Prescription Patterns of Cardiovascular and Kidney Protective Therapies Among Patients with Type 2 Diabetes

Julio A. Lamprea-Montealegre MD, MPH, PhD

University of California, San Francisco

Disclosure

- This project is sponsored by Bayer Healthcare U.S. LLC.
- UCSF team members: Julio A. Lamprea-Montealegre,[1-3] Erin Madden,[2-3] Sri Lekha Tummalapalli,[2-4] Chi D. Chu,[2-3] Carmen A. Peralta,[1-2,5] Delphine S. Tuot,[1,2] Michael G. Shlipak,[1-3] Michelle M. Estrella[1-3]
- Bayer team members: Yuxian Du[6], Rakesh Singh[6], Sheldon X. Kong[6]

[1]Department of Medicine, University of California, San Francisco;
[2]Kidney Health Research Collaborative, University of California, San Francisco, CA;
[3]San Francisco VA Health Care System, San Francisco, CA;
[4]Division of Healthcare Delivery Science & Innovation, Department of Population Health Sciences, Weill Cornell Medicine, New York, NY;
[5]Cricket Health, Inc., San Francisco, California;
[6]Bayer Healthcare U.S. LLC, Whippany, NJ

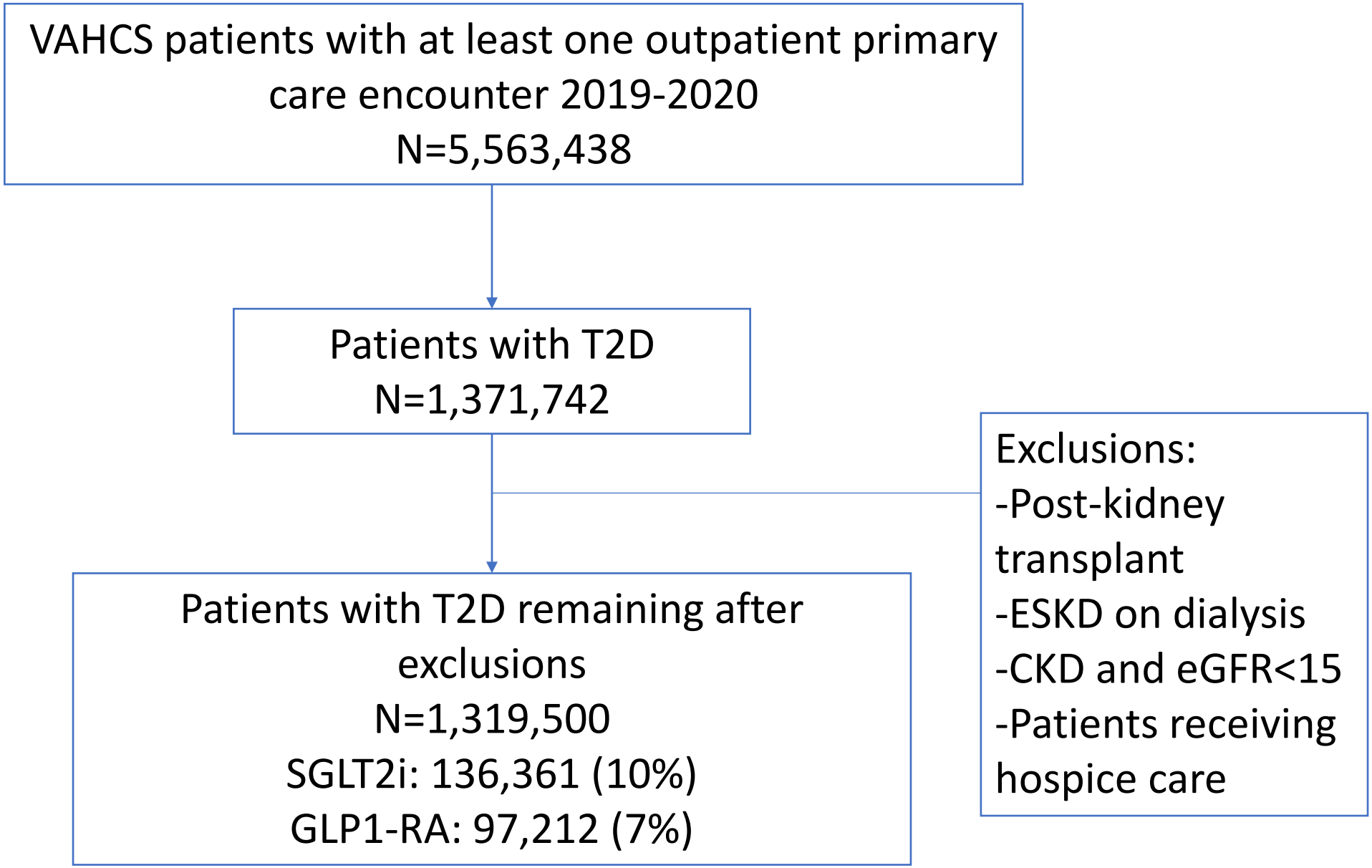
Paradigm shift in cardiac and kidney prevention among patients with type 2 diabetes (T2D)

- Sodium-glucose cotransporter-2 inhibitors (SGLT2i) and glucagon-like receptor agonists (GLP1-RA) have substantial cardiovascular and kidney protection among patients with T2D
- Current ADA guidelines:
  - An SGLT2i and/or GLP1-RA should be prescribed irrespective of glycemic control among patients with T2D and:
    - Atherosclerotic cardiovascular disease (ASCVD) or high ASCVD risk
    - Heart failure: SGLT2i
    - Chronic kidney disease:
      - SGLT2i if eGFR 30-60 ml/min/1.73 m^2 or ACR>30 mg/g
      - GLP1-RA otherwise

Contemporary prescription patterns of SGLT2i and GLP1-RA

- Study setting
  - Veteran Affairs Healthcare System (VAHCS): largest integrated healthcare system in the United States
- Study design
  - Cross-sectional analyses of SGLT2i and GLP1-RA prescription in the VAHCS from January 1st, 2019 to December 31st, 2020
- Outcome
  - Prevalent prescription: any active prescription of SGLT2i or GLP1-RA during the study period

Study population: VAHCS 2019-2020



Prescription of SLGT2i and GLP1-RA according to T2D management and control

	SGLT2i prescription			GLP1-RA prescription	
	N	% prescribed	Multivariable model OR (95% CI)	% prescribed	Multivariable model OR (95% CI)
Hemoglobin A1C					
<7%	661,365	5%	**Reference**	4%	**Reference**
7-8%	337,630	14%	1.67 (1.63,1.71)	9%	1.33 (1.30,1.36)
8-9%	157,230	19%	1.96 (1.90,2.02)	12%	1.57 (1.51,1.63)
>9%	154,154	17%	1.52 (1.46,1.58)	13%	1.50 (1.43,1.56)
No. of additional antidiabetic medications					
0	246,607	1%	**Reference**	1%	**Reference**
1	486,103	5%	1.69 (1.63,1.75)	4%	1.80 (1.72,1.88)
2	370,631	16%	3.52 (3.32,3.72)	12%	3.43 (3.19,3.70)
3+	198,159	24%	5.21 (4.86,5.59)	16%	4.21 (3.87,4.57)

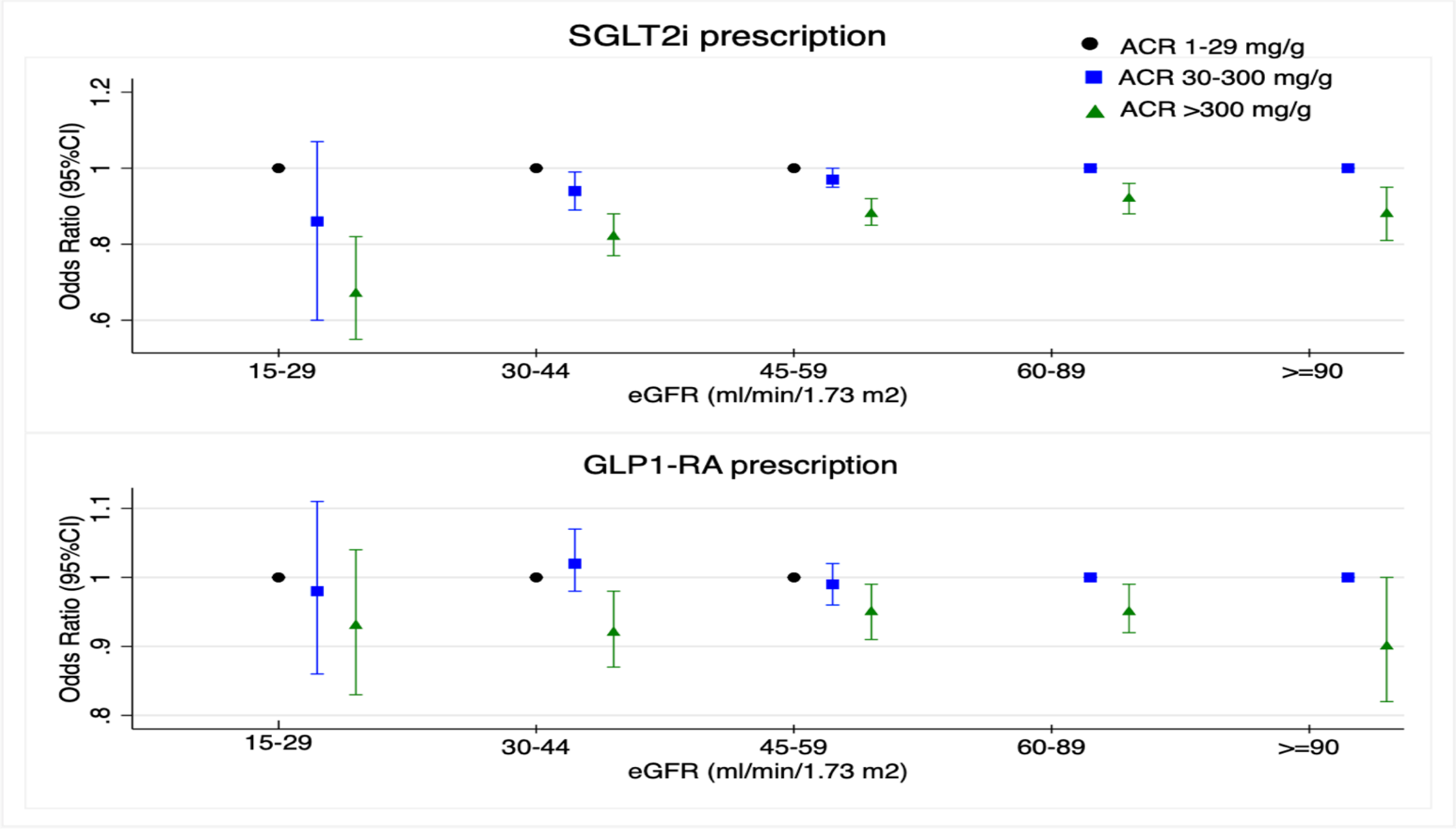
Prescription of SLGT2i and GLP1-RA according to T2D management and control

	SGLT2i prescription			GLP1-RA prescription	
	N	% prescribed	Multivariable model OR (95% CI)	% prescribed	Multivariable model OR (95% CI)
Endocrinology visit					
No	1,138,992	9%	**Reference**	5%	**Reference**
Yes	180,508	21%	1.73 (1.63,1.83)	19%	2.29 (2.11,2.48)
No. of endocrinology visits					
0	1,138,992	9%	**Reference**	5%	**Reference**
1	65,363	15%	1.26 (1.21,1.30)	11%	1.36 (1.29,1.44)
2	28,997	18%	1.37 (1.30,1.44)	14%	1.51 (1.41,1.62)
3+	86,148	27%	1.93 (1.79,2.08)	27%	2.53 (2.28,2.79)

Prescription of SLGT2i and GLP1-RA according to the presence of CVD and CKD

	SGLT2i prescription			GLP1-RA prescription	
	N	% prescribed	Multivariable model OR (95% CI)	% prescribed	Multivariable model OR (95% CI)
ASCVD					
Absent	885,015	9%	**Reference**	7%	**Reference**
Present	434,485	13%	1.41 (1.37,1.45)	9%	1.11 (1.09,1.13)
Heart failure					
Absent	1,179,600	10%	**Reference**	7%	**Reference**
Present	139,900	14%	1.17 (1.14,1.20)	11%	1.02 (1.00,1.04)
CKD					
Absent	666,486	10%	**Reference**	6%	**Reference**
Present	473,733	11%	0.98 (0.97,1.00)	10%	1.13 (1.12,1.15)

Prescription of SLGT2i and GLP1-RA among patients with CKD



Prescription of SLGT2i and GLP1-RA according to ASCVD risk and risk of end-stage kidney disease

	SGLT2i prescription			GLP1-RA prescription	
	N	% prescribed	Multivariable model OR (95% CI)	% prescribed	Multivariable model OR (95% CI)
10-year ASCVD risk (ACC/AHA pooled cohort equation)					
<5%	39,121	13%	**Reference**	10%	**Reference**
5 to 7.4%	25,440	13%	1.02 (0.97, 1.07)	10%	1.03 (0.96, 1.09)
7.5 1.9.9%	157,356	12%	0.93 (0.88, 0.98)	9%	0.85 (0.81, 0.90)
>20%	514,514	9%	0.66 (0.62, 0.70)	6%	0.60 (0.57, 0.64)
5-year ESKD risk (Kidney Failure risk equation)					
<1%	164,185	13%	**Reference**	9%	**Reference**
1 to 2.9%	71,951	12%	0.92 (0.89, 0.96)	11%	1.18 (1.13,1.22)
3 to 4.9%	23,903	12%	0.86 (0.81, 0.92)	12%	1.35 (1.28, 1.42)
> 5%	57,914	9%	0.61 (0.57, 0.66)	14%	1.53 (1.45, 1.62)

Conclusions

- Prescription of SGLT2i and GLP1-RA was low among patients with T2D and concomitant ASCVD, HF, and CKD
- Among patients with CKD, the presence of severe albuminuria was inversely associated with prescription of SLGT2i and GLP1-RA
- Higher ASCVD risk and ESKD risk were inversely associated with prescription
- Our results call for accelerated implementation efforts to improve the delivery of these medications to the highest risk patients