



心腎共病的預防及 早期風險因子管理

蔡尚峰 醫師
臺中榮民總醫院 內科部腎臟科

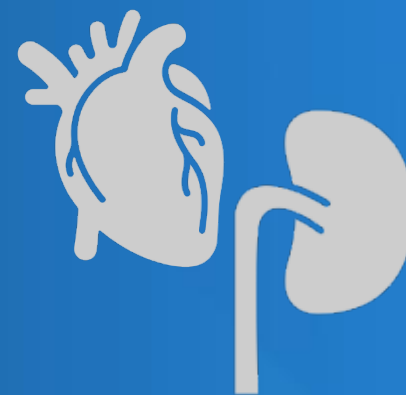


大綱

- 心腎共病風險因子與臨床照護的挑戰
- 心腎共病風險因子早期管理
- 心腎共病預防之臨床實證
- 總結



心腎共病風險因子 與臨床照護的挑戰



AHA: Cardiovascular-Kidney-Metabolic (CKM) Syndrome



Circulation

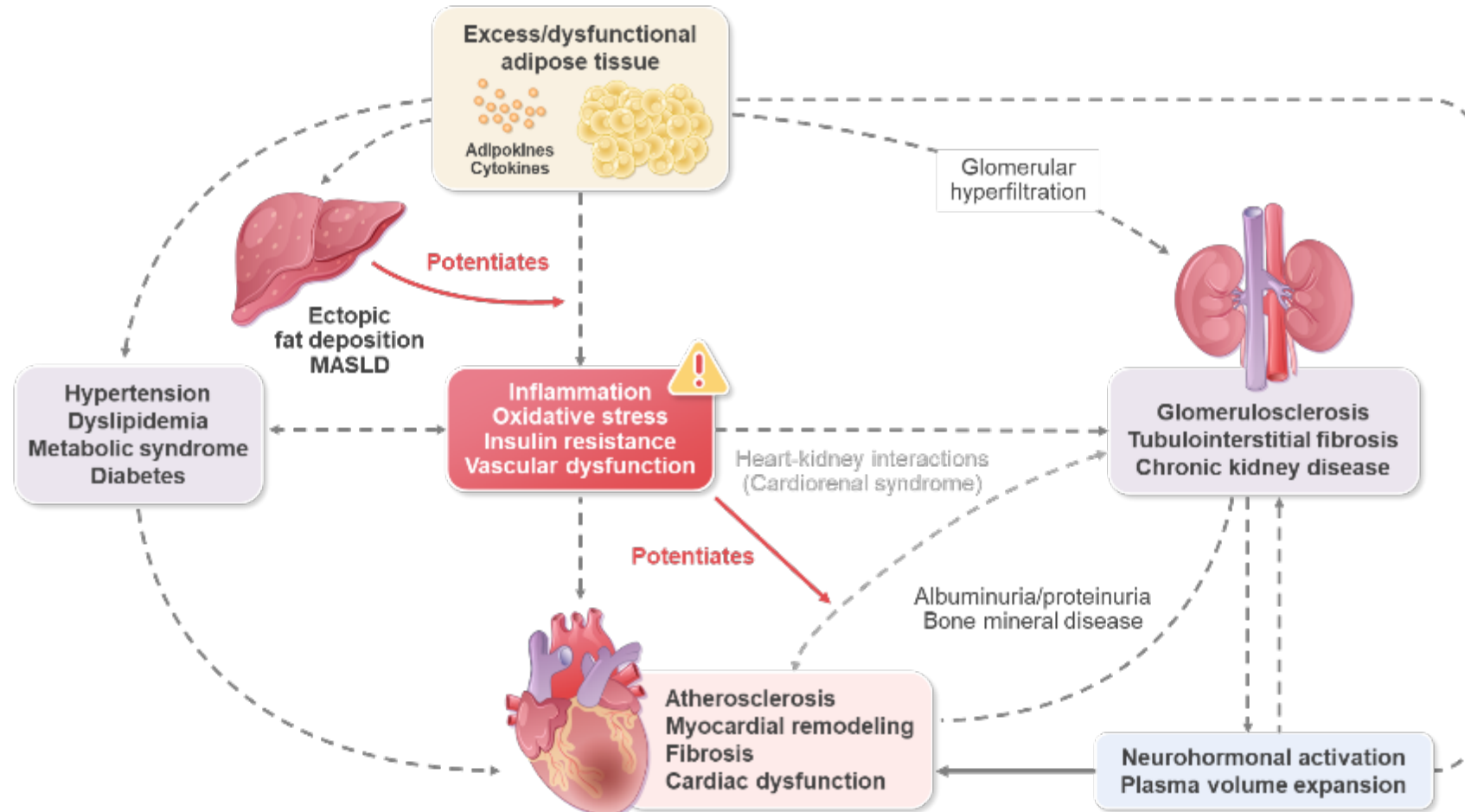
A Synopsis of the Evidence for the Science and Clinical Management of Cardiovascular-Kidney-Metabolic (CKM) Syndrome: A Scientific Statement From the American Heart Association

Chiadi E. Ndumele, Ian J. Neeland, Katherine R. Tuttle, Sheryl L. Chow, Roy O. Mathew, Sadiya S. Khan, Josef Coresh, Carissa M. Baker-Smith, Mercedes R. Carnethon, Jean-Pierre Després, ... [See all authors](#) ✓

Originally published 9 Oct 2023 | <https://doi.org/10.1161/CIR.0000000000001186> | Circulation. 2023;148:1636–1664

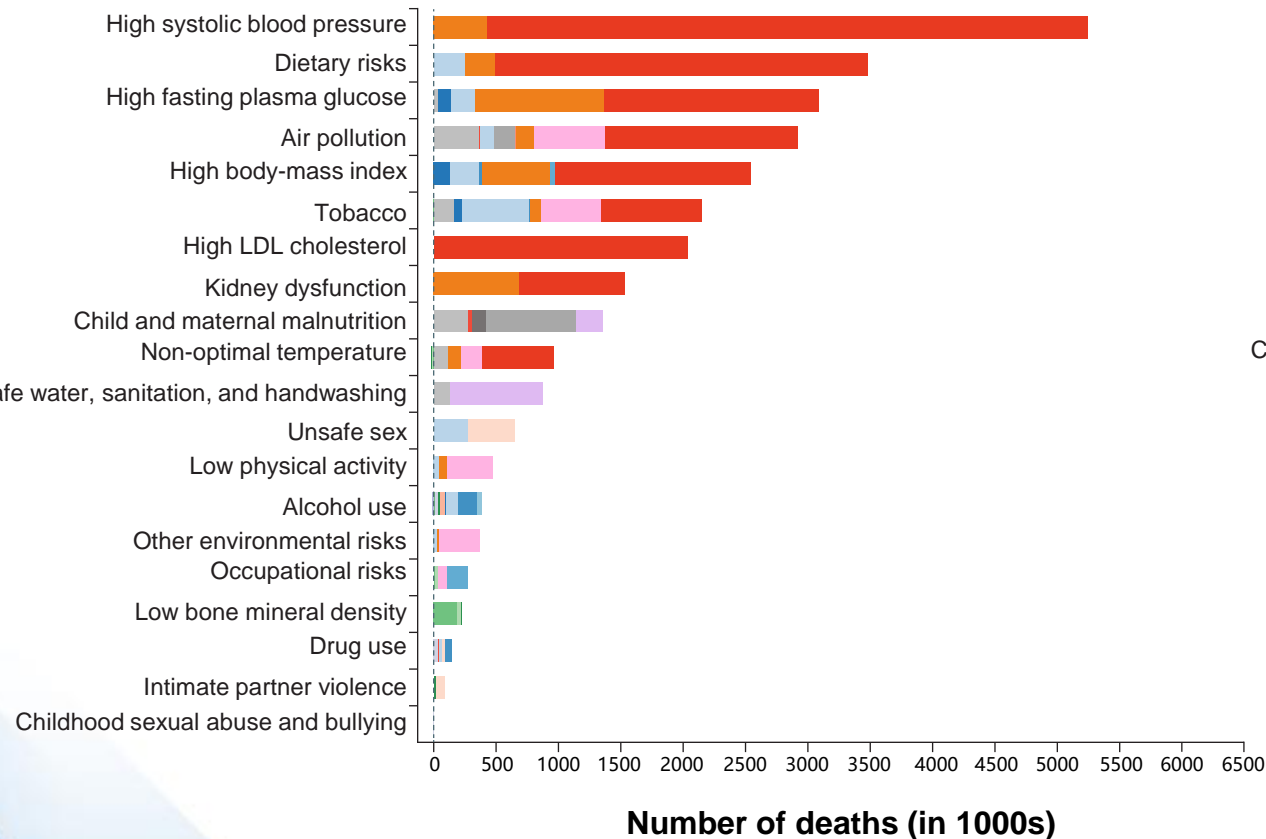
Cardiovascular-Kidney-Metabolic (CKM) Syndrome

心、腎、代謝交互作用

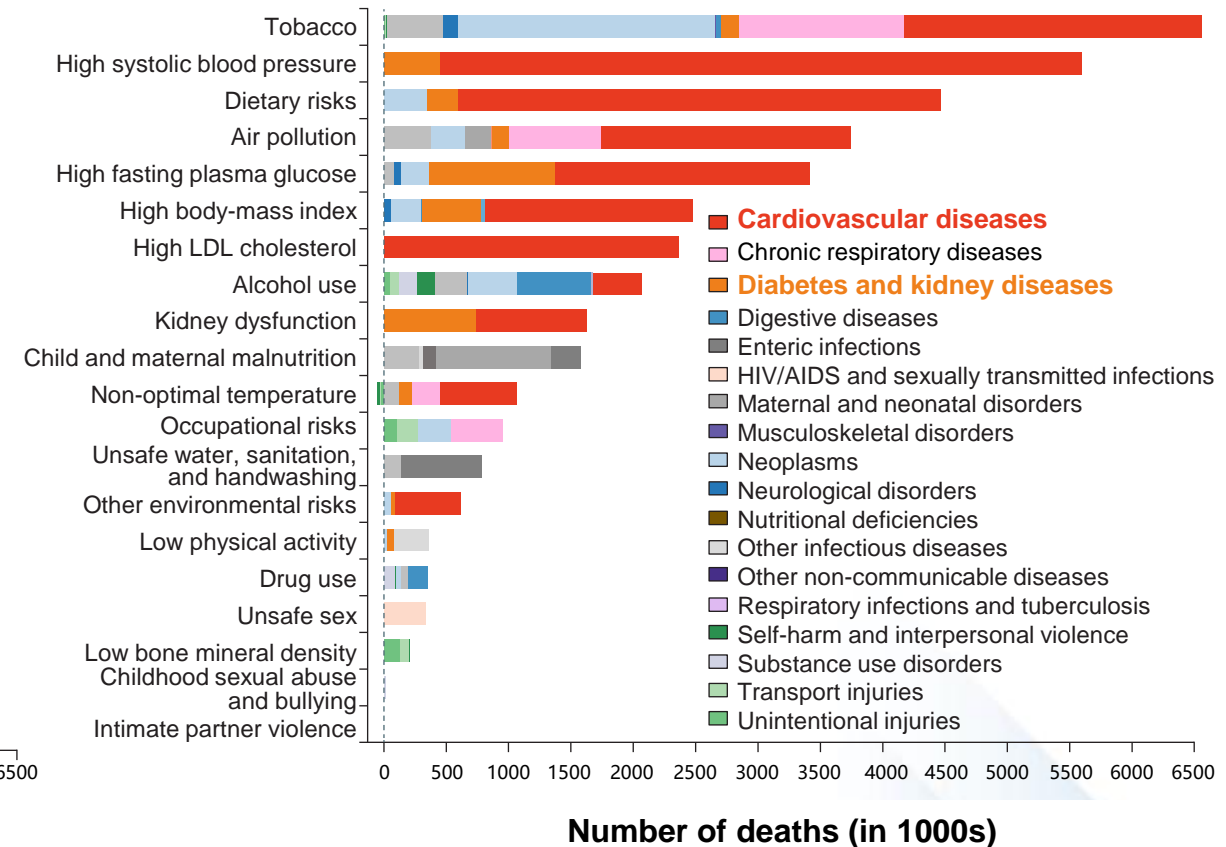


全球20大致死風險因素所對應死因：心腎病變死亡佔最大宗

A Global attributable deaths from Level 2 risk factors for females in 2019



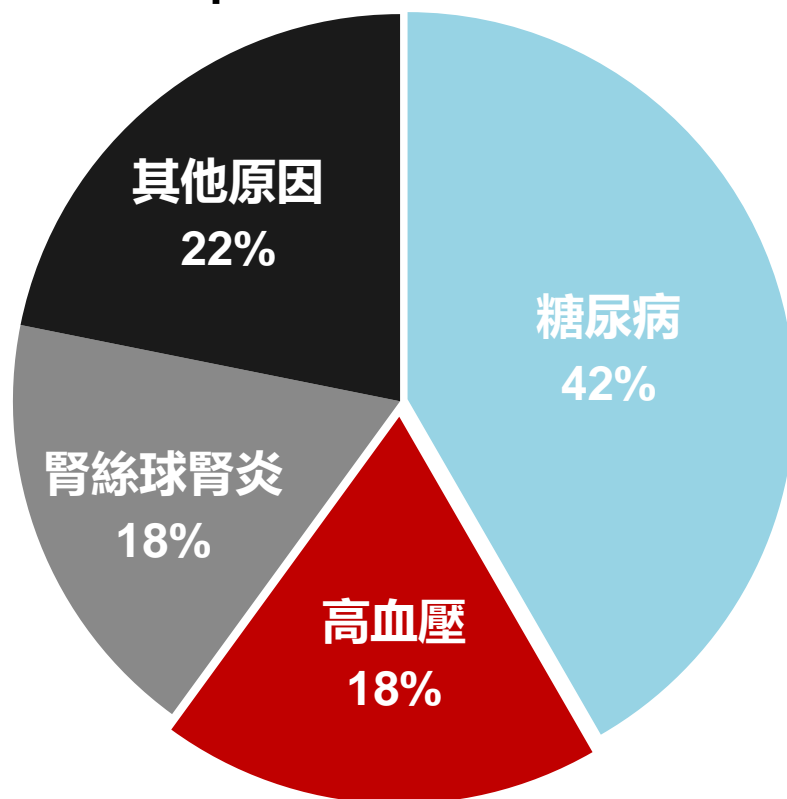
B Global attributable deaths from Level 2 risk factors for males in 2019



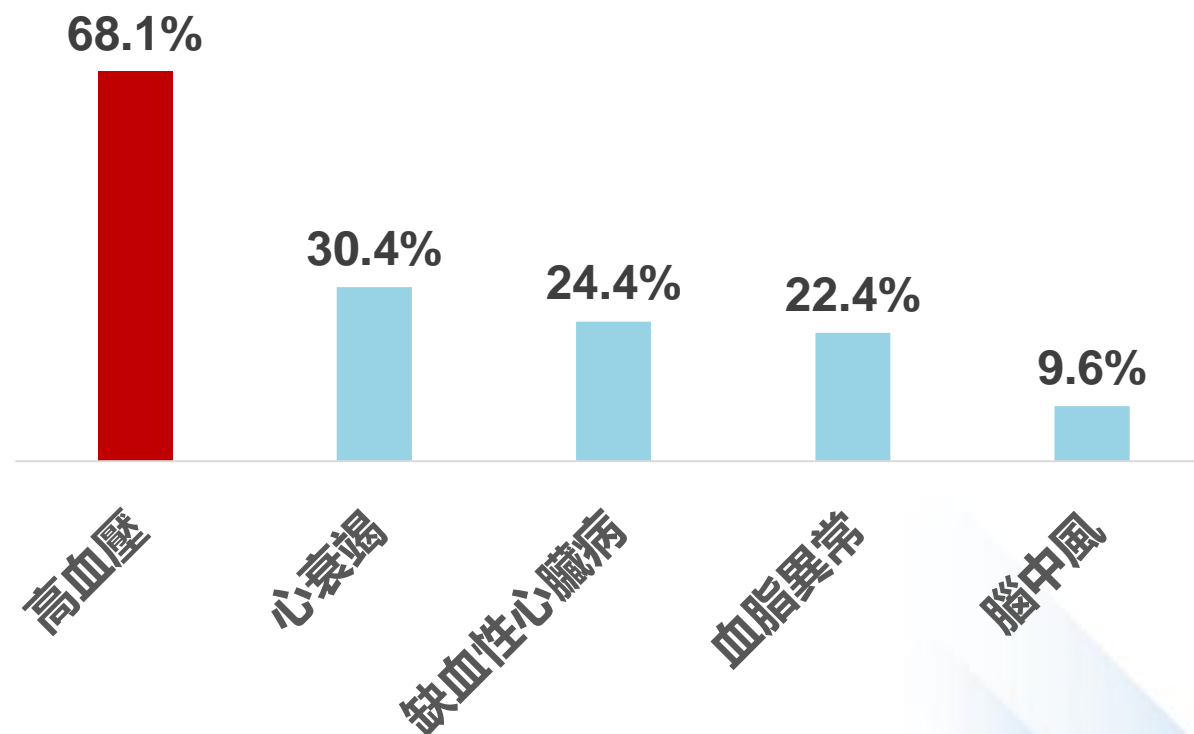


糖尿病、高血壓為末期腎臟病風險主要風險

Age-standardized global prevalence rate of CKD by cause per 100,000 persons in 2016¹

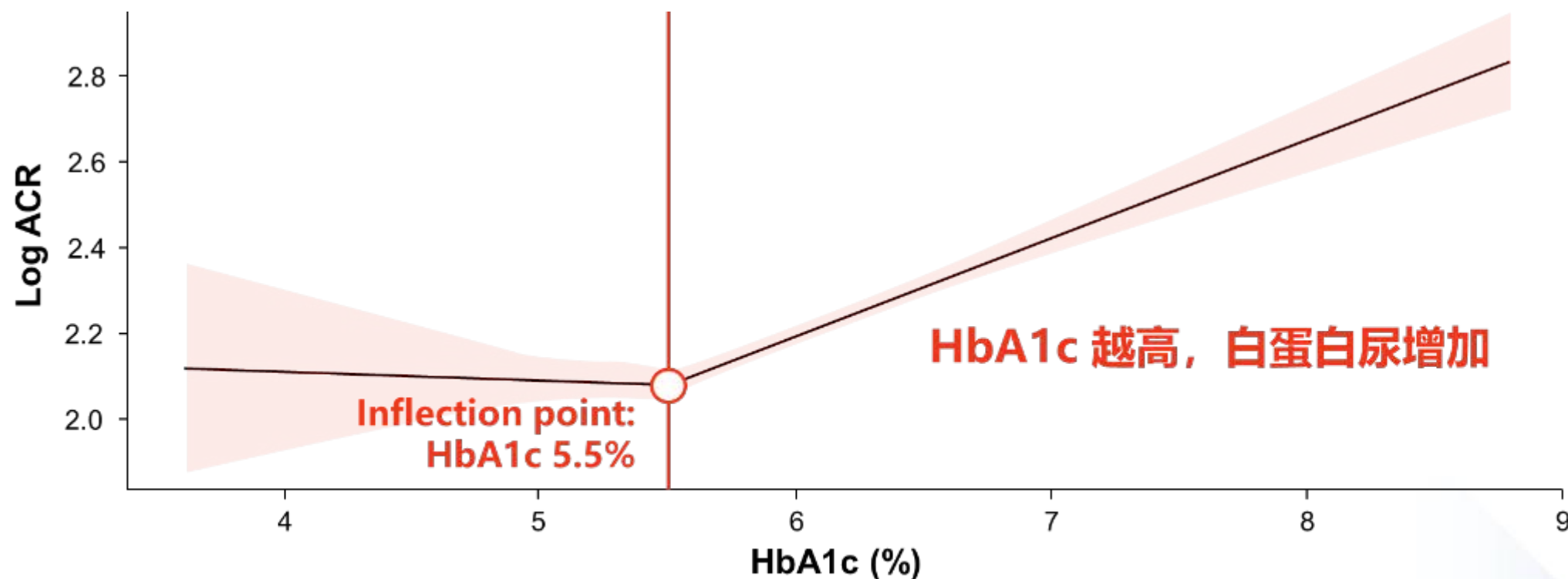


2021 台灣腎病年報伴隨相關共病情況



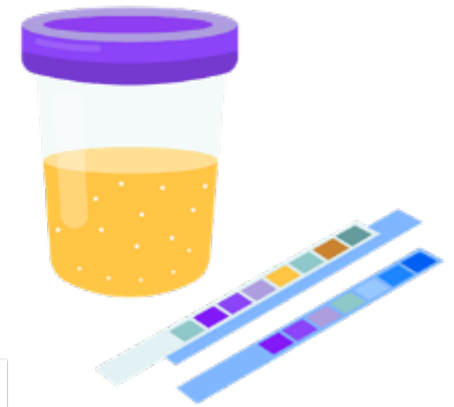
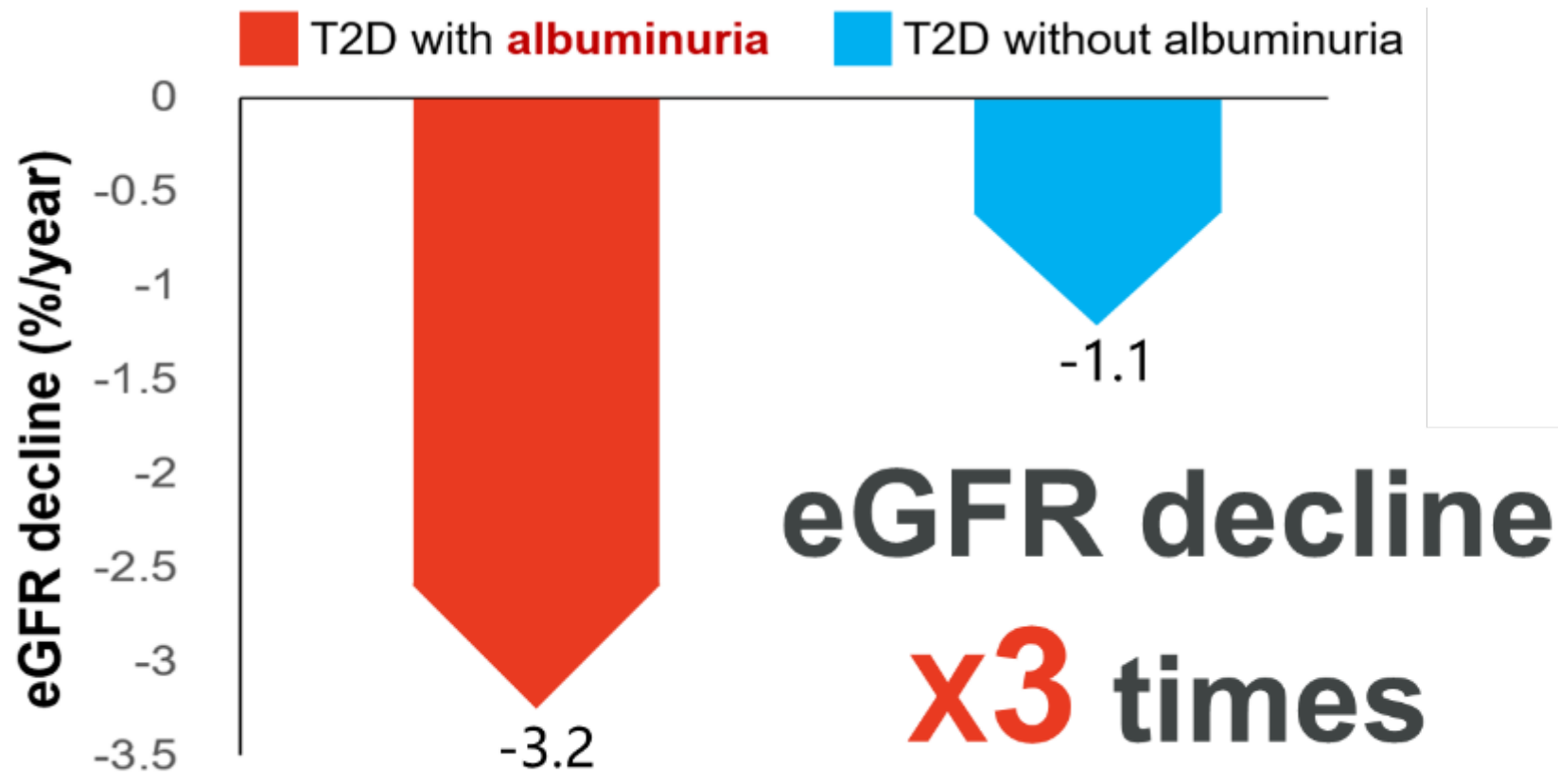


REACTION study亞洲T2D患者： 觀察到A1c越高，白蛋白尿增加



- The relationship between blood glucose and albuminuria was modeled using linear and logistic regression in the REACTION study cohorts (N= 8932).
- REACTION study: A cross-sectional study assess cancer risk and related risk factors in Chinese diabetic population.

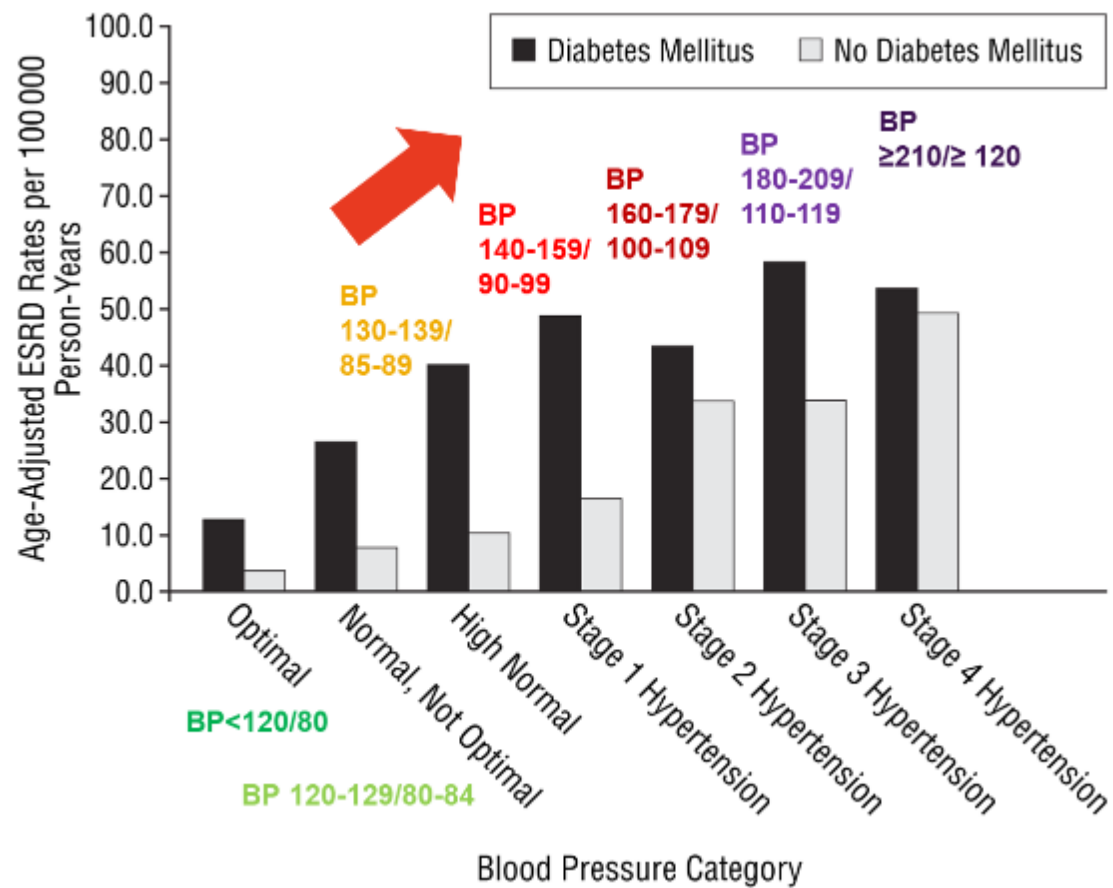
已出現白蛋白尿的糖尿病患者：腎功能3倍速惡化



10,185 participants with type 2 diabetes enrolled in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) study
CKD was defined as eGFR<60 mL/min/1.73 m², albuminuria was defined as a UACR<30 mg/g; Diabetes Care 2019 Oct; dc191438.



Rate for ESRD by BP and DM

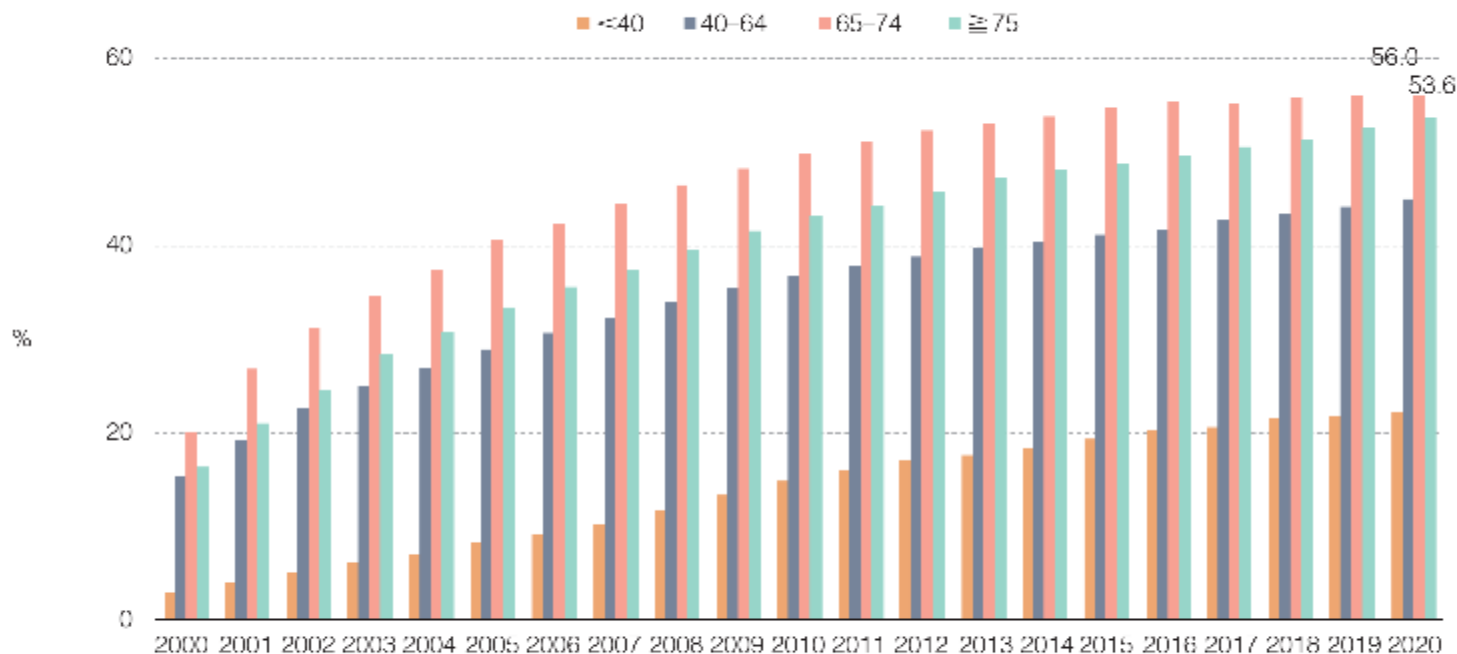




2022台灣腎病年報

透析患者有糖尿病比率逐年增加，2020年達49.6%

圖26 透析盛行患者有糖尿病比率(%) (依年齡別)



註：糖尿病以盛行前一年度之門、住診任一診斷欄位為判斷依據，且符合住院1次或門急診2次以上的定義。糖尿病之ICD-9-CM與ICD-10-CM碼請參考方法學。

2020透析患者有糖尿病比率：
49.6%



2000透析患者有糖尿病比率：
15.0%



糖尿病與高血壓皆為HF高風險族群

ACC/AHA心衰竭分級

Stage D: Advanced HF

Marked HF symptoms that interfere with daily life and with recurrent hospitalizations despite attempts to optimize GDMT.

Stage C: Symptomatic HF

Structural heart disease with current or previous symptoms of HF.

Stage B: Pre-HF

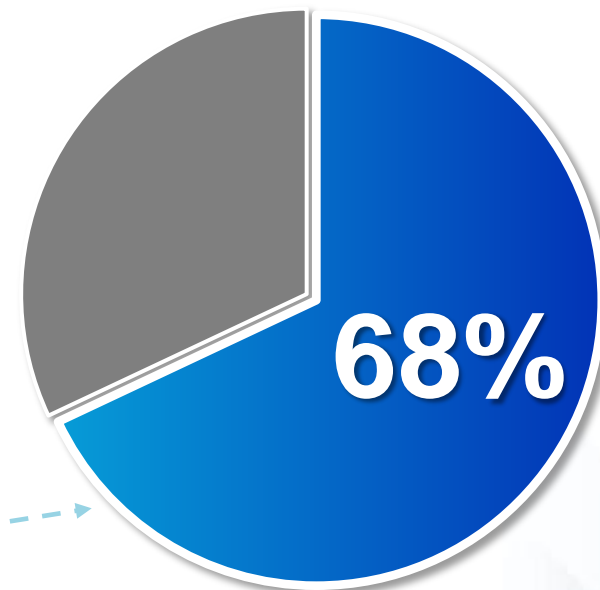
Structural heart disease, Evidence for increased filling pressures, patients with risk factors and Increased levels of B-type natriuretic peptides* or persistently elevated cardiac troponin

Stage A: At Risk for HF

hypertension, ASCVD, diabetes, metabolic syndrome and obesity, exposure to cardiotoxic agents, genetic variant for cardiomyopathy, or positive family history of cardiomyopathy

糖尿病與高血壓

68% 無心臟病史的糖尿病患
潛在左心室功能不全



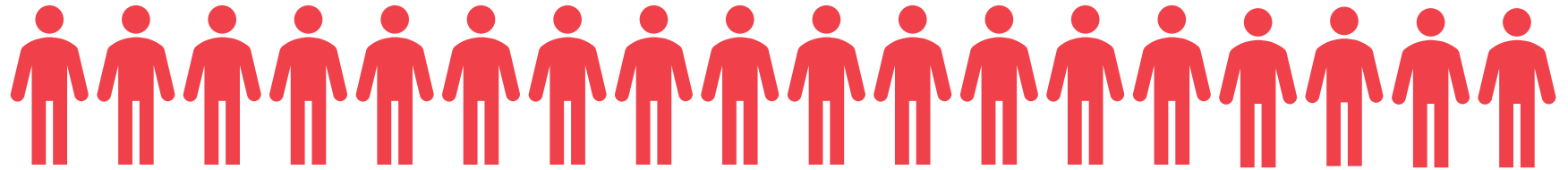
68% of T2D patients (n=386) without cardiac disease had **LV dysfunction** ~5 years after T2D diagnosis³

Presence of CKD is commonly associated with the development of fatal CV comorbidities

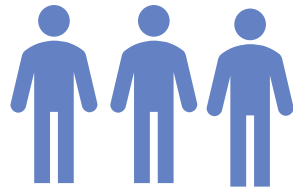
Older patients* with CKD are 6 times more likely to die of CV disease than to advance to ESKD and dialysis†



Deaths due to
CV disease

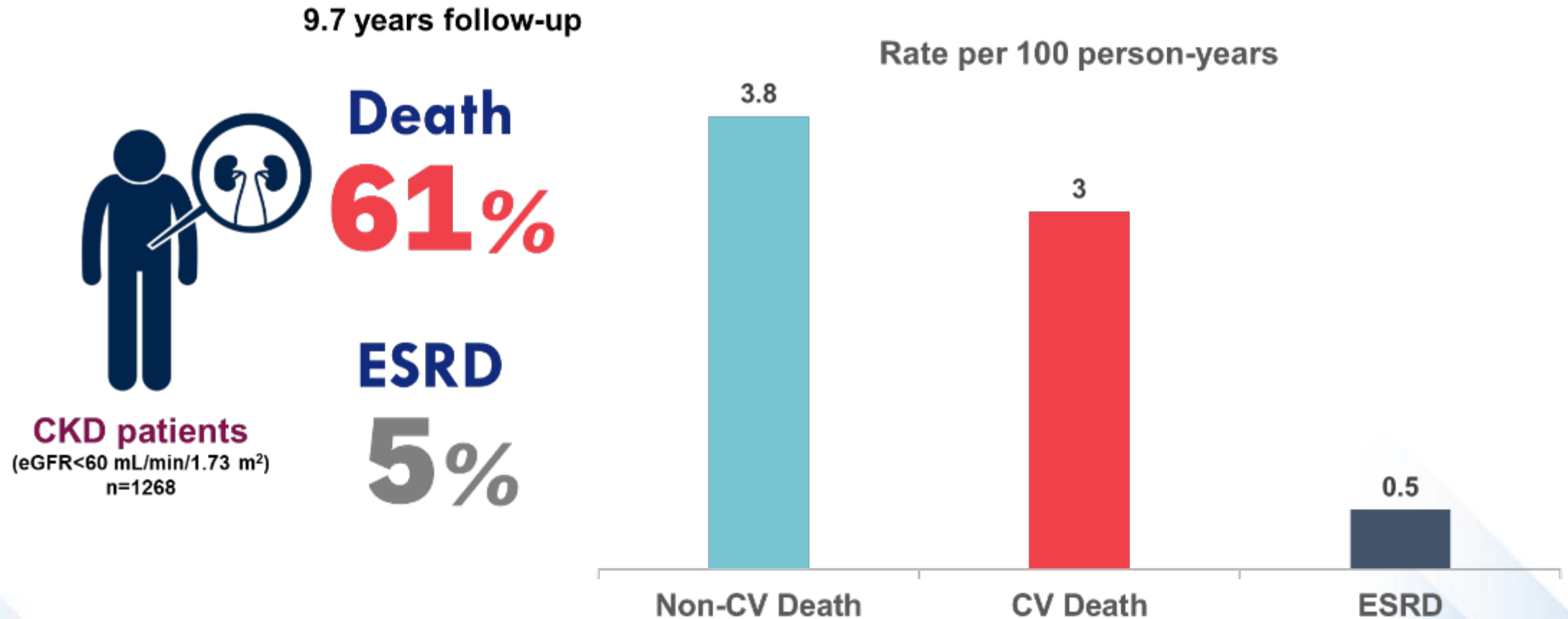


Progression to
ESKD/RRT



*≥65 years of age; †During 9.7 years of median follow-up
RRT, renal replacement therapy
Dalrymple L *et al.* *J Gen Intern Med* 2011;26:379

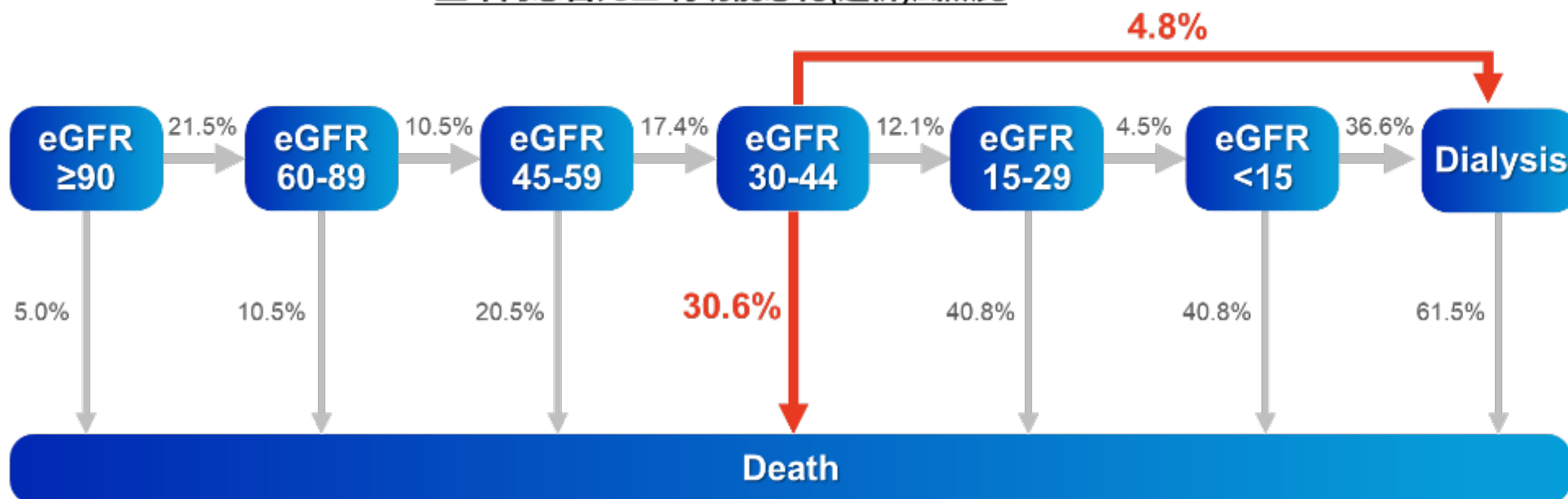
61% CKD患者於診斷後9.7年死亡





針對台灣eGFR<60 T2D患者
無論eGFR 分級，死亡風險皆遠高於洗腎風險

五年內患者死亡/腎功能惡化(透析)風險比

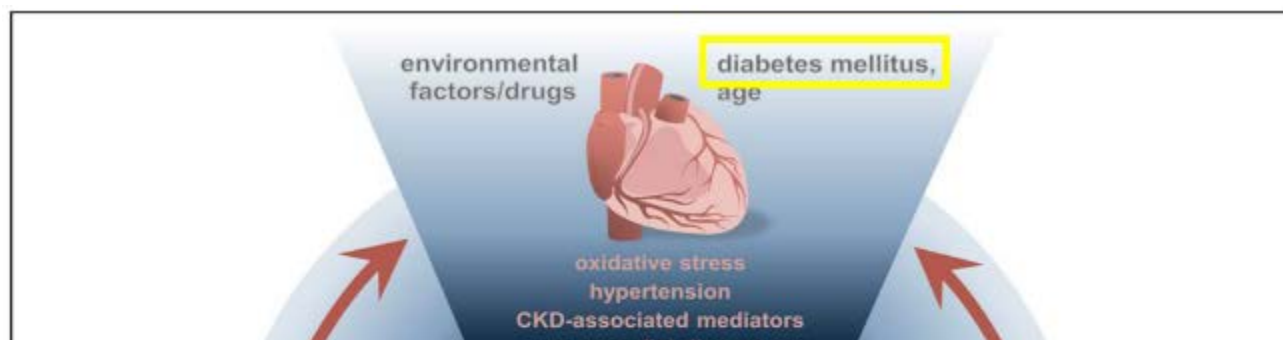


Stage 3B CKD患者
死亡風險較透析發生高





糖、心、腎間交互影響密切 全方位照護是更好的治療策略



預防勝於治療，建議使用具有心腎保護療效的藥物
及時護腎維持心臟功能

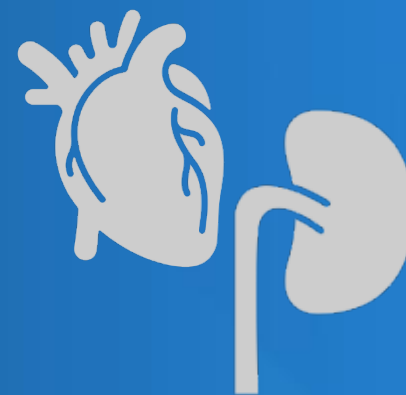


Figure 2. Interaction of cardiovascular disease (CVD) and chronic kidney disease (CKD).

Various mediators and mechanisms in vascular disease, heart failure, and CKD contribute to the progression of CVD and influence the prognosis of patients. PTM indicates post-translational modification.



心腎共病風險因子早期管理





風險篩檢：落實糖尿病患心腎風險篩檢執行



血糖
控制狀況？



腎功能
是否正常？



心衰竭
風險



2024年最新ADA糖尿病治療指引：CKD檢測建議

	檢測建議	證據等級
第2型糖尿病患者 	<u>無論治療情況如何</u> <u>每年</u> 至少檢測1次 <u>UACR</u> 和 <u>eGFR</u>	B
T2D合併CKD患者 	依據CKD分級 UACR和eGFR檢測頻率 提升至 <u>每年1~4次</u>	B



2022 糖尿病及初期慢性腎臟病照護整合方案： 年度追蹤3次eGFR和UARC

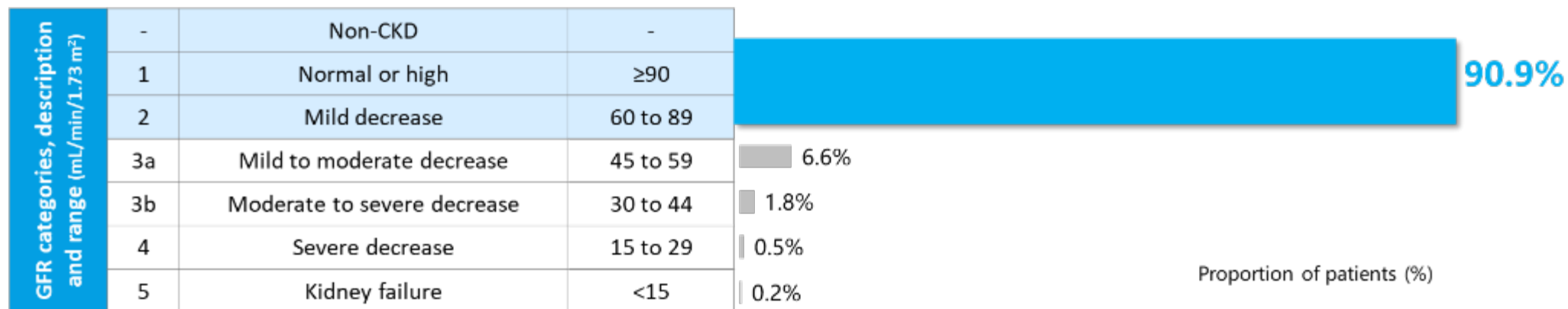
推動落實eGFR、UACR定期篩檢

收案類型		(1) 糖尿病	(2) 初期慢性腎臟病	(3) 糖尿病合併初期慢性腎臟病
項目	血液檢驗	HbA1c、Glucose(AC)、 醣化白蛋白 ¹	Serum CreatinineLDL、 HbA1c ²	HbA1c、Glucose(AC)、 醣化白蛋白 ¹ 、LDL、Creatinine
	腎功能檢驗	X	eGFR、UPCR	eGFR、UACR 、Urine Routine
	血壓	V	V	V
	CKD stage/抽菸	X	V	V
	單次追蹤管理點數	200點	200點	400點
	次數*	3	2	3

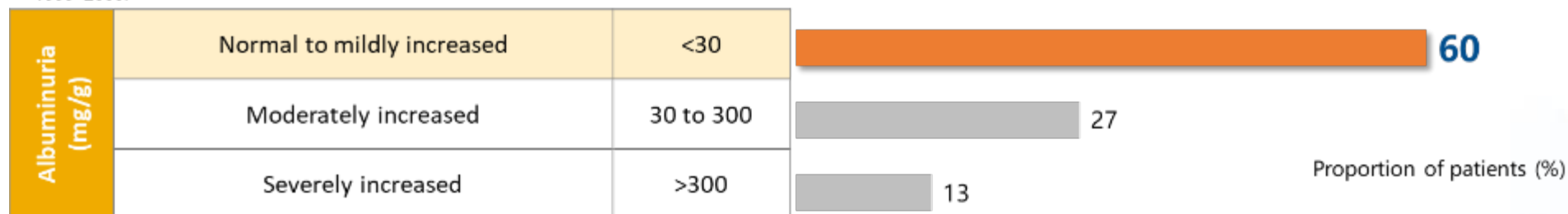
備註: 1.醣化白蛋白:無HbA1C檢驗者必填; 2.DM必要; *假設前一年已收案者, 年度最多申請次數



台灣T2D患腎功能狀態多為 eGFR \geq 60、UACR $<$ 30的早期階段



Study design: A prospective cohort study was designed with an integrated community-based multiple screening program of 106,094 individuals aged ≥ 20 years in Keelung, Taiwan, in 1999–2009.

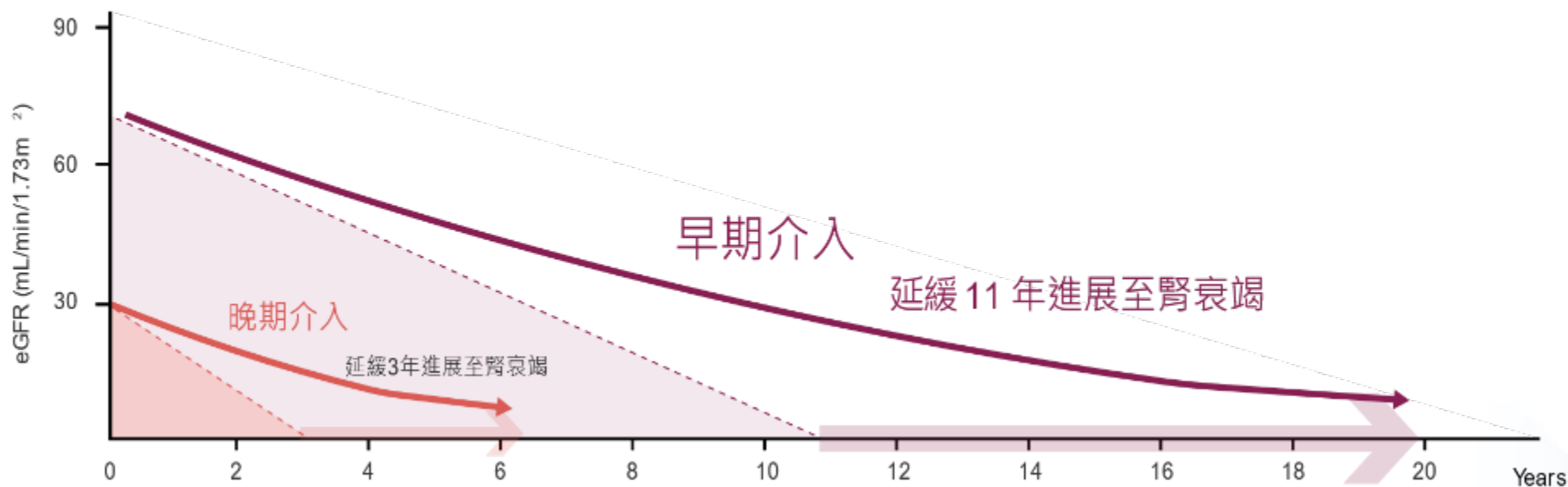


Study design: A total of 1069 type 2 diabetic patients were recruited in this cross-sectional study and they were stratified according to urinary albumin excretion rate.



早期診斷與及時介入是延緩糖尿病腎病變惡化的關鍵

早期治療介入更可延緩腎病變的進展¹⁻³



此為推估模型，並非臨床真實案例

1. Alabama Department of Public Health. Special Task Force on Chronic Kidney Disease report. April 2007. (Accessed Dec 2022.);
2. Shlipak MG et al. Kidney Int. 2021;99:34-47.;
3. Gohda T, et al. Int J Mol Sci. 2022 Nov 9;23(22):13749.



2022年ADA/ACC HF 共識報告： 心衰竭被低估的糖尿病併發症

糖尿病易併發心衰竭

糖尿病族群有
22%合併心衰竭



糖尿病併發心衰竭
盛行率**逐年上升**

過去常被輕忽

心衰竭可能出現在
沒有心血管併發症之糖尿病患者



心血管併發症：
高血壓、冠心病、瓣膜疾病等

雙向共病關係

心衰竭族群有**>60%**
合併**胰島素阻抗**



心衰竭患者常合併
新發生糖尿病



2022年ADA/ACC HF 共識報告： 糖尿病患者應每年檢查**心衰竭Biomarkers**

重點整理



糖尿病患者尚未出現心血管併發症，可能會發展出**左心室收縮或舒張功能異常**，被稱作**糖尿病心肌病**

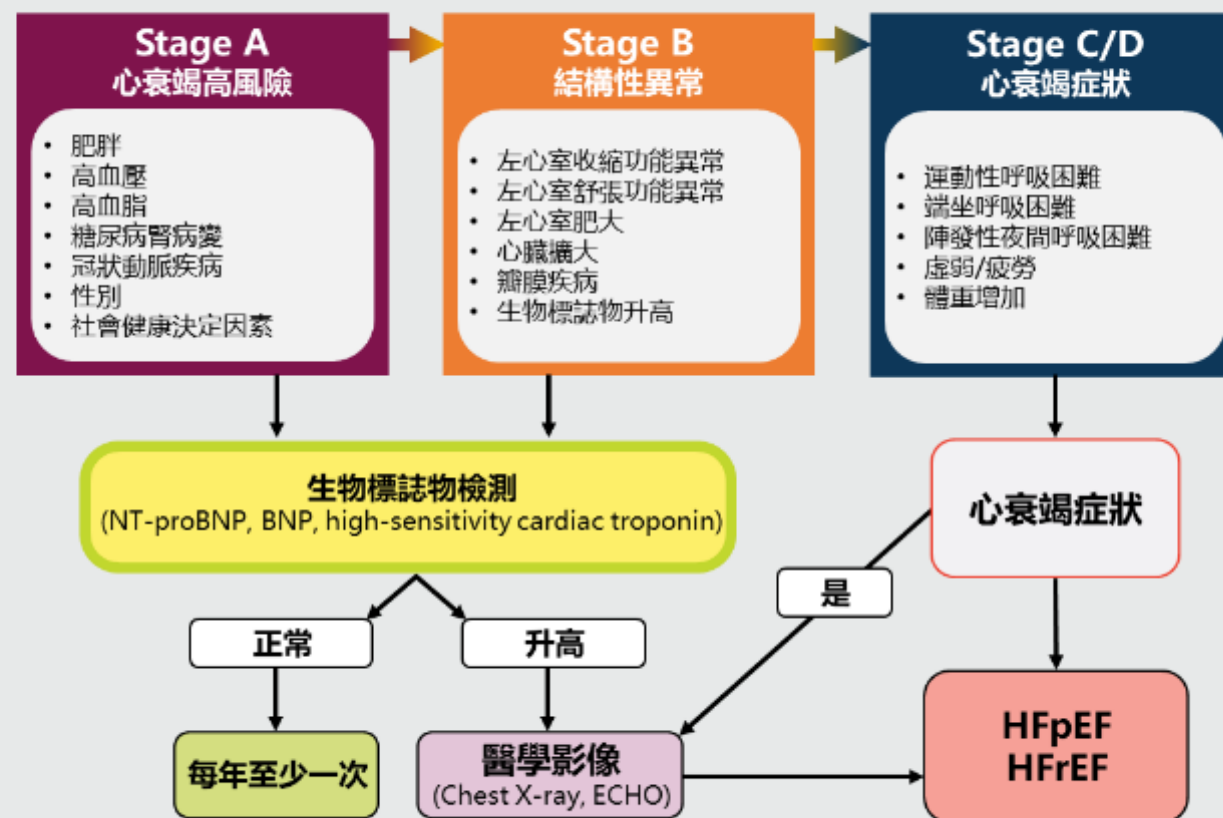


糖尿病患者具**心衰竭風險因子**，列為心衰竭**Stage A**，具**結構性異常**，則列為心衰竭**Stage B**



建議每年進行**至少一次NT-proBNP**檢測，診斷患者是否為心衰竭**Stage B**，並確認**心衰竭症狀**進展風險

根據步驟進行心衰竭篩檢與診斷

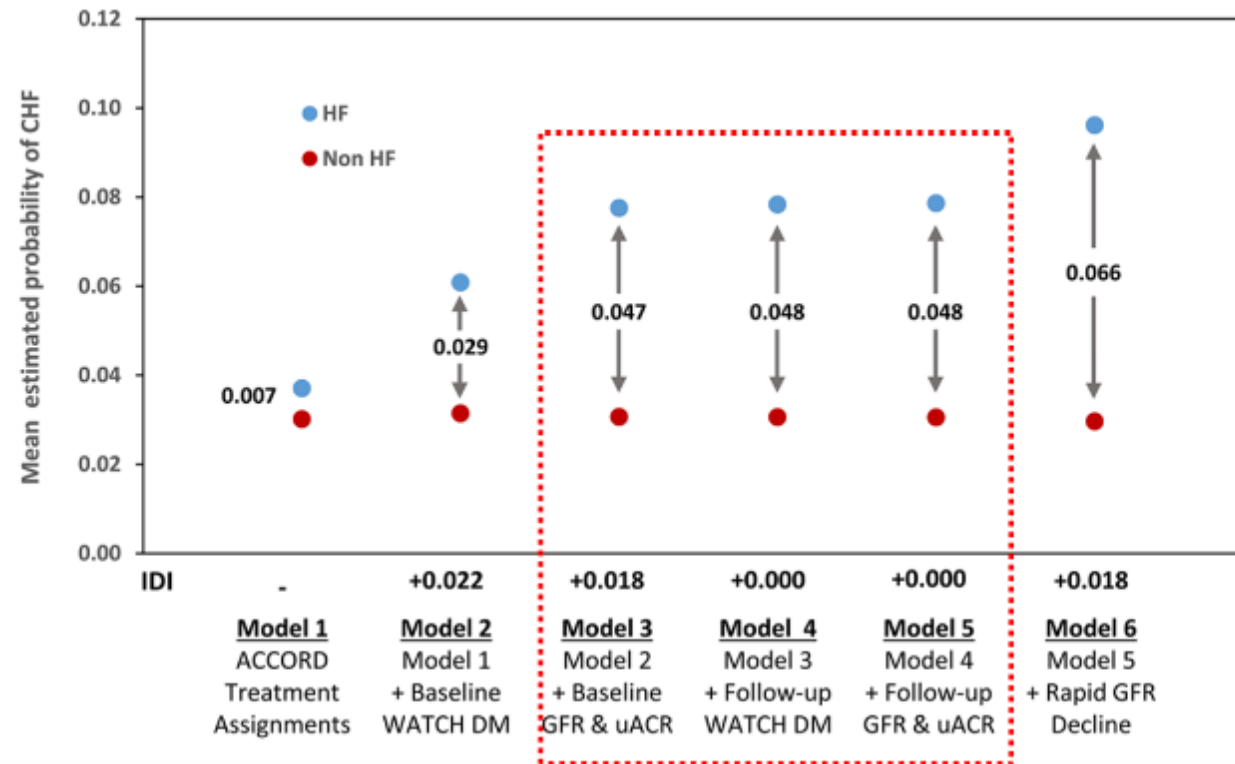




2024年ADA糖尿病指引最新建議： 不論有無心衰竭症狀，應檢查**心衰竭Biomarkers**



蛋白尿與腎功能監控有助心衰竭發現



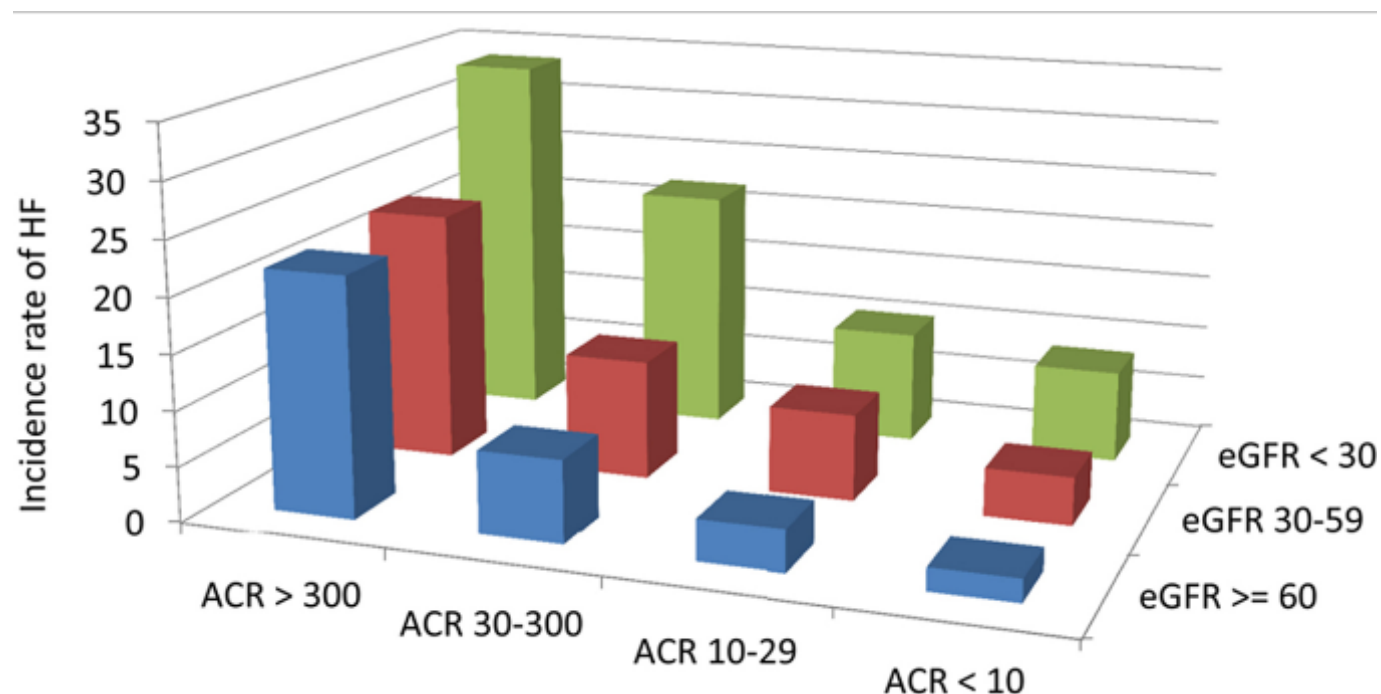
Mean estimated probabilities of HF in ACCORD participants with and without a HF event as estimated by predictive models of increasing complexities.

- Blue symbols represent the mean estimated probabilities of HF among participants who experienced a HF event during follow-up; Red symbols represent the mean estimated probabilities among participants who did not experience a HF event.
- The numbers between the arrows are the differences between estimated probabilities in participants who experienced a HF event and those who did not (also known as “discrimination slopes”).



蛋白尿分期越高、腎功能越差增加心衰竭風險

Worse eGFR and albuminuria links to higher incidence of heart failure



median follow-up of 9.2 years, 881 incident HF events (332 preserved ejection fraction, 447 reduced ejection fraction, 102 unspecified) were observed.



心衰竭具相當高的住院率與死亡率

疾病負擔高

心衰竭影響全球

近6400萬人¹

住院率高

65歲以上患者住院原因

心衰竭佔第一位³

死亡率高

HF患者五年內死亡率

高達50%⁵

早期診斷與及時介入是預防心腎共病的關鍵

台灣每年心衰就診

近24萬人²

平均住院天數長達17天⁴



隨每次HF再住院

死亡風險不斷升高⁶

1. Eur J Heart Fail. 2020 Aug;22(8):1342-1356.

2. 109年度全民健康保險醫療統計年報

3. Cowie MR, et al. ESC Heart Fail. 2014;1(2):110-145.

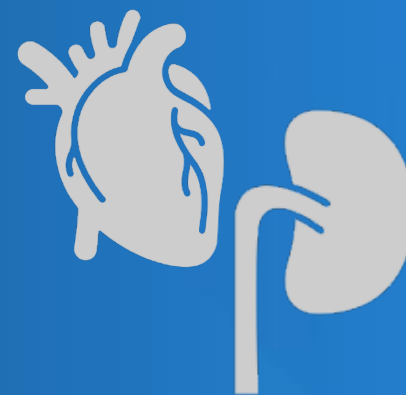
4. ESC Heart Fail . 2020 Dec;7(6):3653-3666.

5. Eur J Heart Fail . 2019 Nov;21(11):1306-1325.

6. Setoguchi S, et al. Am Heart J. 2007;154(2):260-266.



心腎共病預防之臨床實證



2023 最新ESC和ESH兩大指引 糖尿病和高血壓患者，建議使用SGLT2i降低心腎風險



ESC
European Society of Cardiology

Recommendation Table 4 - Recommendations for the prevention of heart failure in patients with type 2 diabetes mellitus and chronic kidney disease

Recommendation	Class ^a	Level ^b
New In patients with T2DM and CKD , SGLT2 inhibitors (dapagliflozin or empagliflozin) are recommended to reduce the risk of HF hospitalization or CV death. ^{5,7,35}	I	A



ESH
European Society of Hypertension

18. HYPERTENSION AND DIABETES MELLITUS
Treatment strategies in diabetes

Recommendations and Statements	Class ^a	Level ^b
New SGLT2is are recommended to reduce cardiac and kidney events in type 2 diabetes	I	A



2022 AHA/ACC/HFSA 治療指引建議 強調 SGLT2i 從 HF 預防到治療的全光譜角色

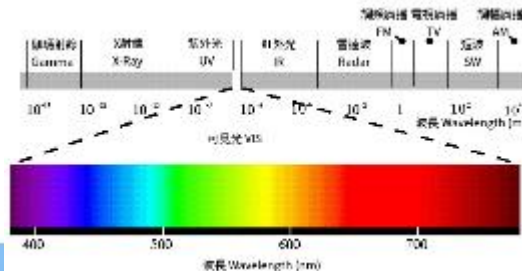
CLINICAL PRACTICE GUIDELINE: FULL TEXT

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

A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines



SGLT2i 從 HF 預防到治療的全光譜角色



GDMT of major medication classes	Stage A At-Risk for Heart Failure	Stage B Pre-Heart Failure	Stage C & D Stage C: Symptomatic Heart Failure & Stage D: Advanced Heart Failure		
			HFrEF LVEF $\leq 40\%$	HFmrEF LVEF 41-49%	HFpEF LVEF $\geq 50\%$
	SGLT2i in pts with DM (1)	SGLT2i in pts with DM (1)	ARNi in NYHA II-III; ACEi or ARB in NYHA II-IV (1)	Diuretics, as needed (1)	Diuretics, as needed (1)
		ACEi (1)	Beta blocker (1)	SGLT2i (2a)	SGLT2i (2a)
		ARB if ACEi intolerant (1)	MRA (1)	ACEi, ARB, ARNi (2b)	ARNi (2b)
		Beta blocker (1)	SGLT2i (1)	MRA (2b)	MRA (2b)
			Diuretics, as needed (1)	Beta blocker (2b)	ARB (2b)
			Hydral-nitrates for NYHA III-IV, in African American pts (1)		



2024 KDIGO CKD治療指引更新: SGLT2i納入一線治療



2024 KDIGO治療指引
建議等級/證據等級¹

CKD患者



證據等級

治療建議

建議3.7.1:
CKD合併T2D且eGFR \geq 20ml/min/1.73m²的成人患者*

1A

建議3.7.2:
CKD合併心衰(無論蛋白尿狀態)
或
eGFR \geq 20ml/min/1.73m²+UACR \geq 200 mg/g 的成人患者**

1A

建議3.7.3:
成人eGFR \geq 20- 45ml /min /1.73m²+UACR < 200 mg/g

2B

推薦使用
SGLT2i

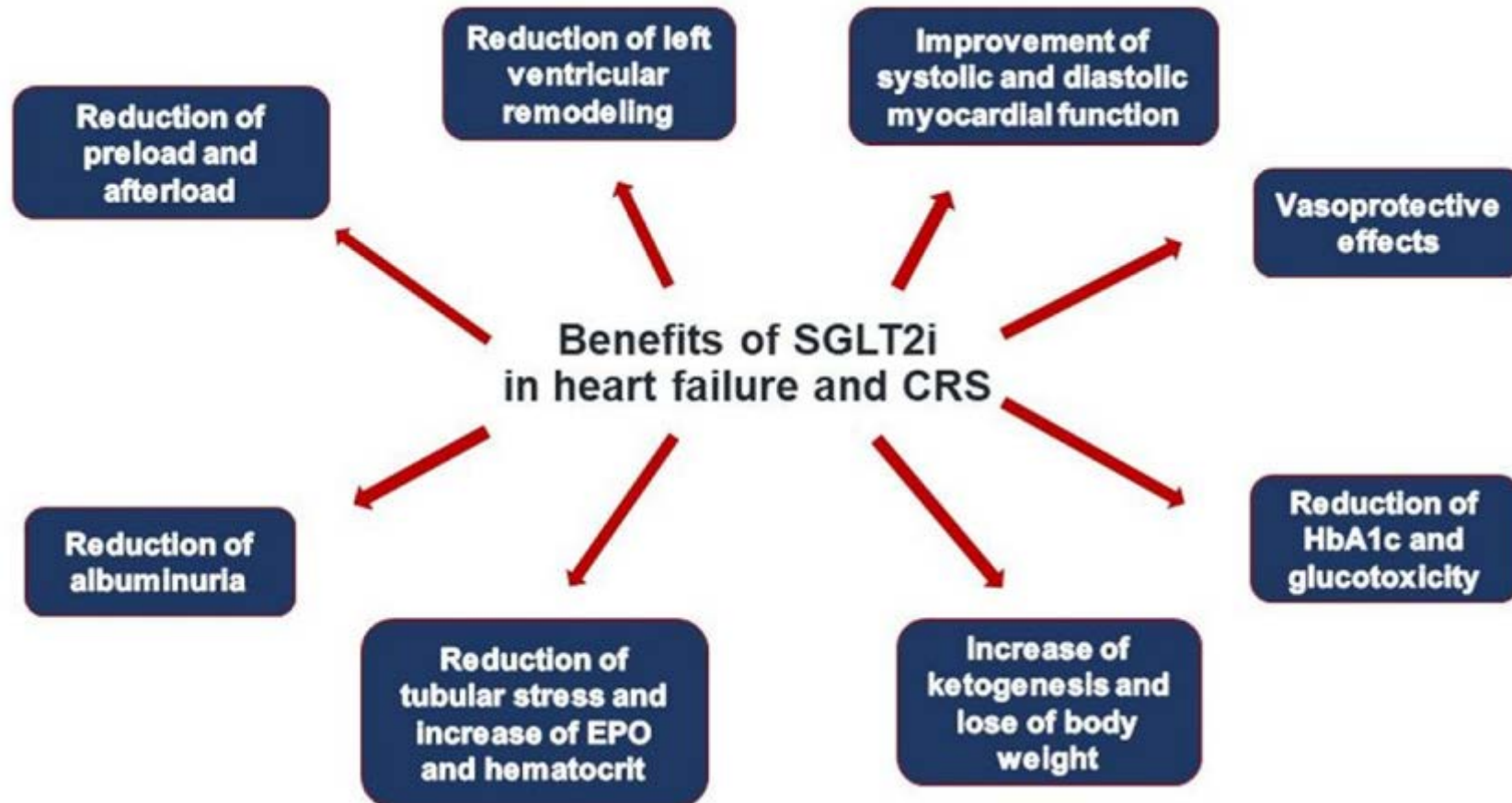
*臨床觀點 3.7.1: 一旦起始使用SGLT2i，即使eGFR < 20 ml/min per 1.73 m²，繼續使用也是合理的，除非患者無法耐受或開始使用腎臟替代治療(透析)

臨床觀點 3.7.2: 在長時間禁食、手術或身處重大醫療疾病治療期間，暫停SGLT2i是合理的 (患者可能有較高的酮症風險)

**臨床觀點 3.7.3: 使用SGLT2i並不需要改變CKD監測的頻率，而起始治療時可逆的eGFR下降通常並不能視為停止治療的指標

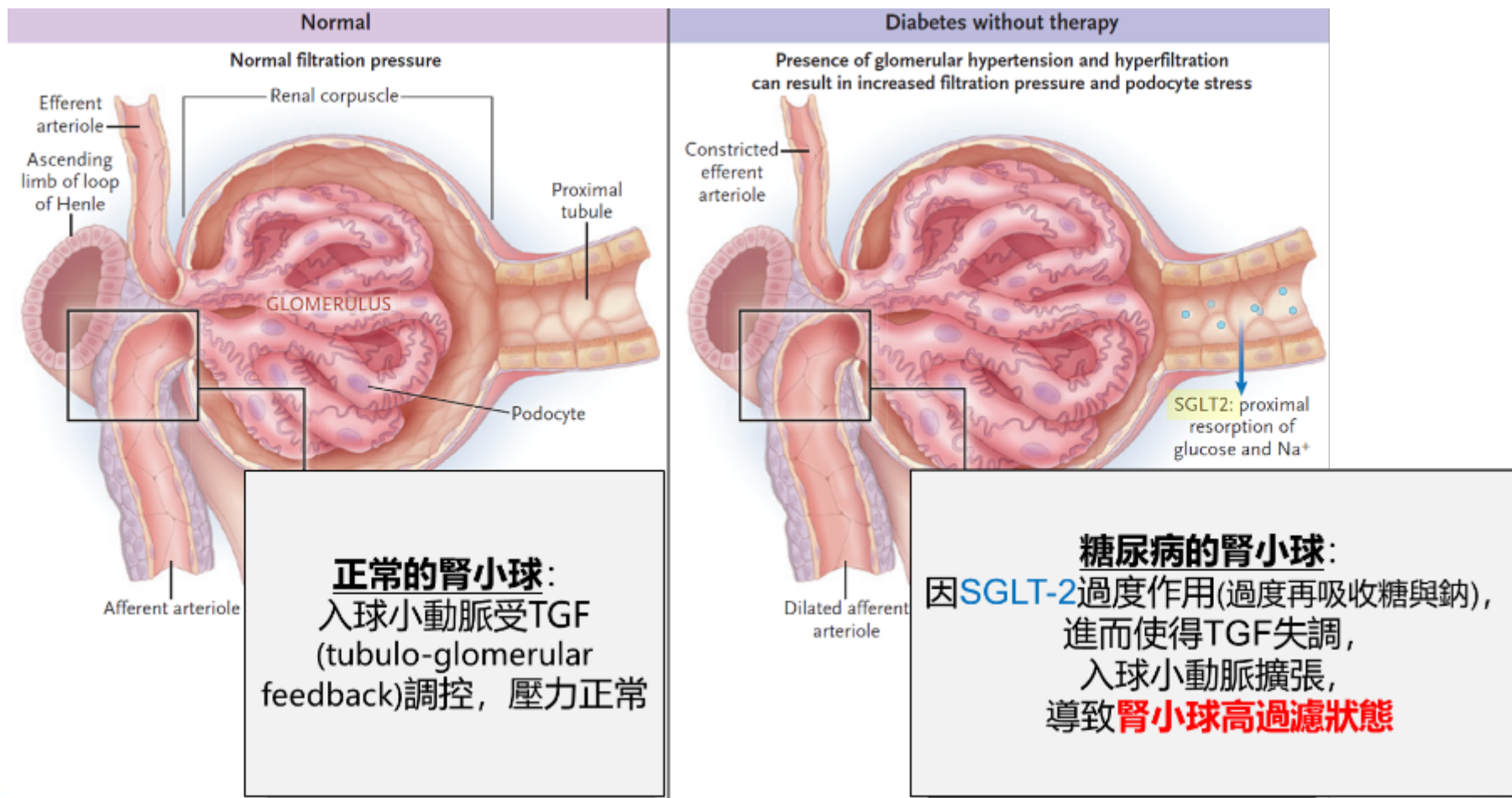
eGFR小於25: Dapagliflozin針對此類病人不建議起始治療，然而Forxiga治療後，eGFR降低至小於25 mL/min/1.73 m²的透析前病人，可持續使用以降低eGFR下降、ESKD、心血管死亡和心衰竭住院的風險。

SGLT2 Inhibitors: An Emerging Therapeutic Tool in CRS

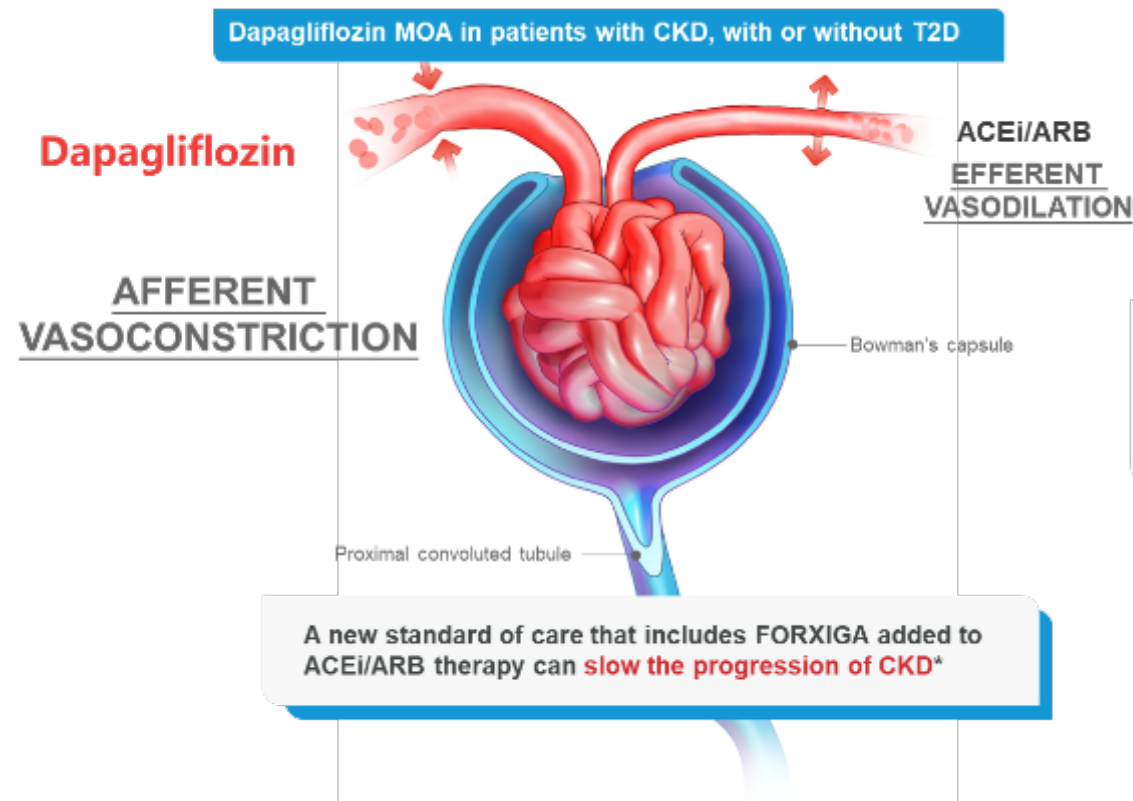




SGLT-2過度作用導致腎小球高過濾狀態



Dapagliflozin保護腎臟機轉-降低腎小球高壓



The primary FORXIGA mechanism for preserving renal function is **not** dependent on the blood glucose-lowering effect and **not** limited to patients with T2D

*Based on results of the primary composite endpoint in DAPA-CKD (39% RRR [5.3% ARR] in CKD progression, ESKD, and renal or CV death [HR 0.61; 95% CI, 0.51, 0.72; p=0.001]).

ACEi = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; ARR = absolute risk reduction; CI = confidence interval; CKD = chronic kidney disease; CV = cardiovascular; DAPA-CKD = Dapagliflozin And Prevention of Adverse outcomes in Chronic Kidney Disease; ESKD = end-stage kidney disease; HR = hazard ratio; MOA = mechanism of action; RRR = relative risk reduction; T2D = Type 2 diabetes.

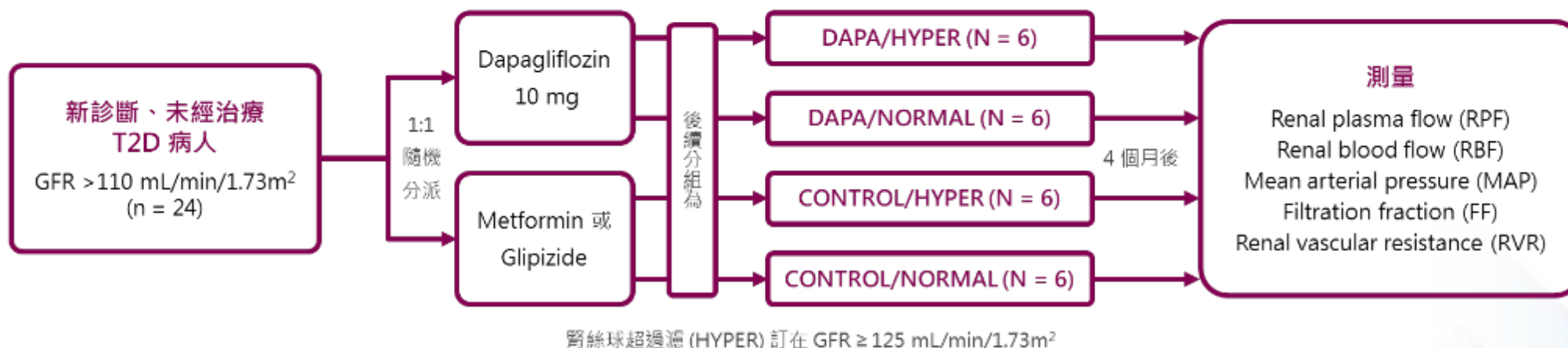
1. Circulation. 2016;134(10):752–772. 2. Lancet Diabetes Endocrinol. 2020;8(7):582–593. 3. N Engl J Med. 2020;383(15):1436–1446. 4. FORXIGA仿單



小型真實世界研究: Dapagliflozin 有助改善 T2D 患者高過濾狀態，達到腎臟保護

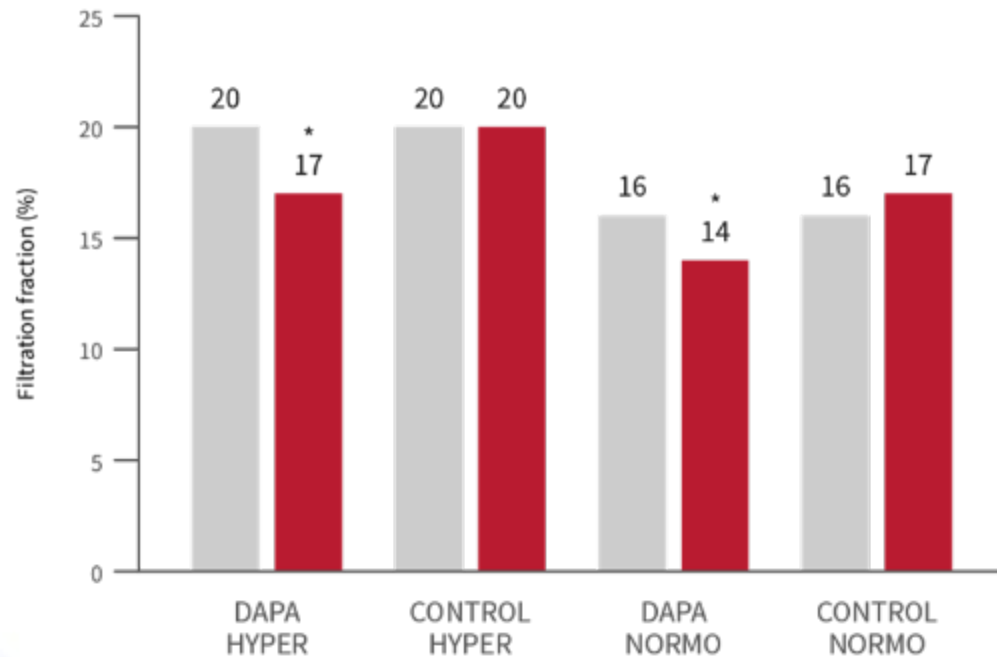
DKD 的自然病程從早期腎絲球超過濾開始，近期 SGLT2i 被證實可延緩 DKD，然而其降低腎絲球壓力的效果是來自於調節入球小動脈收縮、出球小動脈擴張，或兩者皆有，則未有定論。本研究假設 SGLT2i 主要是透過調節出球小動脈擴張以達到降低超過濾的效果。

研究設計

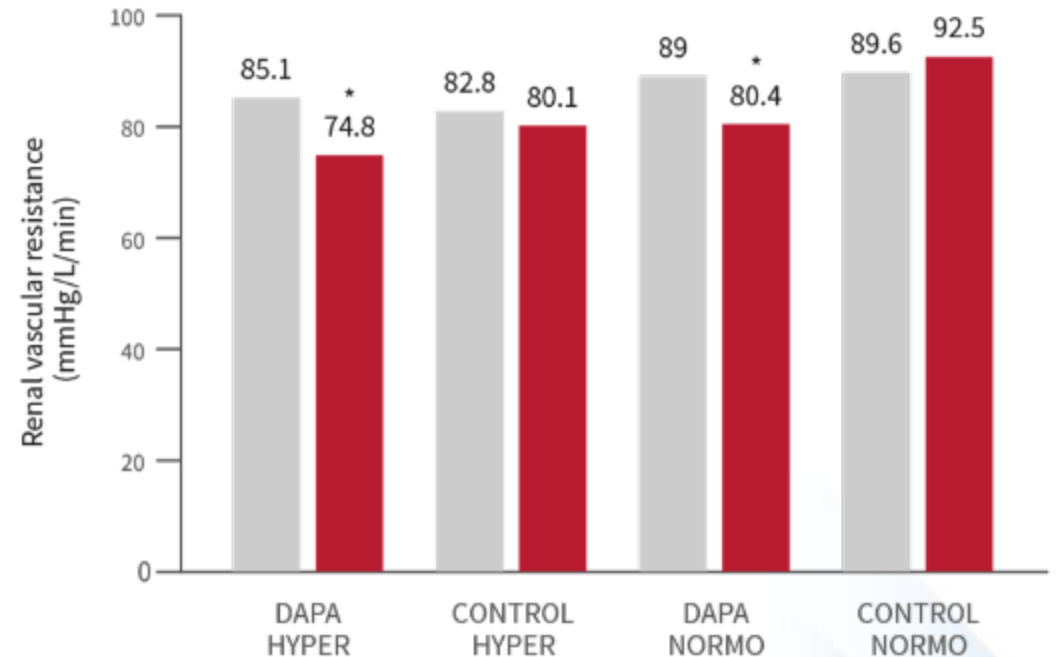


Dapagliflozin腎血管阻力與 Filtration Fraction顯著下降 建議及早使用SGLT2i延緩糖尿病腎病惡化

Filtration Fraction



Renal Vascular Resistance



腎絲球超過濾 (HYPER) 訂在 $GFR \geq 125 \text{ mL/min/1.73m}^2$ * = $p < 0.05$ vs CON/HYPER & CON/NORMO

24 T2D patients (Drug naïve or treated with metoformin or glipizide) with $GFR > 110 \text{ mL/min/1.73m}^2$, measured with iohexol clearance were randomized to dapagliflozin 10 mg/day or metformin/glipizide

T2D: Type 2 diabetes; DKD: Diabetic kidney disease; SGLT2i: Sodium-glucose cotransporter 2 inhibitors; GFR: Glomerular filtration rate; DAPA: Dapagliflozin.

Diabetes 2023;72(Supplement_1):887-P



SGLT2i初期預防實證

	EMPA-REG (2015)	CANVAS (2017)	DECLARE-TIMI 58 (2019)	VERTIS-CV (2020)
藥物 (劑量)	Empagliflozin (10, 25 mg)	Canagliflozin (100, 300 ^a mg)	Dapagliflozin (10 mg)	Ertugliflozin (5, 15 mg)
收錄族群	100% ASCVD	65.6% ASCVD 34.4 MRF	40.6% ASCVD 59.4% MRF	100% ASCVD
多重風險因子族群(MRF) 收錄條件	NA	≥50 yrs with ≥2 additional risk factors: Dyslipidemia, Hypertension, Current smoking, microalbuminuria /macroalbuminuria DM duration ≥ 10 yrs	Men ≥55 yrs ,Women ≥60 yrs AND ≥1 additional risk factors: Dyslipidemia, Hypertension, Current smoking	NA
收錄人數, n	7,020	10,142	17,160	8,246
追蹤時間長度, 年 [中位數]	3.1	2.4	4.2	3.0
主要試驗終點	CV death, MI, stroke (MACE)	CV death, MI, stroke (MACE)	<ul style="list-style-type: none">CV death, MI, stroke (MACE)hHF or CV death	CV death, MI, stroke (MACE)



SGLT2i初期預防實證

	EMPA-REG (2015)	CANVAS (2017)	DECLARE-TIMI 58 (2019)	VERTIS-CV (2020)
藥物 (劑量)	Empagliflozin (10, 25 mg)	Canagliflozin (100, 300 ^a mg)	Dapagliflozin (10 mg)	Ertugliflozin (5, 15 mg)
收錄族群	100% ASCVD	65.6% ASCVD	40.6% ASCVD 59.4% MRF	100% ASCVD
多重風險因子族群 (收錄條件)		microalbuminuria /macroalbuminuria DM duration ≥ 10 yrs	Men ≥55 yrs , Women ≥60 yrs AND ≥1 additional risk factors: Dyslipidemia, Hypertension, Current smoking	NA
收錄人數, n	7,020	10,142	17,160	8,246
追蹤時間長度, 年 [中位數]			4.2	3.0
主要試驗終點			<ul style="list-style-type: none"> CV death, MI, stroke (MACE) hHF or CV death 	CV death, MI, stroke (MACE)

收案最符合廣大族群
六成為無合併ASCVD的DM患者

將hHF納入主要試驗終點
正視HF，跳脫血糖為中心的觀念

Please note that as head-to-head studies were not conducted between these products, cautions is required in the interpretation of the comparison as the study design, demographics and other criteria may be different between trials.

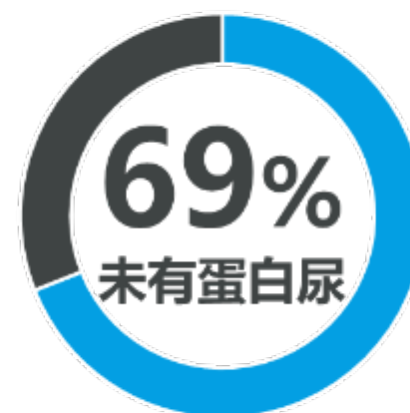
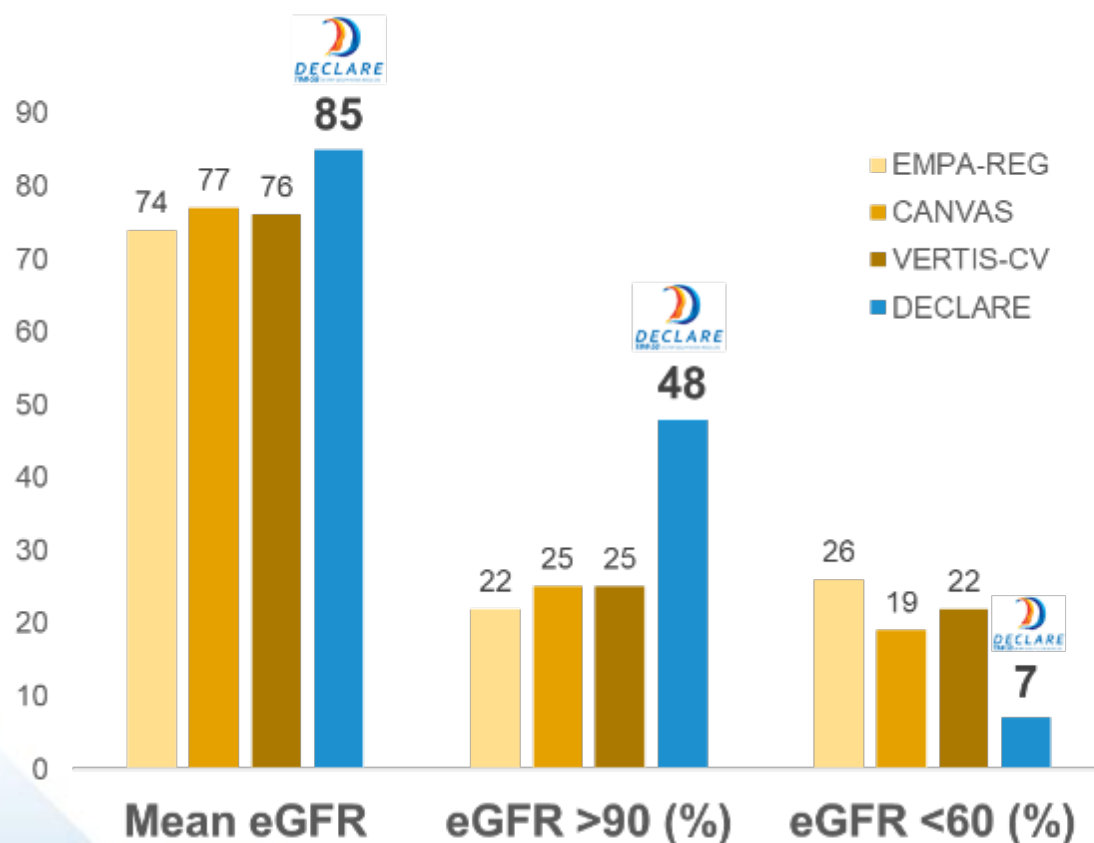
^a台灣目前只有100 mg劑量

1. Wiviott SD et al. N Engl J Med. 2019;380:347-357; 2. Neal B et al. N Engl J Med. 2017;377:644-657; 3. Zinman B et al. N Engl J Med. 2015;373:2117-2128. 4. N Engl J Med 2020;383:1425-35.



DECLARE收納腎功能良好族群 提供早期護腎強力實證

Renal Baseline Characteristics of SGLT2i Trails



■ UACR < 30 mg/g
■ UACR ≥ 30 mg/g



■ eGFR ≥ 60
■ eGFR < 60

Please note that as head-to-head studies were not conducted between these products, cautions is required in the interpretation of the comparison as the study design, demographics and other criteria may be different between trials.

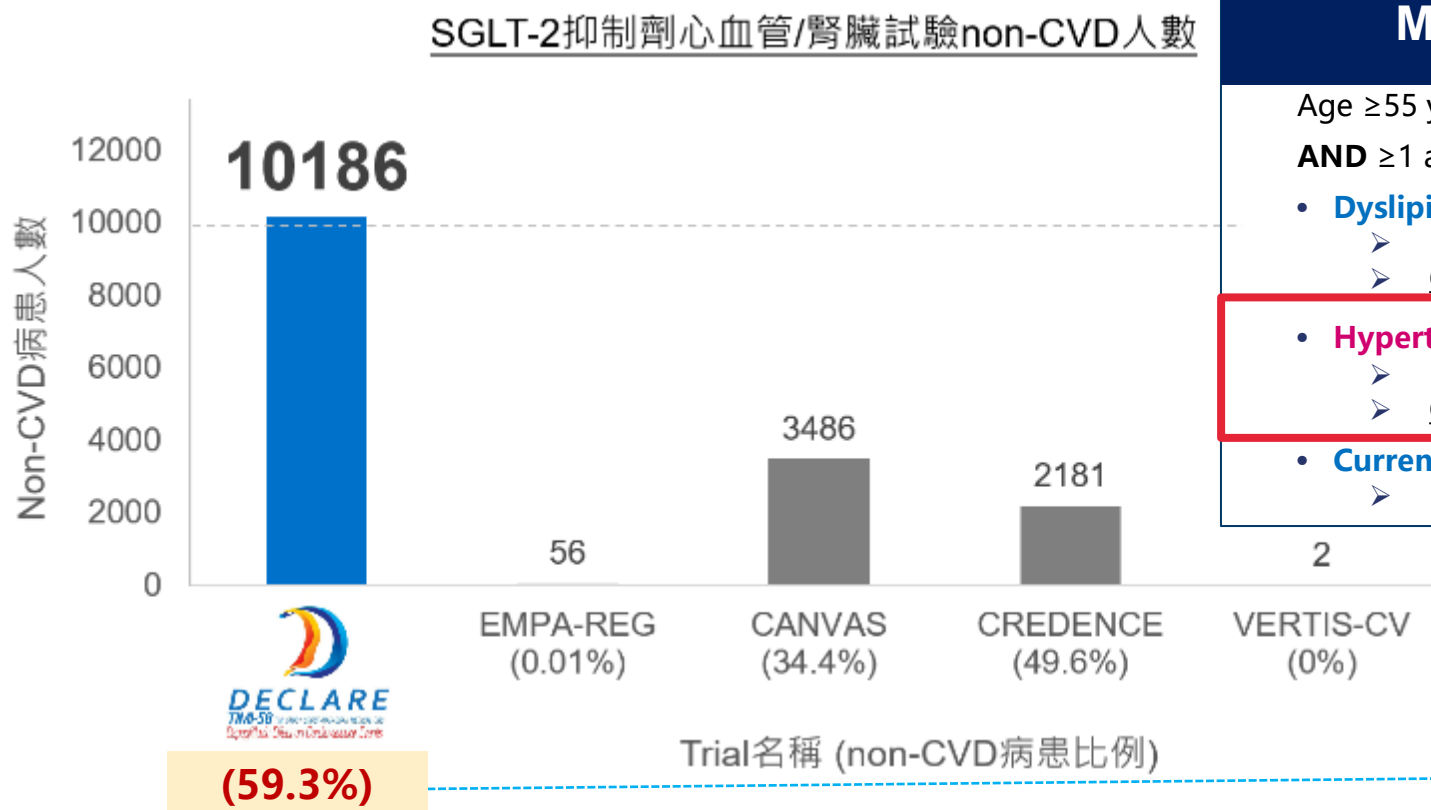
^a台灣目前只有100 mg劑量

1. Wiviott SD et al. N Engl J Med. 2019;380:347-357; 2. Neal B et al. N Engl J Med. 2017;377:644-657; 3. Zinman B et al. N Engl J Med. 2015;373:2117-2128. 4. N Engl J Med 2020;383:1425-35.



DECLARE

唯一non-CVD病患超過萬人的T2DM CVOT



Multiple Risk Factors

Age ≥ 55 years (men), ≥ 60 years (women)

AND ≥ 1 additional risk factors:

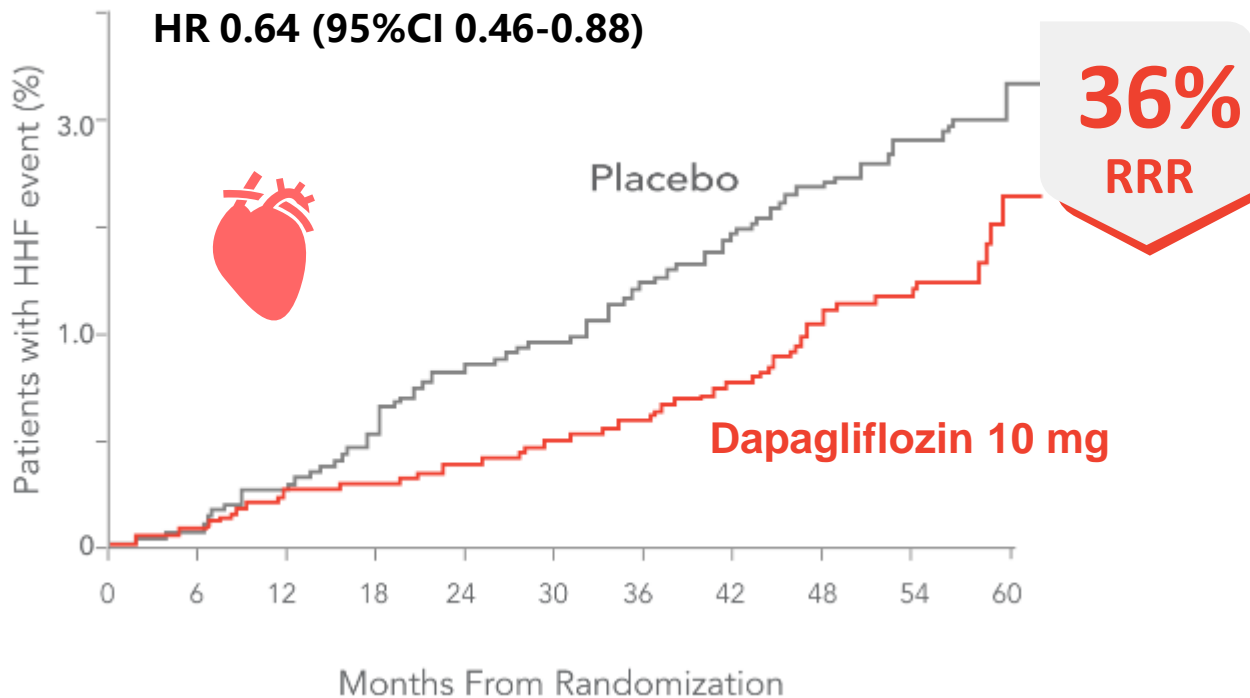
- **Dyslipidemia (73.9%)** (≥ 1 of following)
 - LDL-C > 130 mg/dL (> 3.36 mmol/L)
 - On lipid-lowering therapy
- **Hypertension (91.2%)** (≥ 1 of following)
 - BP $> 140/90$ mm Hg at enrolment
 - On antihypertensive therapy
- **Current smoking (14.4%)**
 - ≥ 5 cigarettes/day for ≥ 1 year

Dapagliflozin 治療 T2D 合併風險因子患者 可預防心衰竭住院和腎臟惡化



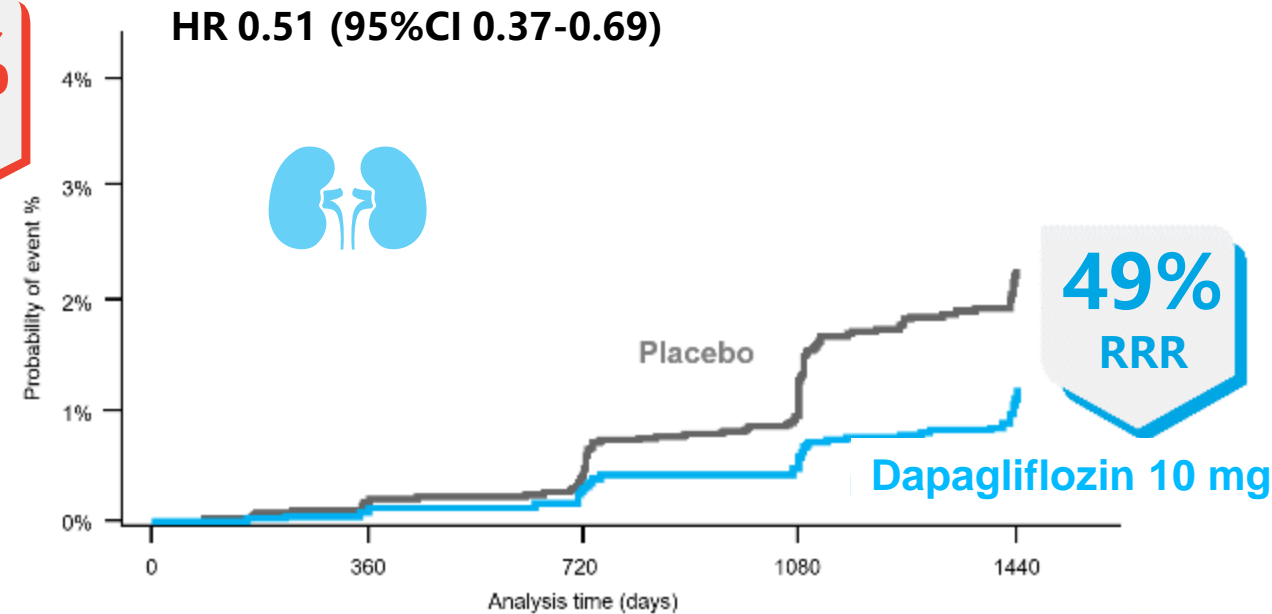
Analyses of **Primary Prevention** in patients with MRF From DECLARE-TIMI 58

Reduction in hHF



Reduction in renal-specific outcome

sustained $\geq 40\%$ eGFR decline to < 60 , ESKD, or renal death



MRF: multiple risk factors, hHF: hospitalization for heart failure

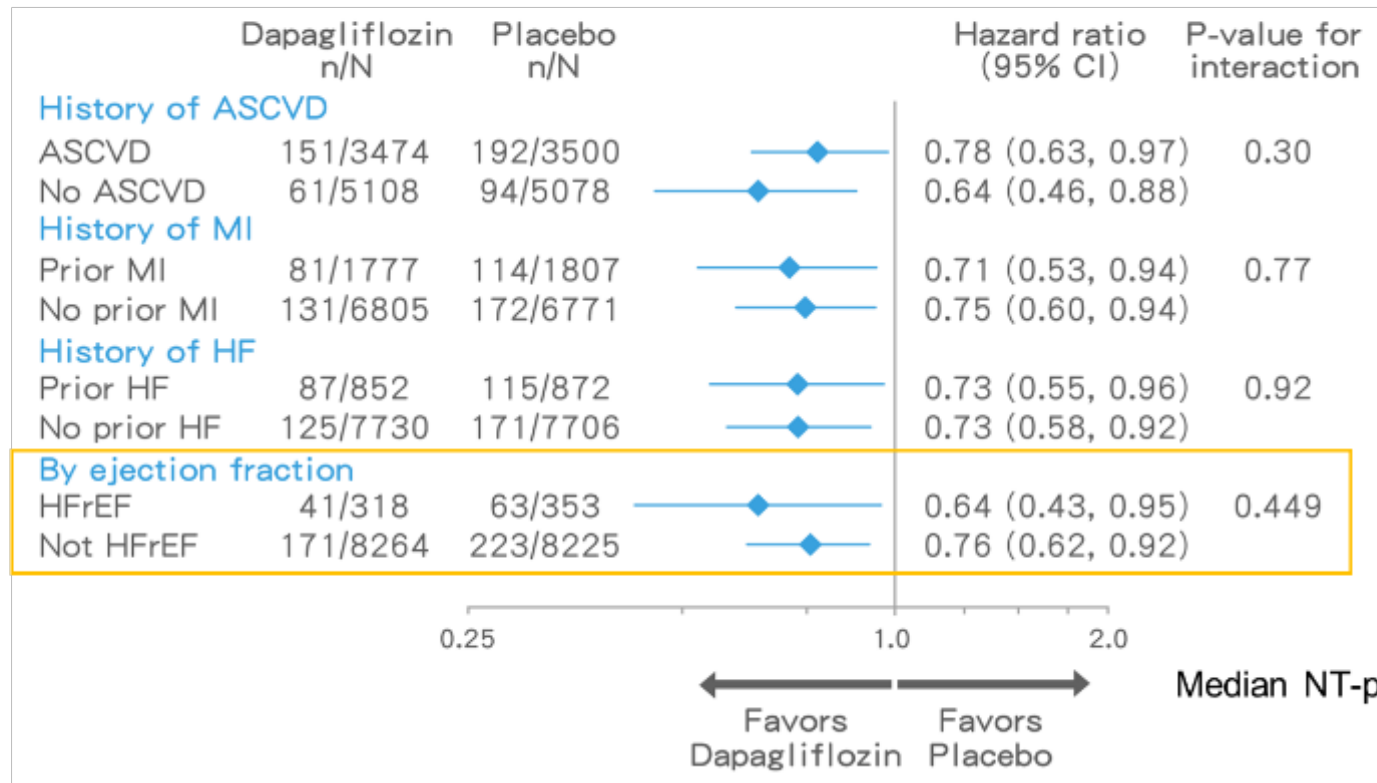
Patients with MRF were men aged ≥ 55 and women aged ≥ 60 years with at least one additional cardiovascular risk factor including dyslipidemia, hypertension, or current tobacco use

Diabetes Care. 2021 May;44(5):1159-1167.

T2D合併心血管風險因子患者使用Dapagliflozin 有效降低hHF 無差別CVD、HF及EF



Reduction of hospitalization for heart failure in different patient types with T2D

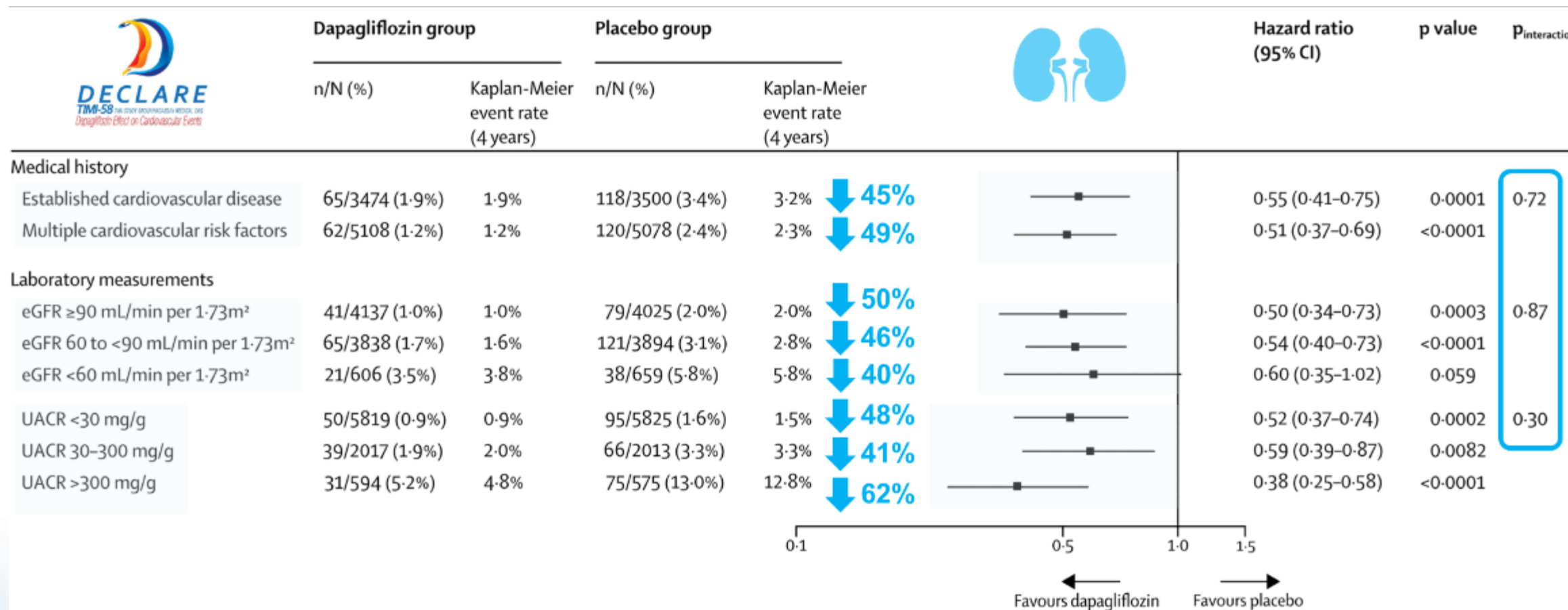


hHF: hospitalization for heart failure

1. Circulation. 2019 May 28;139(22):2516-2527. 2. Circulation. 2019 May 28;139(22):2528-2536 3. Eur J Heart Fail. 2021 Jun;23(6):1026-1036. doi: 10.1002/ehf.2073. .



Dapagliflozin對於T2D患者的腎臟保護 無差別CVD、eGFR及UACR



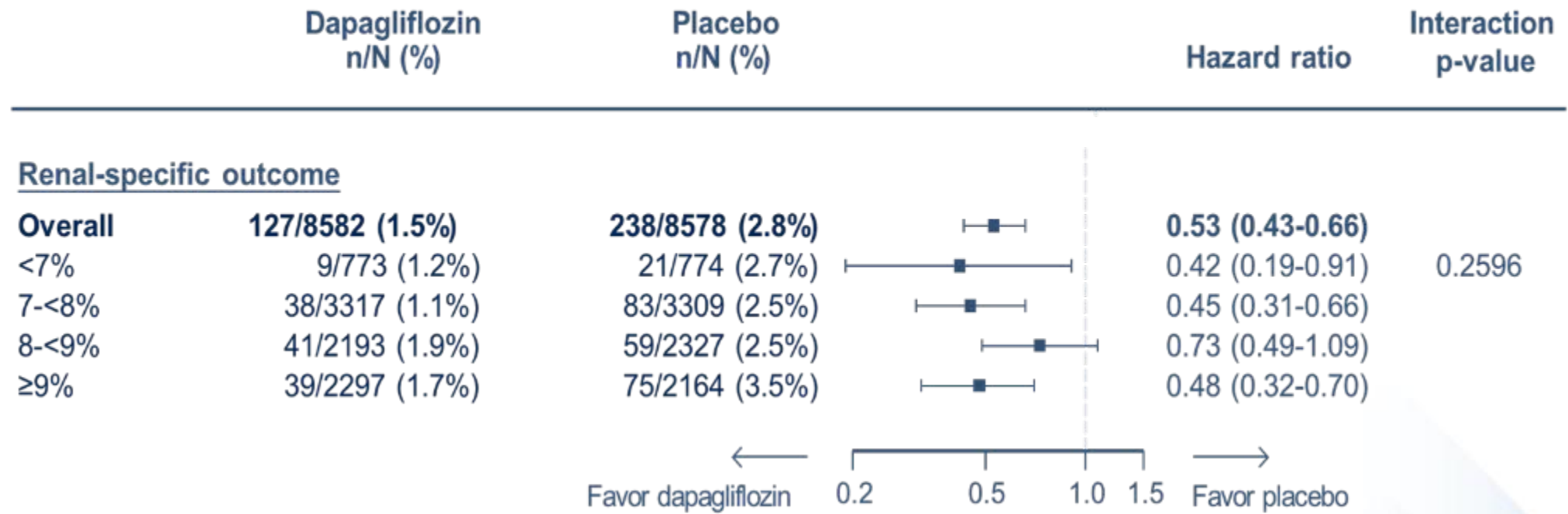
Prespecified exploratory renal endpoint: decrease eGFR ≥40% to <60 mL/min/1.73 m², ESRD or Renal Death; UACR = urine albumin-creatinine ratio.

Lancet Diabetes Endocrinol. 2019 Aug;7(8):606-617.

Dapagliflozin治療T2D患者 腎臟保護效果一致，不論血糖基值高或低



Dapagliflozin vs. 安慰劑 (整體族群)

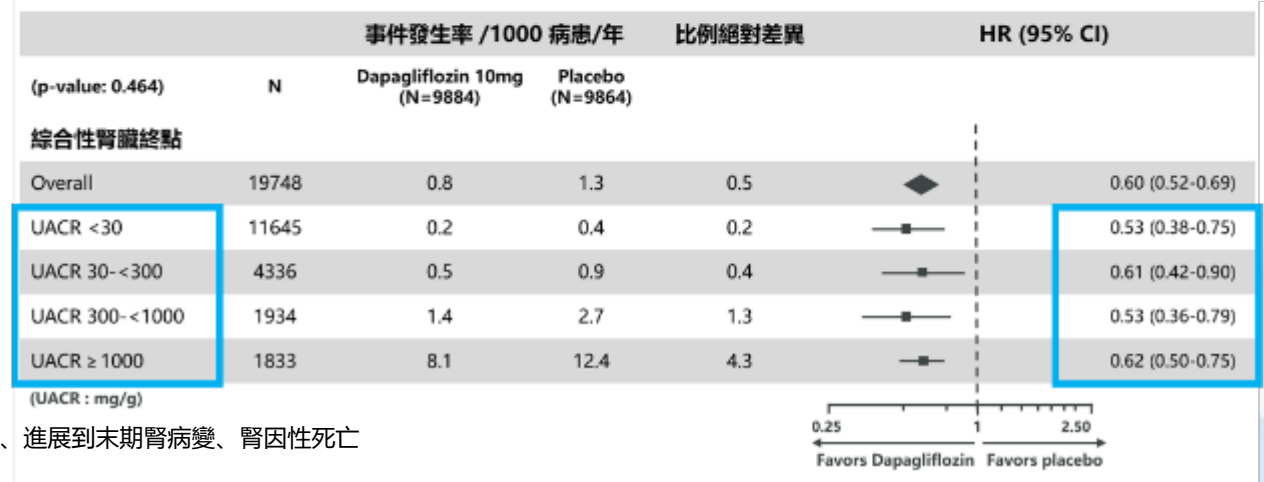
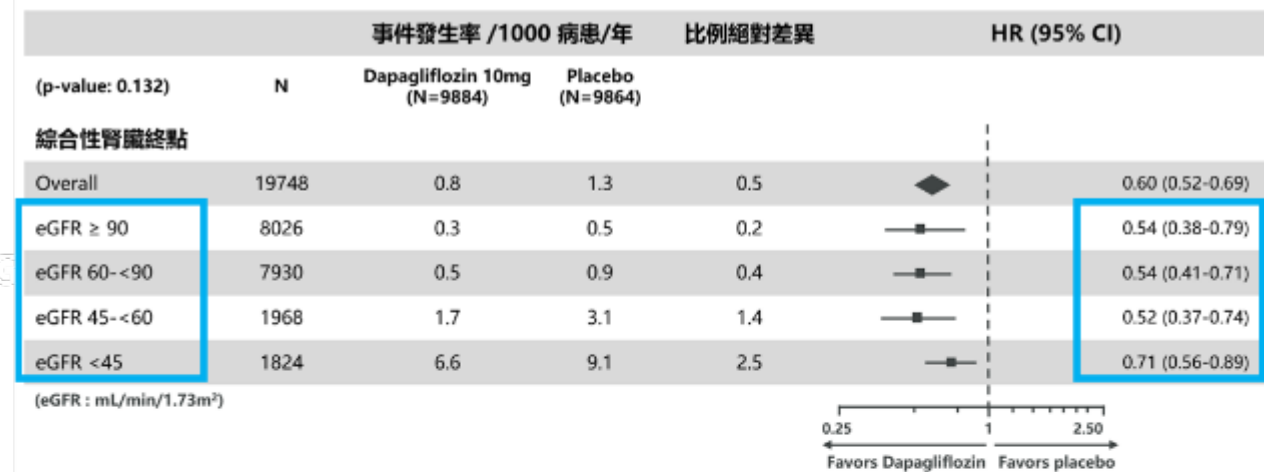


DAPA-CKD & DECLARE pooled analysis: Dapagliflozin減少腎臟惡化無差別eGFR及蛋白尿高低



eGFR ml/min/1.73m ²	DECLARE N	DAPA-CKD N	Total N (%)
<45	184	1640	1824 (9)
45-<60	1050	918	1968 (10)
60-<90	7582	348	7930 (40)
≥90	8026	0	8026 (41)

UACR mg/g	DECLARE N	DAPA-CKD N	Total N (%)
<30	11644	1	11645 (59)
30-<300	4029	307	4336 (22)
300-<1000	809	1125	1934 (10)
≥1000	360	1473	1833 (9)



腎臟終點為 eGFR 持續減少 ≥ 40%、進展到末期腎病變、腎因性死亡

1. Moura F, et al. Presented at: ESC Congress 2022; August 26-29, 2022; Barcelona, Spain. 2.

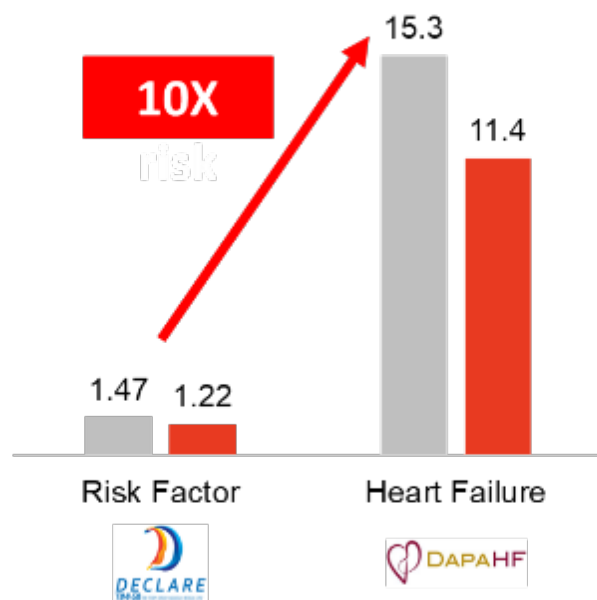
https://academic.oup.com/eurheartj/article/43/Supplement_2/ehac544.2407/6745929?login=false



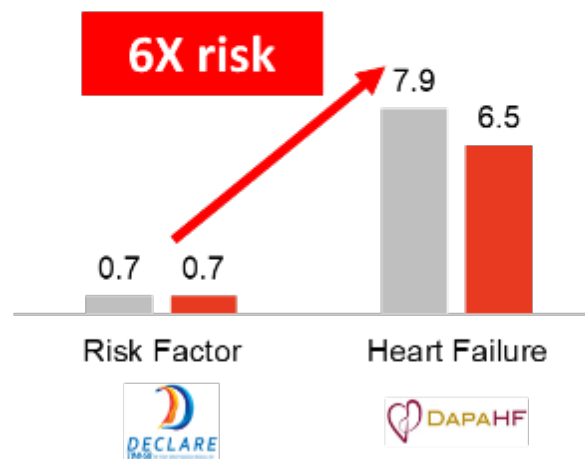
高風險患者早期使用Dapagliflozin治療 降低心腎病變與死亡風險

■ Placebo ■ Dapagliflozin

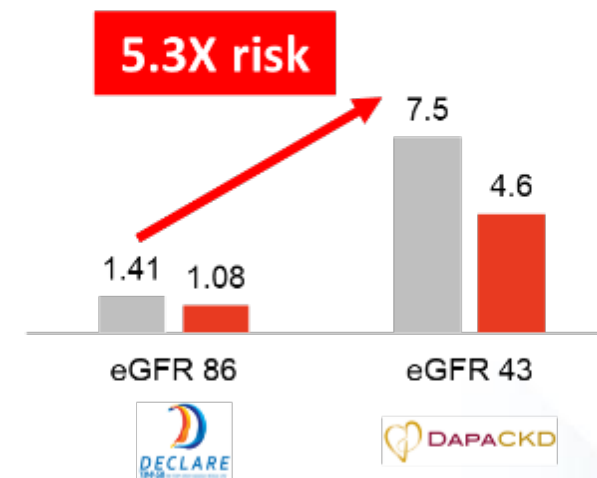
CVD與HF住院風險



全因死亡







複合式腎臟終點



Earlier is better!



臺灣SGLT2i 目前核准適應症

	Dapagliflozin 5, 10 mg	Empagliflozin 10 mg	Empagliflozin 25 mg	Canagliflozin	Ertugliflozin
第2型糖尿病 	血糖控制	有	有	有	有
	預防心血管事件	有 ¹	有 ²		
	降低多重心血管 風險因子患者 心衰竭住院風險	★有 ¹			
	預防新發腎臟病 ⁵	★有 ⁵			
治療慢性腎臟病 	有	有		有 糖尿病腎病變 (巨量蛋白尿 期)	
治療心衰竭  	有 ³ (rEF, pEF, impEF)	有 ⁴ (NYHA II-IV rEF, pEF)			

(依衛福部食藥署網站公告，更新至113/6)

1.用於具第二型糖尿病且已有心血管疾病(CVD)或多重心血管風險因子的成人病人時，Forxiga可**降低心衰竭住院**的風險。

2.用於具第二型糖尿病且已有心血管疾病的成人病人時，Jardiance可降低心血管原因死亡的風險。

3.心衰竭成人病人

4*.紐約心臟學會(NYHA)第二級至第四級的心臟衰竭成年病人;

5.針對第2型糖尿病患者，降低慢性腎臟病(CKD)新發生或惡化的風險



總結

- 高血壓、糖尿病、蛋白尿都是常見的心腎風險因子，糖尿病初期eGFR升高或正常，心腎病變恐已悄悄在發生
- 國內外治療指引均建議，因定期檢測eGFR與UACR，蛋白尿與腎功能監控有助心衰竭與腎病變發現，糖尿病患等高風險族群每年應定期落實檢查，早期診斷與及時介入是預防心腎共病的關鍵
- T2D合併HF或CKD或相關風險因子，為達到優質控糖且兼顧器官保護，建議首選具心腎保護實證的SGLT2i:
 - DECLARE Study收案最符合廣大族群：收納九成腎功能良好族群，六成無合併ASCVD的DM患者，提供早期預防心腎風險強力實證。
 - **護心**：T2D合併心血管風險因子患者，使用Dapagliflozin顯著下降心衰竭住院風險 (HR 0.64, $p < 0.05$)
 - **保腎**：Dapagliflozin治療T2D患者，腎臟保護效果一致，無差別CVD、eGFR及UACR，且不論血糖基值高或低

Thanks for listening !

