

Higher Rates of Persistence and Adherence in Patients with Type 2 Diabetes
Initiating Once-weekly Versus Daily Injectable Glucagon-like Peptide-1
Receptor Agonists in US Clinical Practice (STAY Study)

William H. Polonsky,^{1,2} Riya Arora,³ Mads Faurby,⁴ João Fernandes,^{4,5} Andreas Liebl⁶

¹Behavioral Diabetes Institute, San Diego, CA, USA

²University of California, San Diego, CA, USA

³Novo Nordisk Service Centre Pvt Ltd, Bangalore, India

⁴Novo Nordisk A/S, Søborg, Denmark

⁵Present address: Ferring Pharmaceuticals A/S, Copenhagen, Denmark

⁶Center for Diabetes and Metabolism, m&i-Fachklinik Bad Heilbrunn, Bad Heilbrunn, Germany

Corresponding author: William Polonsky; whp@behavioraldiabetes.org

SUPPLEMENTAL TABLES AND FIGURES

Table S1 Study attrition

	Once-weekly GLP-1 RAs	Daily GLP-1 RAs	Basal insulin
Attrition steps, <i>n</i>			
Known age and sex within the index period, ≥ 1 claim for once-weekly GLP-1 RAs, daily GLP-1 RAs or basal insulin	14,551	23,003	90,337
Aged ≥ 18 years	14,548	22,998	88,953
Individuals with ≥ 1 ICD-9/10 code for T2D in 6 months pre-index	13,263	19,650	74,307
Individuals without ICD-9/10 codes for T1D or secondary diabetes in 6 months pre-index, and without a code for gestational diabetes in 6 months pre- and 12 months post-index	12,010	17,515	58,109
Continuous enrolment for ≥ 6 months pre-index	9970	14,777	47,083
Continuous enrolment for ≥ 12 months post-index	6430	11,313	35,318
GLP-1 RA- and insulin-naïve (6-month washout period)	4311	5639	19,251
Matched GLP-1 RA cohorts, <i>n</i>			
Matched by PS	784	784	–
Matched by IPTW	4311	5639	–

GLP-1 RA glucagon-like peptide-1 receptor agonist, *ICD* International Classification of Diseases, *IPTW* inverse probability of treatment weighting, *PS* propensity score, *T1D* type 1 diabetes, *T2D* type 2 diabetes

Table S2. Pre-matching baseline characteristics

Baseline characteristics	Once-weekly GLP-1 RAs <i>n</i> = 4311	Daily GLP-1 RAs <i>n</i> = 5639	Basal insulin <i>n</i> = 19,251
Age, years, mean (SD)	55.3 (10.1)	55.8 (10.6)	60.4 (12.6)
Women, n (%)	2131 (49.4)	3163 (56.1)	8867 (46.1)
Weight, kg, mean (SD)	107.3 (24.8)	107.0 (24.3)	98.2 (23.9)
Body mass index, kg/m ² , mean (SD)	36.7 (7.9)	36.9 (7.3)	33.6 (7.5)
HbA1c, %, mean (SD)	8.5 (1.7)	8.4 (1.7)	9.7 (2.2)
CCI score, mean (SD)	0.6 (1.1)	0.6 (1.1)	1.2 (1.6)
Baseline antidiabetic medication, number of claims (%)			
Metformin	3397 (45.7)	4044 (45.5)	10,941 (33.9)
DPP-4is	1370 (18.4)	1533 (17.3)	4882 (15.1)
SGLT-2is	772 (10.4)	389 (4.4)	992 (3.1)
Sulfonylureas	1596 (21.5)	2035 (22.9)	8191 (25.4)
GLP-1 RAs	0	0	2230 (6.9)

CCI Charlson Comorbidity Index, DPP-4i dipeptidyl peptidase-4 inhibitor, GLP-1 RA glucagon-like peptide-1 receptor agonist, HbA1c glycated haemoglobin, SGLT-2i sodium–glucose cotransporter-2 inhibitor

Table S3. GLP-1 RA use within PS-matched cohorts

GLP-1 RA	n
Once-weekly GLP-1 RAs	784
Dulaglutide	411
Exenatide extended-release	369
Semaglutide	4
Daily GLP-1 RAs	784
Liraglutide	701
Exenatide immediate-release	83

GLP-1 RA glucagon-like peptide-1 receptor agonist

Table S4 Baseline characteristics of the PS-matched GLP-1 RA cohorts for sensitivity analysis (previous CVD and SGLT-2i use included in matching)

Baseline characteristics	Once-weekly GLP-1 RAs <i>n</i> = 723	Daily GLP-1 RAs <i>n</i> = 723
Age, years, mean (SD)	54.7 (9.9)	54.9 (10.4)
Women, n (%)	366 (50.6)	362 (50.1)
Weight, kg, mean (SD)	107.1 (24.0)	108.3 (24.0)
Body mass index, kg/m ² , mean (SD)	36.6 (7.5)	36.8 (7.3)
HbA1c, %, mean (SD)	8.5 (1.7)	8.5 (1.7)
CCI score, mean (SD)	0.5 (0.9)	0.5 (0.9)
Baseline antidiabetic medication, number of claims (%)		
Metformin	590 (47.5)	564 (46.8)
DPP-4is	235 (18.9)	219 (18.2)
SGLT-2is	103 (8.3)	75 (6.2)
Sulfonylureas	280 (22.5)	286 (23.7)

CCI Charlson Comorbidity Index, *CVD* cardiovascular disease; *DPP-4i* dipeptidyl peptidase-4 inhibitor, *GLP-1 RA* glucagon-like peptide-1 receptor agonist, *HbA1c* glycated haemoglobin, *PS* propensity score, *SD* standard deviation, *SGLT-2i* sodium–glucose cotransporter-2 inhibitor

Table S5 Baseline characteristics of patients not included in the PS-matched cohorts

Baseline characteristics	Once-weekly GLP-1 RAs <i>n</i> = 3527	Daily GLP-1 RAs <i>n</i> = 4855
Age, years, mean (SD)	55.5 (10.1)	56.0 (10.6)
Women, n (%)	1739 (49.3)	2761 (56.9)
Weight, kg, mean (SD)	107.9 (26.8)	106.0 (24.0)
Body mass index, kg/m ² , mean (SD)	37.2 (8.7)	37.1 (7.4)
HbA1c, %, mean (SD)	8.5 (1.7)	8.3 (1.8)
CCI score, mean (SD)	0.7 (1.1)	0.6 (1.1)
Baseline antidiabetic medication, number of claims (%)		
Metformin	2753 (78.1)	3429 (70.6)
DPP-4is	1117 (31.7)	1296 (26.7)
SGLT-2is	611 (17.3)	320 (6.6)
Sulfonylureas	1293 (36.7)	1733 (35.7)

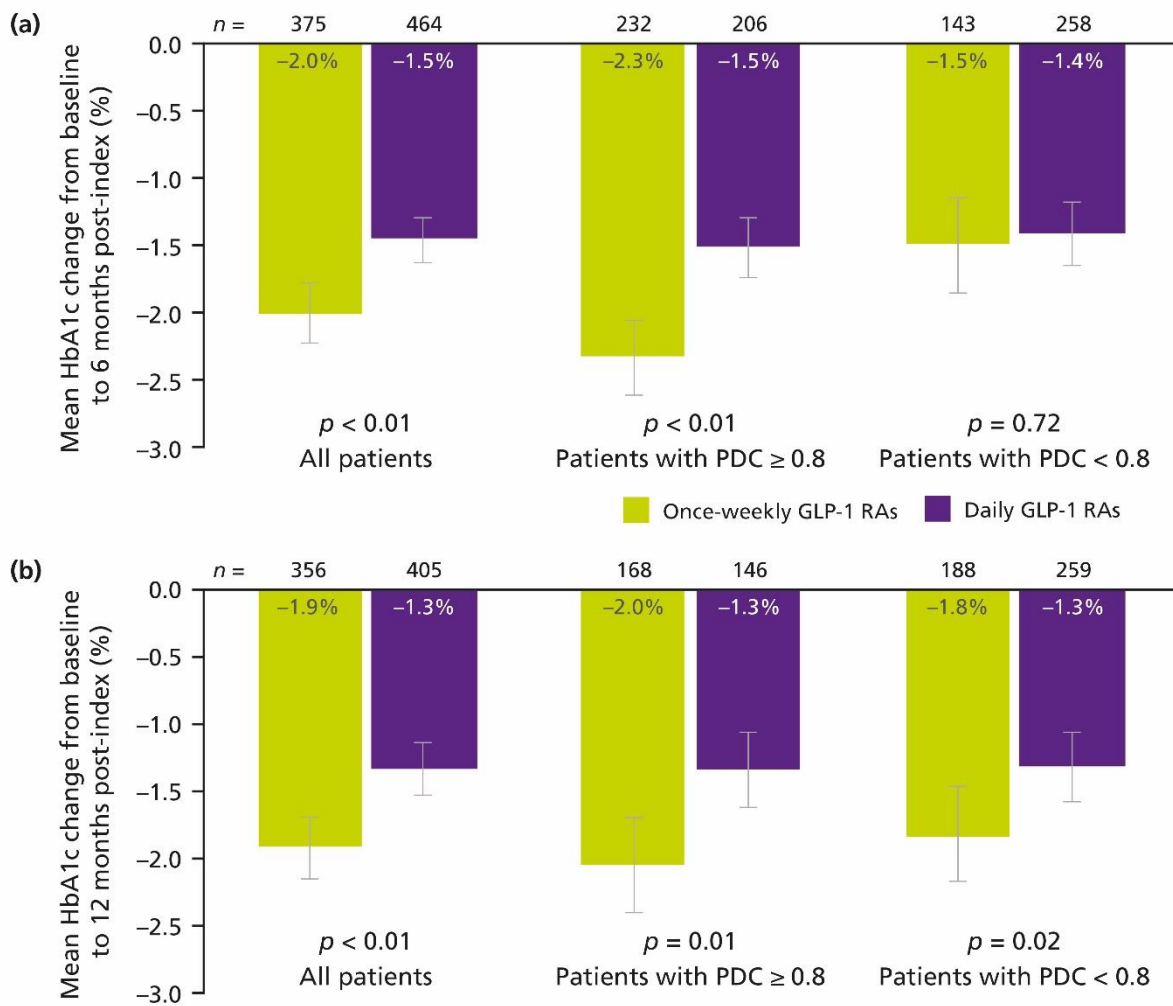
CCI Charlson Comorbidity Index, *DPP-4i* dipeptidyl peptidase-4 inhibitor, *GLP-1 RA* glucagon-like peptide-1 receptor agonist, *HbA1c* glycated haemoglobin, *PS* propensity score, *SD* standard deviation, *SGLT-2i* sodium–glucose cotransporter-2 inhibitor

Table S6 Baseline characteristics of the IPTW-matched GLP-1 RA cohorts

Baseline characteristics	Once-weekly GLP-1 RAs		Daily GLP-1 RAs	
	<i>n</i> = 797	SMD versus insulin	<i>n</i> = 948	SMD versus insulin
Age, years, mean (SD)	58.4 (25.7)	0.05	58.3 (24.0)	0.04
Women, %	43.3	−0.07	48.2	0.00
Weight, kg, mean (SD)	101.7 (52.3)	−0.05	101.4 (50.2)	−0.02
Body mass index, kg/m ² , mean (SD)	34.4 (16.7)	–	34.7 (14.9)	–
HbA1c, %, mean (SD)	9.6 (5.0)	−0.04	9.6 (5.0)	−0.09
CCI score, mean (SD)	0.7 (2.8)	–	0.7 (2.5)	–
Baseline antidiabetic medication, number of claims (%)				
Metformin	652 (46.1)	−0.03	690 (45.7)	0.00
DPP-4is	257 (18.2)	0.09	292 (19.3)	0.02
SGLT-2is	163 (11.5)	0.02	78 (5.2)	0.04
Sulfonylureas	307 (21.7)	0.08	354 (23.4)	0.04

CCI Charlson Comorbidity Index, DPP-4i dipeptidyl peptidase-4 inhibitor, GLP-1 RA glucagon-like peptide-1 receptor agonist, HbA1c glycated haemoglobin, SGLT-2i sodium–glucose cotransporter-2 inhibitor, SMD standardized mean difference

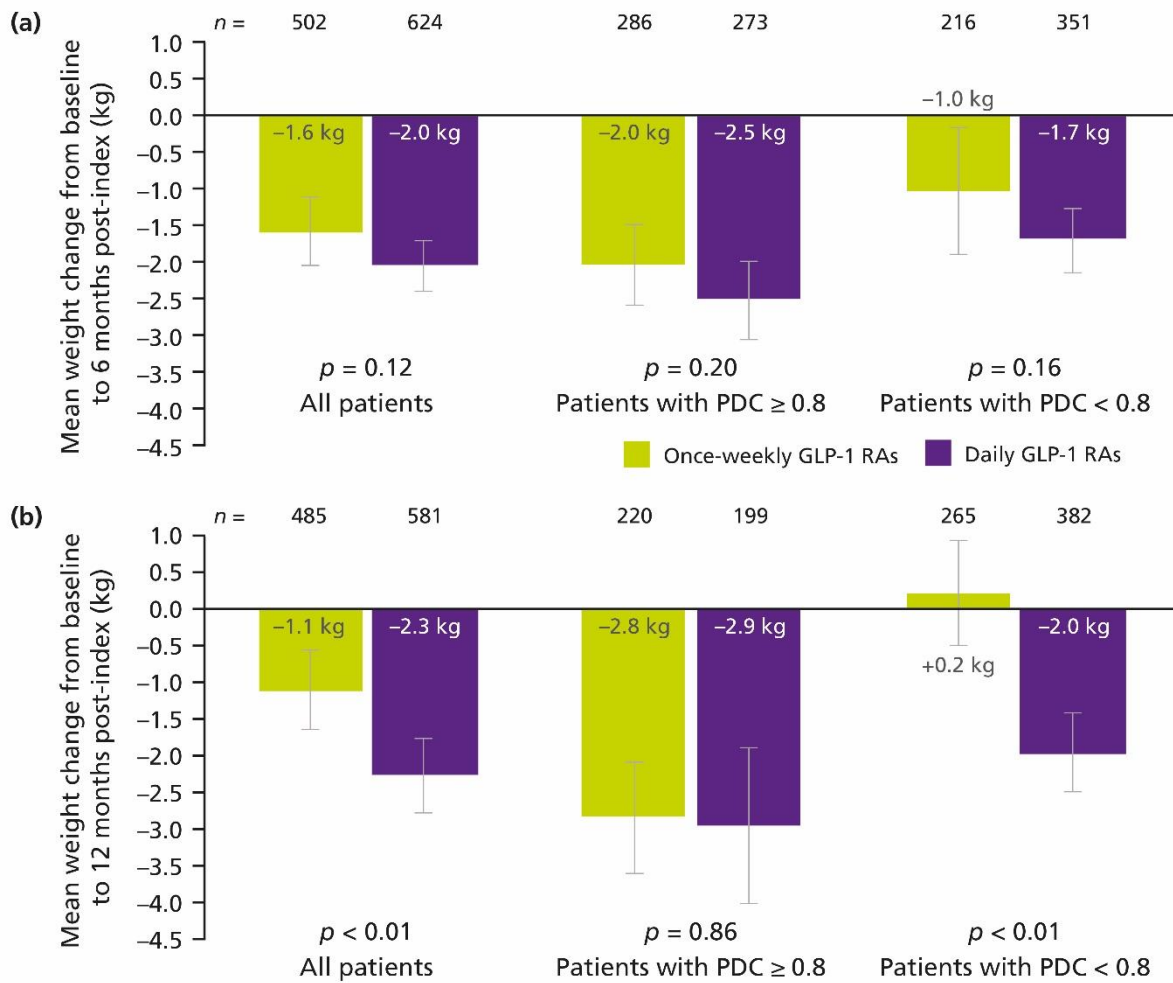
Fig. S1 Changes in HbA1c from baseline to 6 months (a) and 12 months (b) post-index in IPTW-matched cohorts



Error bars represent 95% confidence intervals. Note that numbers in bars are rounded to 1 decimal point, whereas plotted data has 2 decimal points

GLP-1 RA glucagon-like peptide-1 receptor agonist, HbA1c glycated haemoglobin, IPTW inverse probability of treatment weighting, PDC proportion of days covered

Fig. S2 Changes in weight from baseline at 6 months post-index (a) and 12 months post-index (b) in IPTW-matched cohorts



Error bars represent 95% confidence intervals. Note that numbers in bars are rounded to 1 decimal point, whereas plotted data has 2 decimal points

GLP-1 RA glucagon-like peptide-1 receptor agonist, *HbA1c* glycated haemoglobin, IPTW inverse probability of treatment weighting