The year in diabetes……

Hamish Courtney

Belfast


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Holywood
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M2
rumlin
B101
Divis
A48
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BEST PICTURE

The NEW ENGLAND JOURNAL of MEDICINE

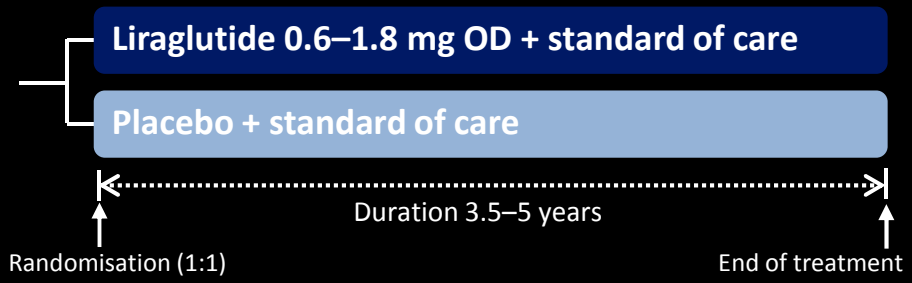
ESTABLISHED IN 1812 JULY 28, 2016 VOL. 375 NO. 4

Liraglutide and Cardiovascular Outcomes in Type 2 Diabetes

Steven P. Marso, M.D., Gilbert H. Daniels, M.D., Kirstine Brown-Frandsen, M.D., Peter Kristensen, M.D., E.M.B.A., Johannes F.E. Mann, M.D., Michael A. Nauck, M.D., Steven E. Nissen, M.D., Stuart Pocock, Ph.D., Neil R. Poulter, F.Med.Sci., Lasse S. Ravn, M.D., Ph.D., William M. Steinberg, M.D., Mette Stockner, M.D., Bernard Zinman, M.D., Richard M. Bergenstal, M.D., and John B. Buse, M.D., Ph.D., for the LEADER Steering Committee on behalf of the LEADER Trial Investigators*

LEADER: Study design

9340 patients
- T2DM
- HbA_{1c} ≥7.0%



Key inclusion criteria

Minimum age of 50 years at screening and concomitant CV, cerebrovascular or peripheral vascular disease, or chronic renal or heart failure

Minimum age of 60 years at screening and other specified risk factors of vascular disease

Primary endpoint

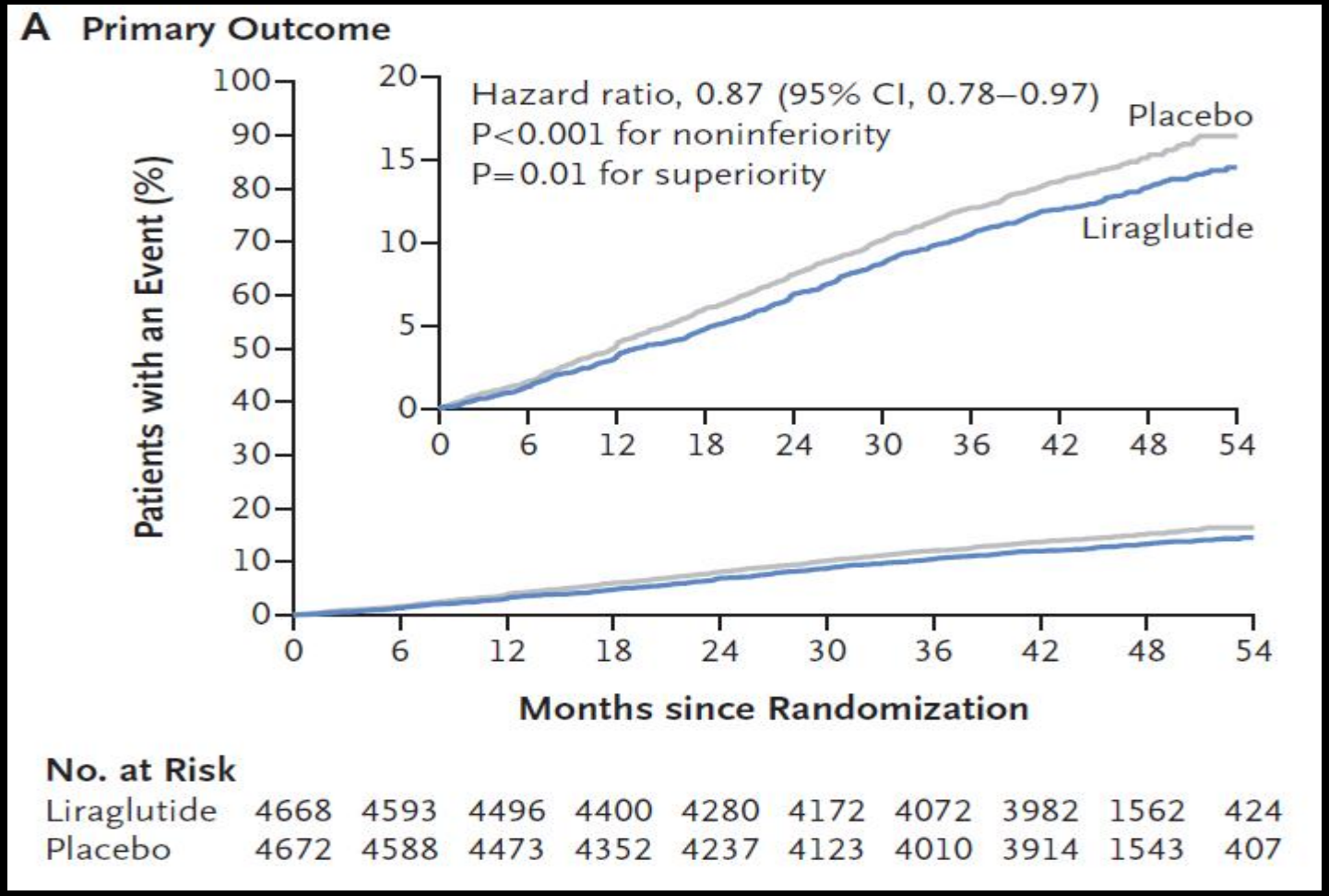
- Time from randomisation to a composite outcome of the first occurrence of CV death, non-fatal MI, or non-fatal stroke

Key secondary endpoints

- First occurrence of an expanded composite CV outcome of CV death, non-fatal MI, non-fatal stroke, revascularisation, unstable angina or hospitalisation for chronic heart failure

Baseline characteristics

Patient characteristics	Total (N=9340)
Mean age (yrs ± SD)	64.3 ± 7.2
Male gender (%)	6003 (64.3)
Mean BMI (kg/m^2 ± SD)	32.5 ± 6.3
Mean HbA_{1c} (% ± SD)	8.7 ± 1.5
Mean diabetes duration (yrs ± SD)	12.7 ± 8.0
Insulin use (%)	3905 (41.8)


A Primary Outcome
Hazard ratio, 0.87 (95% CI, 0.78–0.97)
P<0.001 for noninferiority
P=0.01 for superiority
Placebo
Liraglutide
Patients with an Event (%)
Months since Randomization
No. at Risk
Liraglutide 4668 4593 4496 4400 4280 4172 4072 3982 1562 424
Placebo 4672 4588 4473 4352 4237 4123 4010 3914 1543 407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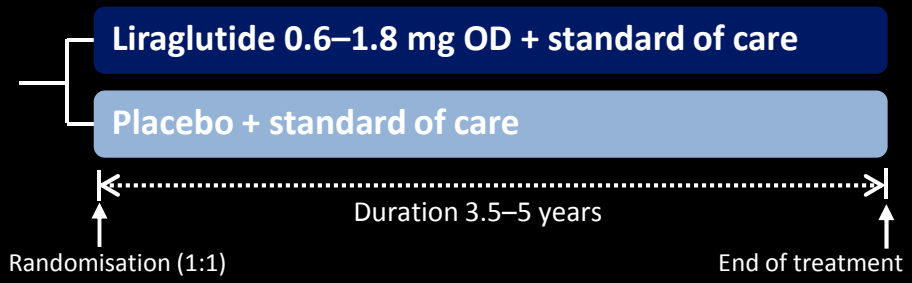
LEADER: Study design

9340 patients

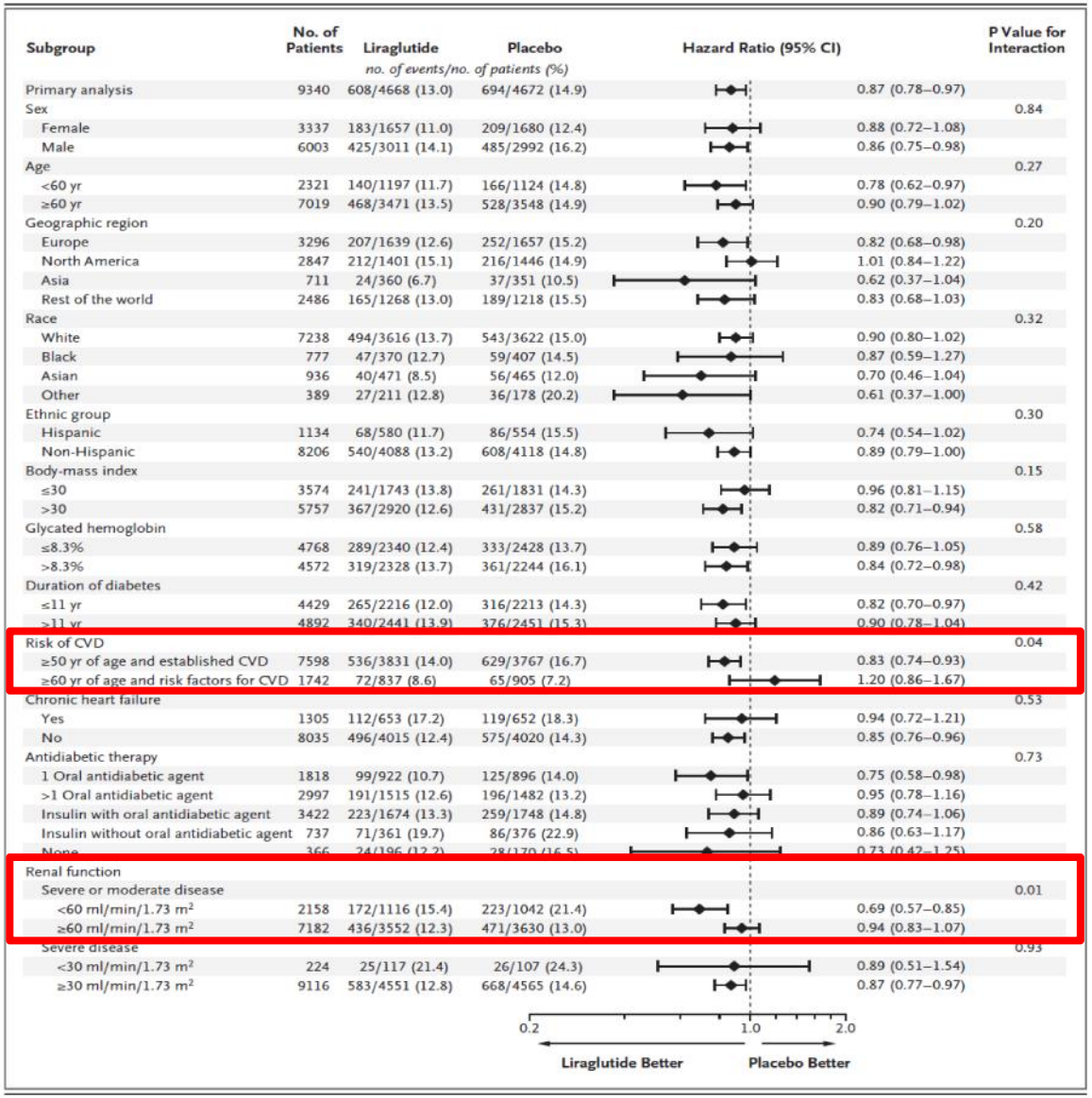
- T2DM
- HbA_{1c} ≥7.0%



Key inclusion criteria

Minimum age of 50 years at screening and concomitant CV, cerebrovascular or peripheral vascular disease, or chronic renal or heart failure

Minimum age of 60 years at screening and other specified risk factors of vascular disease



Subgroup	No. of Patients	Liraglutide	Placebo	Hazard Ratio (95% CI)	P Value for Interaction
		no. of events/no. of patients (%)			
Primary analysis	9340	608/4668 (13.0)	694/4672 (14.9)	0.87 (0.78–0.97)	
Sex					0.84
Female	3337	183/1657 (11.0)	209/1680 (12.4)	0.88 (0.72–1.08)	
Male	6003	425/3011 (14.1)	485/2992 (16.2)	0.86 (0.75–0.98)	
Age					0.27
<60 yr	2321	140/1197 (11.7)	166/1124 (14.8)	0.78 (0.62–0.97)	
≥60 yr	7019	468/3471 (13.5)	528/3548 (14.9)	0.90 (0.79–1.02)	
Geographic region					0.20
Europe	3296	207/1639 (12.6)	252/1657 (15.2)	0.82 (0.68–0.98)	
North America	2847	212/1401 (15.1)	216/1446 (14.9)	1.01 (0.84–1.22)	
Asia	711	24/360 (6.7)	37/351 (10.5)	0.62 (0.37–1.04)	
Rest of the world	2486	165/1268 (13.0)	189/1218 (15.5)	0.83 (0.68–1.03)	
Race					0.32
White	7238	494/3616 (13.7)	543/3622 (15.0)	0.90 (0.80–1.02)	
Black	777	47/370 (12.7)	59/407 (14.5)	0.87 (0.59–1.27)	
Asian	936	40/471 (8.5)	56/465 (12.0)	0.70 (0.46–1.04)	
Other	389	27/211 (12.8)	36/178 (20.2)	0.61 (0.37–1.00)	
Ethnic group					0.30
Hispanic	1134	68/580 (11.7)	86/554 (15.5)	0.74 (0.54–1.02)	
Non-Hispanic	8206	540/4088 (13.2)	608/4118 (14.8)	0.89 (0.79–1.00)	
Body-mass index					0.15
≤30	3574	241/1743 (13.8)	261/1831 (14.3)	0.96 (0.81–1.15)	
>30	5757	367/2920 (12.6)	431/2837 (15.2)	0.82 (0.71–0.94)	
Glycated hemoglobin					0.58
≤8.3%	4768	289/2340 (12.4)	333/2428 (13.7)	0.89 (0.76–1.05)	
>8.3%	4572	319/2328 (13.7)	361/2244 (16.1)	0.84 (0.72–0.98)	
Duration of diabetes					0.42
≤11 yr	4429	265/2216 (12.0)	316/2213 (14.3)	0.82 (0.70–0.97)	
>11 yr	4892	340/2441 (13.9)	376/2451 (15.3)	0.90 (0.78–1.04)	
Risk of CVD					0.04
≥50 yr of age and established CVD	7598	536/3831 (14.0)	629/3767 (16.7)	0.83 (0.74–0.93)	
≥60 yr of age and risk factors for CVD	1742	72/837 (8.6)	65/905 (7.2)	1.20 (0.86–1.67)	
Chronic heart failure					0.53
Yes	1305	112/653 (17.2)	119/652 (18.3)	0.94 (0.72–1.21)	
No	8035	496/4015 (12.4)	575/4020 (14.3)	0.85 (0.76–0.96)	
Antidiabetic therapy					0.73
1 Oral antidiabetic agent	1818	99/922 (10.7)	125/896 (14.0)	0.75 (0.58–0.98)	
>1 Oral antidiabetic agent	2997	191/1515 (12.6)	196/1482 (13.2)	0.95 (0.78–1.16)	
Insulin with oral antidiabetic agent	3422	223/1674 (13.3)	259/1748 (14.8)	0.89 (0.74–1.06)	
Insulin without oral antidiabetic agent	737	71/361 (19.7)	86/376 (22.9)	0.86 (0.63–1.17)	
None	366	24/196 (12.2)	28/170 (16.5)	0.73 (0.42–1.25)	
Renal function					
Severe or moderate disease					0.01
<60 ml/min/1.73 m^2	2158	172/1116 (15.4)	223/1042 (21.4)	0.69 (0.57–0.85)	
≥60 ml/min/1.73 m^2	7182	436/3552 (12.3)	471/3630 (13.0)	0.94 (0.83–1.07)	
Severe disease					0.93
<30 ml/min/1.73 m^2	224	25/117 (21.4)	26/107 (24.3)	0.89 (0.51–1.54)	
≥30 ml/min/1.73 m^2	9116	583/4551 (12.8)	668/4565 (14.6)	0.87 (0.77–0.97)	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The NEW ENGLAND JOURNAL of MEDICINE

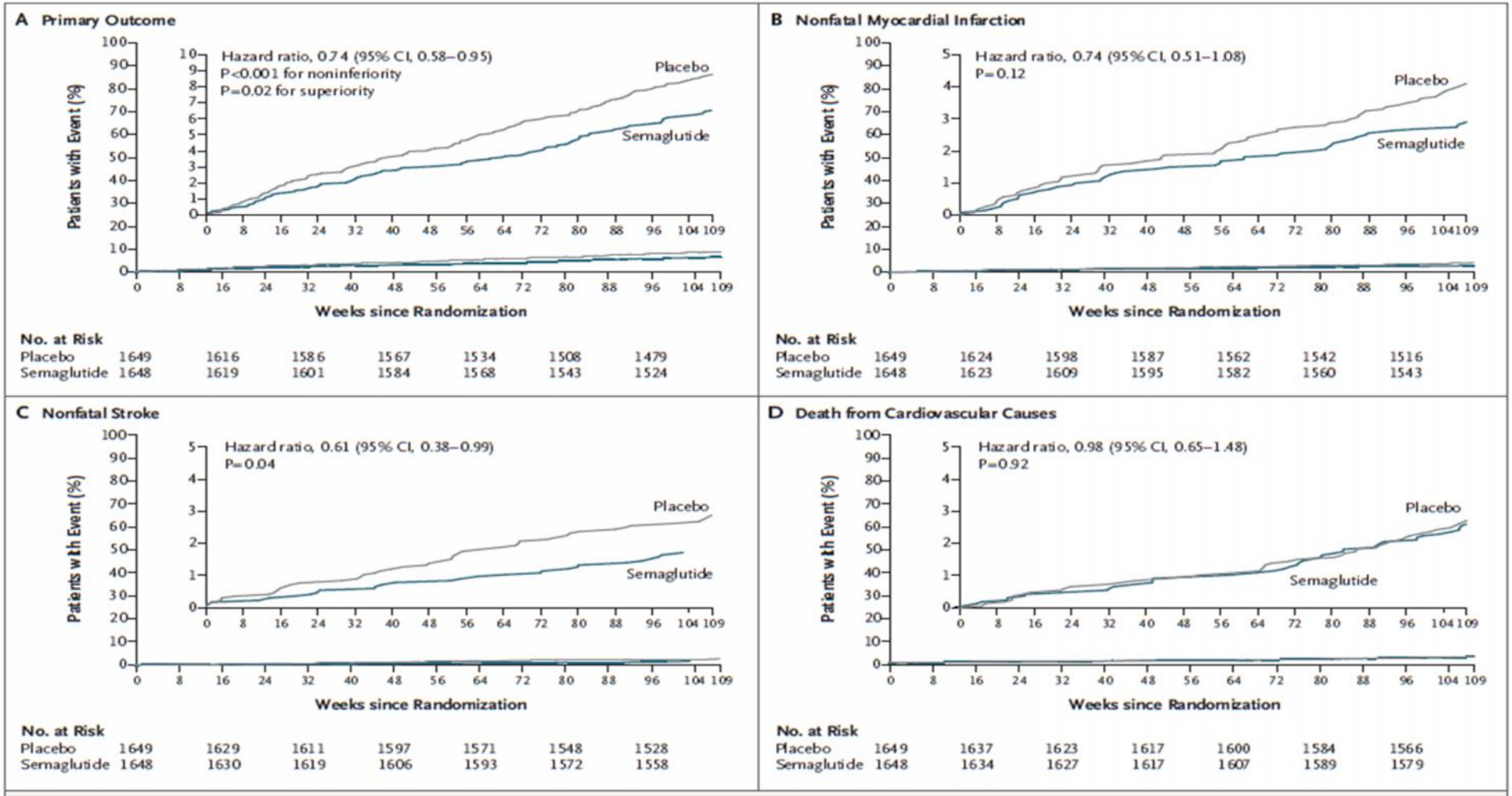
ORIGINAL ARTICLE

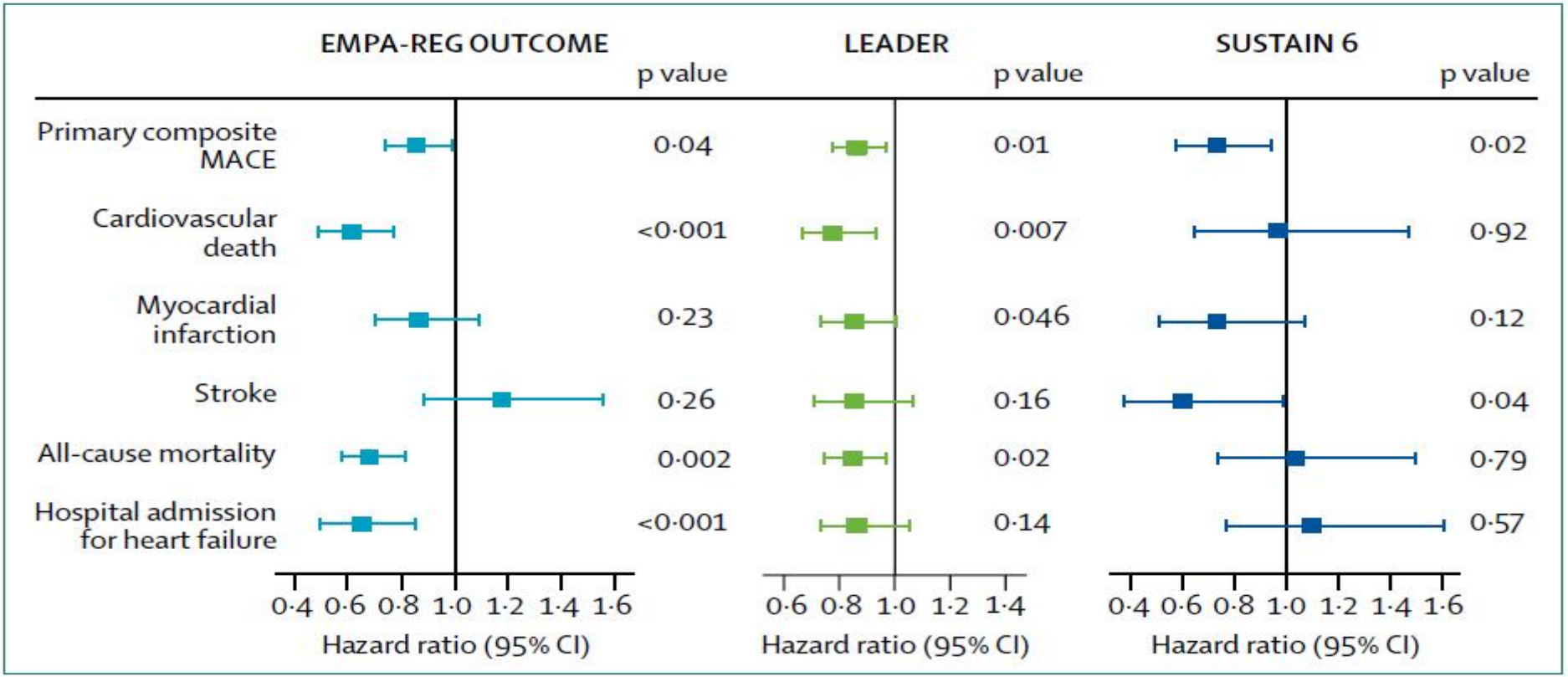
Semaglutide and Cardiovascular Outcomes in Patients with Type 2 Diabetes

Steven P. Marso, M.D., Stephen C. Bain, M.D., Agostino Consoli, M.D., Freddy G. Eliaschewitz, M.D., Esteban Jódar, M.D., Lawrence A. Leiter, M.D., Ildiko Lingvay, M.D., M.P.H., M.S.C.S., Julio Rosenstock, M.D., Jochen Seufert, M.D., Ph.D., Mark L. Warren, M.D., Vincent Woo, M.D., Oluf Hansen, M.Sc., Anders G. Holst, M.D., Ph.D., Jonas Pettersson, M.D., Ph.D., and Tina Vilsbøll, M.D., D.M.Sc., for the SUSTAIN-6 Investigators*

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Semaglutide (N=1648)		Placebo (N=1649)		Total (N=3297)
	0.5 mg (N=826)	1.0 mg (N=822)	0.5 mg (N=824)	1.0 mg (N=825)	
Age — yr	64.6±7.3	64.7±7.1	64.8±7.6	64.4±7.5	64.6±7.4
Male sex — no. (%)	495 (59.9)	518 (63.0)	482 (58.5)	507 (61.5)	2002 (60.7)
Body weight — kg	91.8±20.3	92.9±21.1	91.8±20.3	91.9±20.8	92.1±20.6
Type 2 diabetes					
Duration — yr	14.3±8.2	14.1±8.2	14.0±8.5	13.2±7.4	13.9±8.1
Glycated hemoglobin — %	8.7±1.4	8.7±1.5	8.7±1.5	8.7±1.5	8.7±1.5
Cardiovascular risk factors					
Systolic blood pressure — mm Hg	136.1±18.0	135.8±17.0	135.8±16.2	134.8±17.5	135.6±17.2
Diastolic blood pressure — mm Hg	77.1±9.8	76.9±10.2	77.5±9.9	76.7±10.2	77.0±10.0
Low-density lipoprotein cholesterol — mg/dl†	81.6±47.1	83.3±41.2	80.9±48.1	83.6±45.9	82.3±45.6
Never smoked — no. (%)	390 (47.2)	364 (44.3)	391 (47.5)	348 (42.2)	1493 (45.3)
History of cardiovascular disease — no. (%)					
Ischemic heart disease	493 (59.7)	495 (60.2)	510 (61.9)	496 (60.1)	1994 (60.5)
Myocardial infarction	266 (32.2)	264 (32.1)	267 (32.4)	275 (33.3)	1072 (32.5)
Heart failure	201 (24.3)	180 (21.9)	190 (23.1)	206 (25.0)	777 (23.6)
Ischemic stroke	89 (10.8)	89 (10.8)	96 (11.7)	109 (13.2)	383 (11.6)
Hemorrhagic stroke	28 (3.4)	24 (2.9)	27 (3.3)	29 (3.5)	108 (3.3)
Hypertension	772 (93.5)	771 (93.8)	756 (91.7)	760 (92.1)	3059 (92.8)


A Primary Outcome
Hazard ratio, 0.74 (95% CI, 0.58–0.95)
P<0.001 for noninferiority
P=0.02 for superiority
Placebo
Semaglutide
Patients with Event (%)
Weeks since Randomization
No. at Risk
Placebo 1649 1616 1586 1567 1534 1508 1479
Semaglutide 1648 1619 1601 1584 1568 1543 1524
B Nonfatal Myocardial Infarction
Hazard ratio, 0.74 (95% CI, 0.51–1.08)
P=0.12
Placebo
Semaglutide
Patients with Event (%)
Weeks since Randomization
No. at Risk
Placebo 1649 1624 1598 1587 1562 1542 1516
Semaglutide 1648 1623 1609 1595 1582 1560 1543
C Nonfatal Stroke
Hazard ratio, 0.61 (95% CI, 0.38–0.99)
P=0.04
Placebo
Semaglutide
Patients with Event (%)
Weeks since Randomization
No. at Risk
Placebo 1649 1629 1611 1597 1571 1548 1528
Semaglutide 1648 1630 1619 1606 1593 1572 1558
D Death from Cardiovascular Causes
Hazard ratio, 0.98 (95% CI, 0.65–1.48)
P=0.92
Placebo
Semaglutide
Patients with Event (%)
Weeks since Randomization
No. at Risk
Placebo 1649 1637 1623 1617 1600 1584 1566
Semaglutide 1648 1634 1627 1617 1607 1589 1579


EMPA-REG OUTCOME
LEADER
SUSTAIN 6
p value
p value
p value
Primary composite MACE
0·04
0·01
0·02
Cardiovascular death
<0·001
0·007
0·92
Myocardial infarction
0·23
0·046
0·12
Stroke
0·26
0·16
0·04
All-cause mortality
0·002
0·02
0·79
Hospital admission for heart failure
<0·001
0·14
0·57
0·4 0·6 0·8 1·0 1·2 1·4 1·6
Hazard ratio (95% CI)
0·6 0·8 1·0 1·2 1·4
Hazard ratio (95% CI)
0·4 0·6 0·8 1·0 1·2 1·4 1·6
Hazard ratio (95% CI)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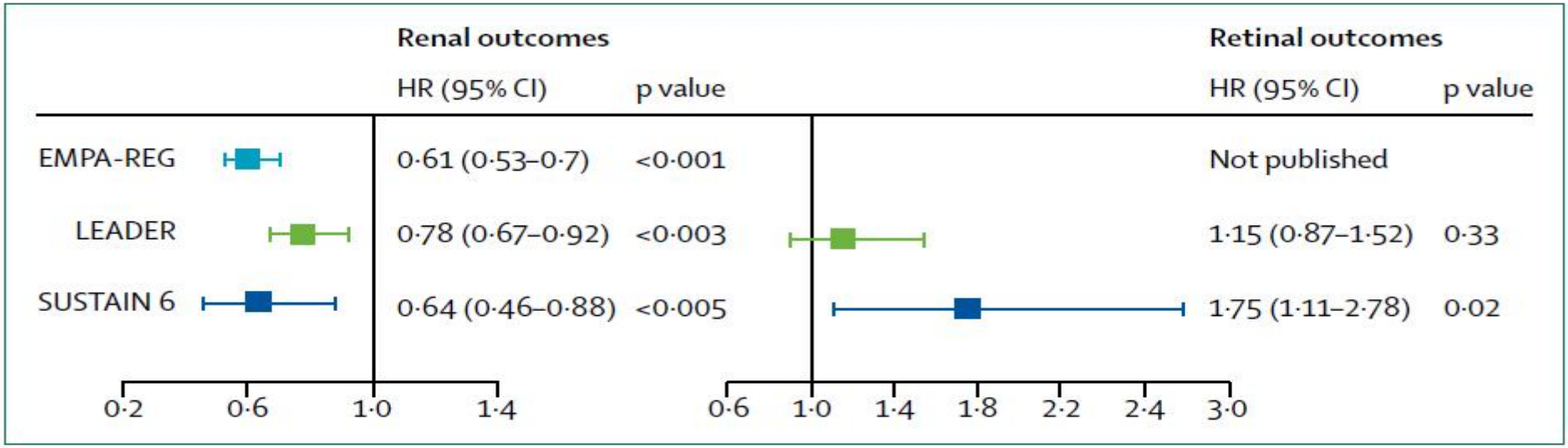
Renal outcomes
HR (95% CI)
p value
Retinal outcomes
HR (95% CI)
p value
EMPA-REG
0·61 (0·53–0·7)
<0·001
Not published
LEADER
0·78 (0·67–0·92)
<0·003
1·15 (0·87–1·52)
0·33
SUSTAIN 6
0·64 (0·46–0·88)
<0·005
1·75 (1·11–2·78)
0·02
0·2
0·6
1·0
1·4
0·6
1·0
1·4
1·8
2·2
2·4
3·0


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Diabetologia (2016) 59:2298–2307
DOI 10.1007/s00125-016-4065-6

ARTICLE

Years of life gained by multifactorial intervention in patients with type 2 diabetes mellitus and microalbuminuria: 21 years follow-up on the Steno-2 randomised trial

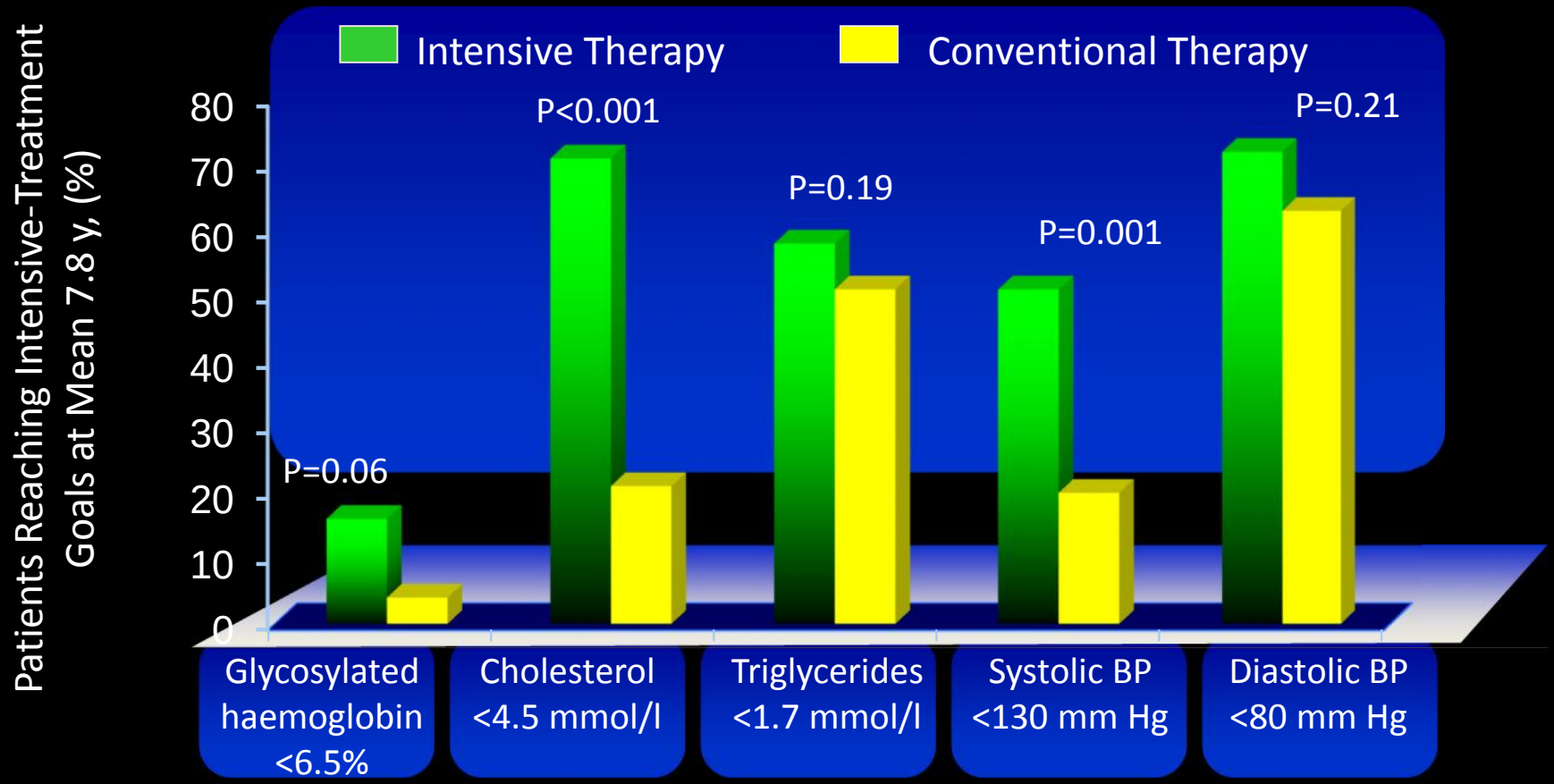
Peter Gæde[1,2] · Jens Oellgaard[1,2,3] · Bendix Carstensen[3] · Peter Rossing[3,4,5] · Henrik Lund-Andersen[3,5,6] · Hans-Henrik Parving[5,7] · Oluf Pedersen[8]

160 patients with T2 DM and microalbuminuria
Mean diabetes duration 5 years
7.8 years intervention

160 patients with T2 DM and microalbuminuria
Mean diabetes duration 5 years
7.8 years intervention

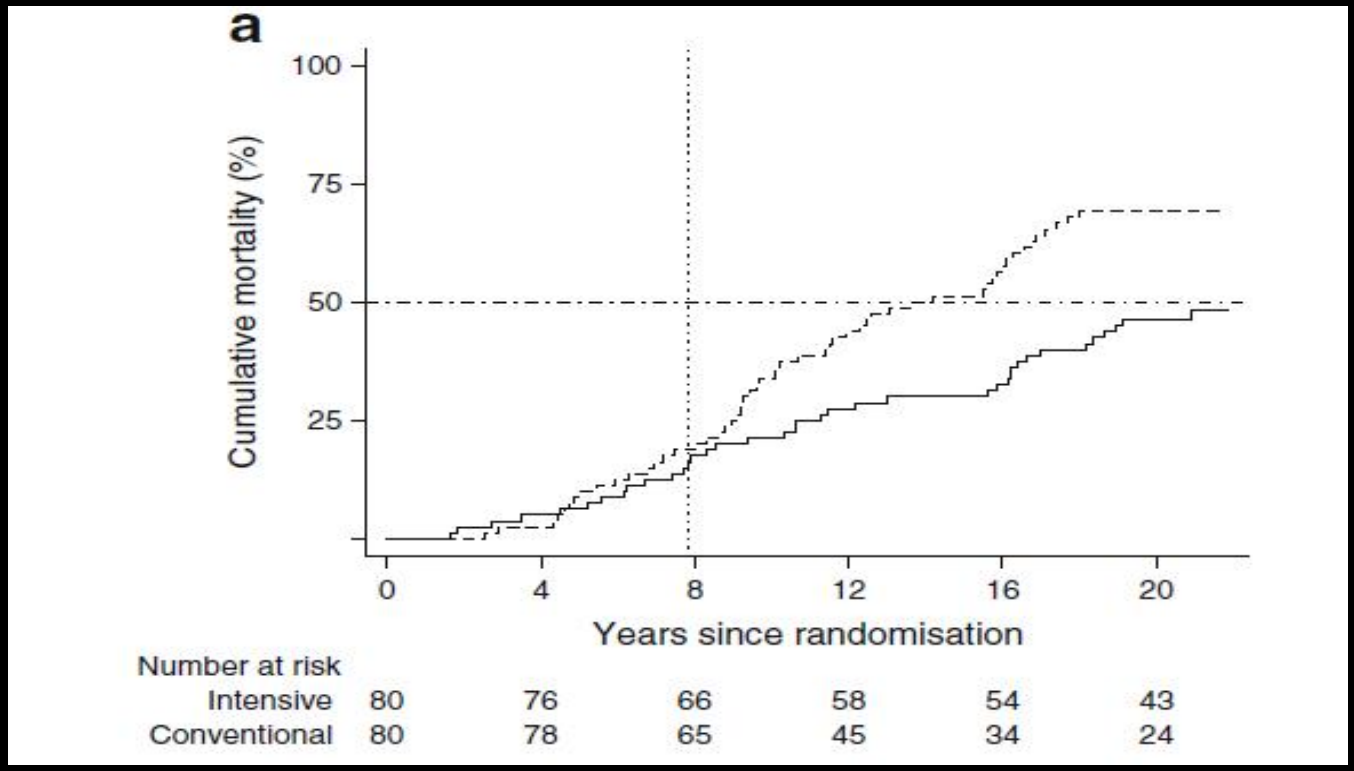
	Conventional	Intensive
Haemoglobin A_{1c} (%)	<7.5	<6.5
Cholesterol (mmol/l)	<6.5	<4.5
Triglycerides (mmol/l)	<2.2	<1.7
Systolic BP (mmHg)	<160	<130
Diastolic BP (mmHg)	<95	<80
ACEi irrespective of BP	No	Yes
Aspirin, primary prevention	No	Yes

Steno-2 Study



Gæde P et al. *N Engl J Med* 2003;348:383-393

Median survival benefit 7.9 yrs



Median delay to 1st CV event 8.1 yrs

Diabetologia (2016) 59:2298–2307

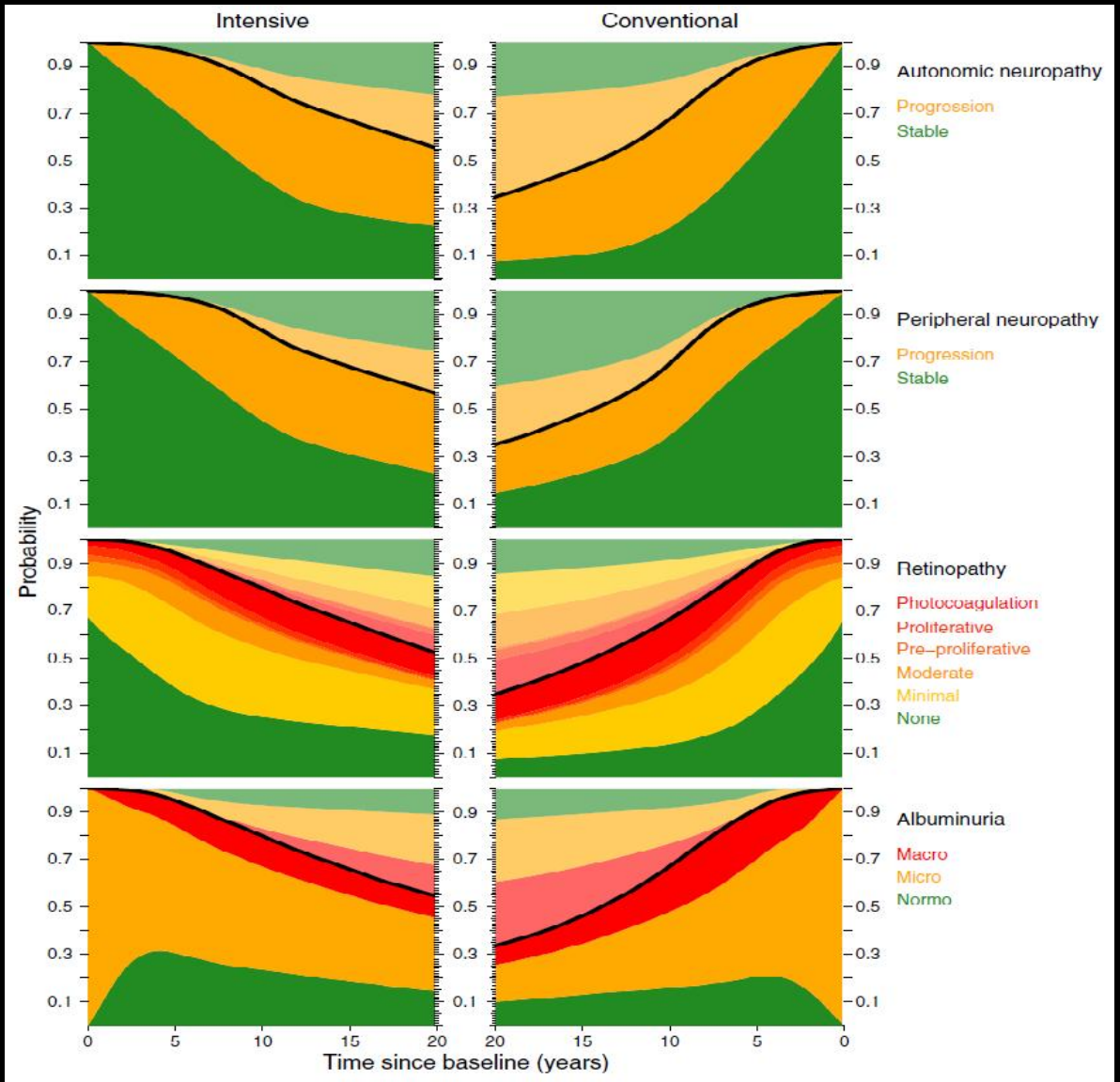

Intensive
Conventional
Probability
0.9
0.7
0.5
0.3
0.1
0
5
10
15
20
Time since baseline (years)
Autonomic neuropathy
Progression
Stable
Peripheral neuropathy
Progression
Stable
Retinopathy
Photocoagulation
Proliferative
Pre−proliferative
Moderate
Minimal
None
Albuminuria
Macro
Micro
Normo

Table 2. Clinical Manifestations of Kidney Disease Among US Adults With Diabetes, 1988 Through 2014

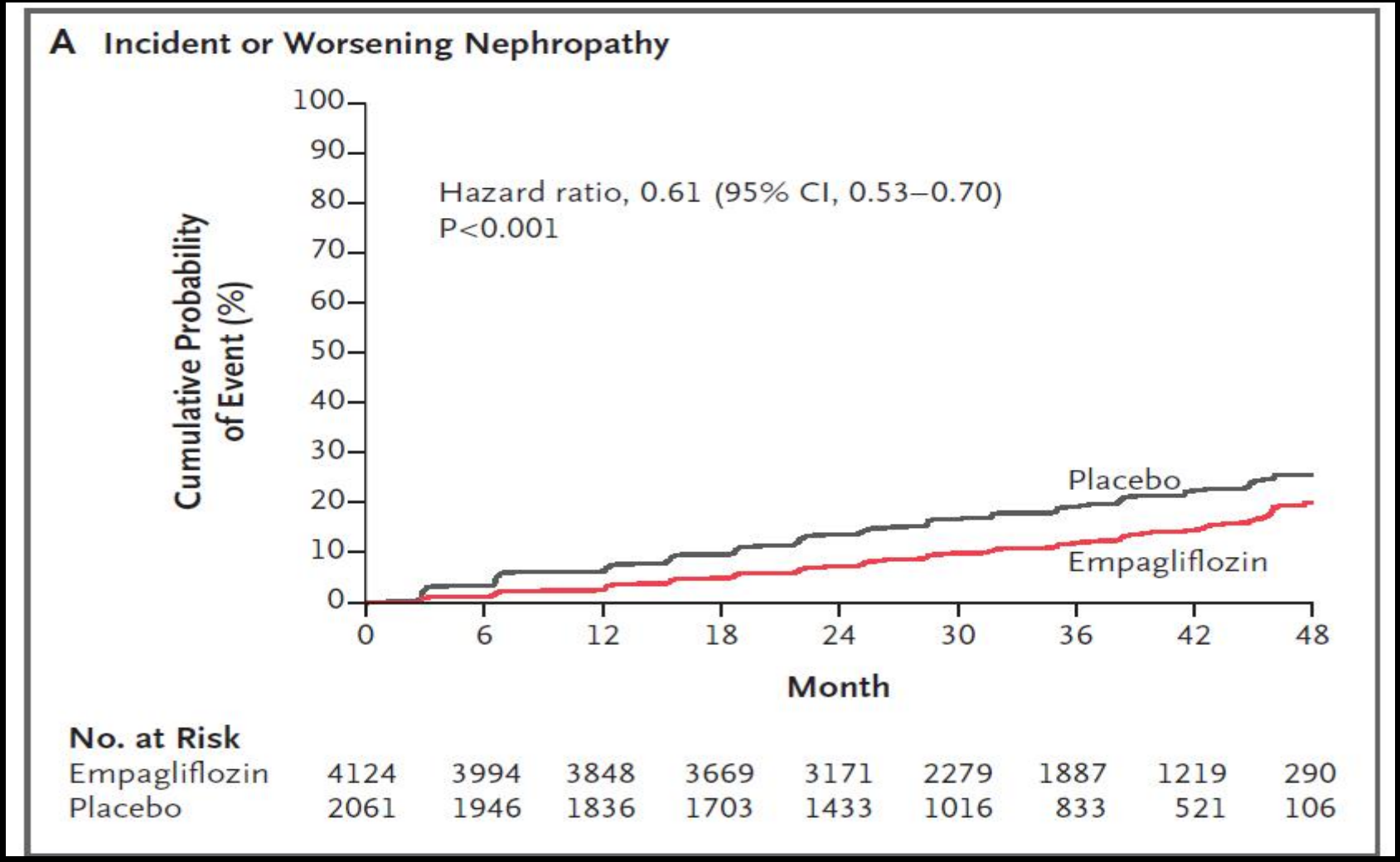
NHANES Period	No. With Diabetes	Unadjusted Prevalence, % (95% CI)		Adjusted Prevalence Ratio (95% CI)[b]	*P* Value for Trend
		Based on a Single Laboratory Value	Accounting for Persistence[a]		
Any diabetic kidney disease[c]					
1988-1994	640	42.5 (38.4-46.6)	28.4 (23.8-32.9)	1 [Reference]	.39
1999-2004	659	40.5 (37.5-43.6)	27.3 (23.1-31.4)	1.00 (0.90-1.11)	
2005-2008	573	39.3 (36.0-42.7)	27.1 (22.6-31.4)	0.99 (0.88-1.10)	
2009-2014	874	38.1 (35.3-41.0)	26.2 (22.6-29.9)	0.95 (0.86-1.06)	
Albuminuria (ACR ≥30 mg/g)					
1988-1994	534	35.2 (31.1-39.5)	20.8 (16.3-25.3)	1 [Reference]	<.001
1999-2004	531	32.1 (29.0-35.3)	18.9 (15.3-22.4)	0.93 (0.79-1.06)	
2005-2008	447	30.4 (27.6-33.4)	17.9 (14.0-21.9)	0.86 (0.75-1.01)	
2009-2014	645	27.1 (24.1-30.3)	15.9 (12.7-19.0)	0.76 (0.65-0.89)	
Macroalbuminuria (ACR ≥300 mg/g)					
1988-1994	155	7.9 (6.0-10.4)	5.6 (2.8-8.4)	1 [Reference]	.22
1999-2004	141	7.4 (5.9-9.2)	5.4 (3.1-7.7)	0.93 (0.65-1.31)	
2005-2008	111	6.9 (5.4-8.7)	4.9 (2.7-7.1)	0.86 (0.60-1.23)	
2009-2014	171	6.7 (5.6-8.2)	5.0 (3.3-6.6)	0.82 (0.59-1.14)	
Estimated GFR <60 mL/min/1.73 m^2					
1988-1994	214	13.1 (10.9-15.7)	9.2 (6.2-12.2)	1 [Reference]	<.001
1999-2004	273	16.0 (14.1-18.2)	11.6 (8.5-14.6)	1.33 (1.09-1.63)	
2005-2008	242	16.6 (14.2-19.4)	11.8 (8.4-15.1)	1.38 (1.09-1.75)	
2009-2014	450	20.1 (18.5-21.8)	14.1 (11.3-17.0)	1.61 (1.33-1.95)	
Estimated GFR <30 mL/min/1.73 m^2					
1988-1994	22	1.0 (0.5-2.0)	NA	1 [Reference]	.004
1999-2004	39	1.7 (1.1-2.6)	NA	1.86 (0.87-3.98)	
2005-2008	28	1.8 (1.2-2.7)	NA	1.93 (0.90-4.11)	
2009-2014	62	2.7 (2.0-3.7)	NA	2.86 (1.38-5.91)	

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Empagliflozin and Progression of Kidney Disease in Type 2 Diabetes

Christoph Wanner, M.D., Silvio E. Inzucchi, M.D., John M. Lachin, Sc.D., David Fitchett, M.D., Maximilian von Eynatten, M.D., Michaela Mattheus, Dipl. Biomath., Odd Erik Johansen, M.D., Ph.D., Hans J. Woerle, M.D., Uli C. Broedl, M.D., and Bernard Zinman, M.D., for the EMPA-REG OUTCOME Investigators*


A Incident or Worsening Nephropathy
Cumulative Probability of Event (%)
100
90
80
70
60
50
40
30
20
10
0
Hazard ratio, 0.61 (95% CI, 0.53–0.70)
P<0.001
Placebo
Empagliflozin
0
6
12
18
24
30
36
42
48
Month
No. at Risk
Empagliflozin 4124 3994 3848 3669 3171 2279 1887 1219 290
Placebo 2061 1946 1836 1703 1433 1016 833 521 106

	Empagliflozin (EMPA-REG OUTCOME; n=7020)
Incident or worsening nephropathy	0·61 (0·53–0·70); p<0·001
New-onset macroalbuminuria	0·62 (0·54–0·72); p<0·001
Doubling of serum creatinine concentration and eGFR ≤45 mL/min/1·73m²	0·56 (0·39–0·79); p<0·001
Need for renal replacement therapy	0·45 (0·21–0·97); p=0·04
Death due to renal disease	3 (empagliflozin) *vs* 0 (placebo);* NR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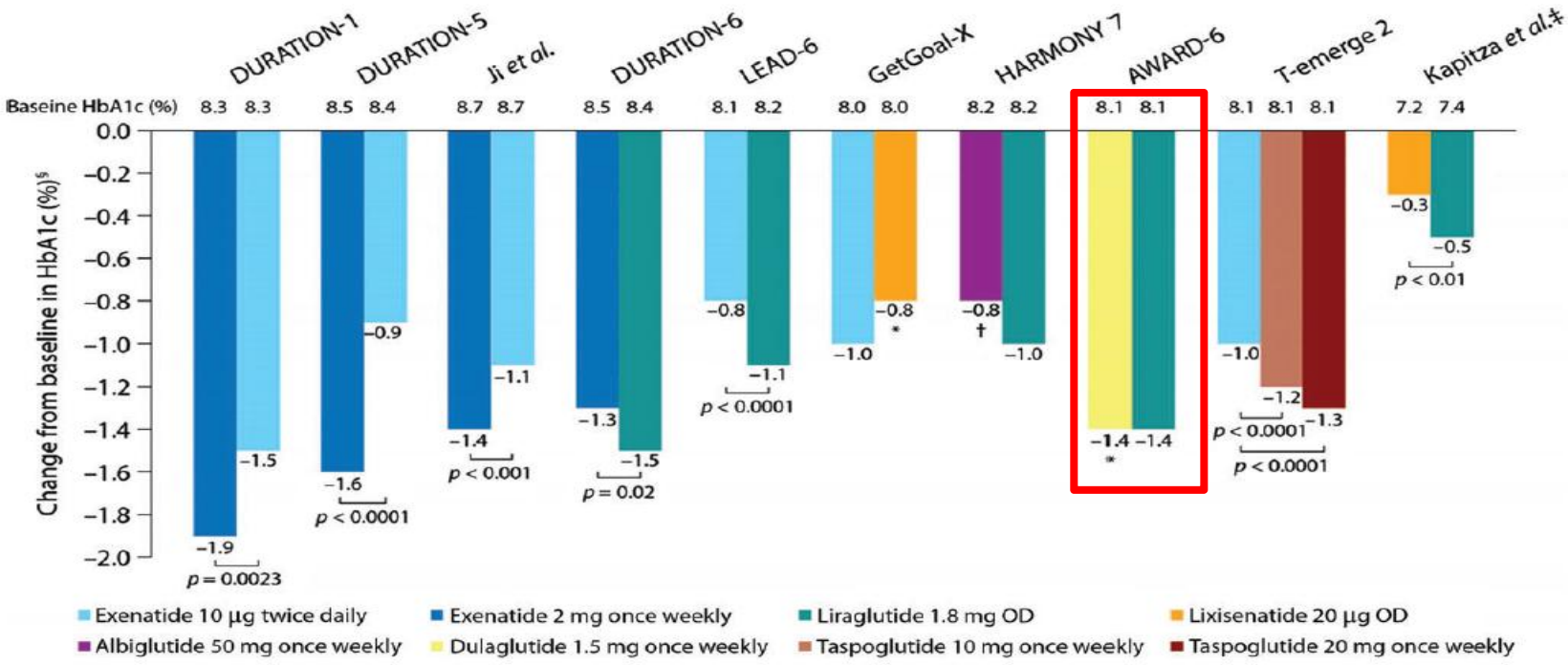
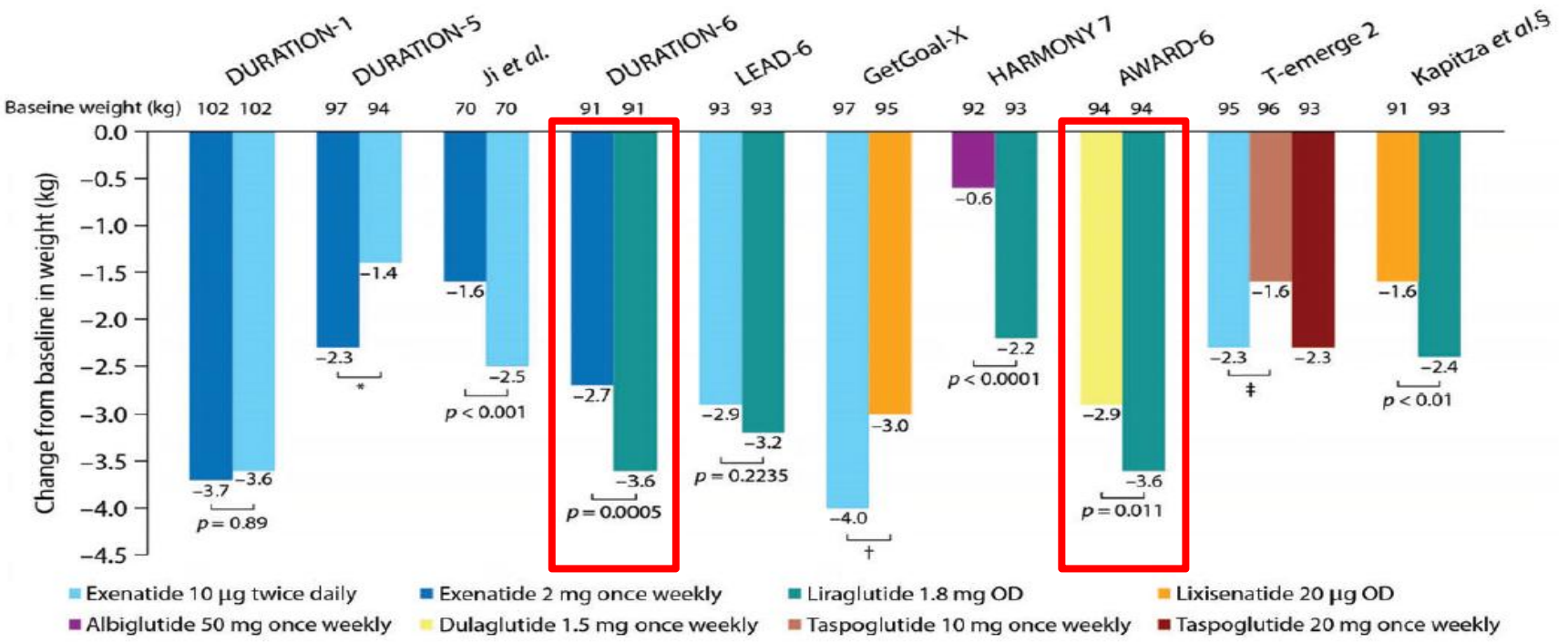
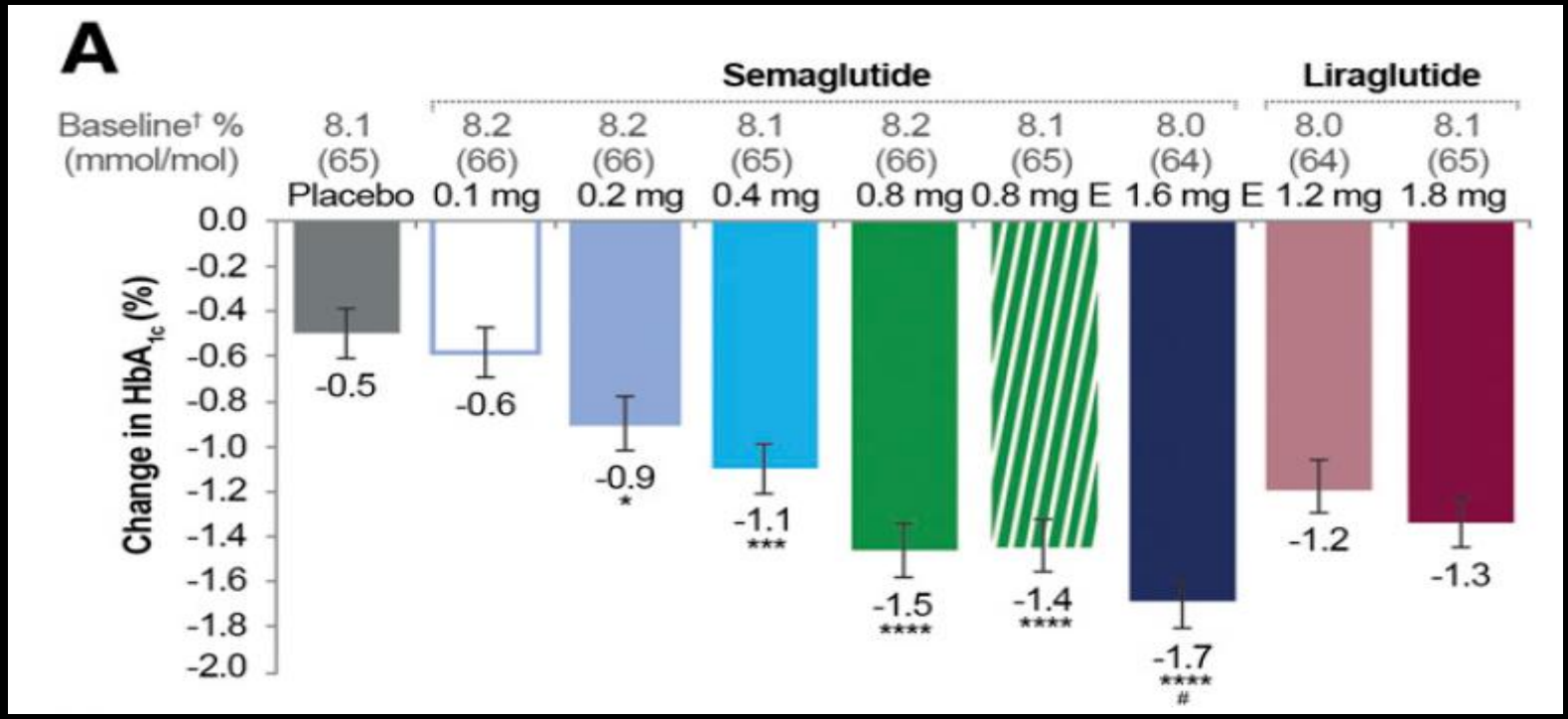
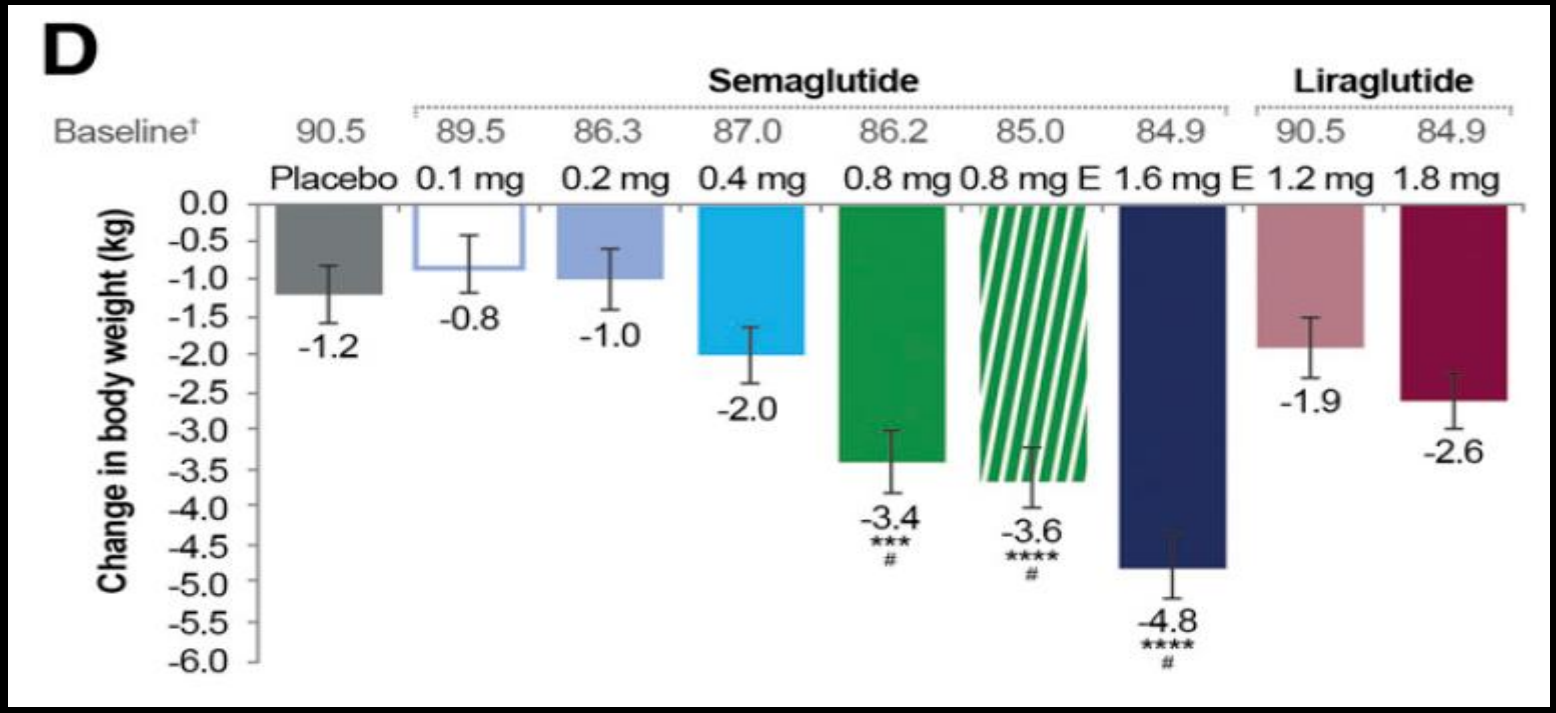
FRANCE
RESULT
ENGLAND 1-2 ICELAND
#ENGISL
#DareToDream
VAUXHALL
VAUXHALL
10


DURATION-1
DURATION-5
Ji et al.
DURATION-6
LEAD-6
GetGoal-X
HARMONY 7
AWARD-6
T-emerge 2
Kapitza et al.‡
Baseine HbA1c (%)
8.3 8.3
8.5 8.4
8.7 8.7
8.5 8.4
8.1 8.2
8.0 8.0
8.2 8.2
8.1 8.1
8.1 8.1 8.1
7.2 7.4
Change from baseline in HbA1c (%)§
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
−1.2
−1.4
−1.6
−1.8
−2.0
−1.9
−1.5
p = 0.0023
−1.6
−0.9
p < 0.0001
−1.4
−1.1
p < 0.001
−1.3
−1.5
p = 0.02
−0.8
−1.1
p < 0.0001
−1.0
−0.8
*
−0.8
†
−1.0
−1.4 −1.4
*
−1.0
−1.2
p < 0.0001
−1.3
p < 0.0001
−0.3
−0.5
p < 0.01
Exenatide 10 µg twice daily
Exenatide 2 mg once weekly
Liraglutide 1.8 mg OD
Lixisenatide 20 µg OD
Albiglutide 50 mg once weekly
Dulaglutide 1.5 mg once weekly
Taspoglutide 10 mg once weekly
Taspoglutide 20 mg once weekly

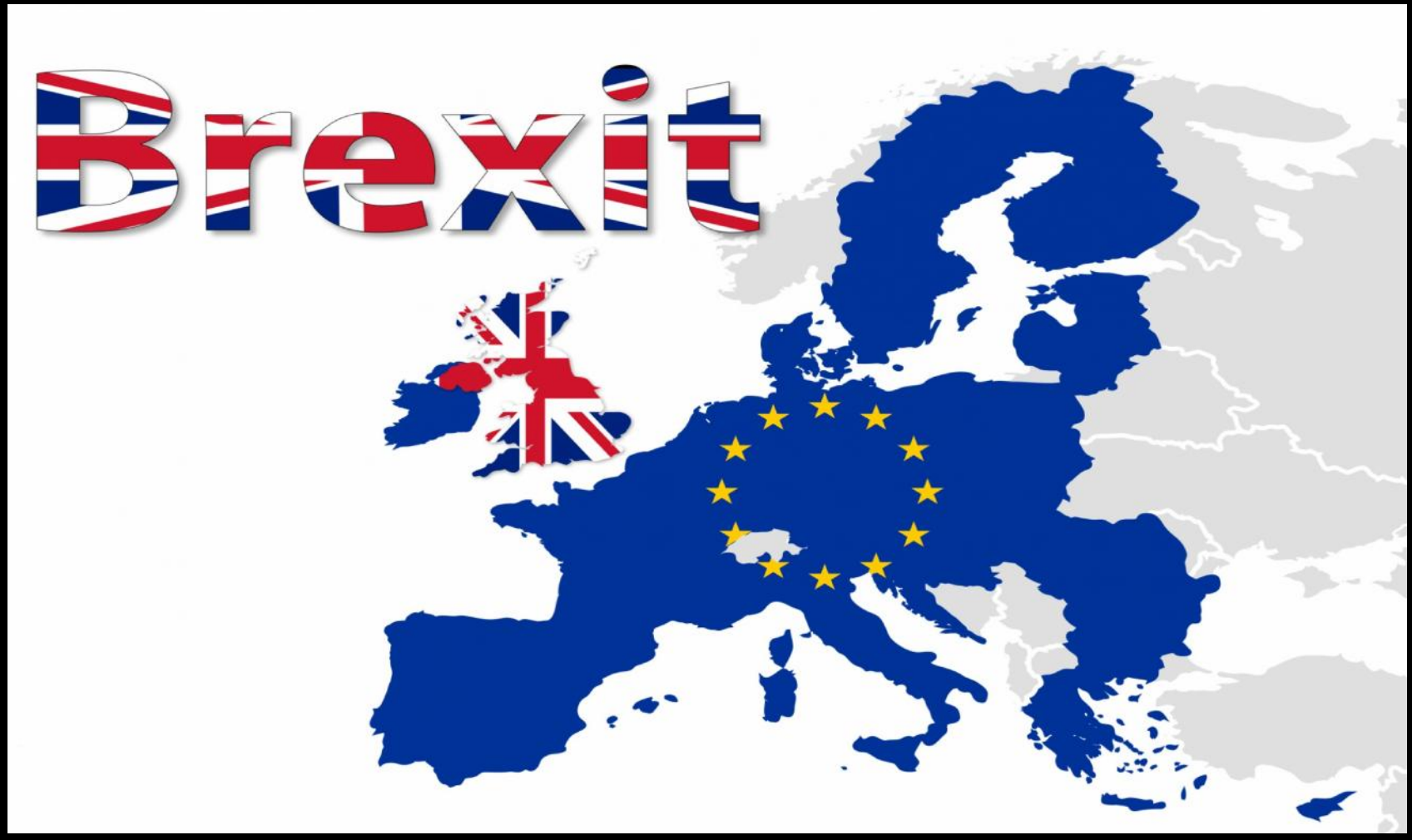

DURATION-1
DURATION-5
Ji et al.
DURATION-6
LEAD-6
GetGoal-X
HARMONY 7
AWARD-6
T-emerge 2
Kapitza et al.§
Baseine weight (kg) 102 102 97 94 70 70 91 91 93 93 97 95 92 93 94 94 95 96 93 91 93
Change from baseline in weight (kg)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
−3.7
−3.6
p = 0.89
−2.3
−1.4
*
−1.6
−2.5
p < 0.001
−2.7
−3.6
p = 0.0005
−2.9
−3.2
p = 0.2235
−4.0
−3.0
†
−0.6
−2.2
p < 0.0001
−2.9
−3.6
p = 0.011
−2.3
‡
−1.6
−2.3
−1.6
−2.4
p < 0.01
Exenatide 10 µg twice daily
Exenatide 2 mg once weekly
Liraglutide 1.8 mg OD
Lixisenatide 20 µg OD
Albiglutide 50 mg once weekly
Dulaglutide 1.5 mg once weekly
Taspoglutide 10 mg once weekly
Taspoglutide 20 mg once weekly



Diabetes Care Volume 39, February 2016



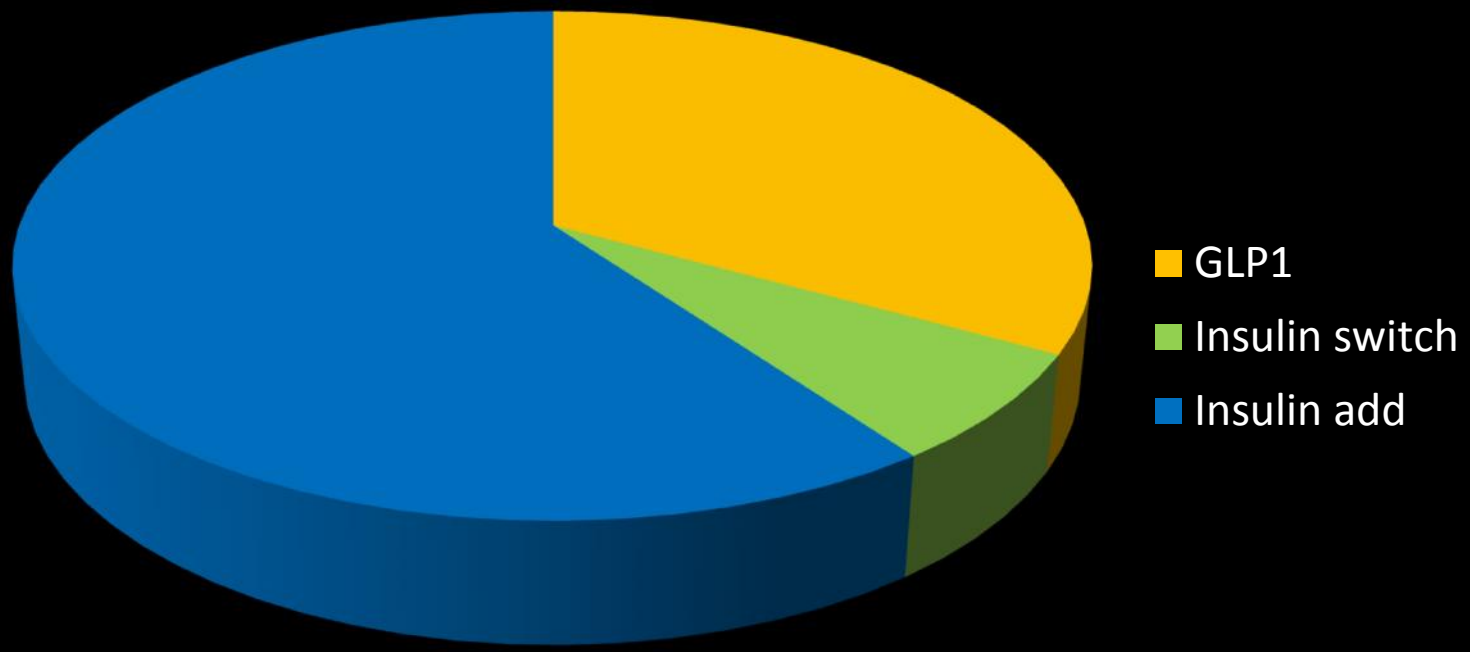
Diabetes Care Volume 39, February 2016


Brexit

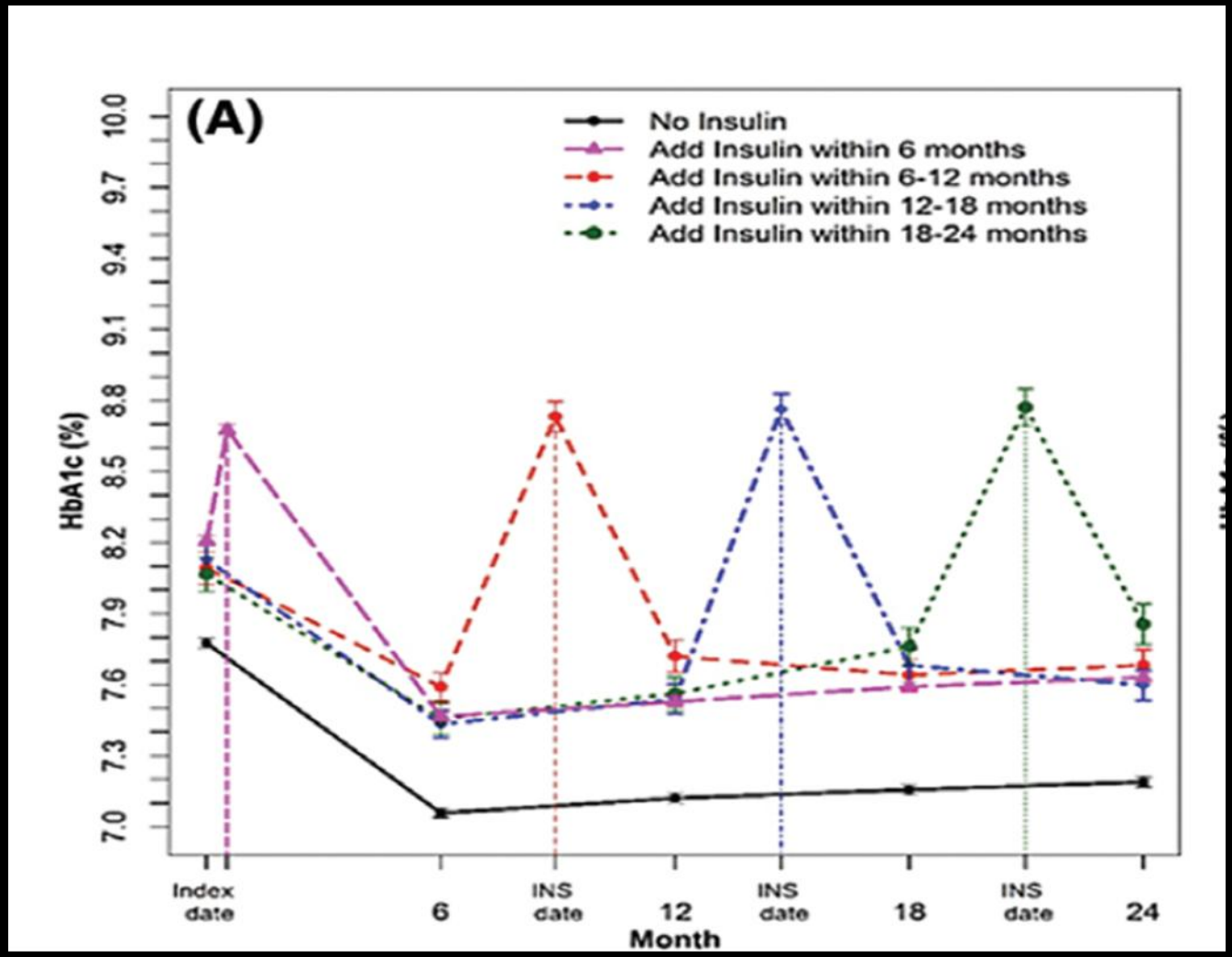

WAT

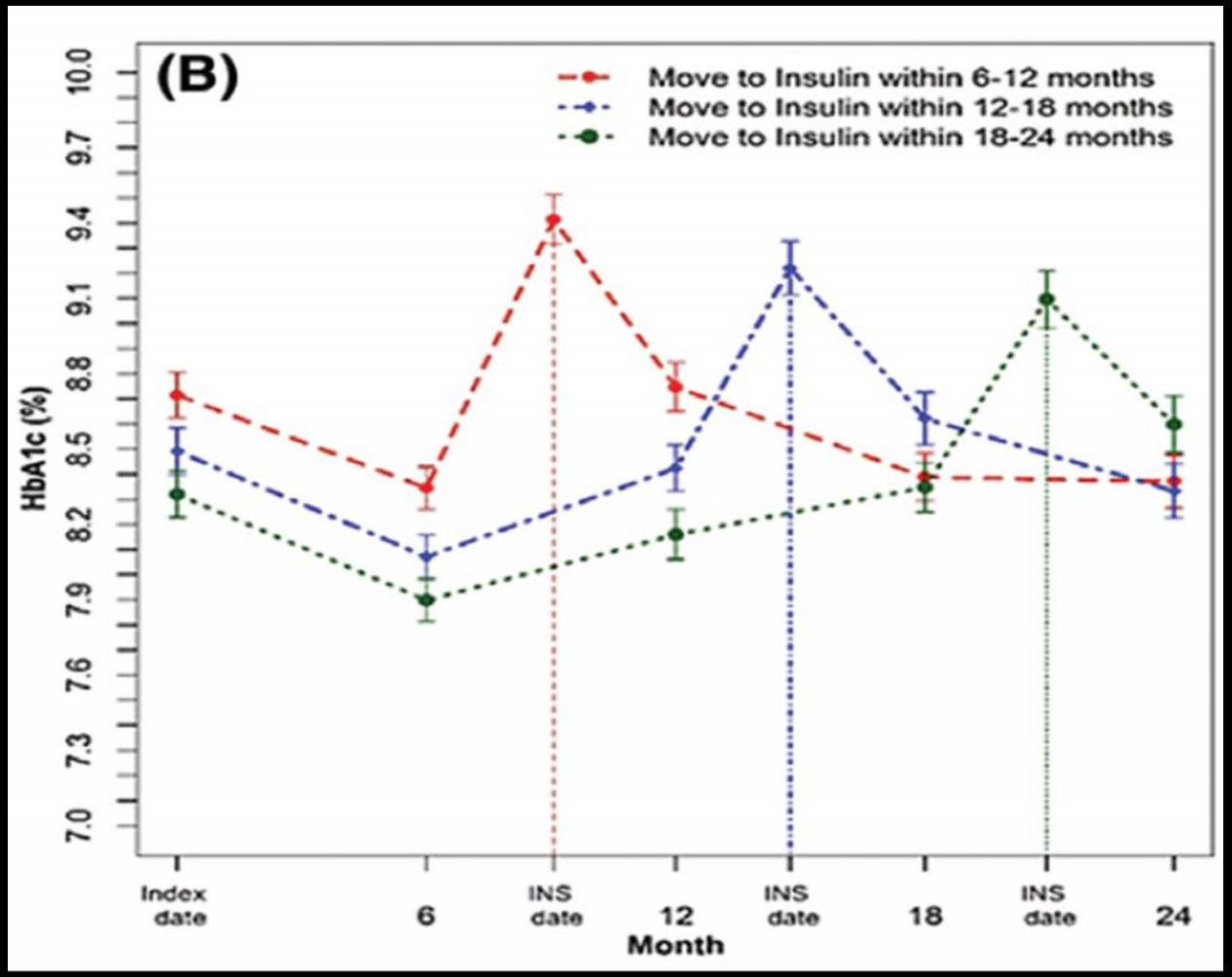
Addition of or switch to insulin therapy in people treated with glucagon-like peptide-1 receptor agonists: A real-world study in 66 583 patients

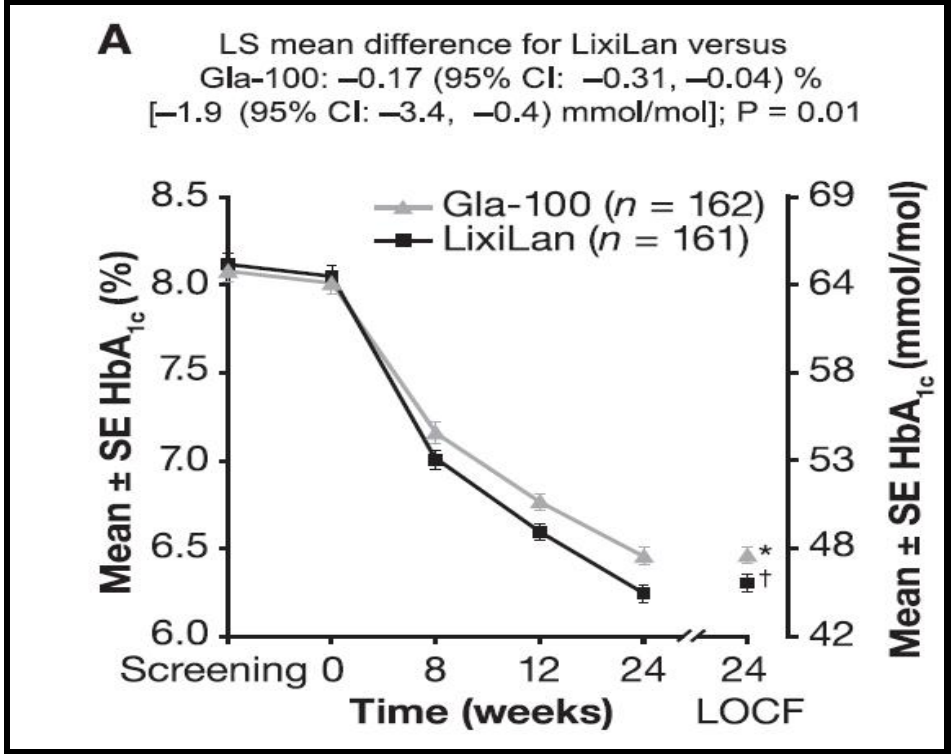
Olga Montvida MSc[1,2] | Kerenaftali Klein PhD[1] | Sudhesh Kumar MD[3] | Kamlesh Khunti PhD[4] | Sanjoy K. Paul PhD[1]

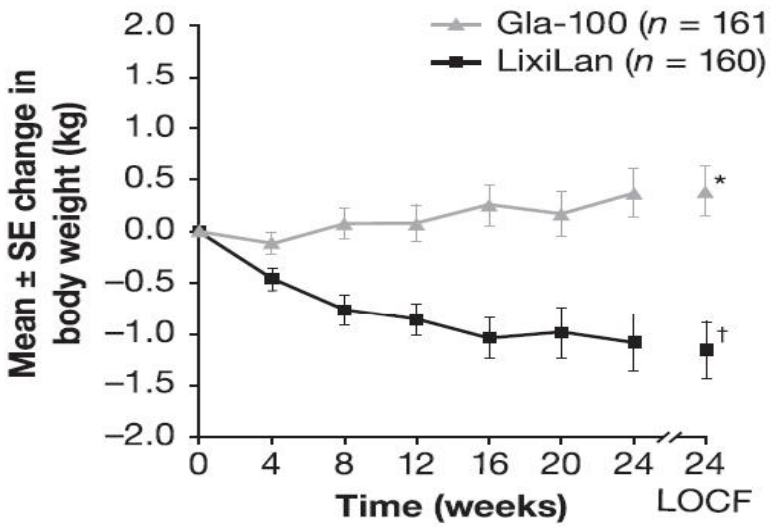


Diabetes Obes Metab 2017; 19(1):108–117

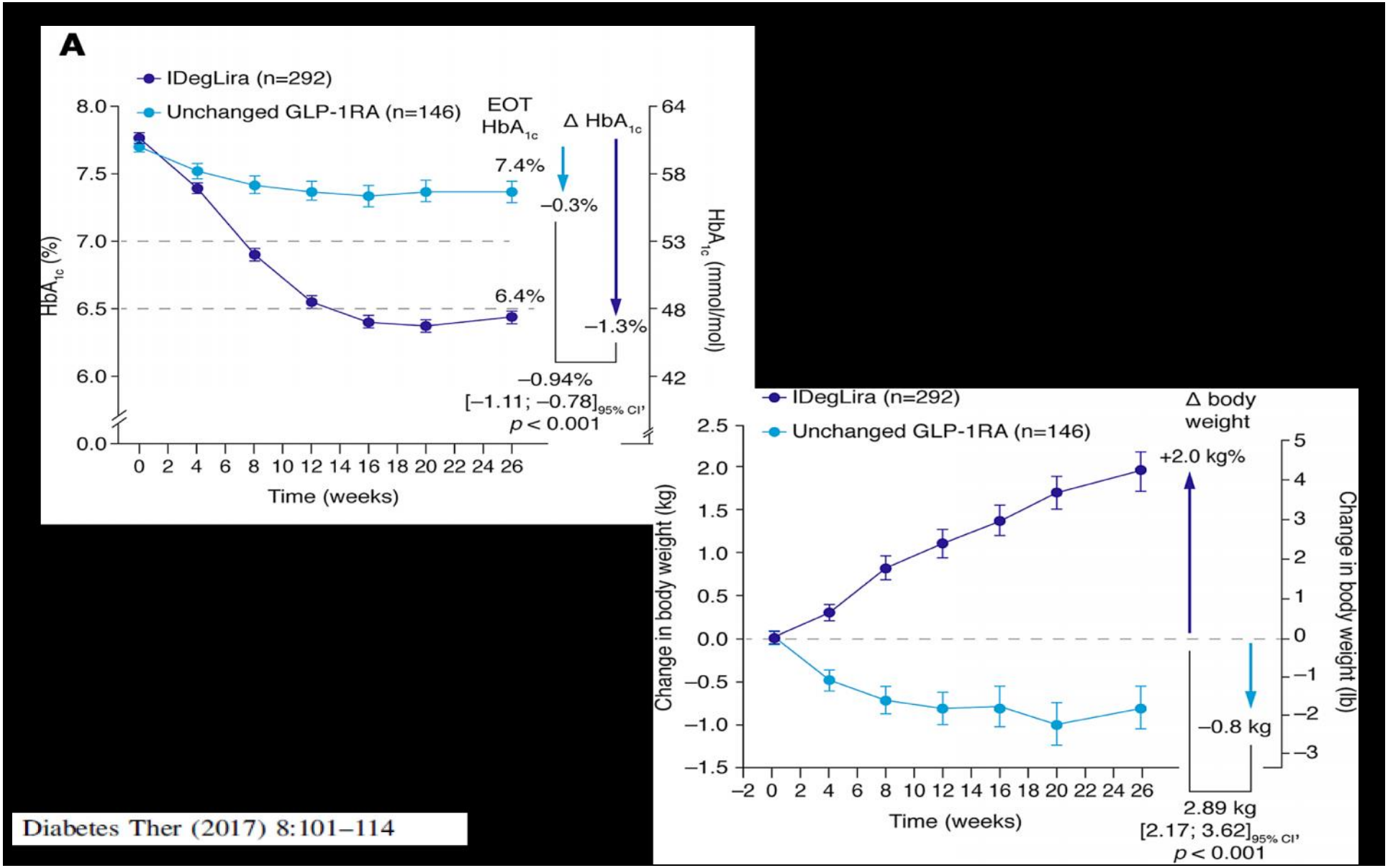

(A)
No Insulin
Add Insulin within 6 months
Add Insulin within 6-12 months
Add Insulin within 12-18 months
Add Insulin within 18-24 months
HbA1c (%)
10.0
9.7
9.4
9.1
8.8
8.5
8.2
7.9
7.6
7.3
7.0
Index date
6
INS date
12
INS date
18
INS date
24
Month


(B)
Move to Insulin within 6-12 months
Move to Insulin within 12-18 months
Move to Insulin within 18-24 months
HbA1c (%)
10.0
9.7
9.4
9.1
8.8
8.5
8.2
7.9
7.6
7.3
7.0
Index date
6
INS date
12
INS date
18
INS date
24
Month





Diabetes Care Volume 39, September 2016

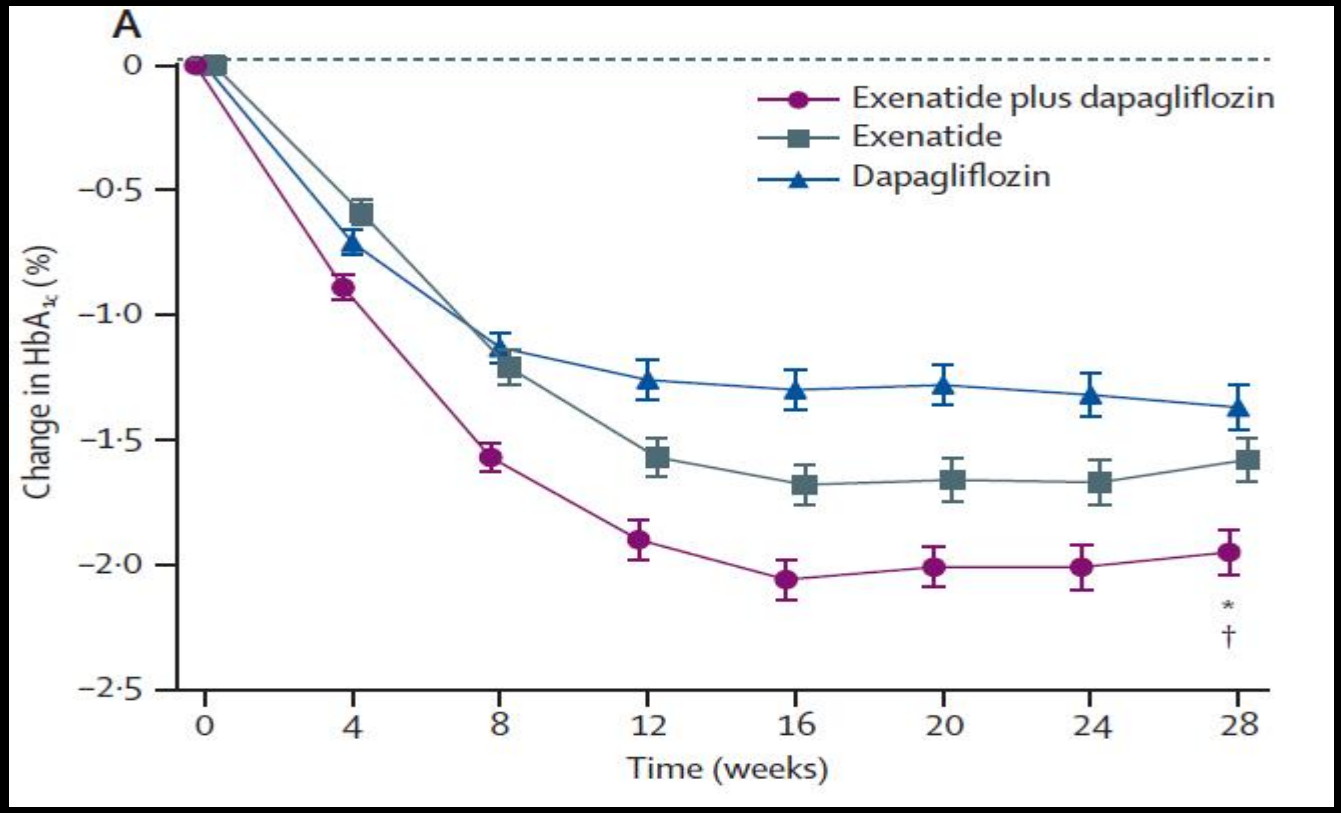


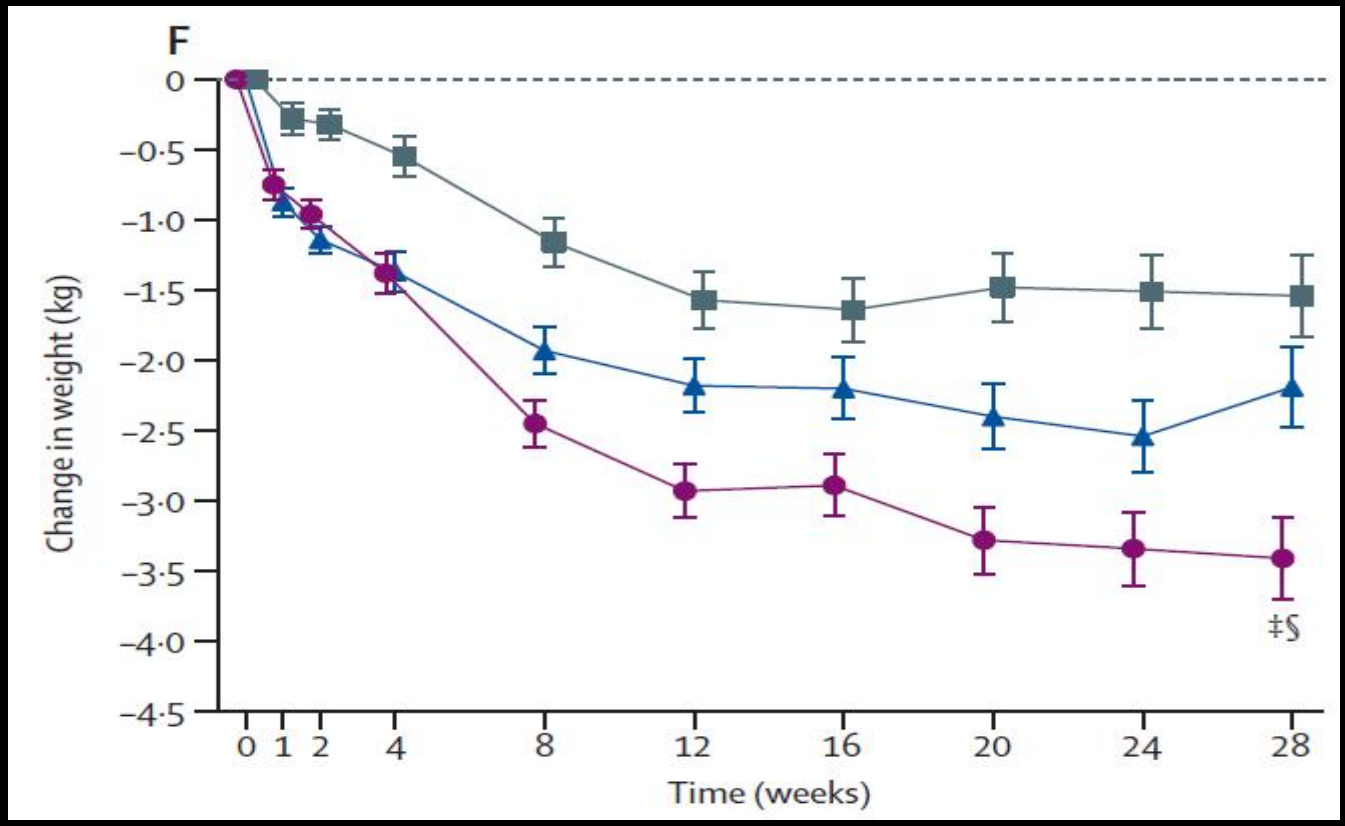
Diabetes Ther (2017) 8:101–114

Exenatide once weekly plus dapagliflozin once daily versus exenatide or dapagliflozin alone in patients with type 2 diabetes inadequately controlled with metformin monotherapy (DURATION-8): a 28 week, multicentre, double-blind, phase 3, randomised controlled trial

*Juan P Frías, Cristian Guja, Elise Hardy, Azazuddin Ahmed, Fang Dong, Peter Öhman, Serge A Jabbour**

www.thelancet.com/diabetes-endocrinology **Vol 4 December 2016**


A
0
−0·5
−1·0
−1·5
−2·0
−2·5
Change in HbA1c (%)
Exenatide plus dapagliflozin
Exenatide
Dapagliflozin
*
†
0
4
8
12
16
20
24
28
Time (weeks)


F
0
−0·5
−1·0
−1·5
−2·0
−2·5
−3·0
−3·5
−4·0
−4·5
Change in weight (kg)
0 1 2 4 8 12 16 20 24 28
Time (weeks)
‡§


adidas
adidas
TEAM GB

TAD Talking About Diabetes

ABOUT US
TAD TALK EVENTS
TAD TALK 2016
TAD TALK VIDEOS
GET INVOLVED
CONTACT

TAD TALK 2017

What to expect?

Following the success and overwhelming response from last year's event, we will be hosting the second Talking About Diabetes (TAD) event on **Saturday 22 April**.

Please join us for a series of inspirational and empowering talks at the TAD 2017 event. Here you will have the chance to engage with several high profile speakers whose lives have been impacted by type 1 diabetes (T1D) and hear first hand, the challenges and successes they have experienced. This day is for anyone who wants to learn more about the achievements of others with T1D and be confident that the condition is not a barrier to great success.

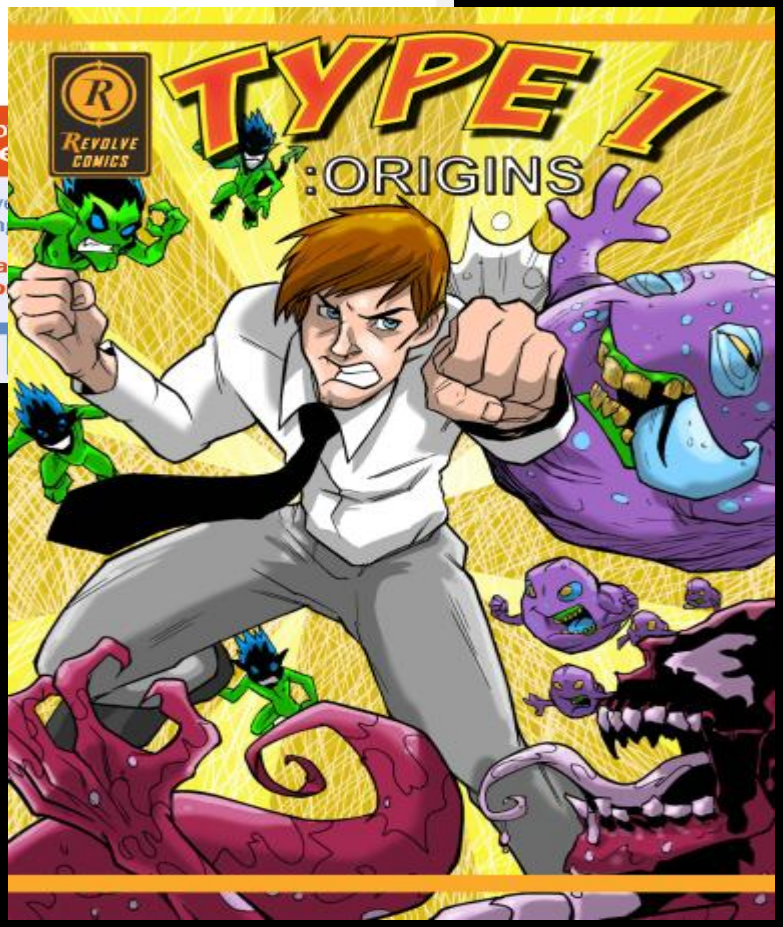
We're back! Sign up no
Talking About Diabe

Inspirational and empow
high-profile speakers livin

Saturday 22 April, 9:30a
Birkbeck College, Londo

For more information
and to register:
www.high5events.co.uk/TAD17

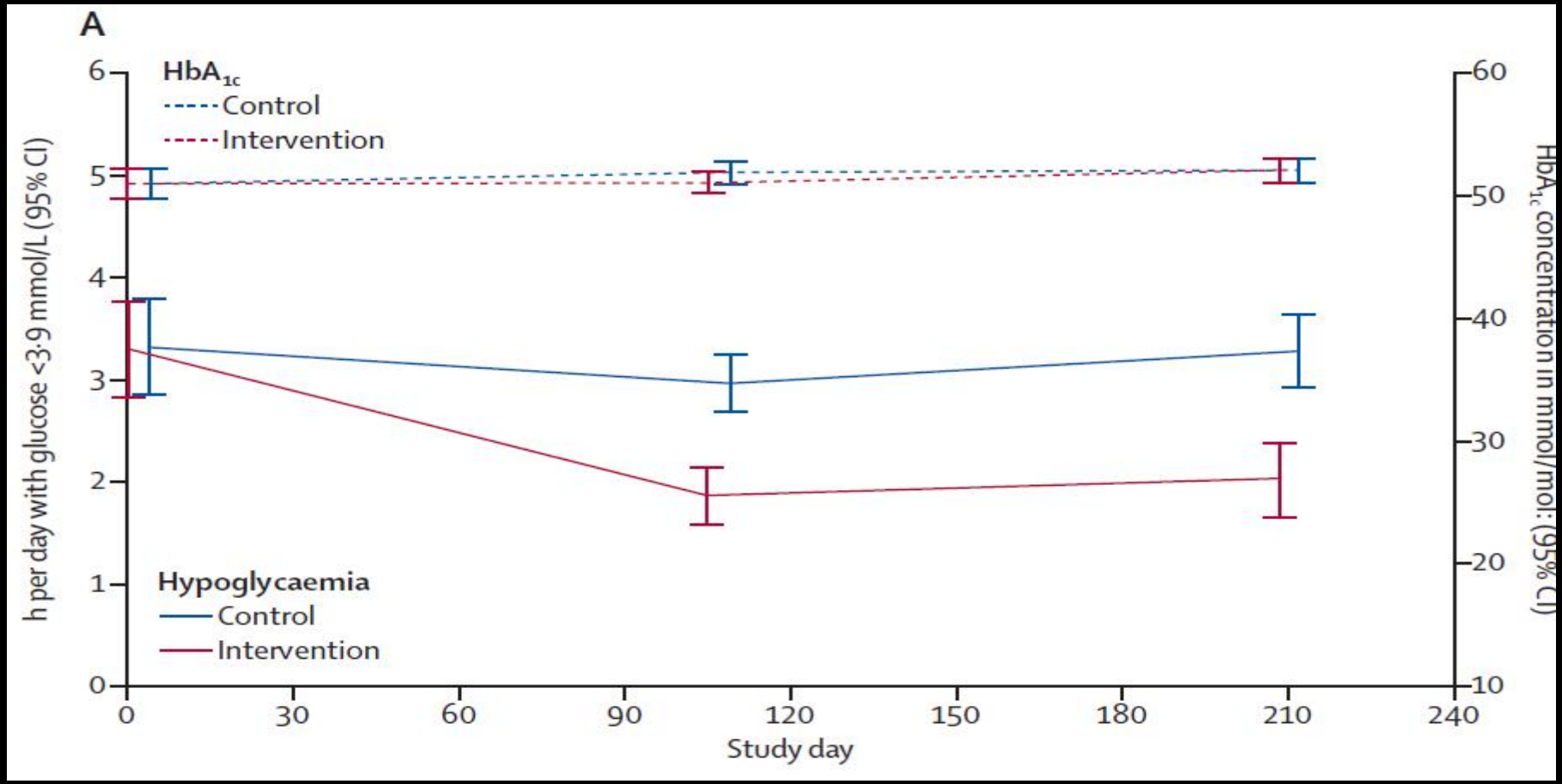
twitter

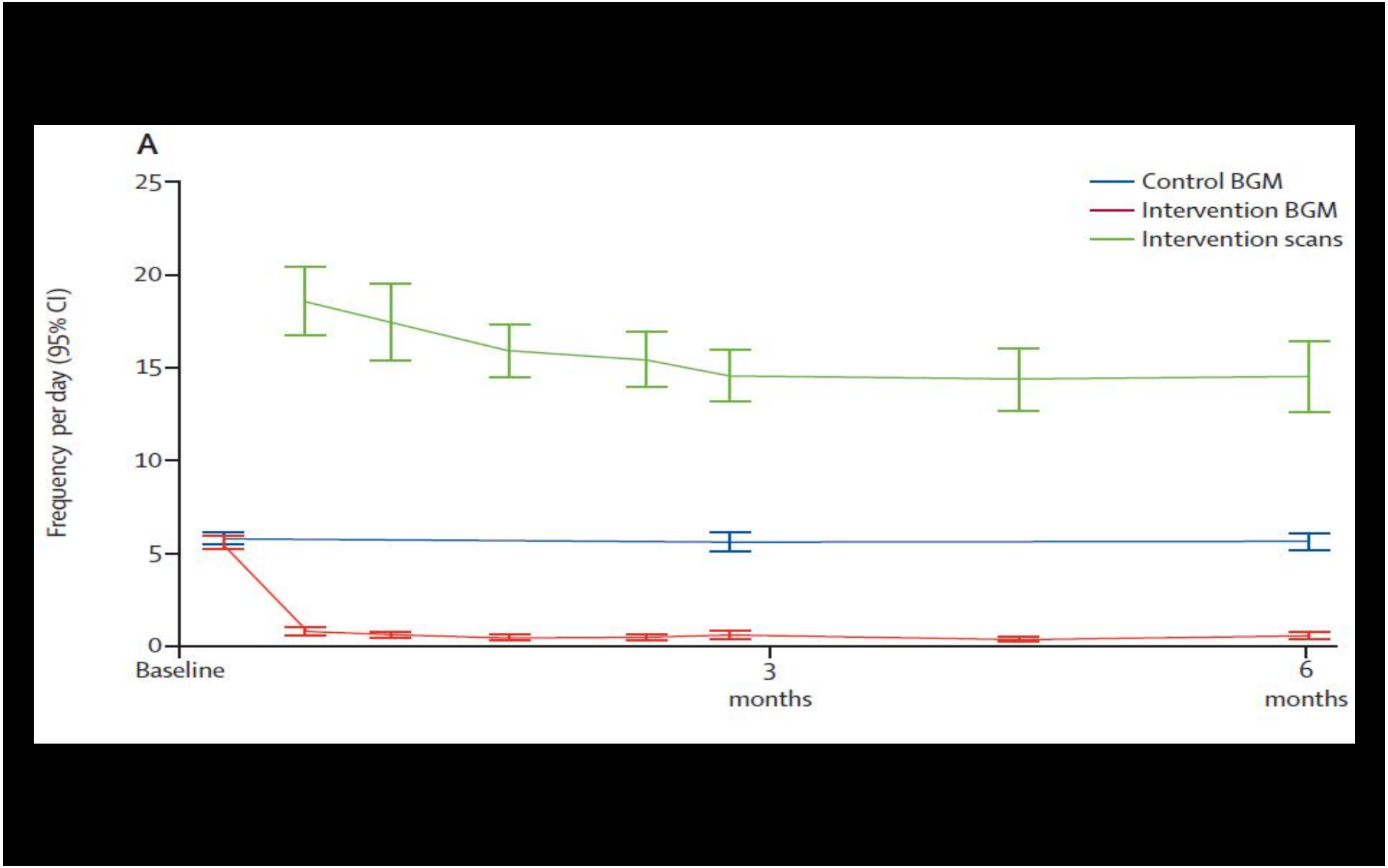


Novel glucose-sensing technology and hypoglycaemia in type 1 diabetes: a multicentre, non-masked, randomised controlled trial

Jan Bolinder, Ramiro Antuna, Petronella Geelhoed-Duijvestijn, Jens Kröger, Raimund Weitgasser

www.thelancet.com Vol 388 November 5, 2016


A
HbA1c
Control
Intervention
Hypoglycaemia
Control
Intervention
h per day with glucose <3·9 mmol/L (95% CI)
HbA1c concentration in mmol/mol: (95% CI)
Study day
0
30
60
90
120
150
180
210
240
1
2
3
4
5
6
10
20
30
40
50
60


A
Frequency per day (95% CI)
25
20
15
10
5
0
Baseline
3
months
6
months
Control BGM
Intervention BGM
Intervention scans

DIABETICMedicine

Letters

DOI: 10.1111/dme.13315

Flash Glucose Monitoring is associated with improved glycaemic control but use is largely limited to more affluent people in a UK diabetes centre

Diabet. Med. 34, 732 (2017)

JAMA | Original Investigation

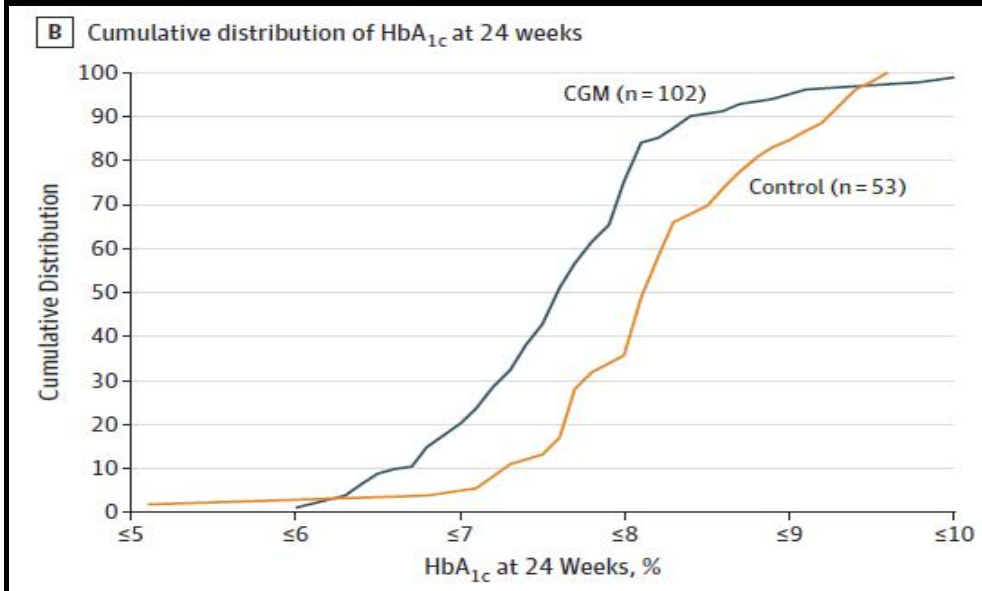
Effect of Continuous Glucose Monitoring on Glycemic Control in Adults With Type 1 Diabetes Using Insulin Injections
The DIAMOND Randomized Clinical Trial

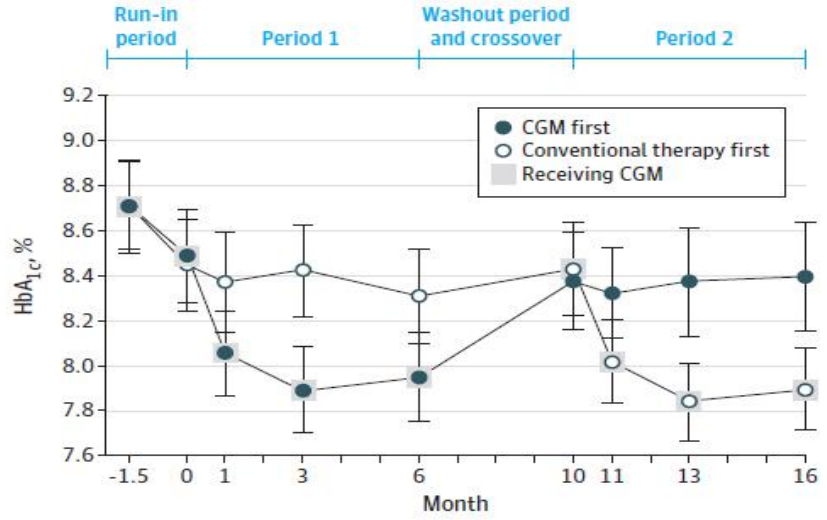
Roy W. Beck, MD, PhD; Tonya Riddlesworth, PhD; Katrina Ruedy, MSPH; Andrew Ahmann, MD; Richard Bergenstal, MD; Stacie Haller, RD, LD, CDE; Craig Kollman, PhD; Davida Kruger, MSN, APN-BC; Janet B. McGill, MD; William Polonsky, PhD; Elena Toschi, MD; Howard Wolpert, MD; David Price, MD; for the DIAMOND Study Group

JAMA | Original Investigation

Continuous Glucose Monitoring vs Conventional Therapy for Glycemic Control in Adults With Type 1 Diabetes Treated With Multiple Daily Insulin Injections
The GOLD Randomized Clinical Trial

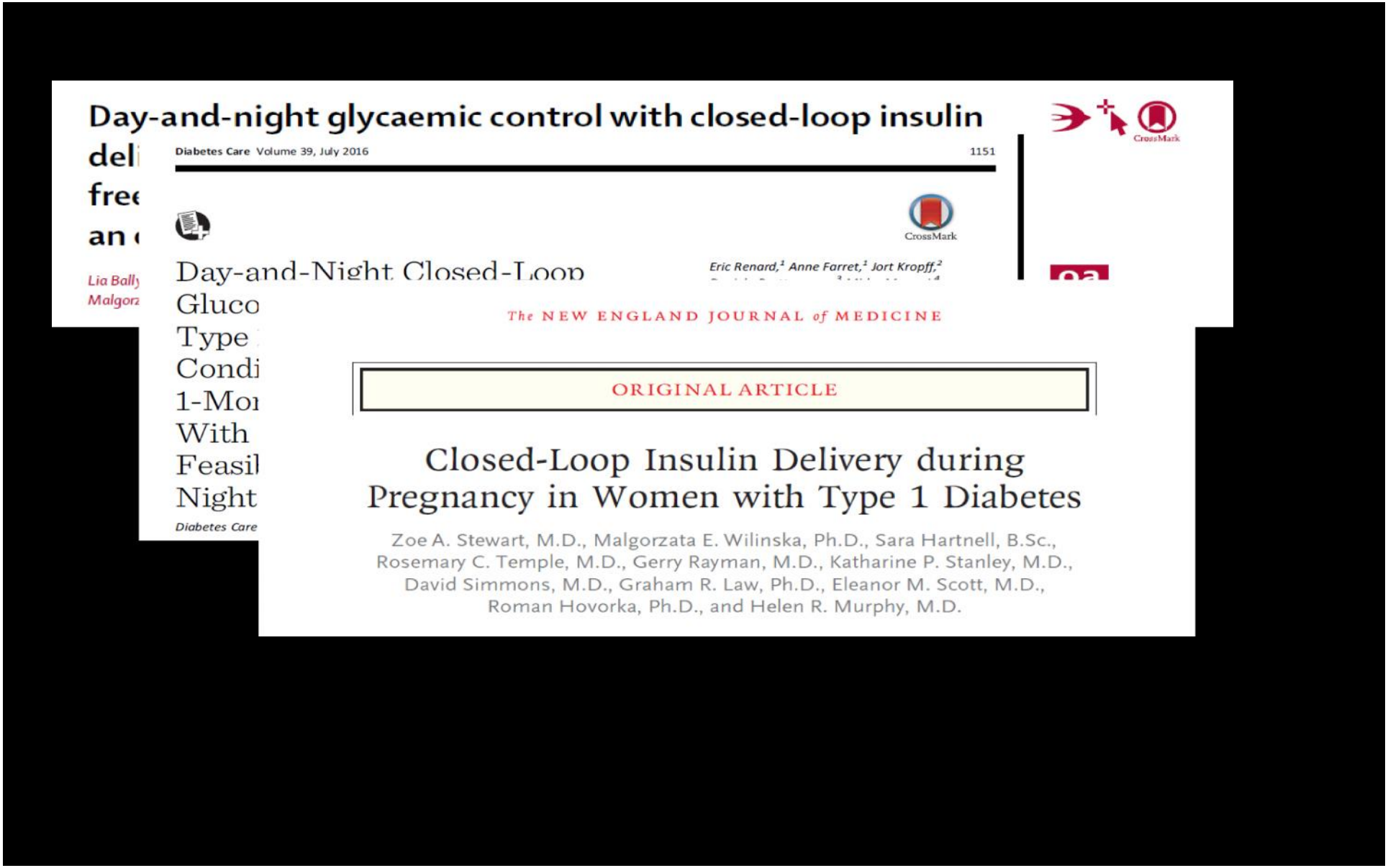
Marcus Lind, MD, PhD; William Polonsky, PhD; Irl B. Hirsch, MD; Tim Heise, MD; Jan Bolinder, MD, PhD; Sofia Dahlqvist; Erik Schwarz, MD, PhD; Arndís Finna Ólafsdóttir, RN; Anders Frid, MD, PhD; Hans Wedel, PhD; Elsa Ahlén, MD; Thomas Nyström, MD, PhD; Jarl Hellman, MD





No. of patients

CGM first	69	69	69	69	69	66	67	68	69
Conventional therapy first	73	72	71	73	73	73	70	73	73



Day-and-night glycaemic control with closed-loop insulin deli
free
an

Lia Bally
Malgorz

Diabetes Care Volume 39, July 2016 1151

Day-and-Night Closed-Loop Gluco
Type
Condi
1-Mo
With
Feasil
Night

Diabetes Care

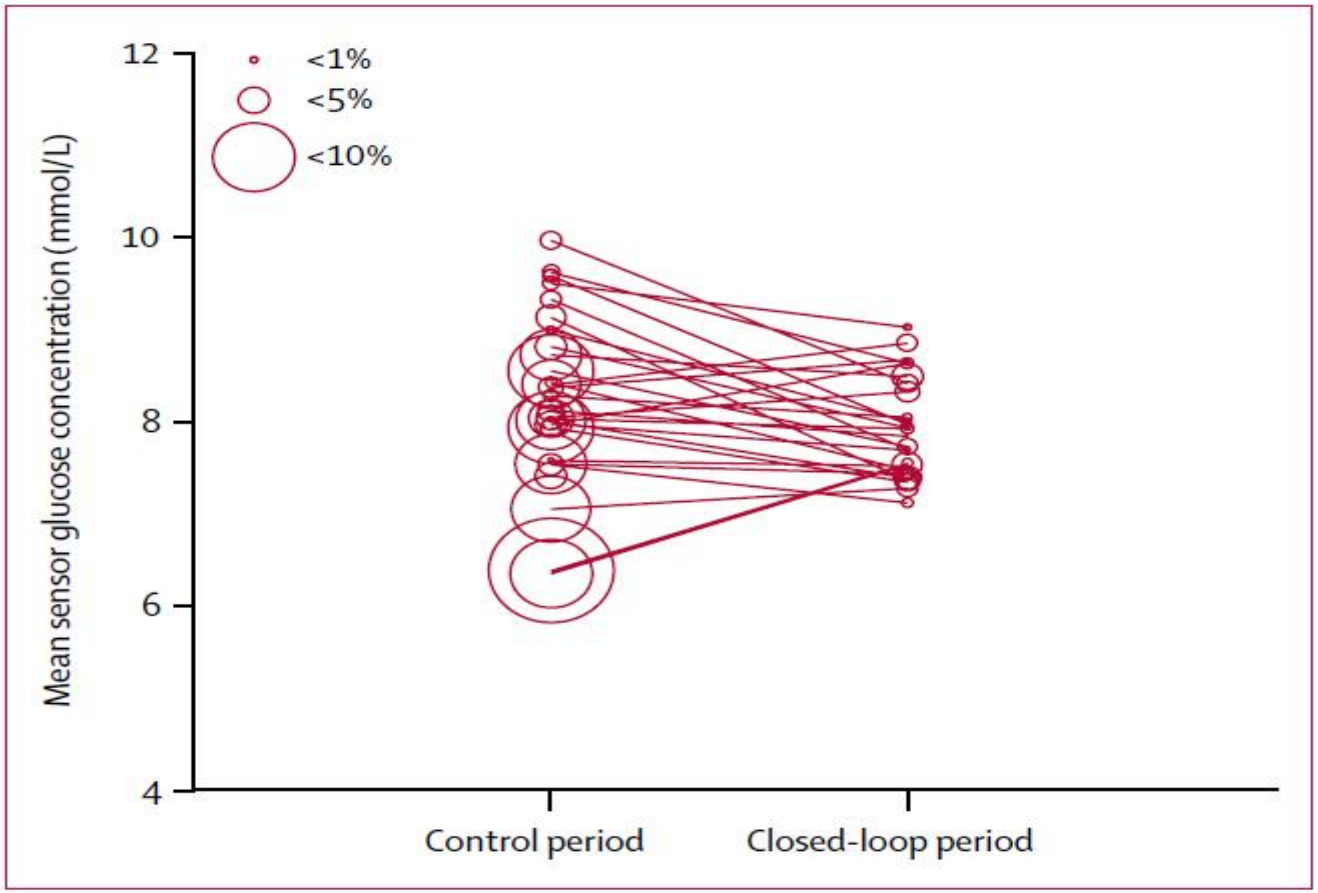
Eric Renard,[1] Anne Farret,[1] Jort Kropff,[2]

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Closed-Loop Insulin Delivery during Pregnancy in Women with Type 1 Diabetes

Zoe A. Stewart, M.D., Malgorzata E. Wilinska, Ph.D., Sara Hartnell, B.Sc., Rosemary C. Temple, M.D., Gerry Rayman, M.D., Katharine P. Stanley, M.D., David Simmons, M.D., Graham R. Law, Ph.D., Eleanor M. Scott, M.D., Roman Hovorka, Ph.D., and Helen R. Murphy, M.D.


12
10
8
6
4
<1%
<5%
<10%
Mean sensor glucose concentration (mmol/L)
Control period
Closed-loop period

Letters

RESEARCH LETTER

Safety of a Hybrid Closed-Loop Insulin Delivery System in Patients With Type 1 Diabetes

Closed-loop artificial pancreas technology uses a control algorithm to automatically adjust insulin delivery based on subcutaneous sensor data to improve diabetes management. Currently available systems stop insulin in response to existing[1] or predicted[2] low sensor glucose values, whereas hybrid closed-loop systems combine user-delivered premeal boluses with automatic interprandial insulin delivery.[3] This study investigated the safety of a hybrid closed-loop system in patients with type 1 diabetes.

124 patients
5% increase in time in target range

JAMA October 4, 2016 Volume 316, Number 13


Children under ten must be
accompanied by an adult
at the buffet.

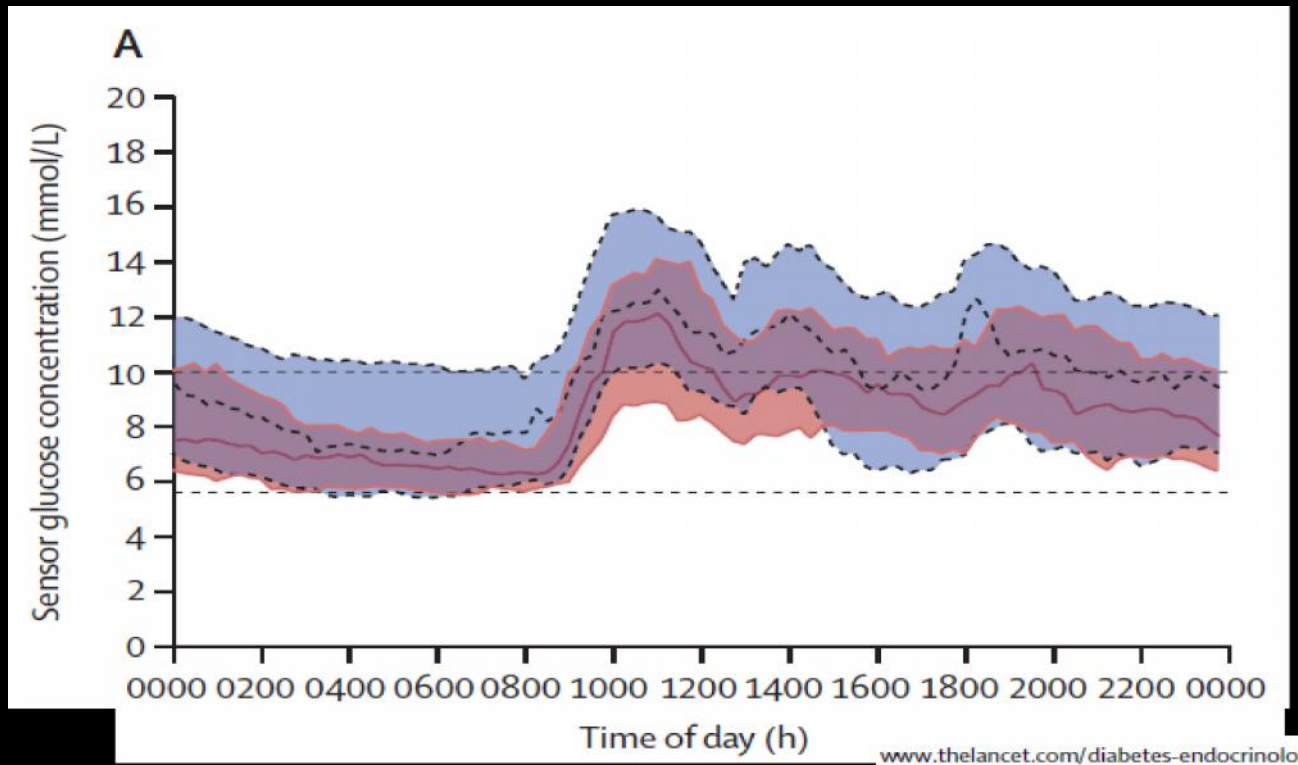
Closed-loop insulin delivery in inpatients with type 2 diabetes: a randomised, parallel-group trial

Hood Thabit, Sara Hartnell, Janet M Allen, Andrea Lake, Malgorzata E Wilinska, Yue Ruan, Mark L Evans, Anthony P Coll, Roman Hovorka

www.thelancet.com/diabetes-endocrinology **Vol 5 February 2017**

Closed-loop insulin delivery in inpatients with type 2 diabetes: a randomised, parallel-group trial

Hood Thabit, Sara Hartnell, Janet M Allen, Andrea Lake, Malgorzata E Wilinska, Yue Ruan, Mark L Evans, Anthony P Coll, Roman Hovorka



Efficacy of sitagliptin for the hospital management of general medicine and surgery patients with type 2 diabetes (Sita-Hospital): a multicentre, prospective, open-label, non-inferiority randomised trial

Francisco J Pasquel, Roma Gianchandani, Daniel J Rubin, Kathleen M Dungan, Isabel Anzola, Patricia C Gomez, Limin Peng, Israel Hodish, Tim Bodnar, David Wesorick, Vijay Balakrishnan, Kwame Osei, Guillermo E Umpierrez

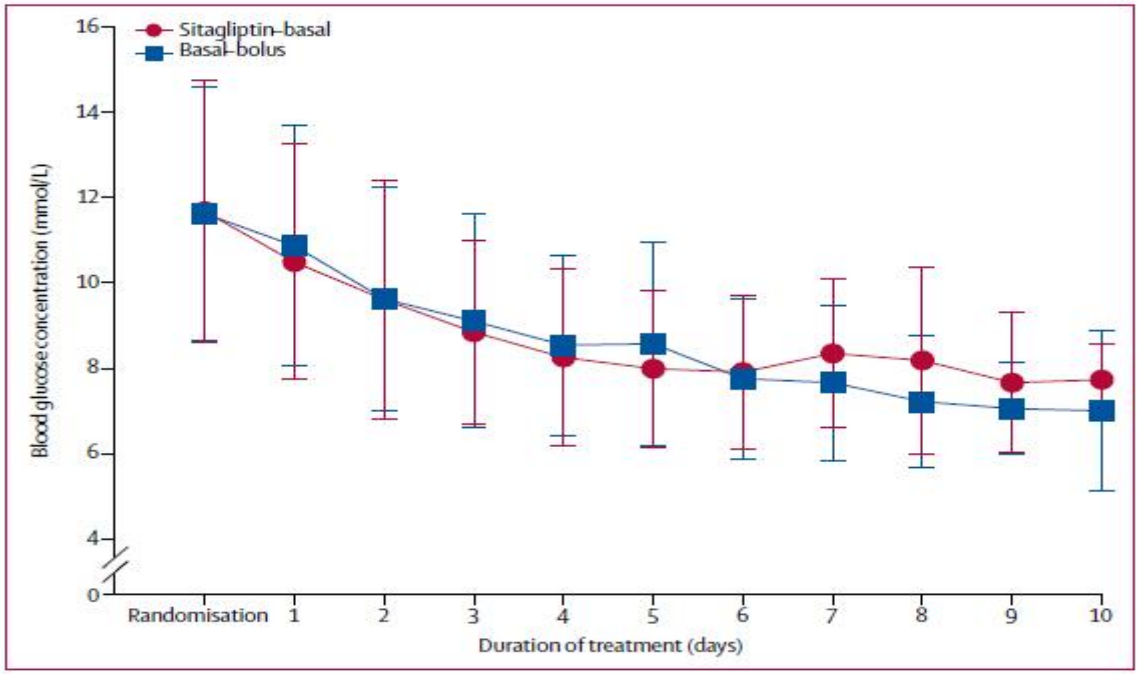
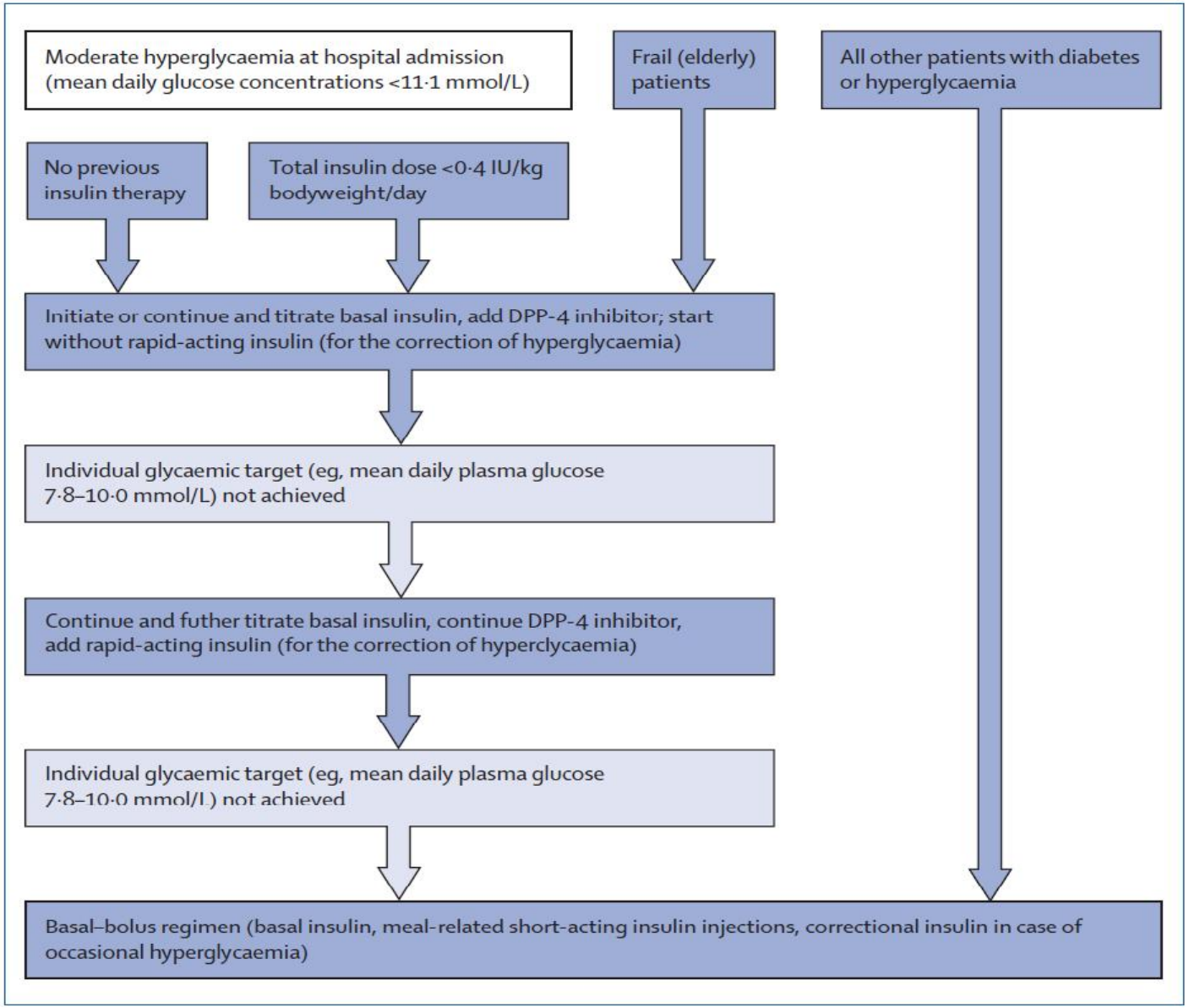


Figure 2: **Mean daily blood glucose concentrations**


Moderate hyperglycaemia at hospital admission (mean daily glucose concentrations <11·1 mmol/L)
Frail (elderly) patients
All other patients with diabetes or hyperglycaemia
No previous insulin therapy
Total insulin dose <0·4 IU/kg bodyweight/day
Initiate or continue and titrate basal insulin, add DPP-4 inhibitor; start without rapid-acting insulin (for the correction of hyperglycaemia)
Individual glycaemic target (eg, mean daily plasma glucose 7·8–10·0 mmol/L) not achieved
Continue and futher titrate basal insulin, continue DPP-4 inhibitor, add rapid-acting insulin (for the correction of hyperclycaemia)
Individual glycaemic target (eg, mean daily plasma glucose 7·8–10·0 mmol/L) not achieved
Basal–bolus regimen (basal insulin, meal-related short-acting insulin injections, correctional insulin in case of occasional hyperglycaemia)

Trends in hospital admissions for hypoglycaemia in England: a retrospective, observational study

Francesco Zaccardi, Melanie J Davies, Nafeesa N Dhalwani, David R Webb, Gemma Housley, Dominic Shaw, James W Hatton, Kamlesh Khunti

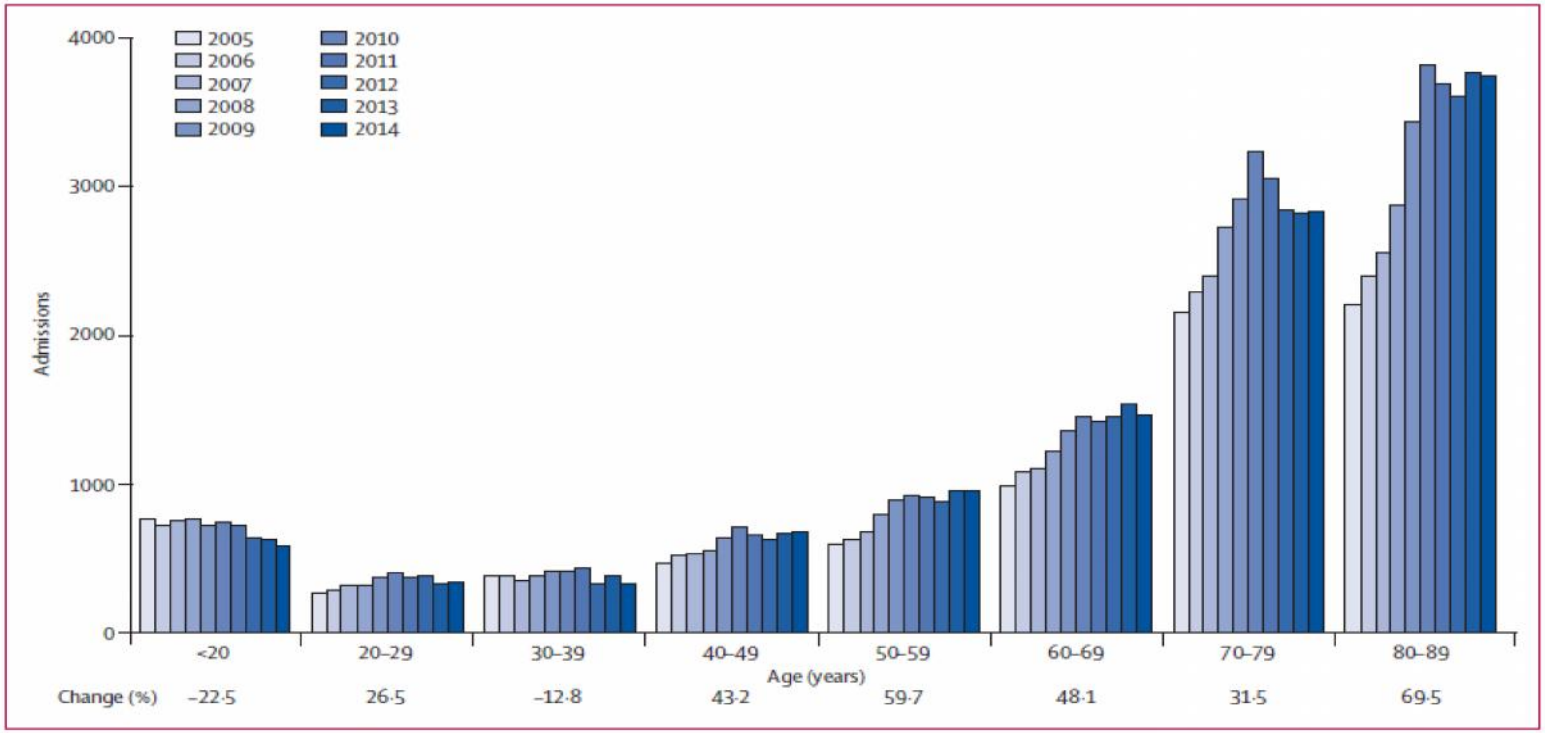
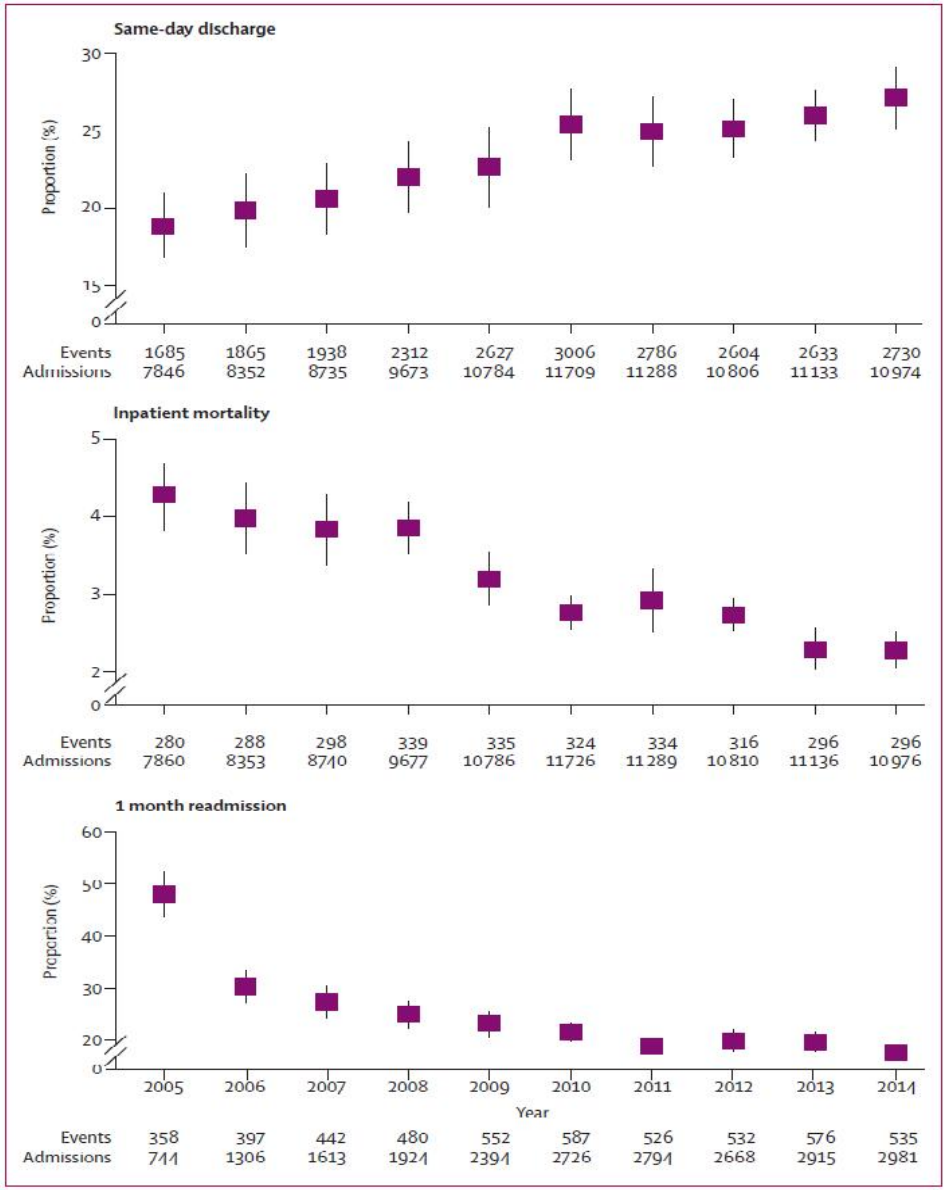


Figure 1: **Crude hospital admissions for hypoglycaemia, England, 2005–14**
Change given as number of admissions in 2014 versus those in 2005.


Same-day discharge
Proportion (%)
30
25
20
15
0
Events 1685 1865 1938 2312 2627 3006 2786 2604 2633 2730
Admissions 7846 8352 8735 9673 10784 11709 11288 10806 11133 10974
Inpatient mortality
Proportion (%)
5
4
3
2
0
Events 280 288 298 339 335 324 334 316 296 296
Admissions 7860 8353 8740 9677 10786 11726 11289 10810 11136 10976
1 month readmission
Proportion (%)
60
50
40
30
20
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
Year
Events 358 397 442 480 552 587 526 532 576 535
Admissions 711 1306 1613 1921 2391 2726 2791 2668 2915 2981

Diabetologia (2016) 59:2082–2087
DOI 10.1007/s00125-016-4034-0

ARTICLE

Risk of death following admission to a UK hospital with diabetic ketoacidosis

Fraser W. Gibb[1] · Wei Leng Teoh[1] · Joanne Graham[2] · K. Ann Lockman[2]

	Single admission (n = 96)	2 – 5 admissions (n = 111)	More than 5 admissions (n = 64)	P
Total admissions	1	3 (2 – 4)	10 (8 – 15)	<0.001
Diabetes duration at final follow-up admission (years)	7.6 (2.3 – 13.6)	9.5 (6.9 – 16.0)	12.8 (10.0 – 17.5)	<0.001
Age at final follow-up admission (years)	31 (23 – 42)	27 (20 – 43)	25 (22 – 36)	0.079
Age at diabetes diagnosis (years)	24 (16 – 34)	16 (12 – 29)	14 (9 – 23)	<0.001
Length of stay at last DKA admission (days)	2 (1 – 3)	2 (1 – 4)	2 (2 – 4)	0.367
SIMD rank	2723 (1559 – 4310)	3023 (1366 – 4288)	1825 (813 – 3346)	0.005
Cardiovascular disease present prior to inclusion in study (%)	7.3	13.5	7.8	0.265
Cardiovascular disease present at last DKA admission (%)	7.3	15.3	15.6	0.154
HbA1c (mmol/mol) [%]	79 (66 – 96) [9.4 (8.2 – 10.9)]	92 (76 – 115) [10.6 (9.1 – 12.7]	103 (89 – 108) [11.6 (10.3 – 12.0)]	<0.001
Hydrogen ion at last DKA (nmol/L)	72 (57 – 109)	72 (54 – 103)	77 (57 – 104)	0.767
Lactate at last DKA (mmol/L)	3.2 (2.1 – 5.1)	3.2 (2.2 – 4.3)	3.4 (2.2 – 4.6)	0.813
Glucose at last DKA (mmol/L)	35.1 (26.0 – 44.1)	28.9 (22.2 – 38.9)	36.0 (27.3 – 44.3)	0.005
Urea at last DKA (mmol/L)	9.1 (6.5 – 12.9)	8.4 (6.1 – 11.6)	8.2 (6.3 – 11.4)	0.474
Creatinine at last DKA admission (µmol/L)	134 (102 – 189)	119 (95 – 156)	118 (89 – 148)	0.036
White cell count at last DKA ($x10^9$/L)	19.4 (13.1 – 27.6)	18.3 (11.8 – 24.4)	15.4 (10.9 – 22.4)	0.098

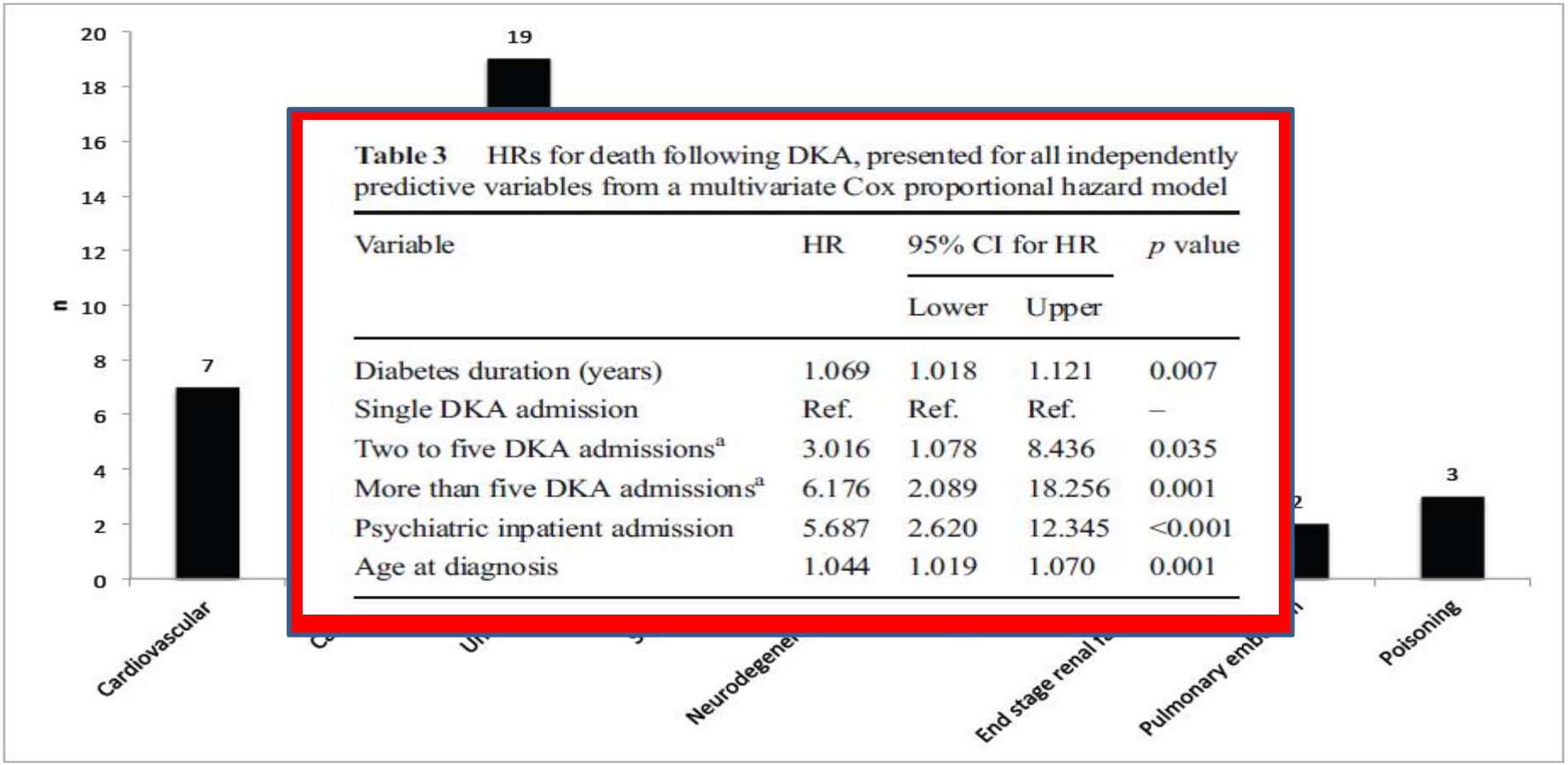


Table 3 HRs for death following DKA, presented for all independently predictive variables from a multivariate Cox proportional hazard model

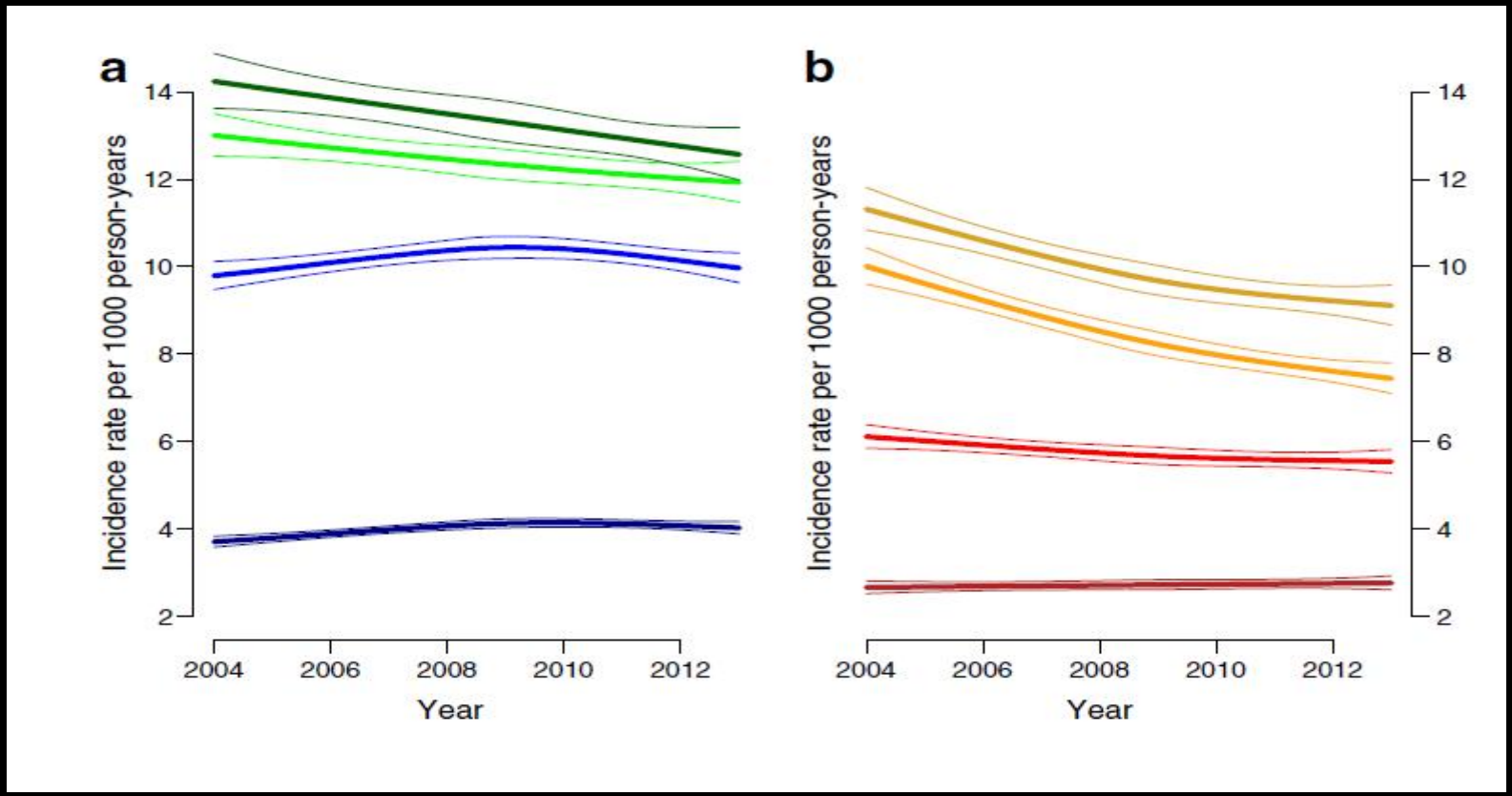
Variable	HR	95% CI for HR		*p* value
		Lower	Upper	
Diabetes duration (years)	1.069	1.018	1.121	0.007
Single DKA admission	Ref.	Ref.	Ref.	–
Two to five DKA admissions[a]	3.016	1.078	8.436	0.035
More than five DKA admissions[a]	6.176	2.089	18.256	0.001
Psychiatric inpatient admission	5.687	2.620	12.345	<0.001
Age at diagnosis	1.044	1.019	1.070	0.001

Diabetologia (2016) 59:2106–2113
DOI 10.1007/s00125-016-4054-9

ARTICLE

Trends in type 2 diabetes incidence and mortality in Scotland between 2004 and 2013

Stephanie H. Read[1] · Joannes J. Kerssens[2] · David A. McAllister[1] · Helen M. Colhoun[3] · Colin M. Fischbacher[2] · Robert S. Lindsay[4] · Rory J. McCrimmon[5] · John A. McKnight[6] · John R. Petrie[4] · Naveed Sattar[4] · Sarah H. Wild[1] · On behalf of the Scottish Diabetes Research Network Epidemiology Group


a
b
Incidence rate per 1000 person-years
14
12
10
8
6
4
2
2004
2006
2008
2010
2012
Year

Diabetologia (2016) 59:1692–1701
DOI 10.1007/s00125-016-3971-y

ARTICLE

Incidence, prevalence and mortality of type 2 diabetes requiring glucose-lowering treatment, and associated risks of cardiovascular complications: a nationwide study in Sweden, 2006–2013

Anna Norhammar[1,2] · Johan Bodegård[3] · Thomas Nyström[4] · Marcus Thuresson[5] · Jan W. Eriksson[6] · David Nathanson[4]

	2006	2007	2008	2009	2010	2011	2012	2013	Change (%) from 2006 to 2013	*p* for trend
Swedish population, *n*	7,574,846	7,650,473	7,723,931	7,800,212	7,861,268	7,909,176	7,953,511	8,006,339	5.7	<0.001
Type 2 diabetes population[a], *n*	207,303	227,837	249,495	270,284	293,013	313,599	334,360	352,436	70.0	<0.001
Prevalence (%)	2.7	3.0	3.2	3.5	3.7	4.0	4.2	4.4	60.8	<0.001
Swedish population[b], *n*	7,388,283	7,443,170	7,496,094	7,550,717	7,590,984	7,616,163	7,639,912	7,671,979	3.8	<0.001
Incident type 2 diabetes population[c], *n*	34,020	29,261	31,226	30,966	33,332	31,853	32,411	30,620	−10.0	0.865
Incidence per 100,000, *n*	460	393	417	410	439	418	424	399	−13.3	0.436
Deaths in type 2 diabetes population[d], (*n*, %)	8,727 (4.2)	9,568 (4.2)	10,177 (4.1)	10,603 (3.9)	11,267 (3.8)	11,650 (3.7)	12,544 (3.8)	12,733 (3.6)	−14.2	<0.001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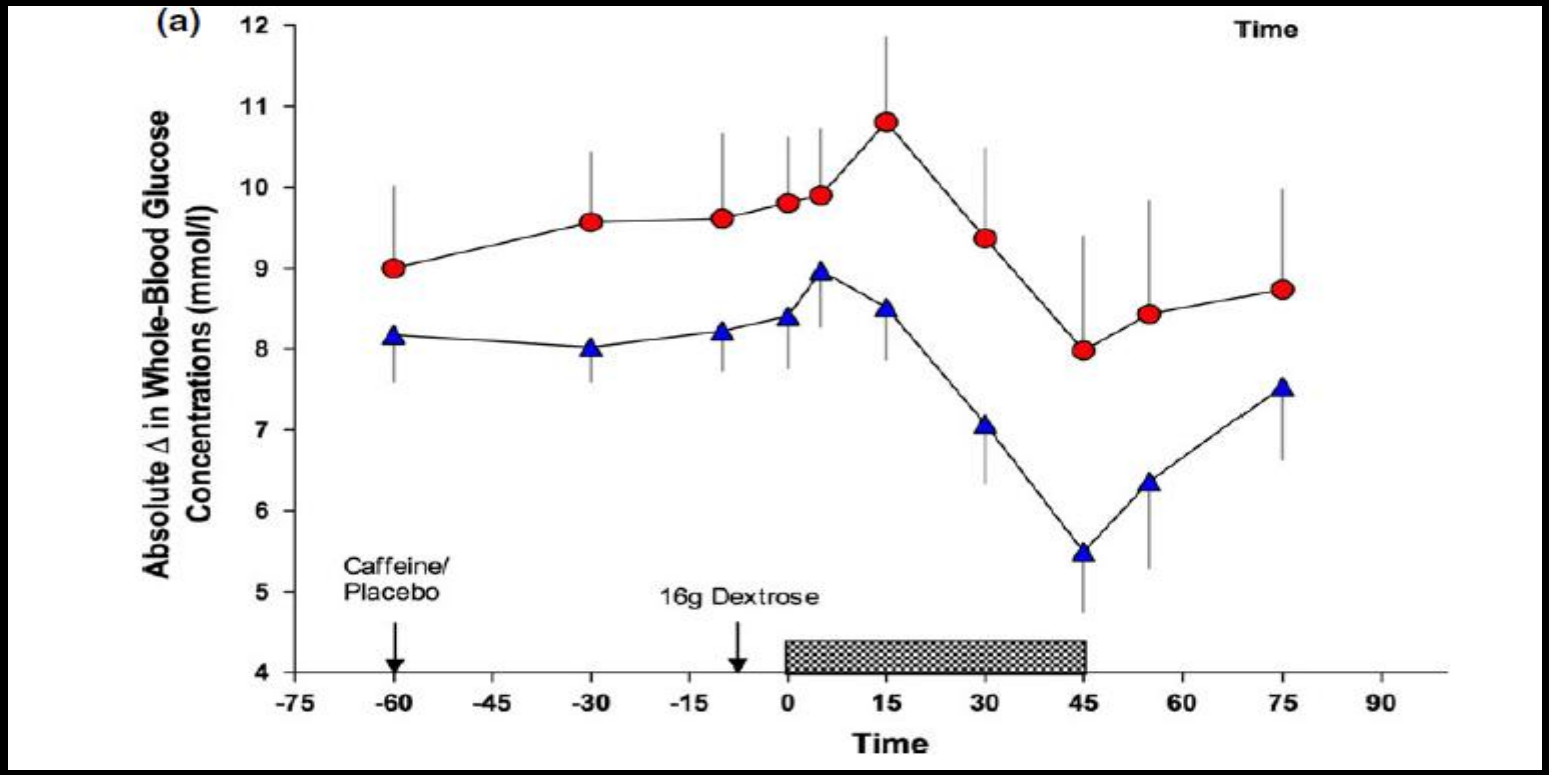
DOI: 10.1111/dme.12857

Research: Metabolism

Effects of acute caffeine supplementation on reducing exercise-associated hypoglycaemia in individuals with Type 1 diabetes mellitus

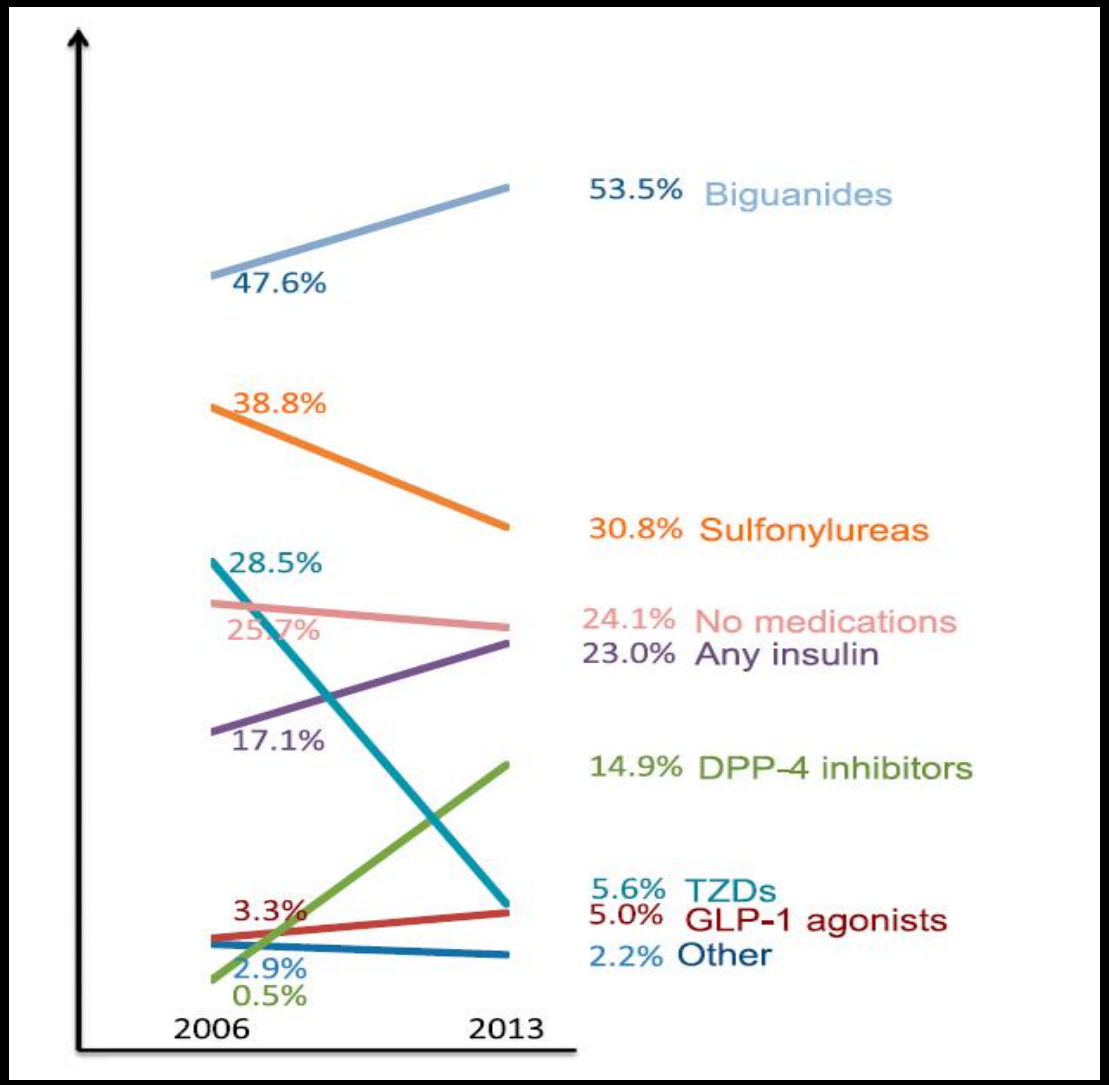
D. P. Zaharieva, L. A. Miadovnik, C. P. Rowan, R. J. Gumieniak, V. K. Jamnik and M. C. Riddell

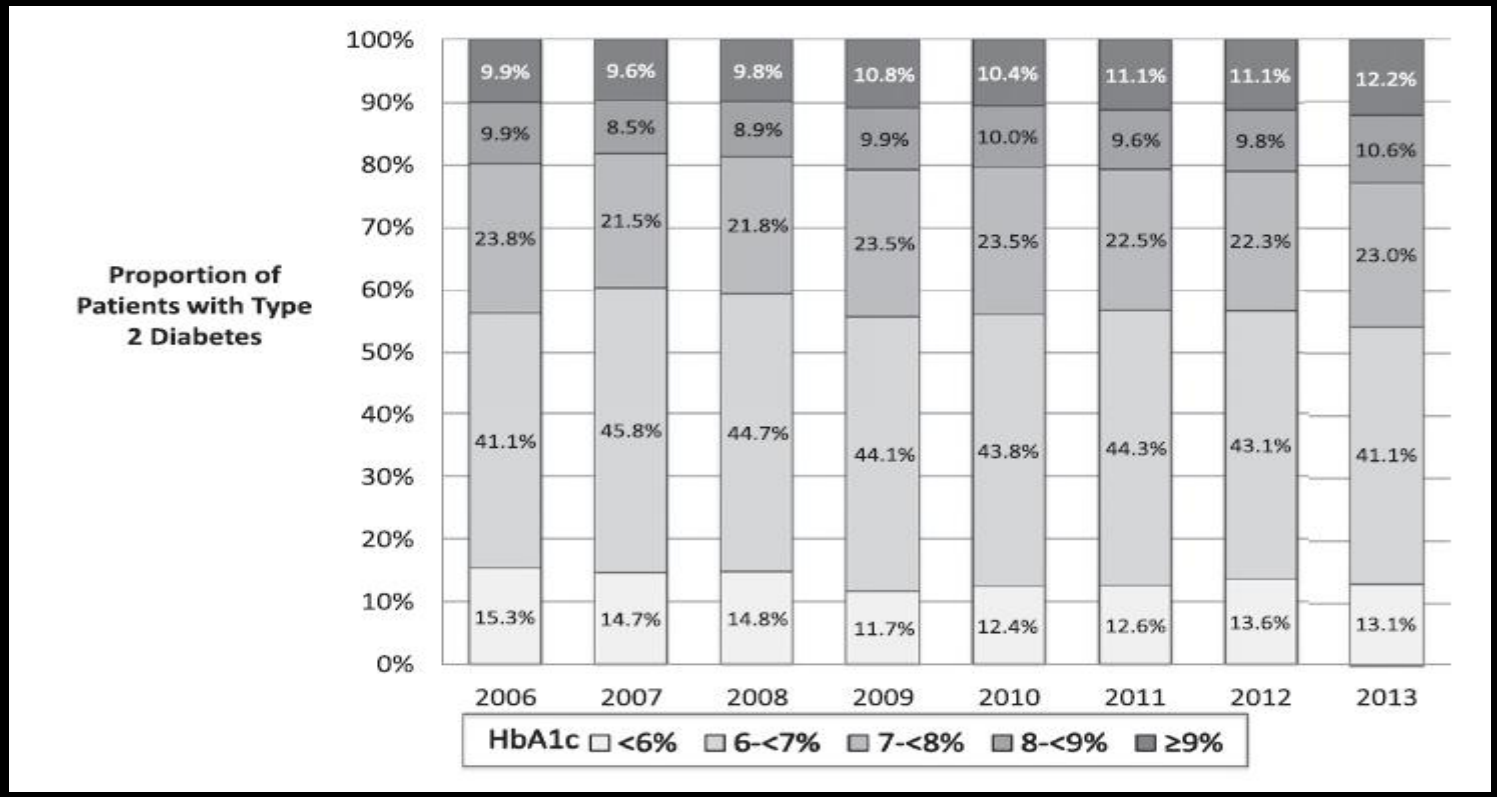

(a)
Time
Absolute Δ in Whole-Blood Glucose Concentrations (mmol/l)
12
11
10
9
8
7
6
5
4
Caffeine/ Placebo
16g Dextrose
-75
-60
-45
-30
-15
0
15
30
45
60
75
90
Time

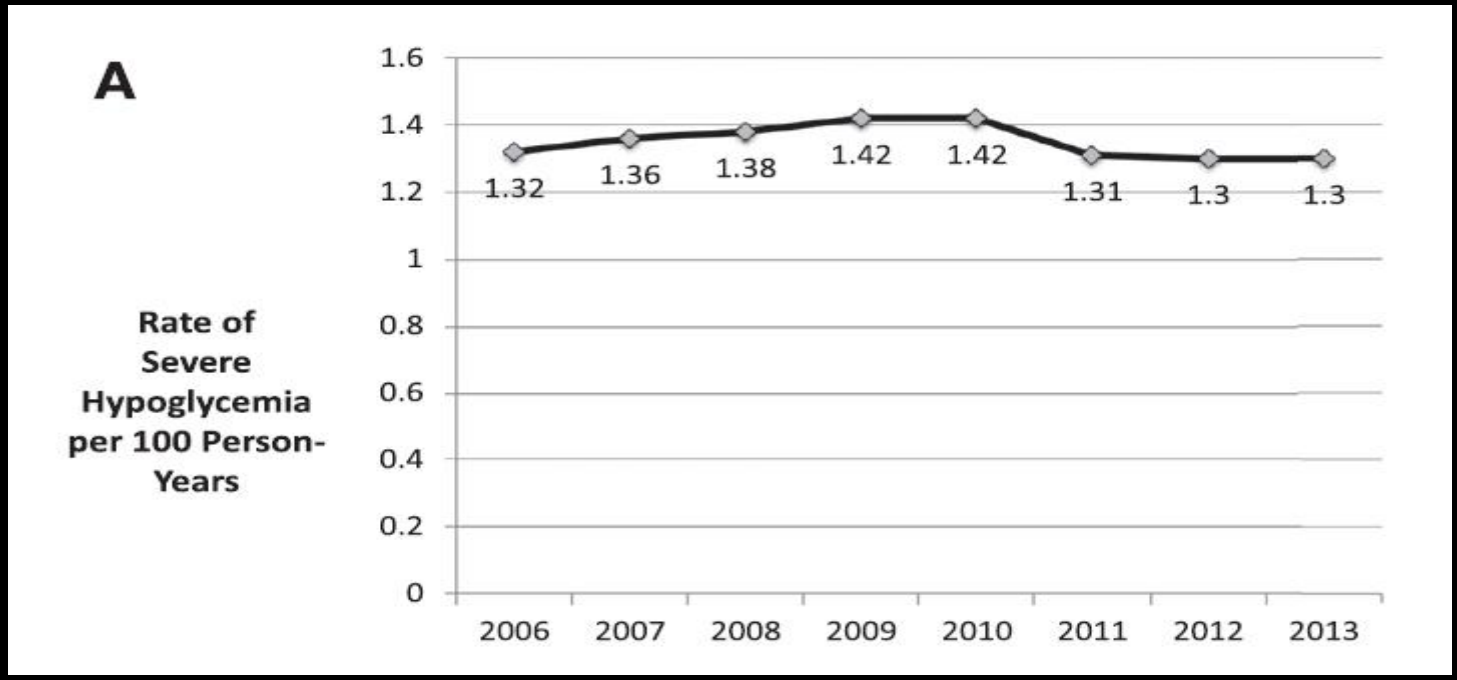
Trends in Drug Utilization, Glycemic Control, and Rates of Severe Hypoglycemia, 2006–2013

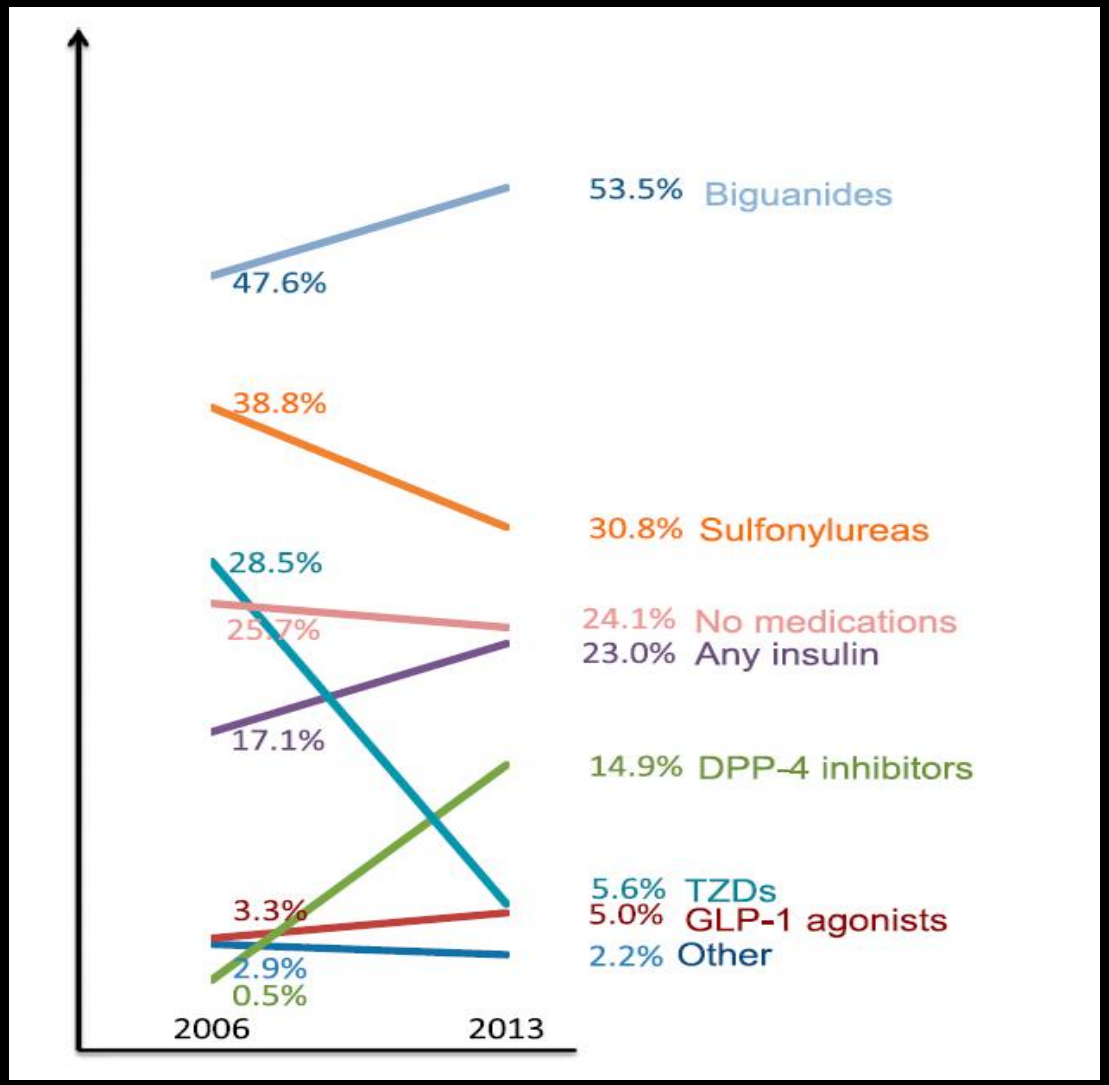
Kasia J. Lipska,[1] Xiaoxi Yao,[2,3] Jeph Herrin,[4] Rozalina G. McCoy,[2,3,5] Joseph S. Ross,[6,7] Michael A. Steinman,[8] Silvio E. Inzucchi,[1] Thomas M. Gill,[9] Harlan M. Krumholz,[4,7] and Nilay D. Shah[2,3,10]

Diabetes Care 2017;40:468–475 | DOI: 10.2337/dc16-0985


53.5% Biguanides
47.6%
38.8%
30.8% Sulfonylureas
28.5%
24.1% No medications
25.7%
23.0% Any insulin
17.1%
14.9% DPP-4 inhibitors
5.6% TZDs
3.3%
5.0% GLP-1 agonists
2.2% Other
2.9%
0.5%
2006
2013


Proportion of Patients with Type 2 Diabetes
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
9.9%
9.9%
23.8%
41.1%
15.3%
9.6%
8.5%
21.5%
45.8%
14.7%
9.8%
8.9%
21.8%
44.7%
14.8%
10.8%
9.9%
23.5%
44.1%
11.7%
10.4%
10.0%
23.5%
43.8%
12.4%
11.1%
9.6%
22.5%
44.3%
12.6%
11.1%
9.8%
22.3%
43.1%
13.6%
12.2%
10.6%
23.0%
41.1%
13.1%
2006
2007
2008
2009
2010
2011
2012
2013
HbA1c <6% 6-<7% 7-<8% 8-<9% ≥9%


A
Rate of Severe Hypoglycemia per 100 Person-Years
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1.32
1.36
1.38
1.42
1.42
1.31
1.3
1.3
2006
2007
2008
2009
2010
2011
2012
2013


53.5% Biguanides
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23.0% Any insulin
17.1%
14.9% DPP-4 inhibitors
5.6% TZDs
3.3%
5.0% GLP-1 agonists
2.2% Other
2.9%
0.5%
2006
2013

DIABETICMedicine

DOI: 10.1111/dme.13331

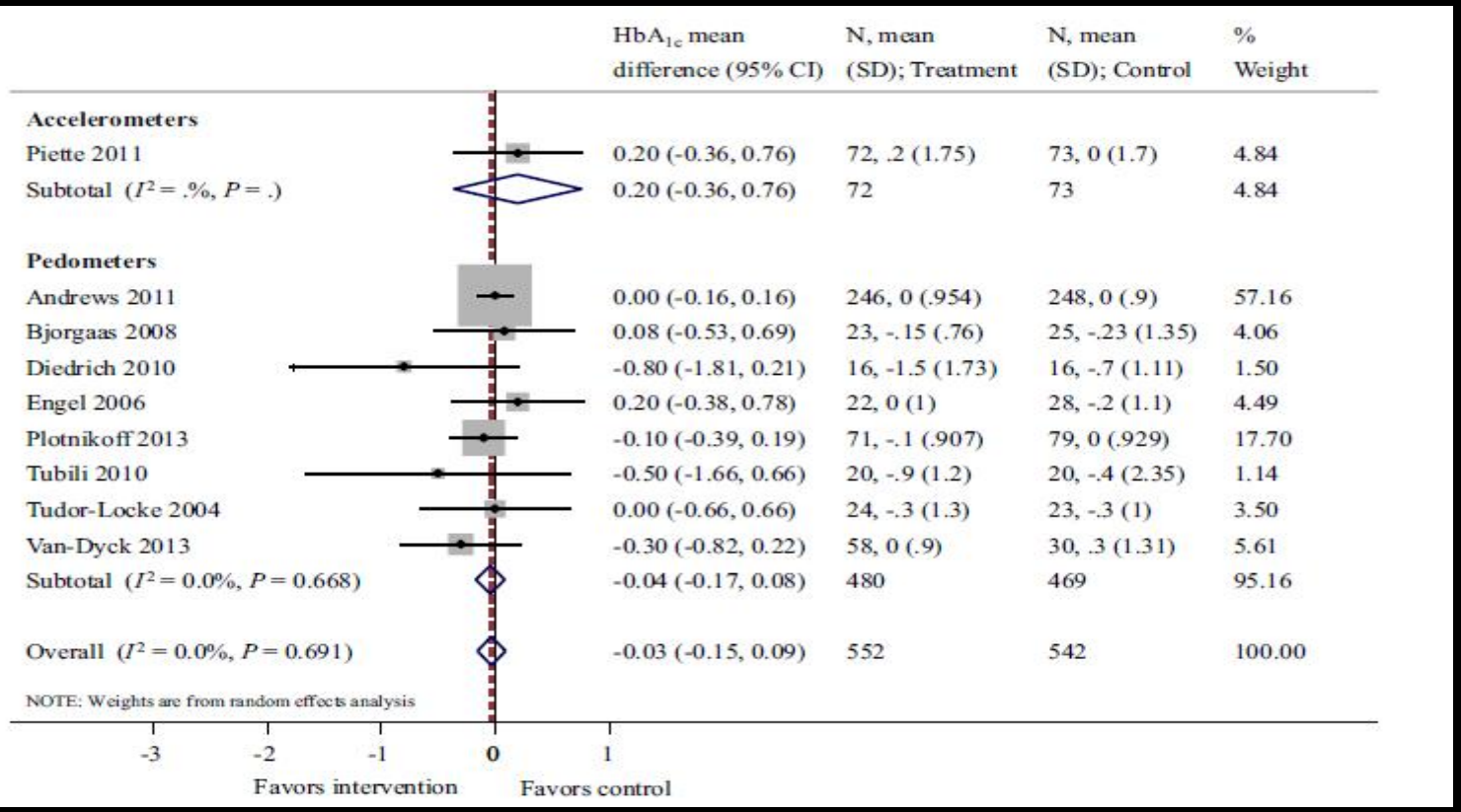
Systematic Review or Meta-analysis

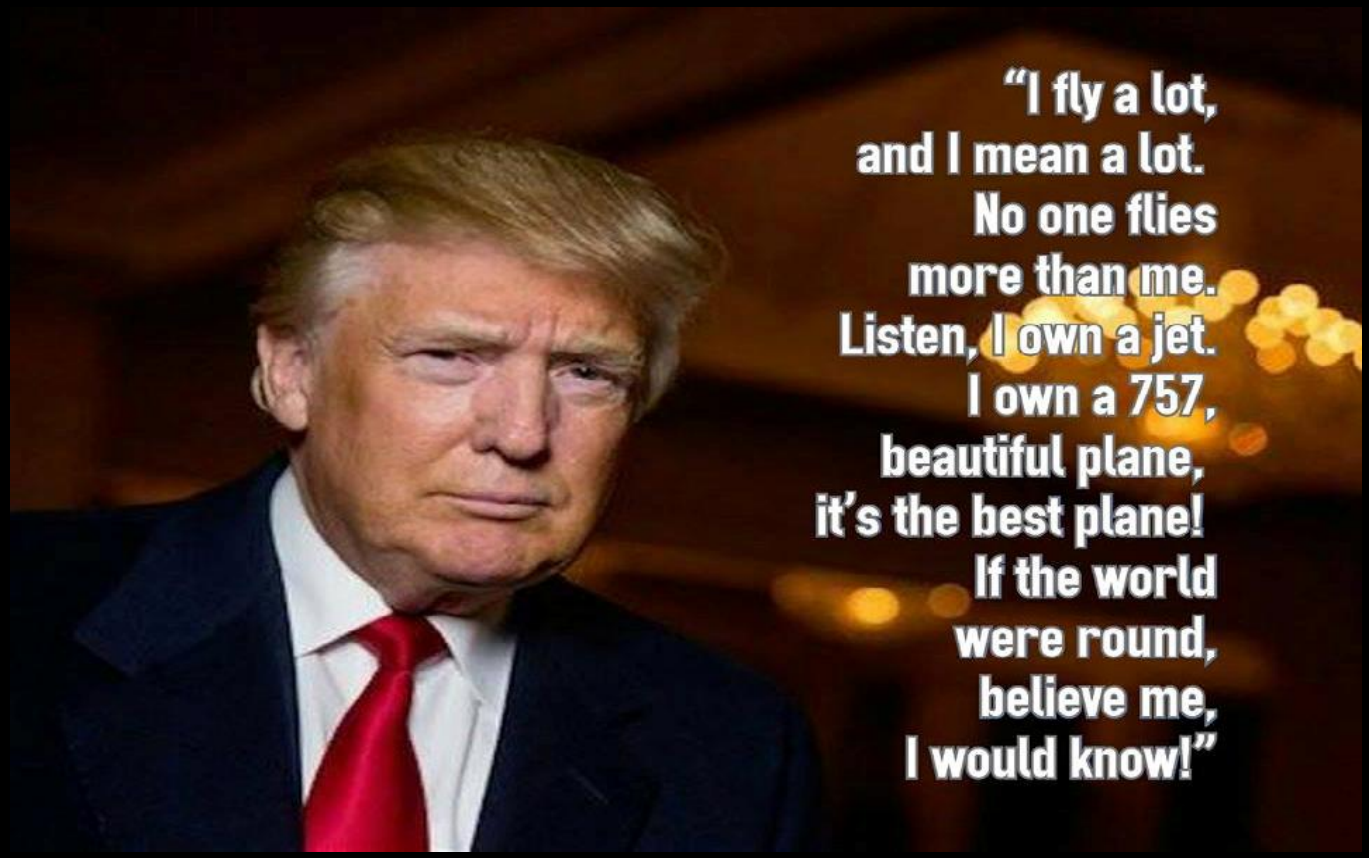
Impact of accelerometer and pedometer use on physical activity and glycaemic control in people with Type 2 diabetes: a systematic review and meta-analysis

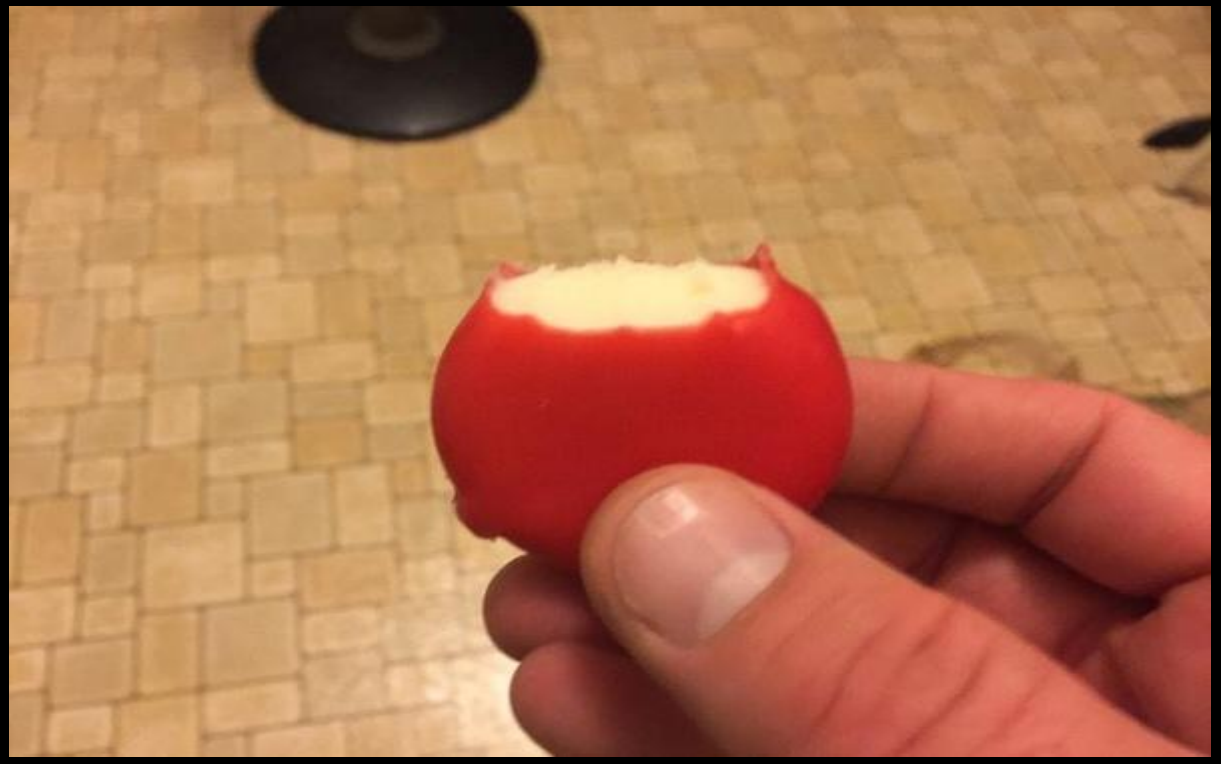
R. Baskerville[1], I. Ricci-Cabello[1], N. Roberts[2] and A. Farmer[1]

[1]Nuffield Department of Primary Care Health Sciences and [2]Bodleian Libraries, University of Oxford, Oxford, UK

Accepted 3 February 2017


HbA1c mean difference (95% CI)
N, mean (SD); Treatment
N, mean (SD); Control
% Weight
Accelerometers
Piette 2011 0.20 (-0.36, 0.76) 72, .2 (1.75) 73, 0 (1.7) 4.84
Subtotal (I² = .%, P = .) 0.20 (-0.36, 0.76) 72 73 4.84
Pedometers
Andrews 2011 0.00 (-0.16, 0.16) 246, 0 (.954) 248, 0 (.9) 57.16
Bjorgaas 2008 0.08 (-0.53, 0.69) 23, -.15 (.76) 25, -.23 (1.35) 4.06
Diedrich 2010 -0.80 (-1.81, 0.21) 16, -1.5 (1.73) 16, -.7 (1.11) 1.50
Engel 2006 0.20 (-0.38, 0.78) 22, 0 (1) 28, -.2 (1.1) 4.49
Plotnikoff 2013 -0.10 (-0.39, 0.19) 71, -.1 (.907) 79, 0 (.929) 17.70
Tubili 2010 -0.50 (-1.66, 0.66) 20, -.9 (1.2) 20, -.4 (2.35) 1.14
Tudor-Locke 2004 0.00 (-0.66, 0.66) 24, -.3 (1.3) 23, -.3 (1) 3.50
Van-Dyck 2013 -0.30 (-0.82, 0.22) 58, 0 (.9) 30, .3 (1.31) 5.61
Subtotal (I² = 0.0%, P = 0.668) -0.04 (-0.17, 0.08) 480 469 95.16
Overall (I² = 0.0%, P = 0.691) -0.03 (-0.15, 0.09) 552 542 100.00
NOTE: Weights are from random effects analysis
-3
-2
-1
0
1
Favors intervention
Favors control


"I fly a lot,
and I mean a lot.
No one flies
more than me.
Listen, I own a jet.
I own a 757,
beautiful plane,
it's the best plane!
If the world
were round,
believe me,
I would know!"

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21


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RIGHT