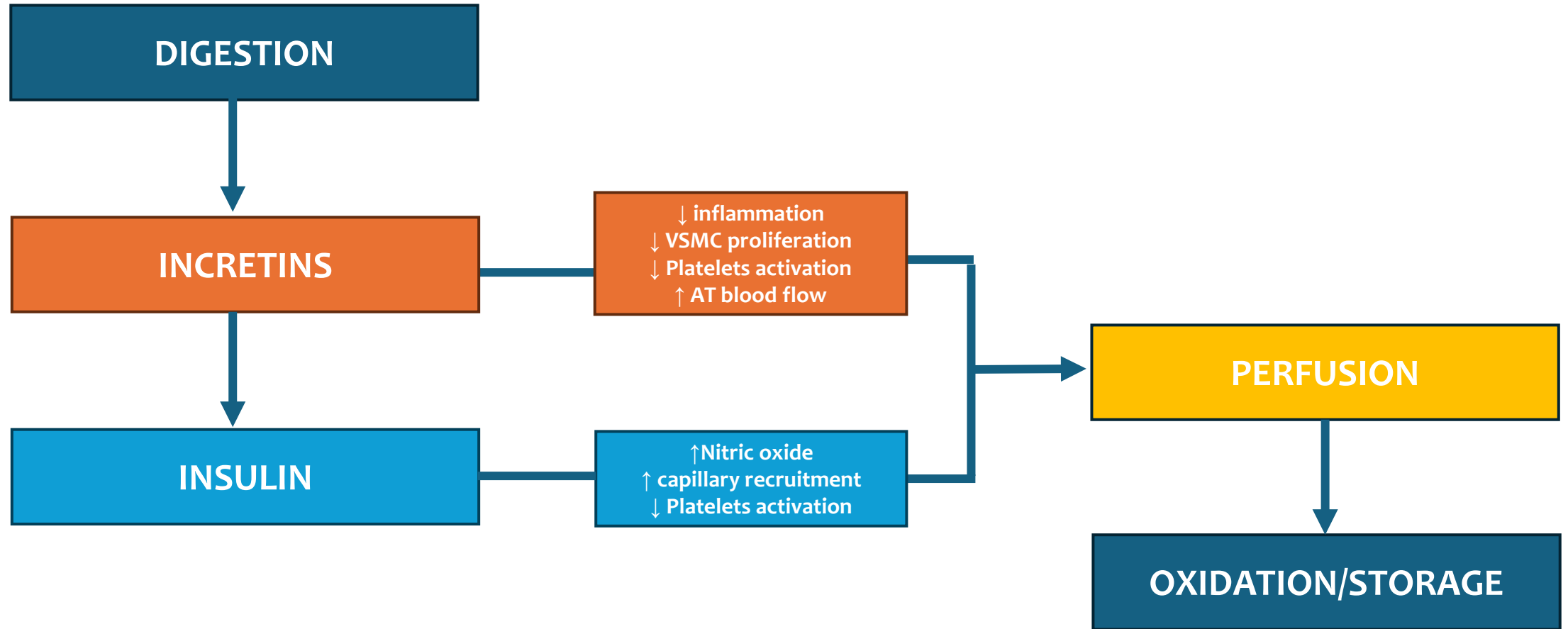


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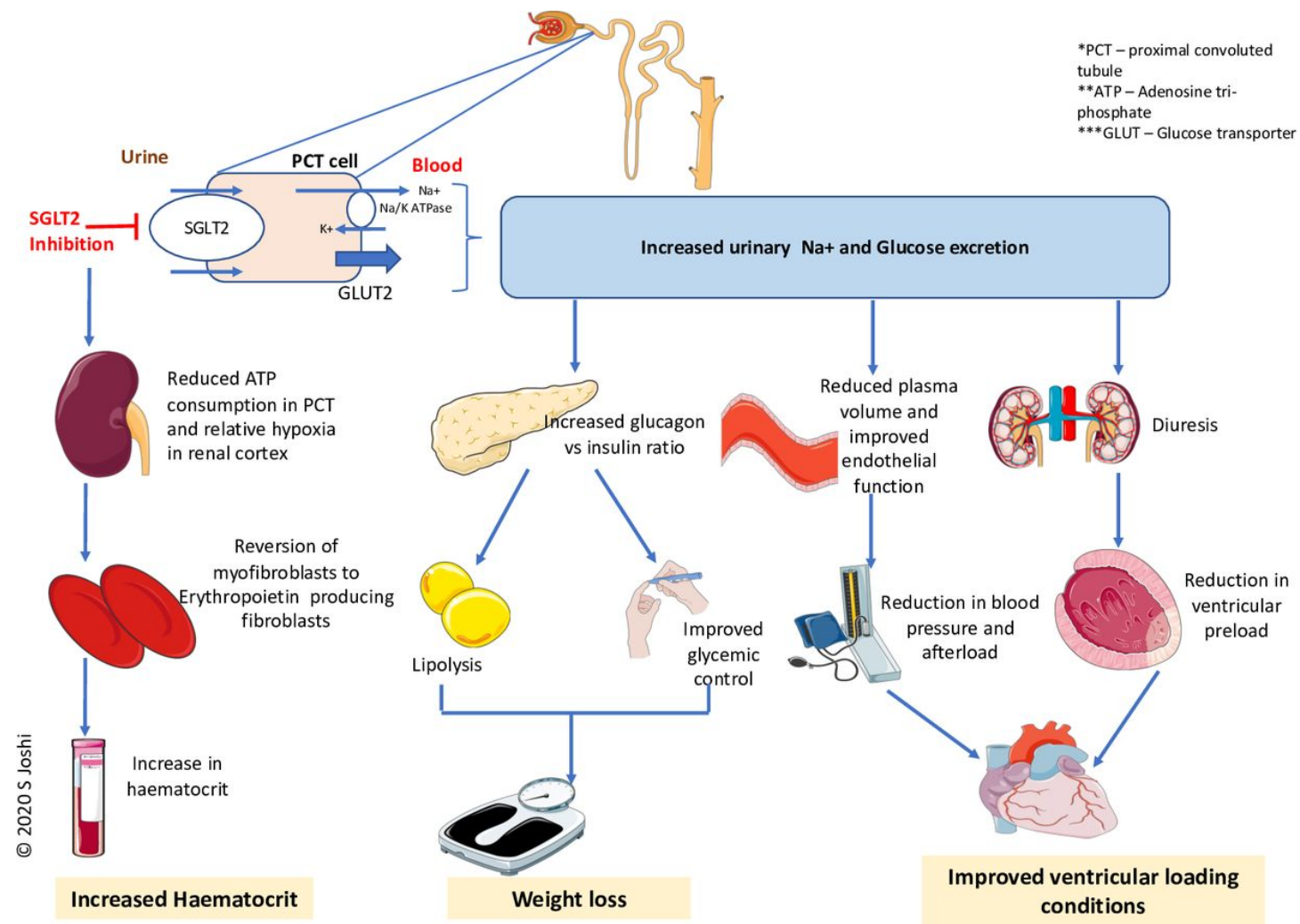


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# Incretins couple Digestion with Oxidation



# Schematic diagram showing conventional mechanisms of action of SGLT2 inhibitors.

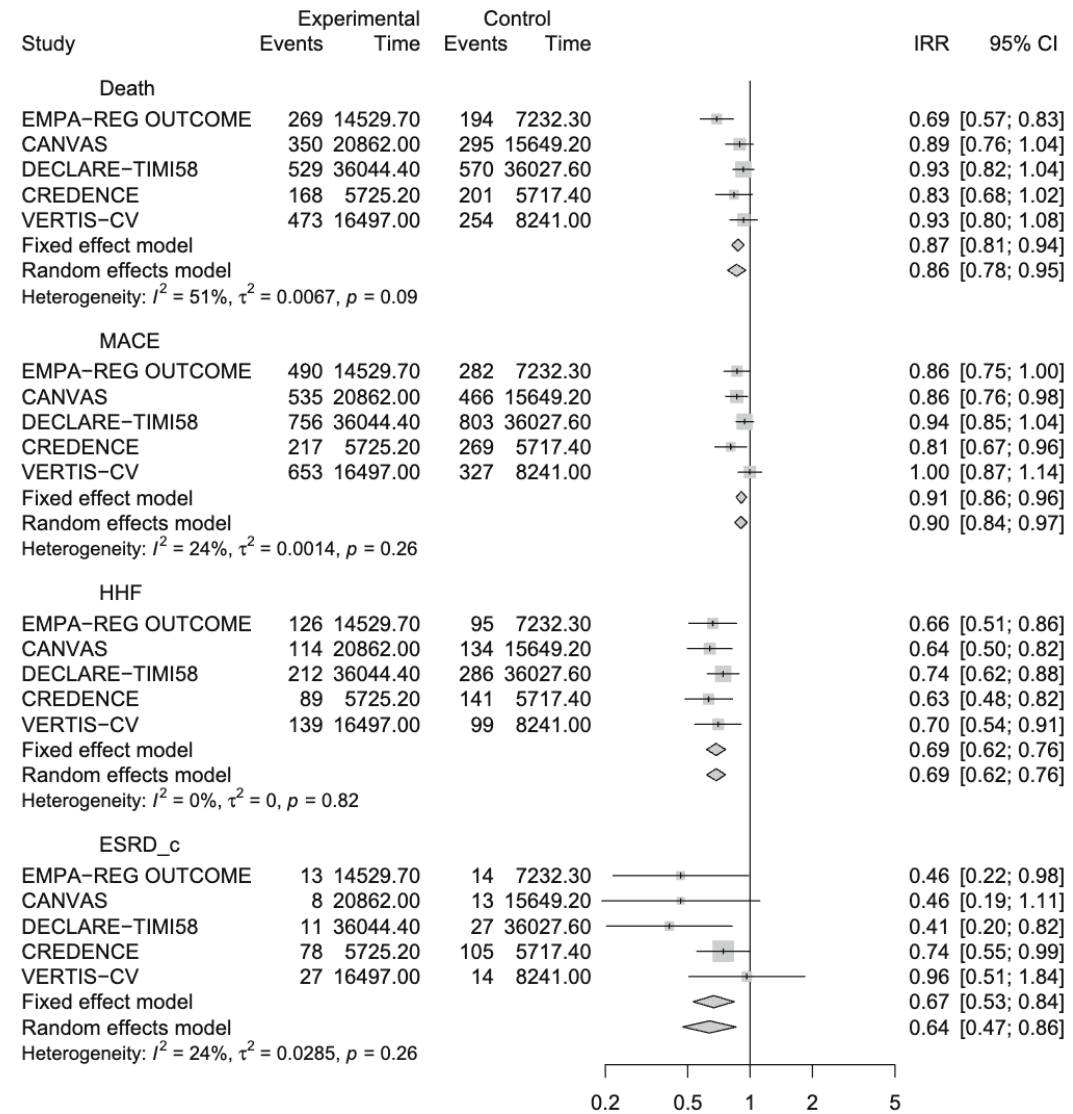


This figure was created using Servier medical art. <http://smart.servier.com>



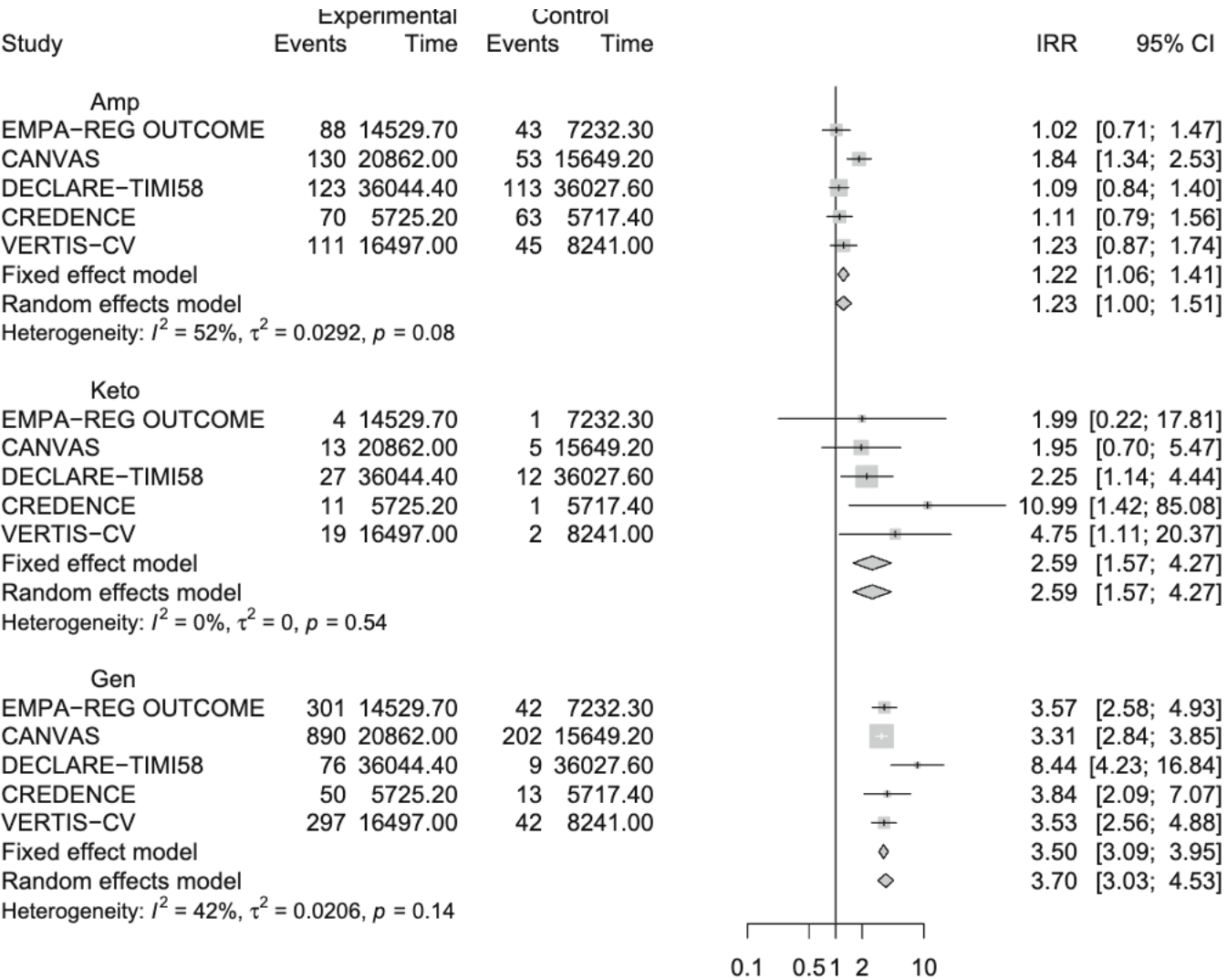
## SGLT2 inhibitors in type 2 diabetes: a systematic review and meta-analysis of cardiovascular outcome trials balancing their risks and benefits

Elisa Marilly<sup>1</sup> · Judith Cottin<sup>1</sup> · Natalia Cabrera<sup>2</sup> · Catherine Cornu<sup>3</sup> · Remy Boussageon<sup>4</sup> · Philippe Moulin<sup>5</sup> · Jean-Christophe Lega<sup>6</sup> · François Gueyffier<sup>2</sup> · Michel Cucherat<sup>2</sup> · Guillaume Grenet<sup>1</sup>

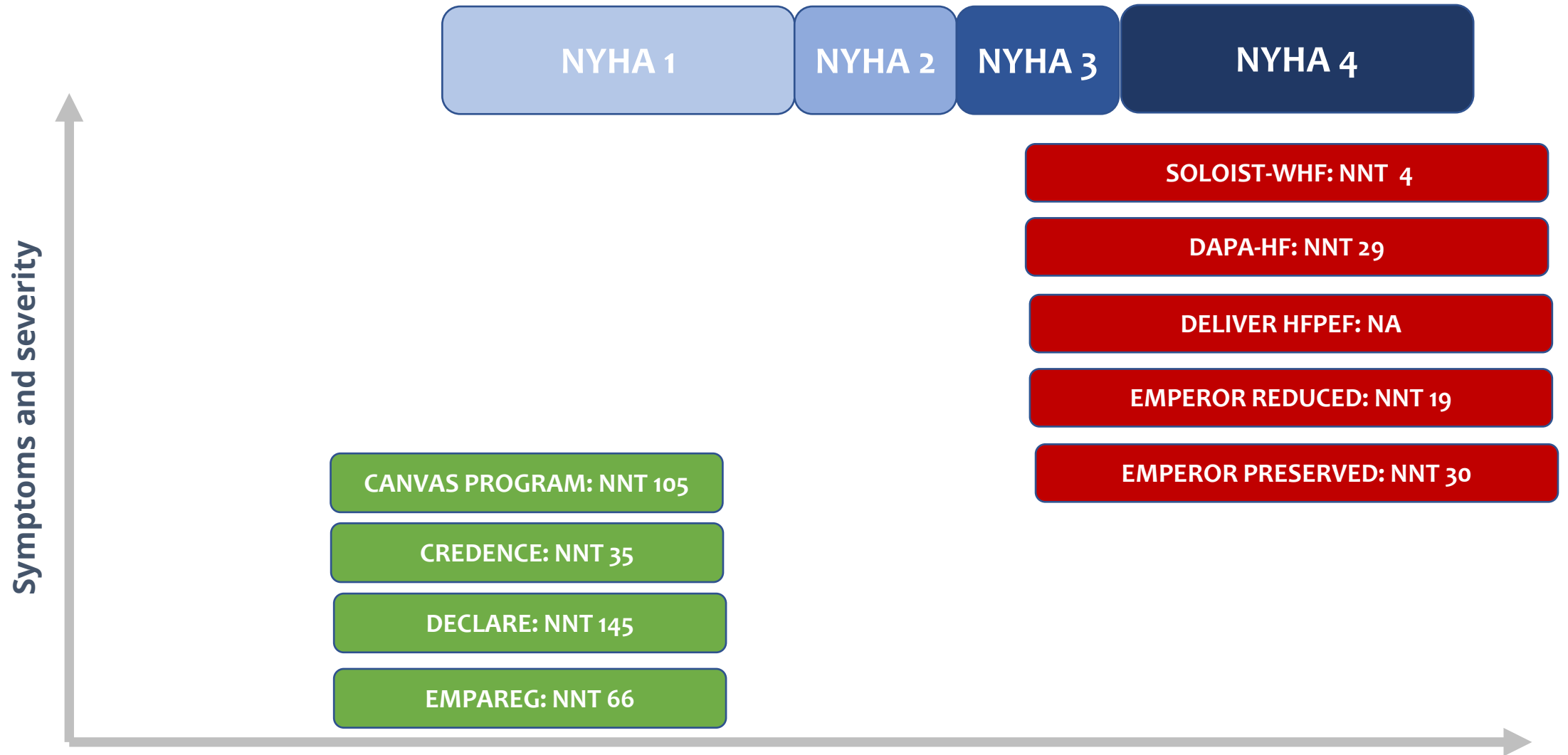


SGLT2 inhibitors in type 2 diabetes: a systematic review and meta-analysis of cardiovascular outcome trials balancing their risks and benefits

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# THE PROGRESSIVE NATURE OF HF

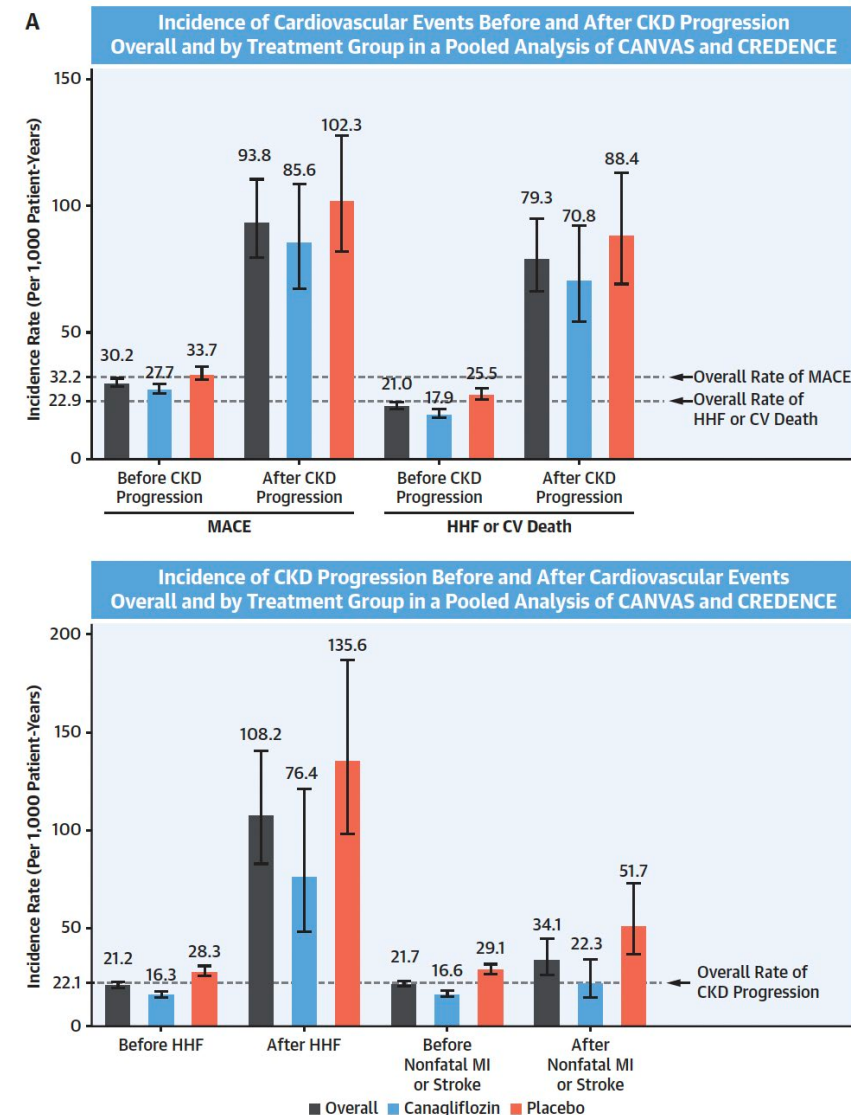


## BRIEF REPORT

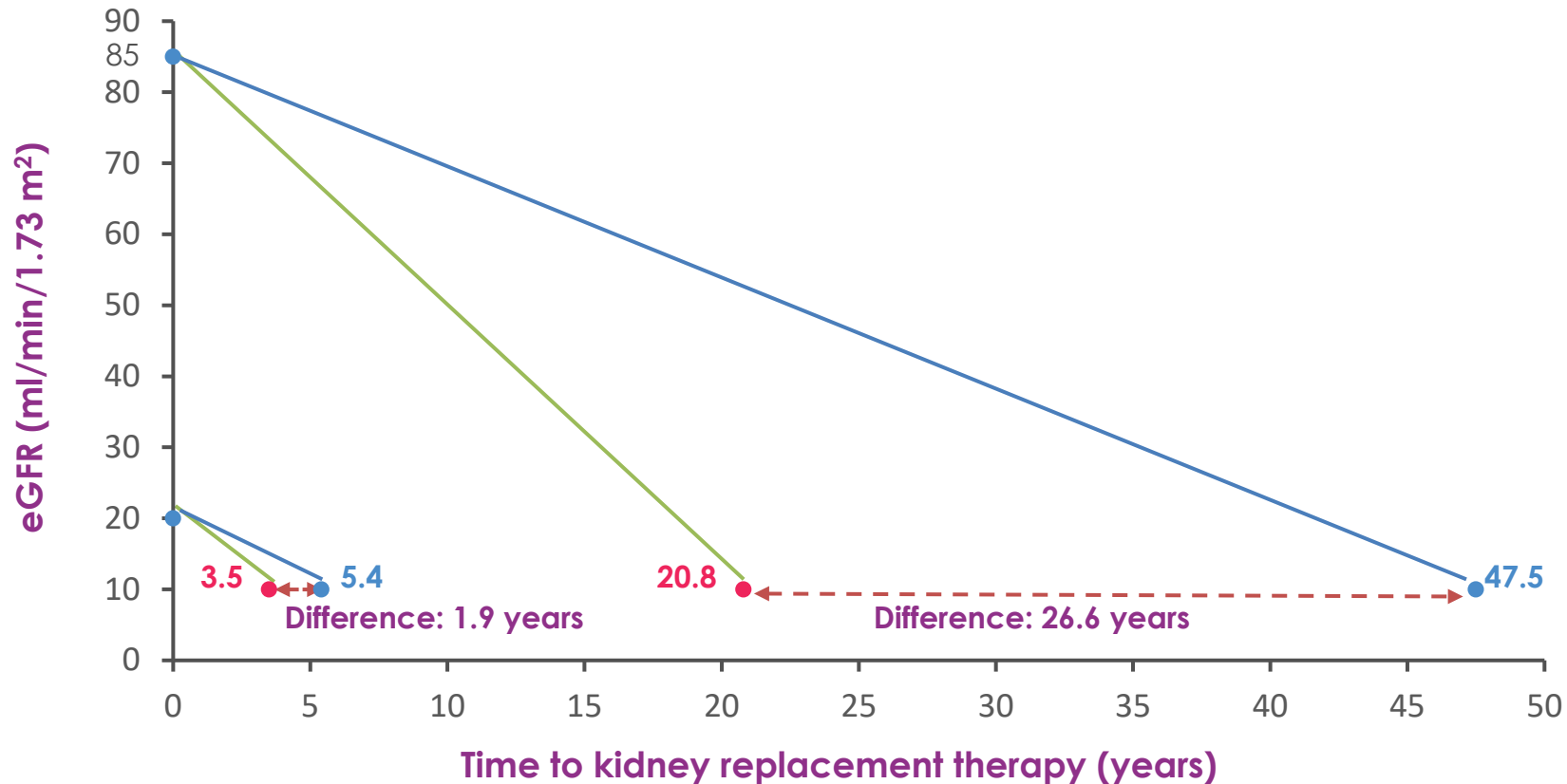
# Bidirectional Relationship Between Kidney Disease Progression and Cardiovascular Events in Type 2 Diabetes

Brendon L. Neuen, PhD,<sup>a,b,c</sup> John W. Ostrominski, MD,<sup>b,d</sup> Brian Claggett, PhD,<sup>b</sup> Iris E. Beldhuis, MD,<sup>b,e</sup> Safia Chatur, MD,<sup>b</sup> Finnian R. McCausland, MBBS,<sup>f</sup> Sunil V. Badve, PhD,<sup>a,g,h</sup> Clare Arnott, PhD,<sup>a,i</sup> Hiddo J.L. Heerspink, PhD,<sup>a,j</sup> Min Jun, PhD,<sup>a</sup> Michael Falster, PhD,<sup>k</sup> Juliana de Oliveira Costa, PhD,<sup>k</sup> Carol Pollock, PhD,<sup>c,l</sup> Meg J. Jardine, PhD,<sup>m,n</sup> Kenneth W. Mahaffey, MD,<sup>o</sup> Vlado Perkovic, PhD,<sup>a</sup> Scott D. Solomon, MD,<sup>b</sup> Muthiah Vaduganathan, MD, MPH<sup>b</sup>

**FIGURE 1** Cardiovascular, Kidney, and Mortality Risk Before and After Nonfatal Cardio-Kidney Outcomes



# Time to kidney replacement therapy



\*The difference in the time to kidney failure corresponds to the values in the figure on the previous slide for baseline eGFR 20 and 85 ml/min/1.73m².  
eGFR, estimated glomerular filtration rate  
Fernández-Fernandez B et al. Clin Kidney J 2023;0:1

# CARDIOVASCULAR CONTINUUM EARLY TREATMENT

**LOW-to-MODERATE RISK**

**HIGH RISK**

**VERY HIGH RISK**

**ENDOTHELIAL DYSFUNCTION  
MICROVASCULAR DYSFUNCTION**

**SUBCLINICAL ATHEROSCLEROSIS**

**TARGET ORGAN DAMAGE**

