



ABCD Nationwide Exenatide and Liraglutide Audits

Dr Bob Ryder and Dr Ken Thong
on behalf of the ABCD nationwide
exenatide and liraglutide audit
contributors

DUK APC, London, 1 April 2011

ABCD Nationwide Exenatide and Liraglutide Audits

- *Exenatide and Liraglutide in real clinical use in the UK*
 - *Real (too busy) doctors and nurses in the real NHS*
 - *Real cancelled clinics and appointments*
 - *Real patients – compliant, non compliant ...*
 - *Real DNA's*
 - *Real chaos, poor communication and misunderstandings*
 - *Real enthusiasm for a new and different form of treatment*

Important



- The slides in this presentation show data from large scale real-life audits not from head-to-head clinical trials
- Data from the exenatide and liraglutide audits are shown together *not* for the purposes of comparison of the effectiveness of the two drugs, but to ...
- Serve to illustrate trends in clinical practice re the use of these two agents

Important

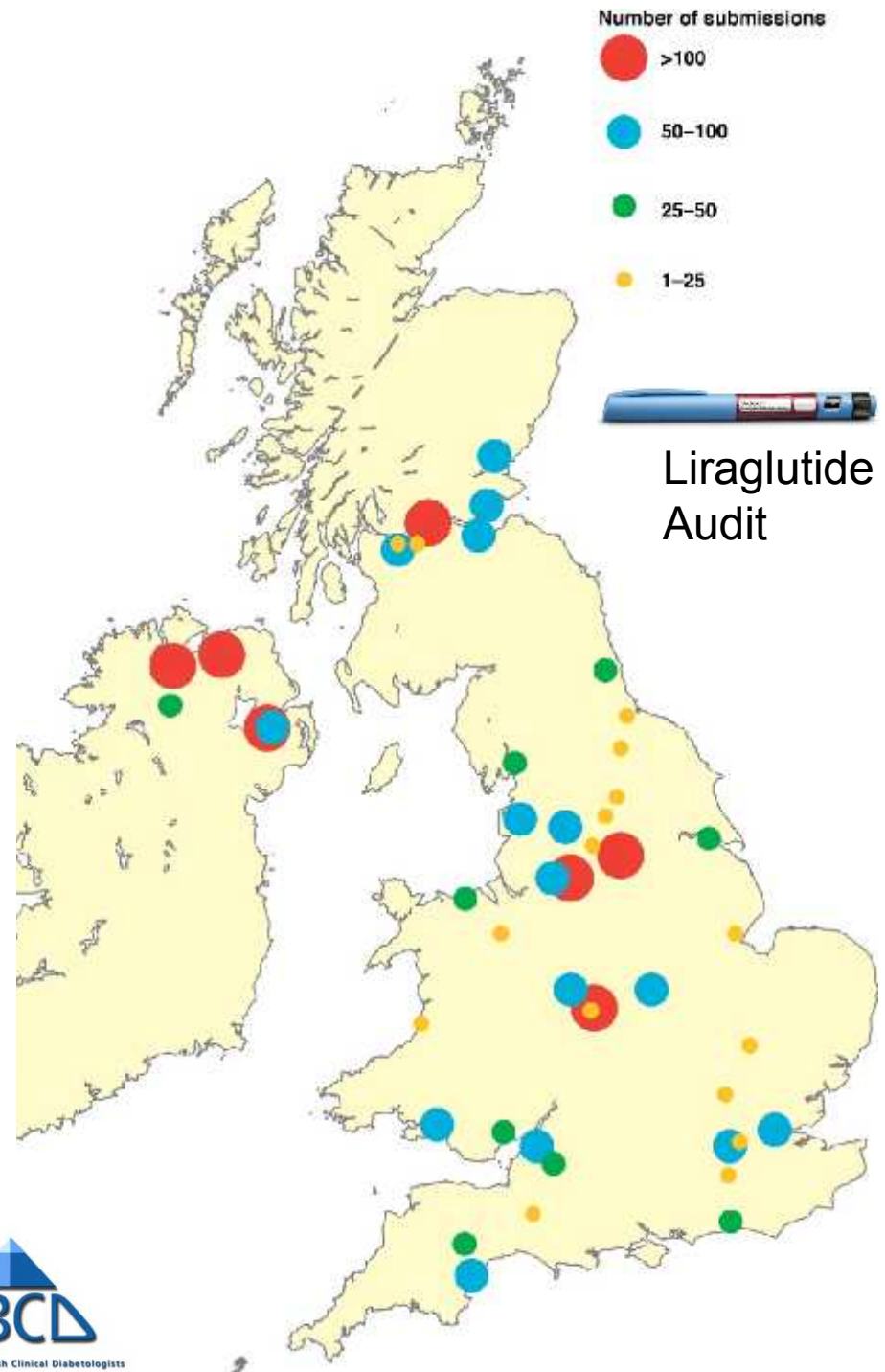
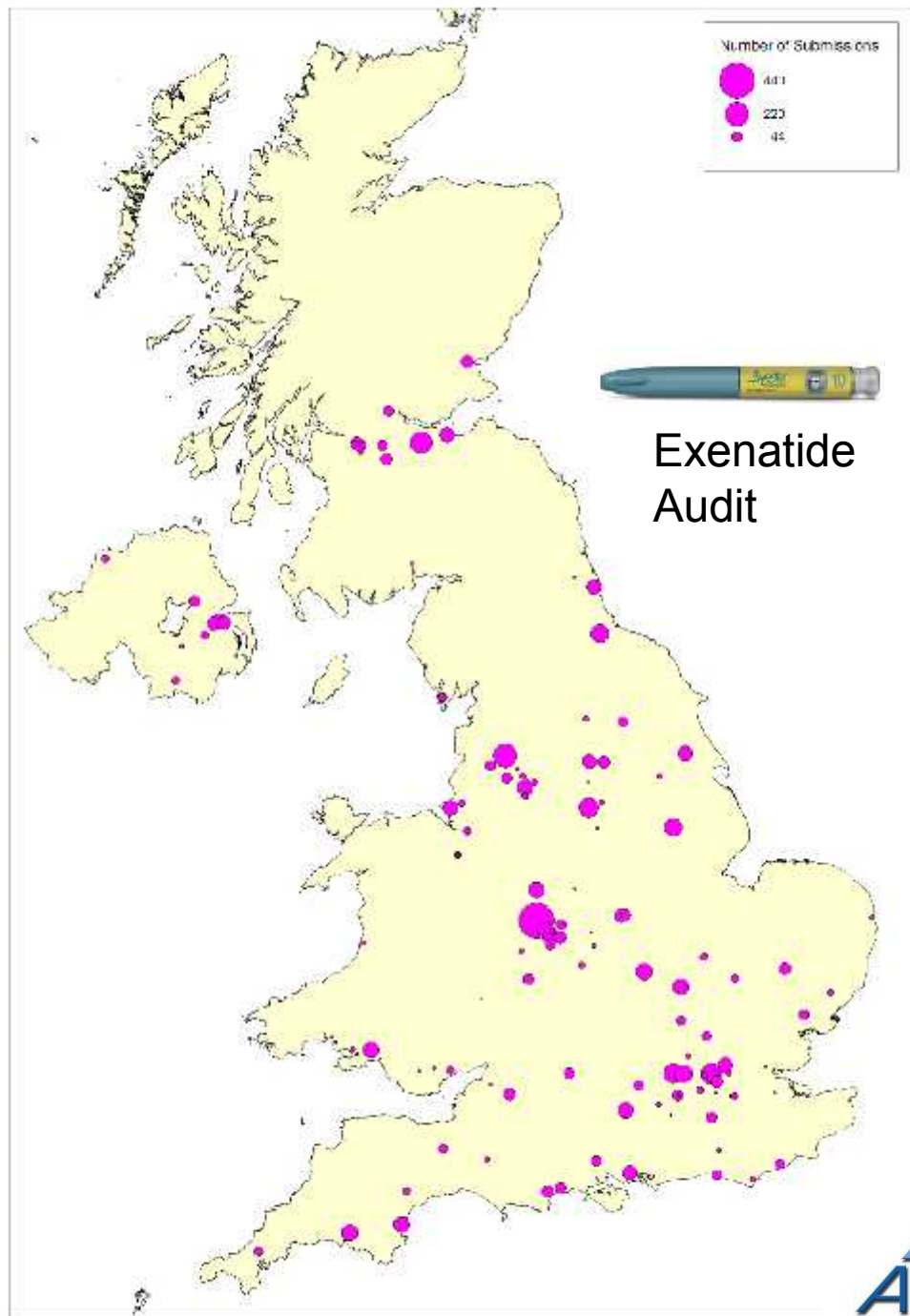


- To prepare you:
 - As a rule of thumb the following data tends to show a bigger HbA1c effect for liraglutide but bigger weight effect for exenatide.
 - We suspect this is mostly due to increased confidence of clinicians with time in **continuing and/or reducing less** other medications, **in particular insulin**, when using GLP1 receptor agonists
 - Exenatide data = 2007-2009
 - Liraglutide data = 2009-2010

Audit characteristics



	Exenatide Audit	Liraglutide Audit
Launch date	December 2008	November 2009
Data collection	Online questionnaire or emailed spreadsheet	Downloaded audit tool, email of csv files
Contributors	315	210
Centres	126	64
Patients	6717	3010
Duration of follow-up: median (range)	32 (0.1-175) weeks	Ongoing
Status	Primary analyses completed, <i>long term follow-up planned</i>	<i>This audit has just started</i>



Baseline diabetes treatment use and discontinuation



	Exenatide Audit	Liraglutide Audit
Metformin	84.0% (0.9%)	82.7% (0.7%)
Sulphonylurea	49.5% (6.5%)	42.8% (5.3%)
Thiazolidinedione	27.1% (13.4%)	20.5% (7.5%)
Meglitinide	2.0% (0.6%)	1.0% (0.2%)
Acarbose	0.9% (0.3%)	0.7% (0.3%)
DPPIV Inhibitor	2.2% (1.4%)	10.9% (9.3%)
Exenatide	-	21.9% (21.9%)
Insulin	33.9% (8.1%)	39.6% (2.6%)

Proportion of 6717 and 3010 patients respectively

- Relevant data presented for liraglutide audit *excluded* patients who have been previously on exenatide or switched from exenatide to liraglutide

Baseline characteristics



	Exenatide Audit	Liraglutide Audit	p value
n	6717	<i>2303 (from 3010)</i>	
Male (%)	54.9	54.1	0.491
Caucasian (%)	84.4	90.4	<0.001
Age (yrs)	54.9 (10.6)	55.4 (11.2)	0.033
Diabetes duration (yrs)	8 (5-13)	9 (5-13)	0.424
HbA1c (%)	<i>9.47 (1.69)</i>	<i>9.32 (1.72)</i>	0.001
Weight (kg)	<i>113.8 (23.4)</i>	<i>111.1 (23.0)</i>	<0.001
BMI (kg/m ²)	39.8 (8.0)	39.1 (7.5)	<0.001
Single oral therapy (%)	12.7	12.0	0.371
Dual oral therapy (%)	28.1	28.1	0.969
≥3 oral therapy (%)	15.6	17.9	0.012
On insulin (%)	33.9	39.8	<0.001

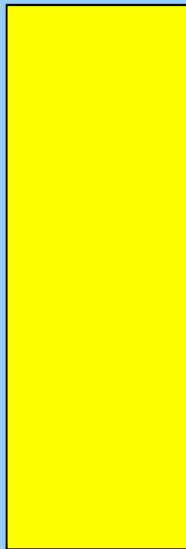
Results with mean (SD) and median diabetes duration (inter-quartile range)

Results for exenatide adapted from Ryder et al. Pract Diab Int 2010; 27:352-357b

HbA1c and Weight changes

Colour scheme for results

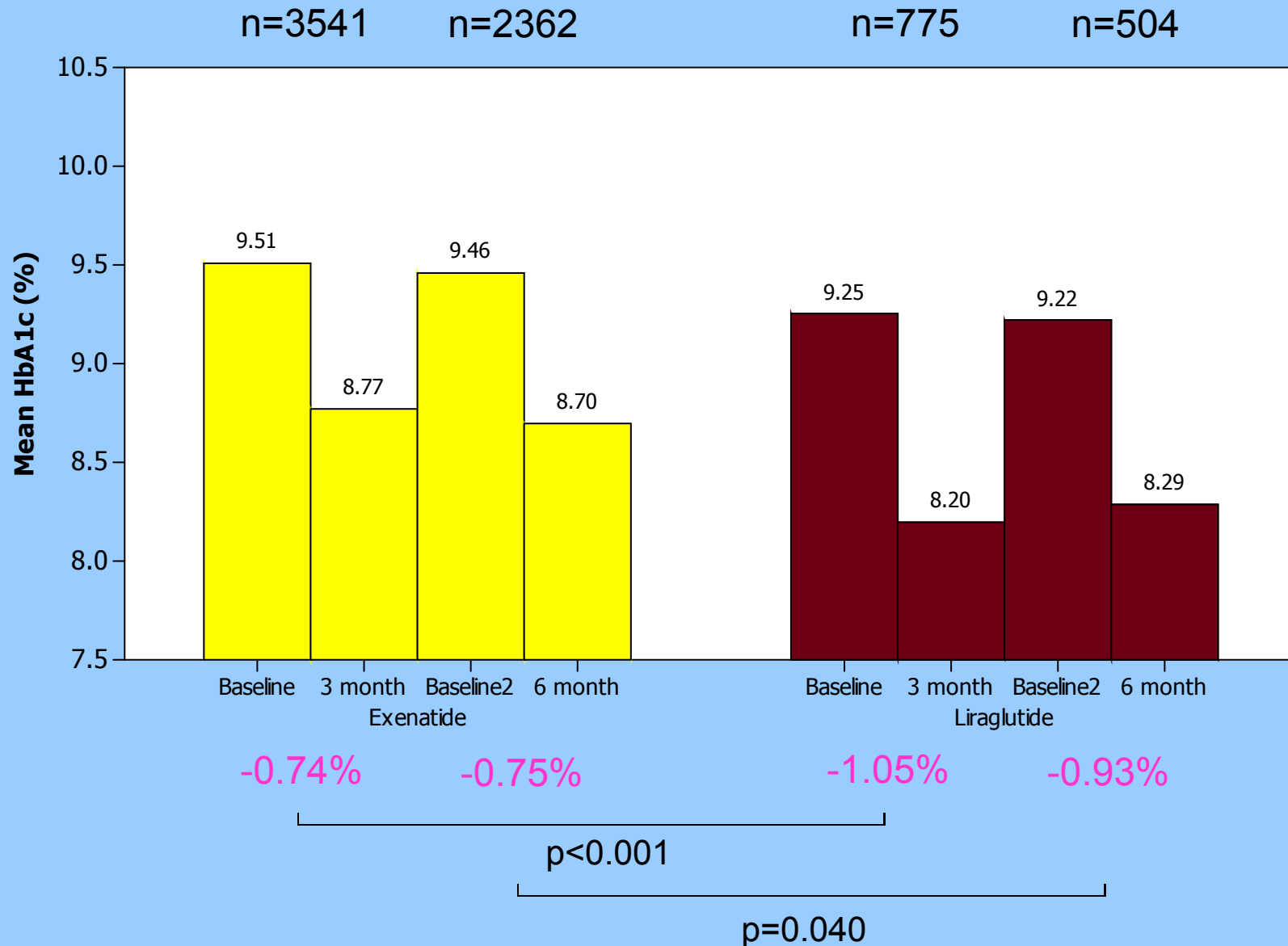
Exenatide



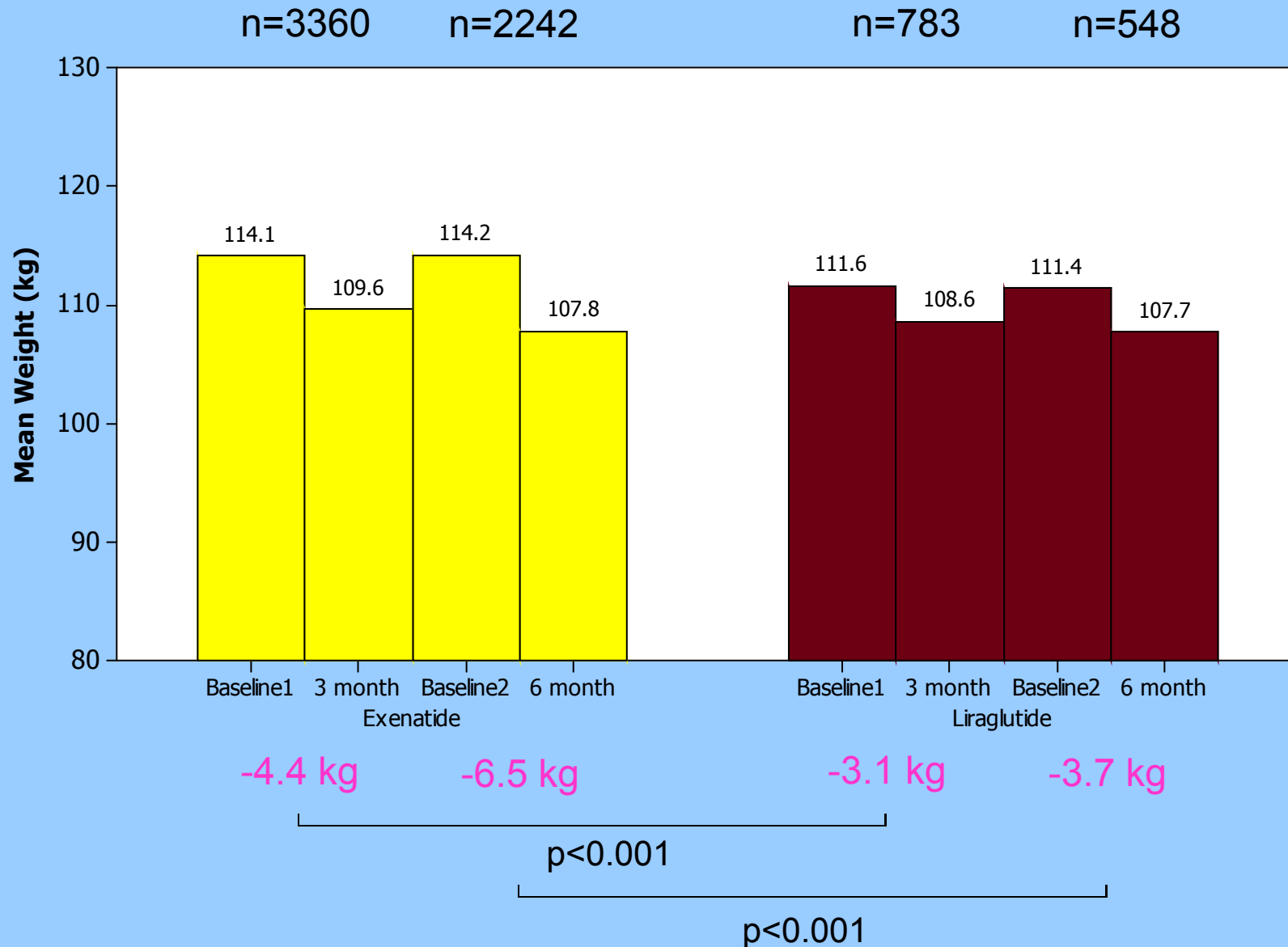
Liraglutide



HbA1c results at 3 and 6 months: exenatide and liraglutide



Weight results at 3 and 6 months: exenatide and liraglutide

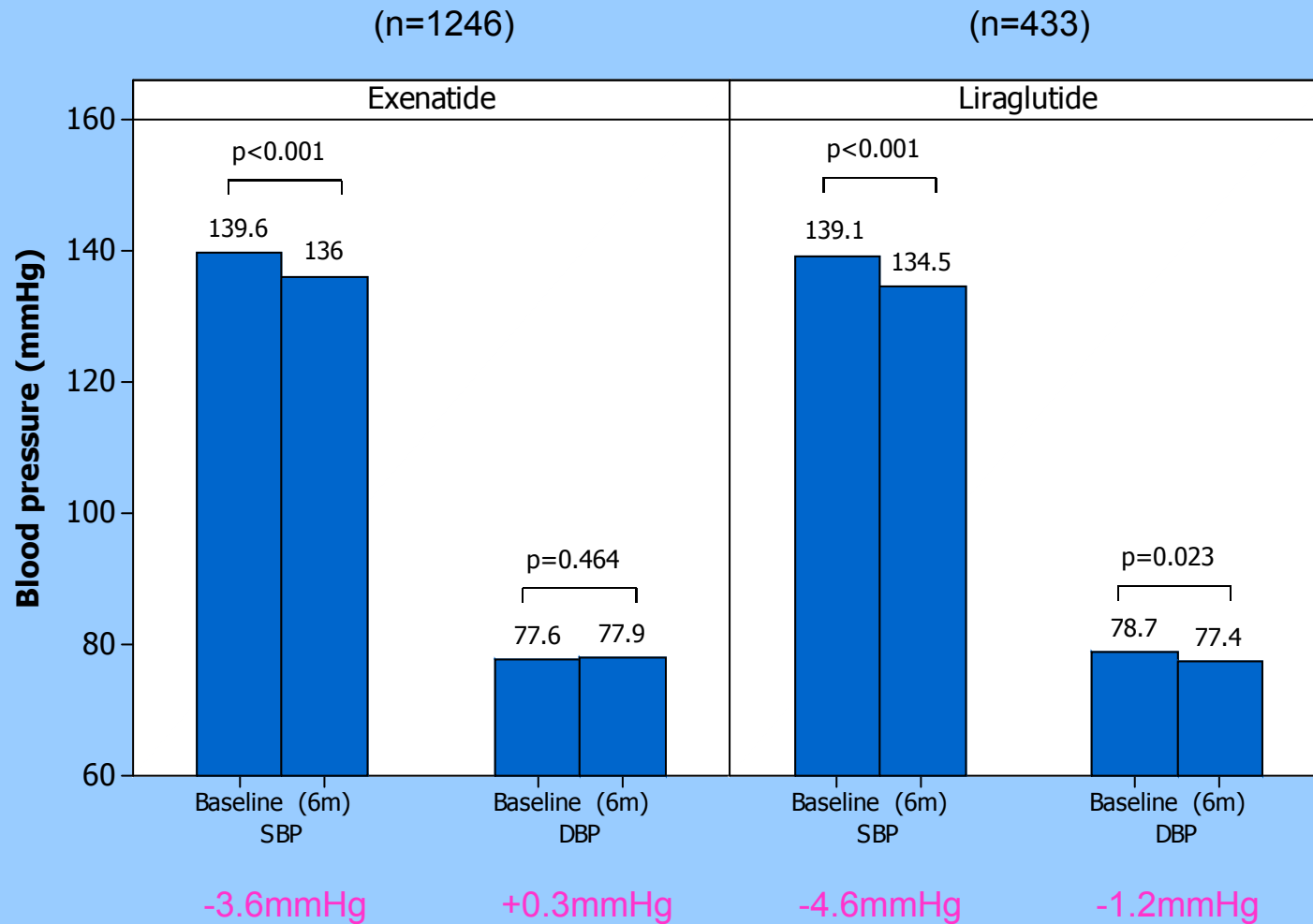


Findings 1

- Patients appear to achieve **greater HbA1c reduction but lesser weight reduction** in the liraglutide audit as compared with the exenatide audit
- However, there were lesser insulin and TZD discontinuation but greater DPPIV inhibitor discontinuation in the liraglutide audit
- Contributors might have learnt from the previous use of exenatide to **avoid over-reduction of diabetes treatment** when initiating liraglutide

Blood Pressure and Lipids

Blood pressure results: exenatide and liraglutide

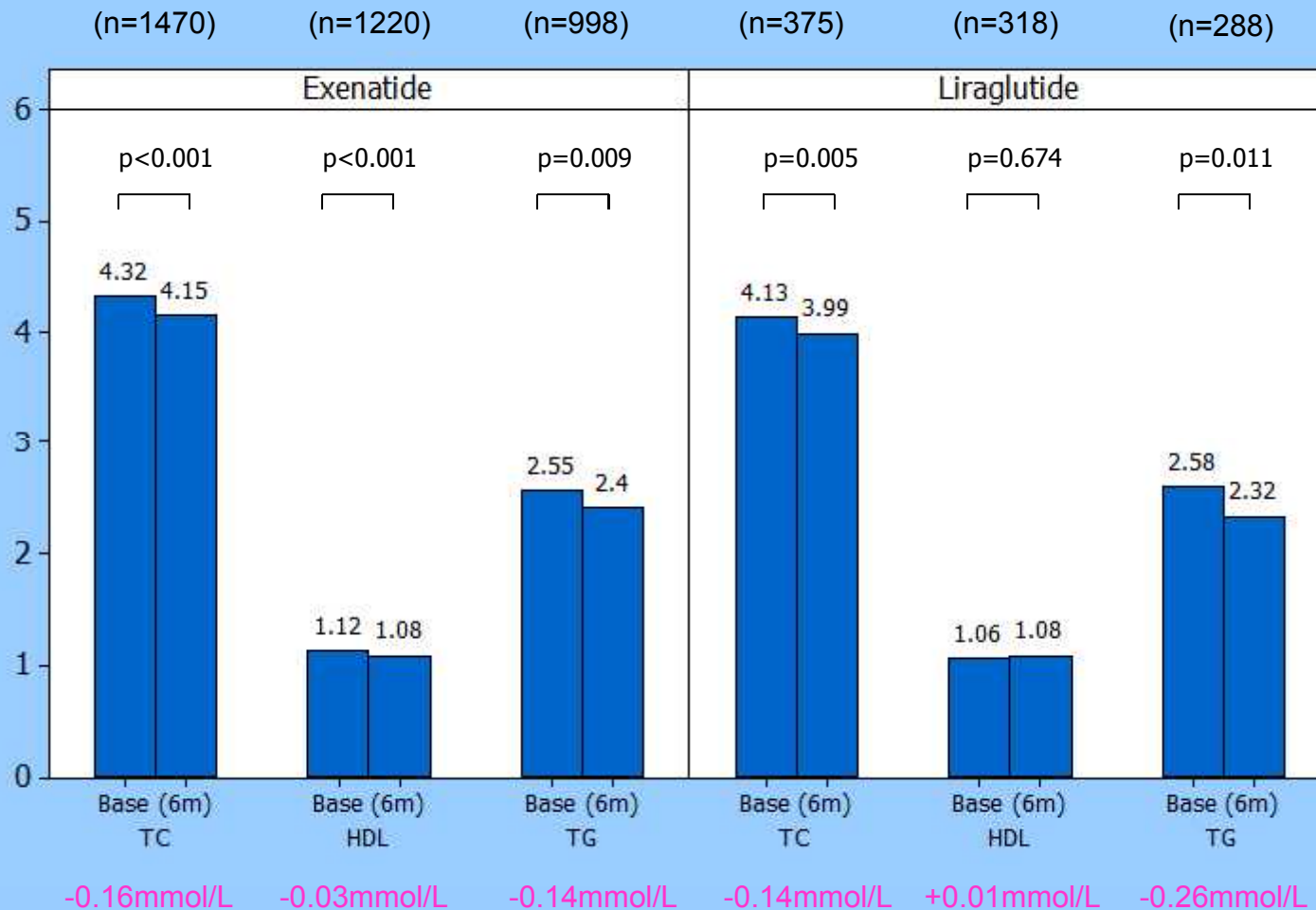


Latest SBP and DBP - median 26 weeks

6 months

Results for exenatide adapted from Ryder et al. *Pract Diab Int* 2010; 27:352-357b

Lipid results: exenatide and liraglutide



Latest TC, HDL, TG - median 26 weeks

6 months

Results for exenatide adapted from Ryder et al. *Pract Diab Int* 2010; 27:352-357b

Findings 2

- Consistent lowering of SBP, total cholesterol and triglycerides with exenatide and liraglutide
- Diastolic blood pressure also lowered with liraglutide

Adherence to NICE guidelines/guidance



NHS
National Institute for
Health and Clinical Excellence

Issue date: May 2009

Type 2 diabetes

The management of type 2 diabetes

This guideline partially updates
NICE clinical guideline 66 and replaces it:

March 2010
Recommendations 1.14.2.3, 1.14.2.4, 1.14.2.5 and 1.14.2.6 in this guideline have been updated and replaced by 'Neuropathic pain: the pharmacological management of neuropathic pain in adults in non-specialist settings' (NICE clinical guideline 66), available from www.nice.org.uk/ourguidance/CG66

September 2010
In September 2010 the European Medicines Agency (EMA), the European Union (EU) body responsible for monitoring the safety of medicines, recommended the suspension of the marketing authorisation for rosiglitazone (Avandia, Avandia and Avaglin) from GlaxoSmithKline. The EMA has concluded that the benefits of rosiglitazone no longer outweigh its risks and the marketing authorisation should be suspended across the EU. The EMA has advised that patients who are currently taking rosiglitazone-containing medicines should make an appointment with their doctor at a convenient time to discuss suitable alternative treatments. Patients are advised not to stop their treatment without speaking to their doctor. NICE does not recommend the use of drugs without marketing authorisation. Therefore, as a result of the EMA's decision, NICE has temporarily withdrawn its recommendations on the use of rosiglitazone in this guideline.

NICE clinical guideline 87
Developed by the National Collaborating Centre for Chronic Conditions and the Centre for Clinical Practice at NICE

NHS
National Institute for
Health and Clinical Excellence

Issue date: October 2010

Liraglutide for the treatment of type 2 diabetes mellitus

This guidance was developed using the
single technology appraisal process

NICE technology appraisal guidance 209

Patients excluded by NICE

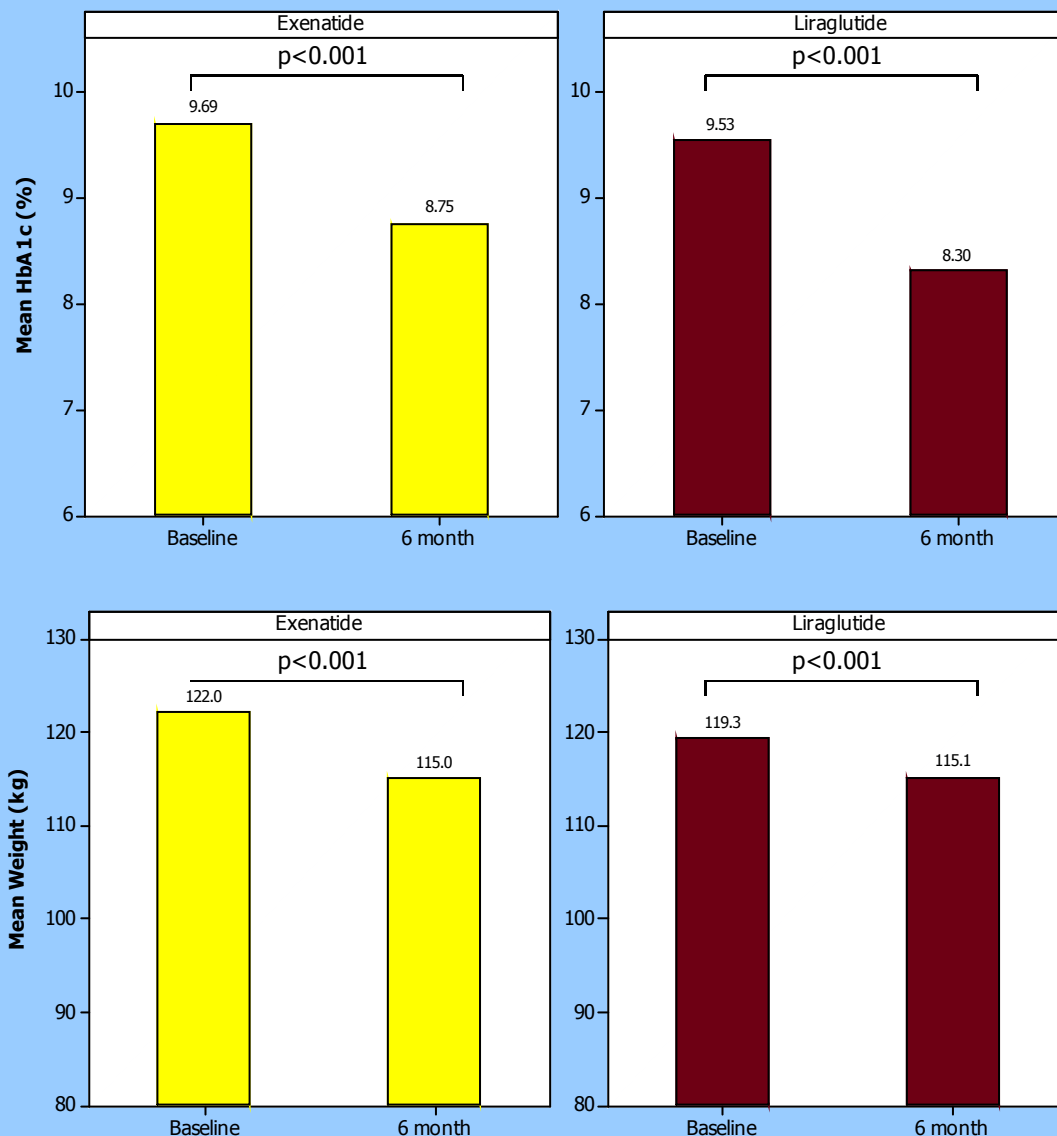


	Starting Exenatide	Starting Liraglutide
NICE compliant	21.7%	28.6%
NICE non-compliant	46.5%	66.6%
HbA1c <7.5%	9.4%	11.7%
BMI <35 kg/m ²	14.6% (*1.3%)	28.6% (*3.7%)
3 OHA	6.6%	6.6%
Insulin	22.9%	37.1%
Lacked details	31.8%	4.8%

NICE adherence for number of OHA and insulin use was judged after treatment changes made at GLP-1 initiation. Patients on 1.8mg dose of liraglutide was accepted as NICE compliant for this preliminary analysis

**percentage of 6717 and 2303 patients who had BMI <35 kg/m² but who were of South Asian or Afro Caribbean ethnicity, or held professional driving licences*

6 month HbA1c and Weight results among patients meeting NICE criteria on starting exenatide and liraglutide





Patients excluded by NICE



GLP-1 mimetic (exenatide)

1.1.14 Consider adding a GLP-1 mimetic (exenatide) as third line therapy to first-line metformin and a second-line sulfonylurea when control of blood glucose remains or becomes inadequate (HbA_{1c} ≥ 7.5%, or other higher level agreed with the individual), and the person has:

- a body mass index (BMI) ≥ 35.0 kg/m² in those of European descent (with appropriate adjustment for other ethnic groups) and specific psychological or medical problems associated with high body weight; or

³ At the time of publication pioglitazone was the only thiazolidinedione with UK marketing authorisation for use with insulin.

- a BMI < 35.0 kg/m², and therapy with insulin would have significant occupational implications or weight loss would benefit other significant obesity-related comorbidities.

1.1.15 Only continue GLP-1 mimetic (exenatide) therapy if the person has had a beneficial metabolic response (a reduction of at least 1.0 percentage point in HbA_{1c} and a weight loss of at least 3% of initial body weight at 6 months).

1.1.16 Discuss the potential benefits and risks of treatment with a GLP-1 mimetic (exenatide) with the person to enable them to make an informed decision.

Insulin therapy

1.1 Liraglutide 1.2 mg daily in triple therapy regimens (in combination with metformin and a sulfonylurea, or metformin and a thiazolidinedione) is recommended as an option for the treatment of people with type 2 diabetes, only if used as described for exenatide in 'Type 2 diabetes: the management of type 2 diabetes' (NICE clinical guideline 87); that is, when control of blood glucose remains or becomes inadequate (HbA_{1c} ≥ 7.5%, or other higher level agreed with the individual), and the person has:

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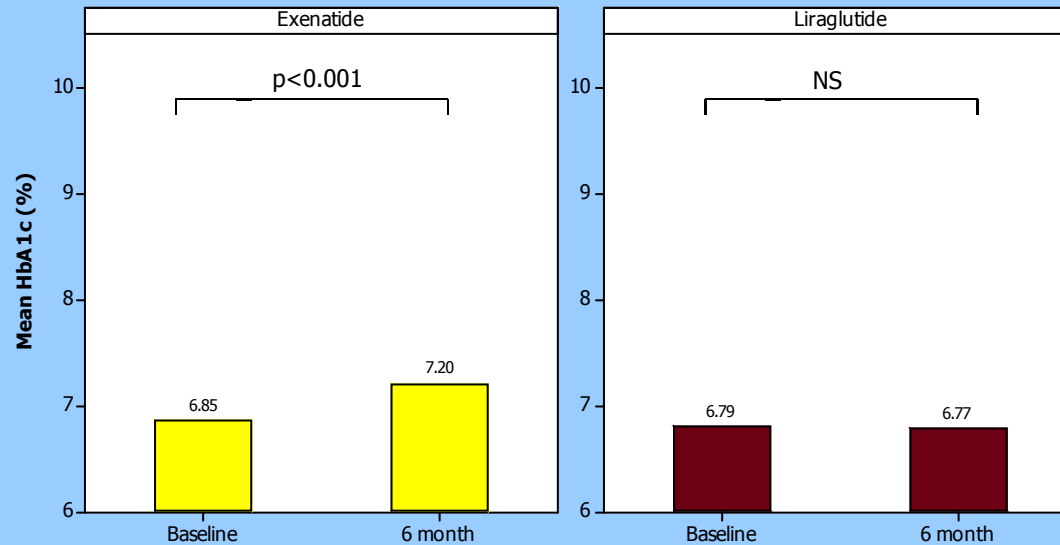
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6 month HbA1c and Weight results among patients with baseline HbA1c < 7.5% starting exenatide and liraglutide

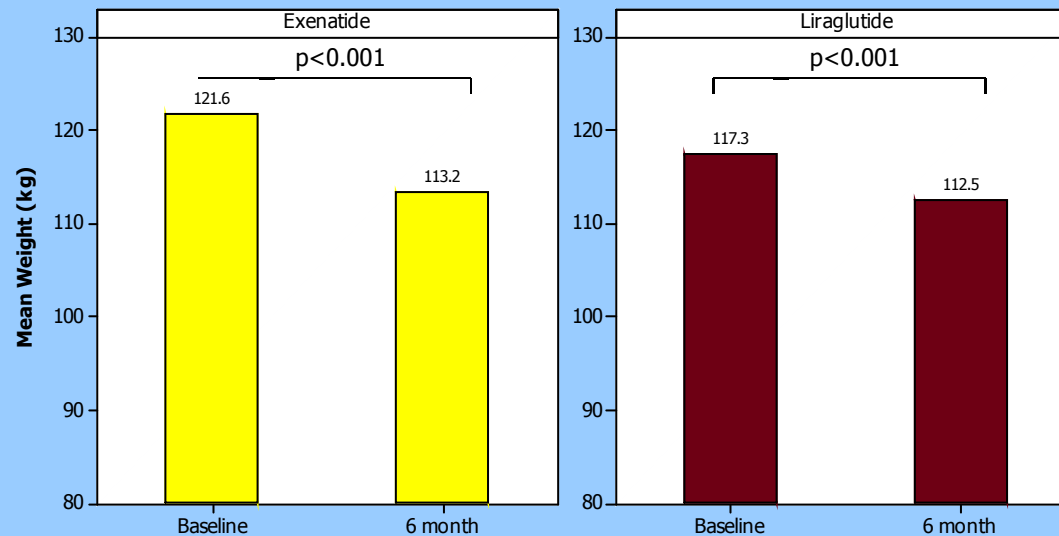


+0.34%*



-0.02%*

-8.4 kg*



-4.8 kg

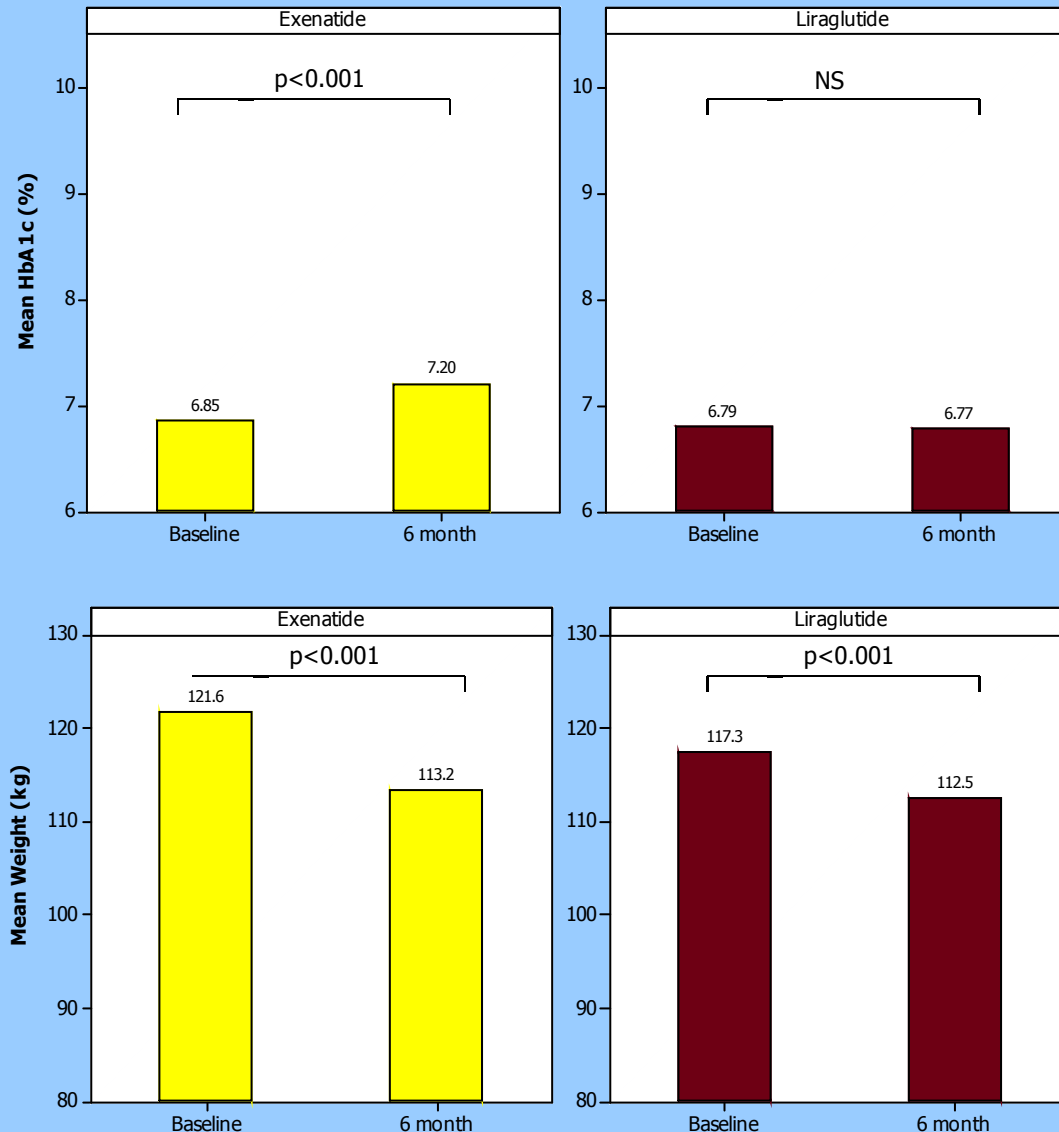
*significantly different from group meeting NICE criteria for use

6 month HbA1c and Weight results among patients with baseline HbA1c < 7.5% starting exenatide and liraglutide

+0.34%*

Anecdote: 35 year old lady, HbA1c 5.7%. Weight fell on exenatide by 17.2kg from 109.2kg to 92kg, whilst HbA1c remained unchanged. Her periods returned (PCO).

-8.4 kg*



-0.02%*

-4.8 kg

*significantly different from group meeting NICE criteria for use



Patients excluded by NICE



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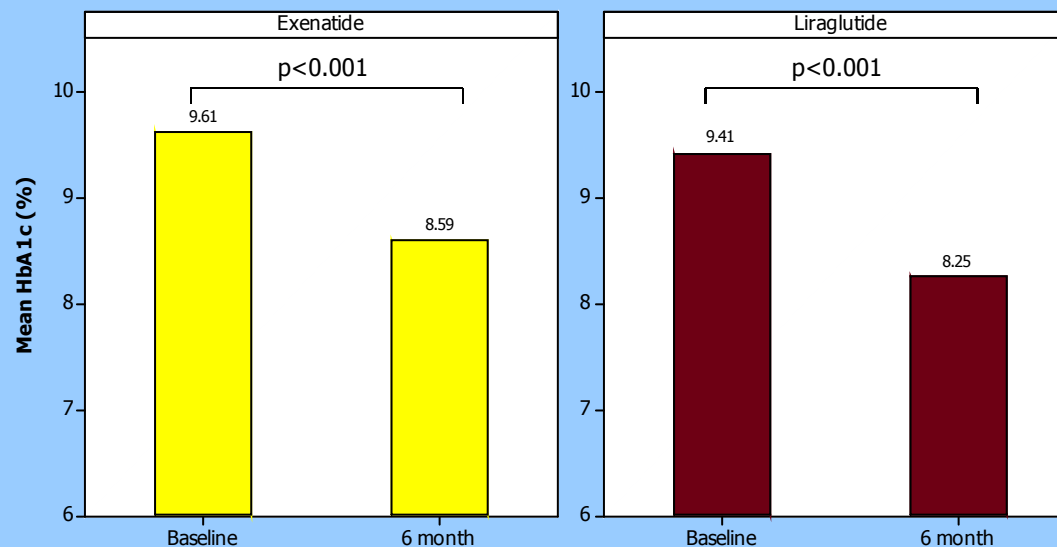
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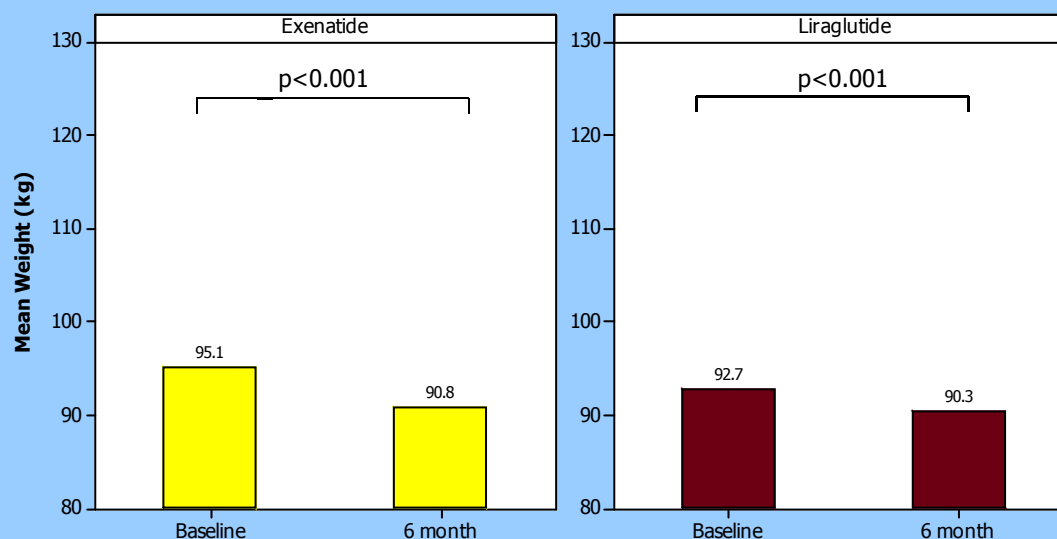
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6 month HbA1c and Weight results among patients with baseline BMI <math><35 \text{ kg/m}^2</math> starting exenatide and liraglutide



-1.02%

-1.16%



-4.3 kg*

-2.4 kg*

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NICE short clinical guideline 87 – Type 2 diabetes: newer agents

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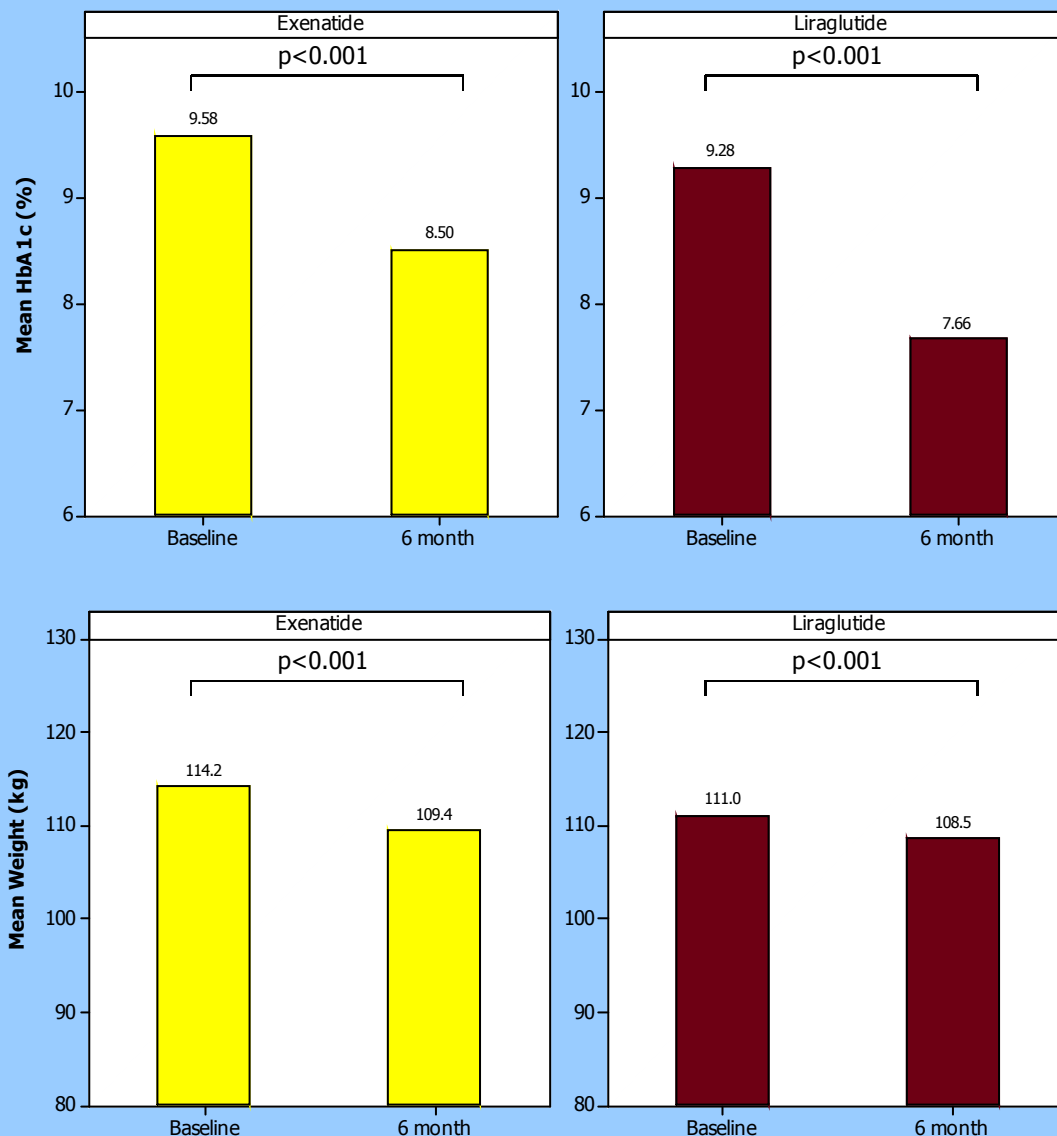
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6 month HbA1c and Weight results among patients on triple oral therapy starting exenatide and liraglutide

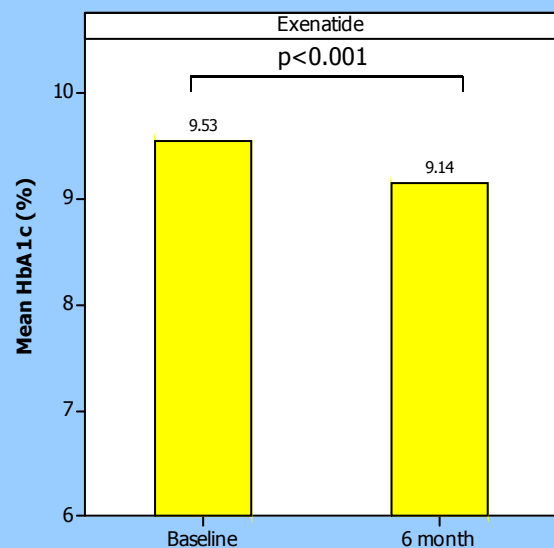


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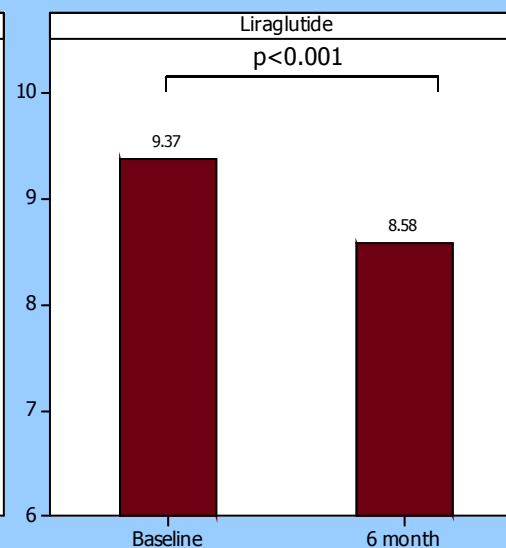
6 month HbA1c and Weight results among patients on insulin starting exenatide and liraglutide



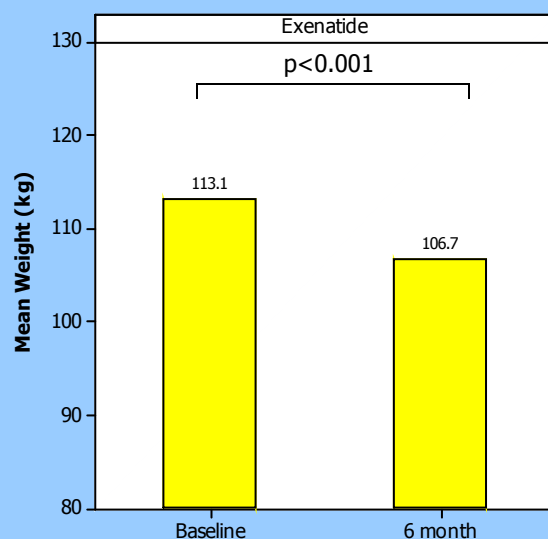
-0.39%*



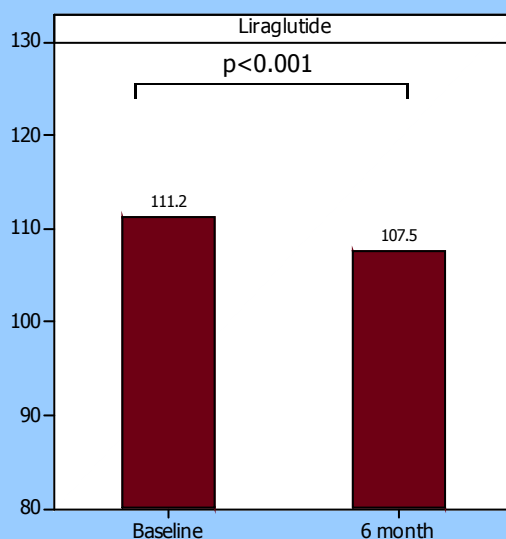
-0.79%*



-6.4 kg



-3.7 kg



*significantly different from group meeting NICE criteria for use

Findings 3

- Exenatide and liraglutide were commonly used outside that of NICE guidelines with considerable benefits to patients in terms of glycaemic control and weight loss

NICE: Only continue if beneficial metabolic response



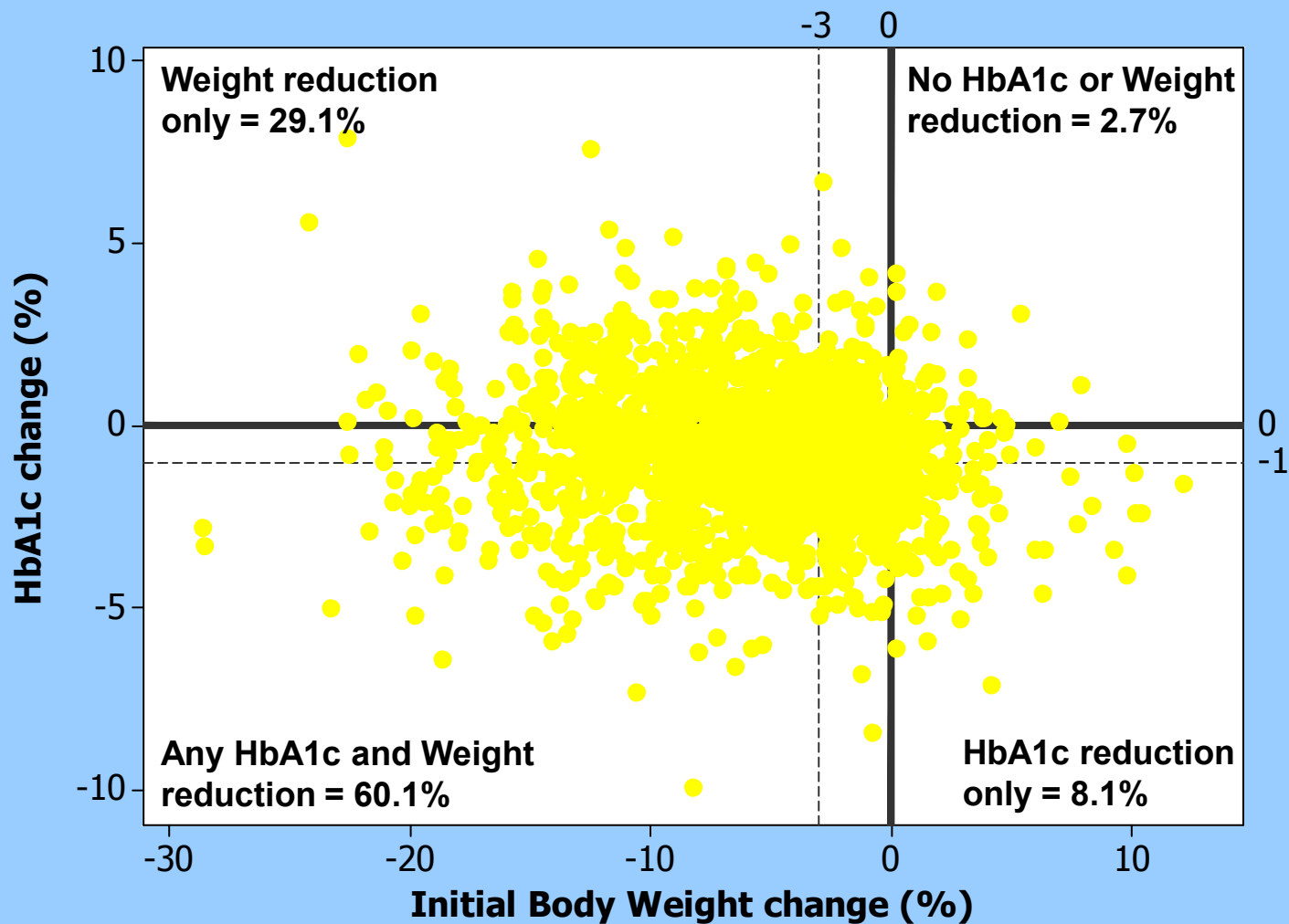
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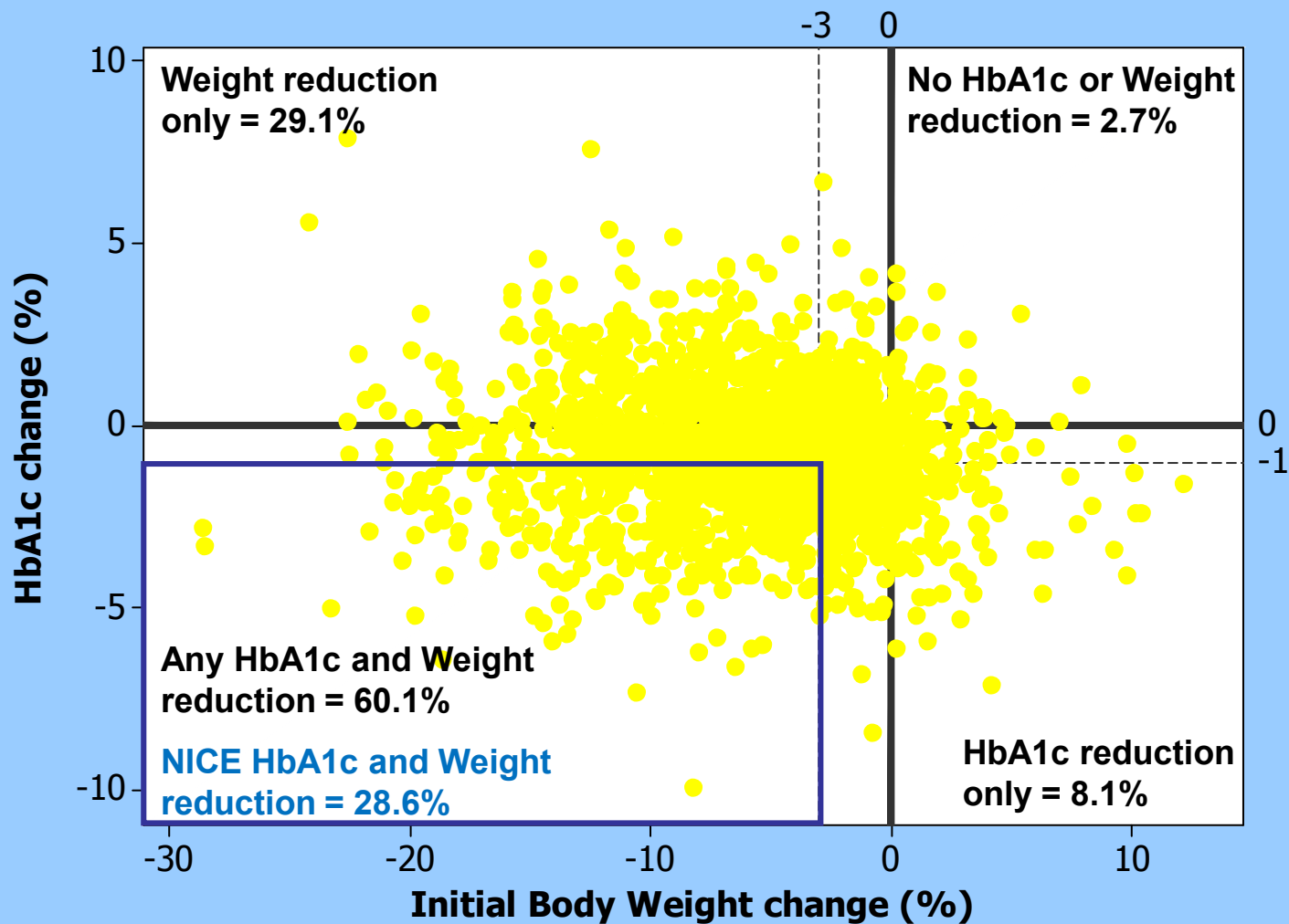
should only be continued as described for exenatide in 'Type 2 diabetes: the management of type 2 diabetes' (NICE clinical guideline 87); that is, if a beneficial metabolic response has been

- **At 6 months:**
 - ✓ **HbA1c fall by $\geq 1\%$**
 - ✓ **Weight loss $\geq 3\%$ initial body weight**

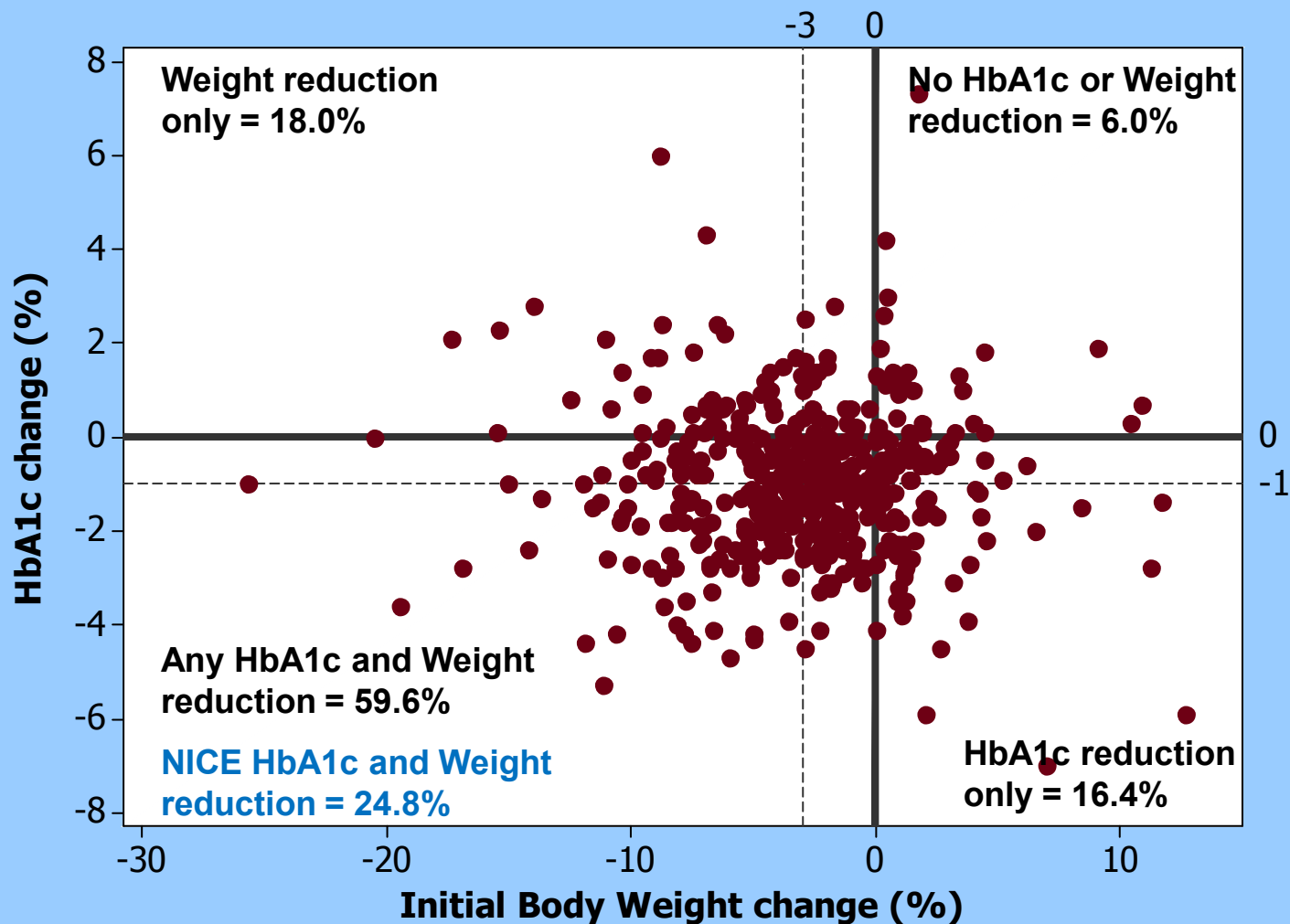
HbA1c and IBW changes at 6 months in 1882 patients on exenatide



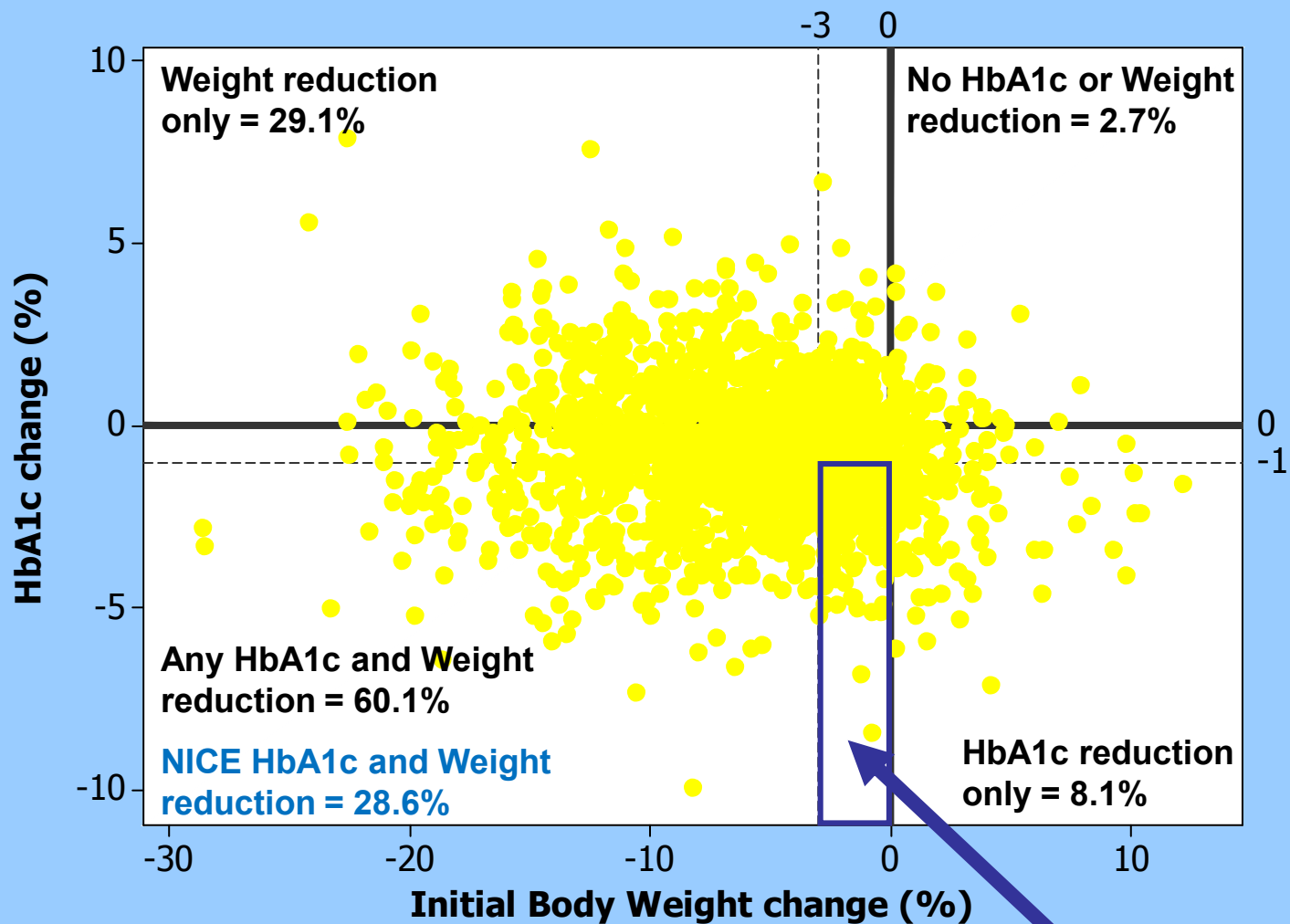
HbA1c and IBW changes at 6 months in 1882 patients on exenatide



HbA1c and IBW changes at 6 months in 451 patients on liraglutide (excluding those who were on exenatide)

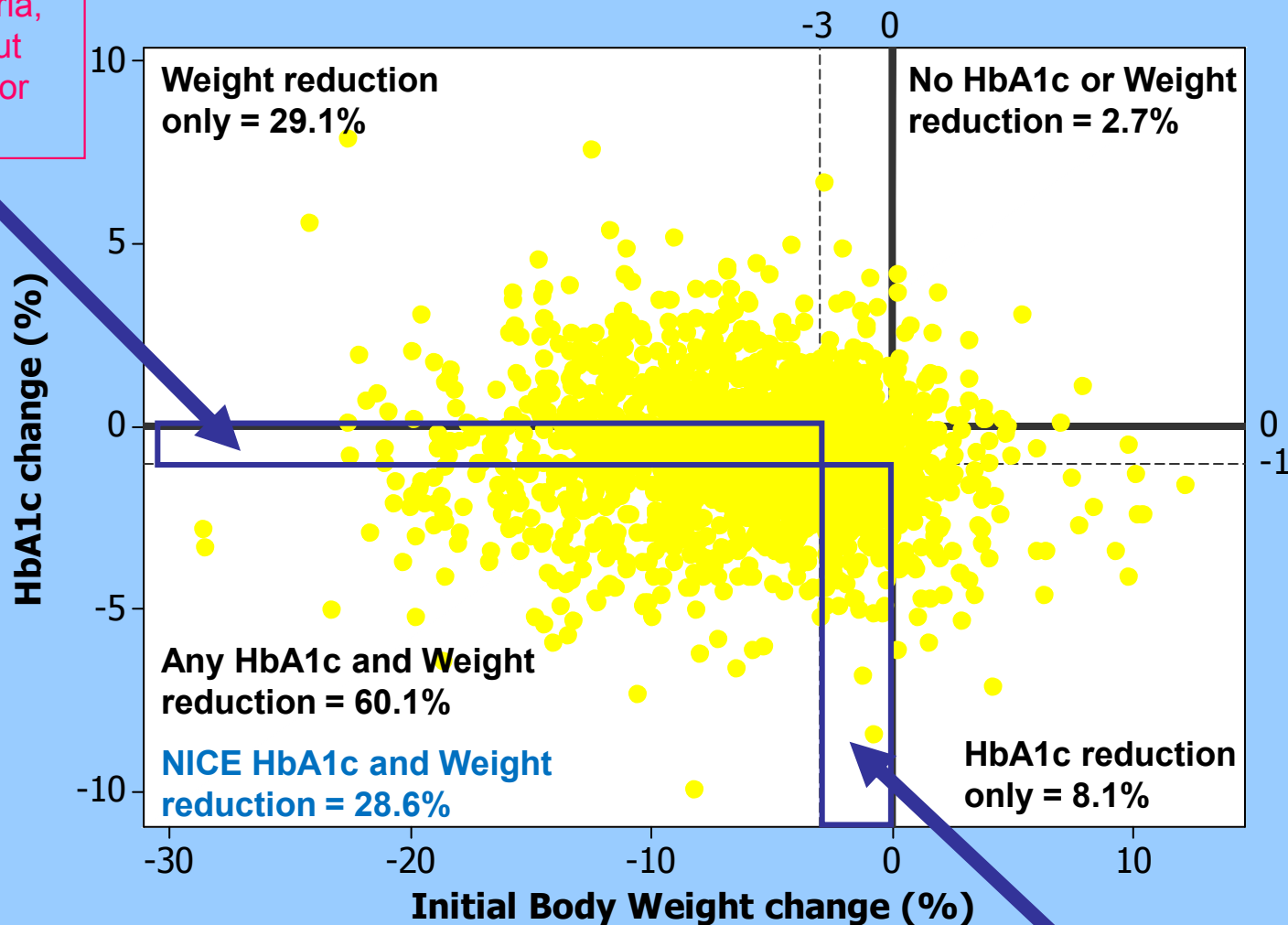


HbA1c and IBW changes at 6 months in 1882 patients on exenatide



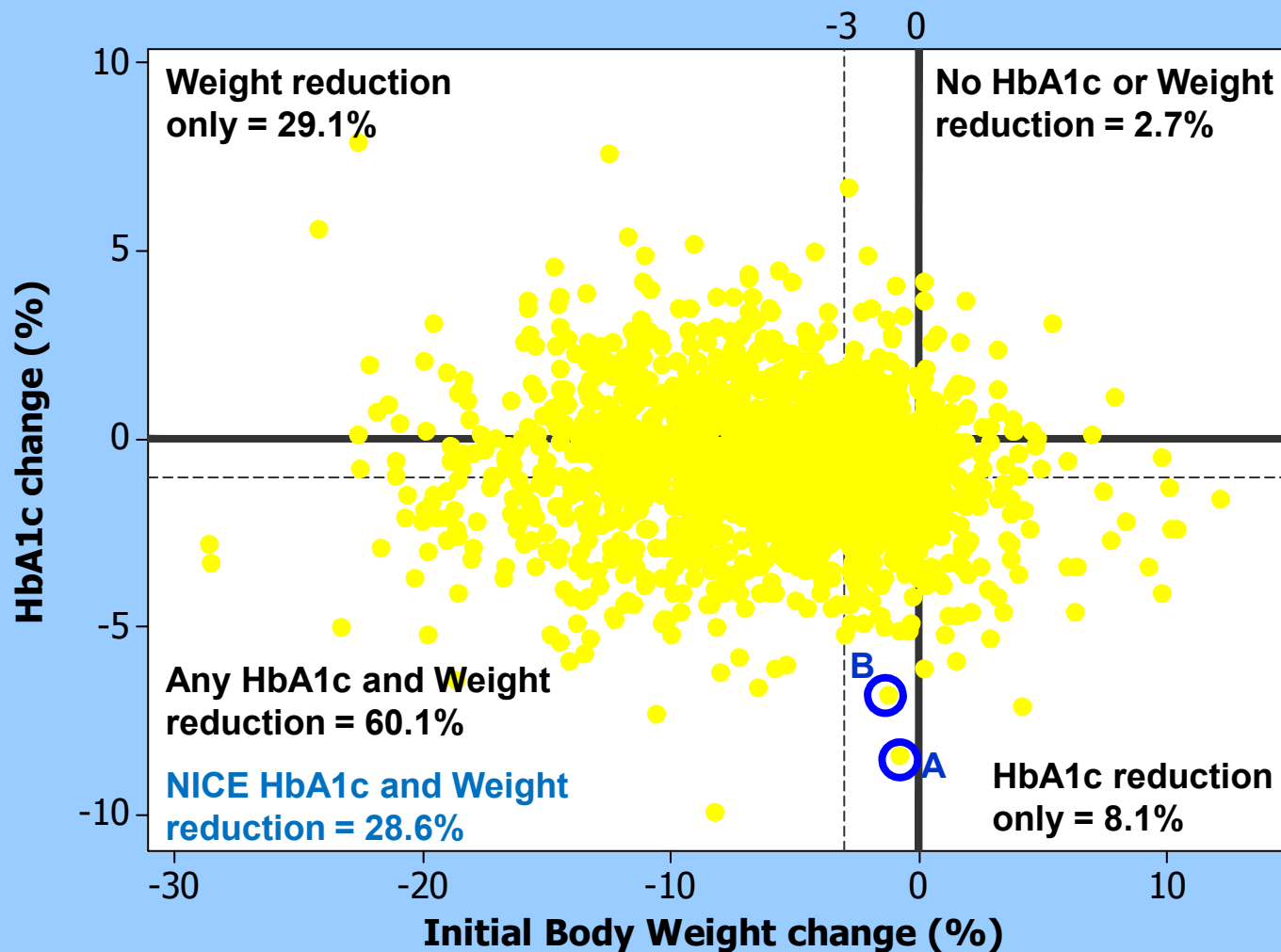
HbA1c and IBW changes at 6 months in 1882 patients on exenatide

Wt loss criteria,
HbA1c fall but
not enough for
NICE



HbA1c criteria, weight loss
but not enough for NICE

HbA1c and IBW changes at 6 months in 1882 patients on exenatide



Patient A

Male age 48.

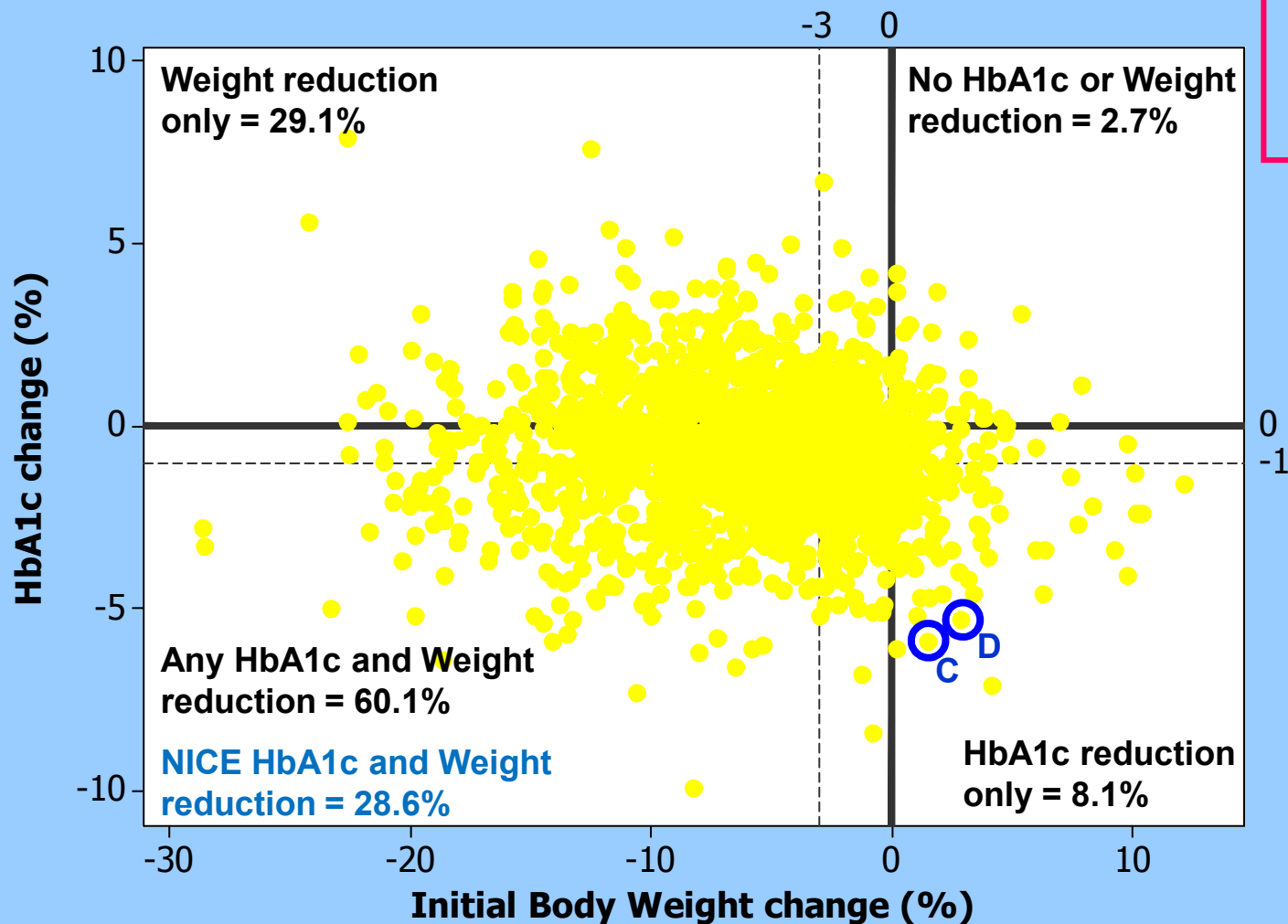
HbA1c reduction 8.4% from 17% to 8.6%, weight reduction 1.2kg from 143.7kg to 142.5kg (0.8% initial body wt)

Patient B

Female age 63

HbA1c reduction 6.8% from 12.9% to 6.1%, weight reduction 1kg from 79kg to 78kg (1.3% initial body wt)

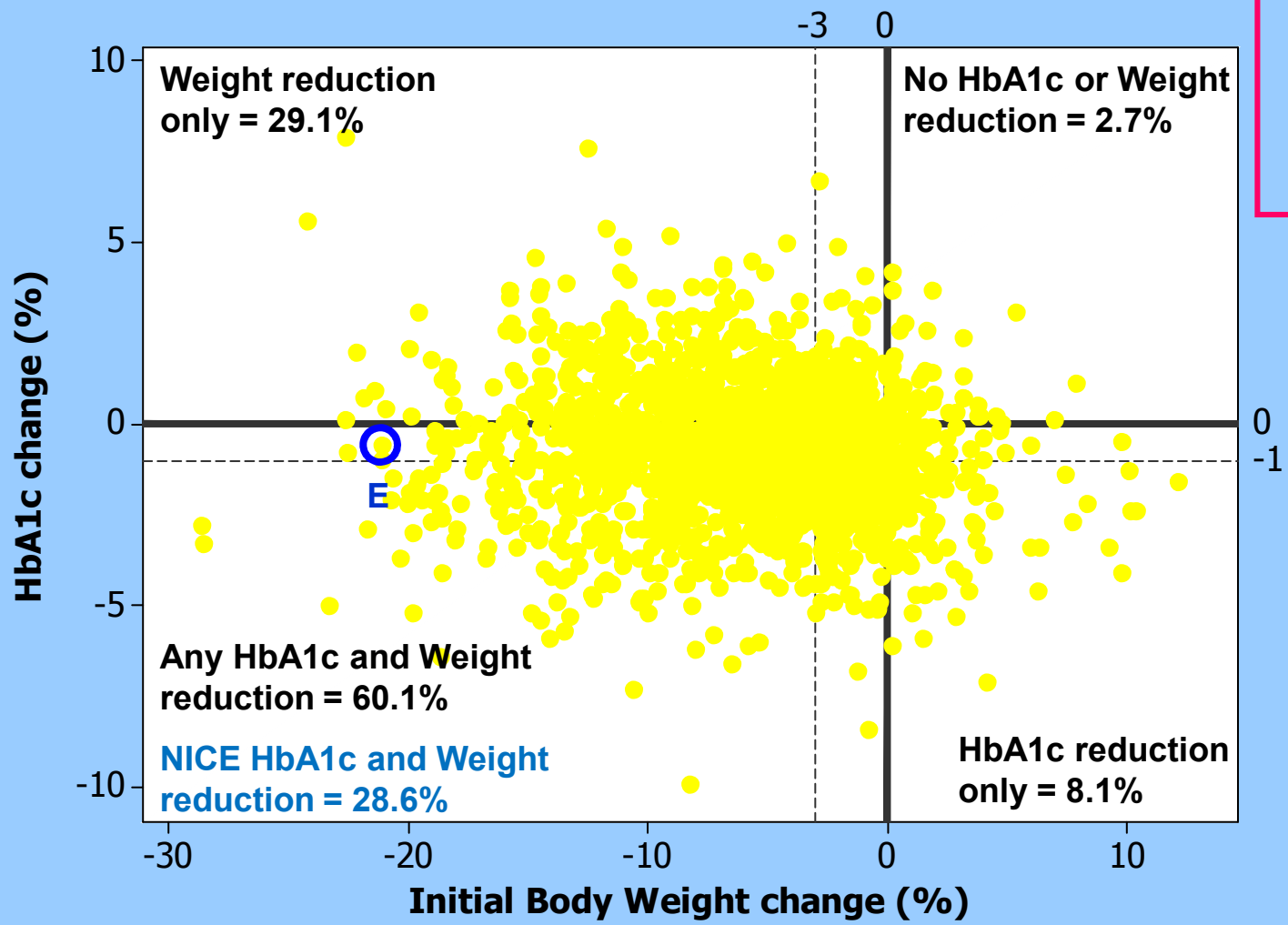
HbA1c and IBW changes at 6 months in 1882 patients on exenatide



Patient C
Male age 36
HbA1c reduction 5.9% from 12.8% to 6.9%, weight increase by 1.4kg from 93.6kg to 95kg

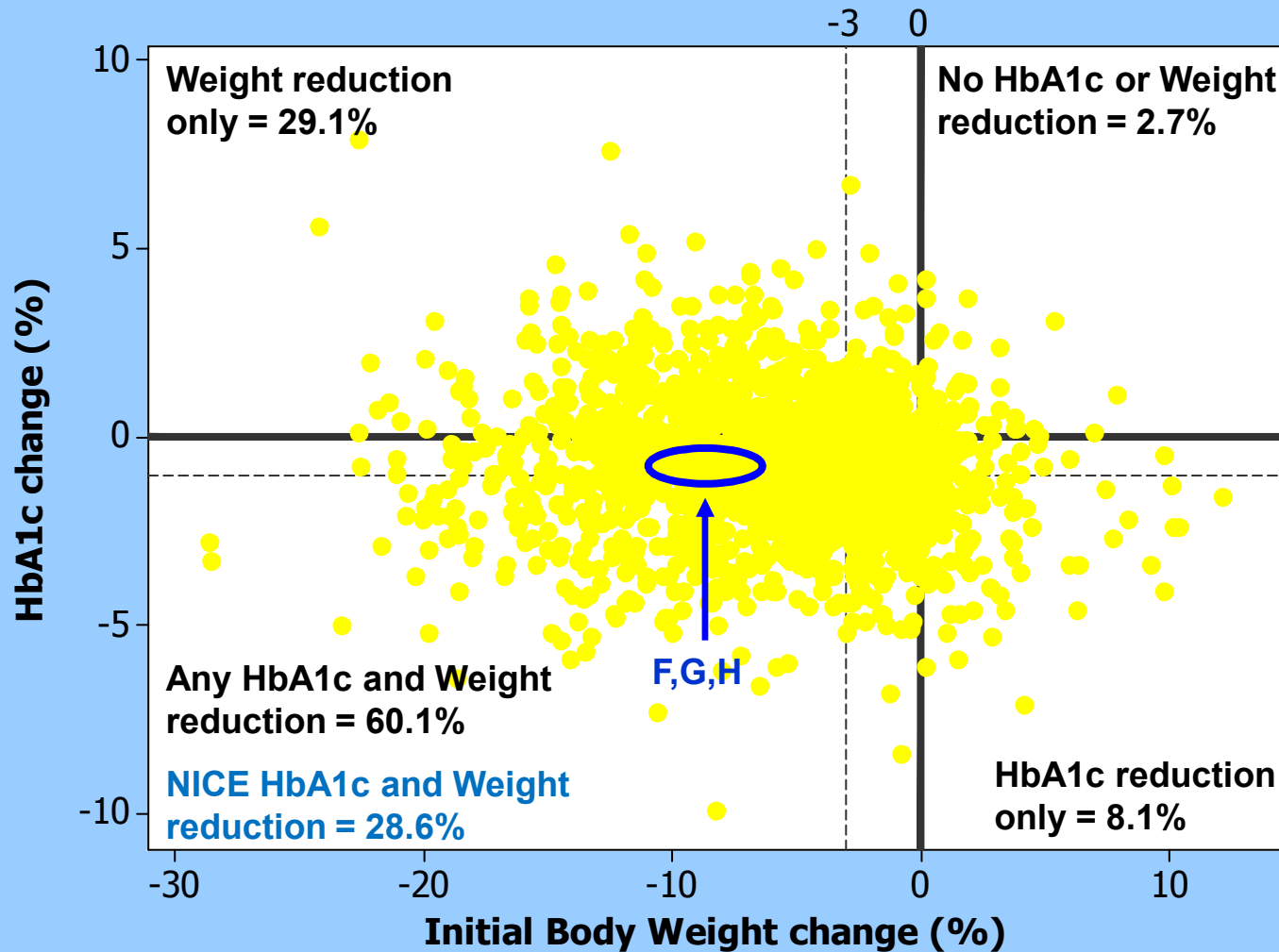
Patient D
Female age 37
HbA1c reduction 5.3% from 11.9% to 6.6%, weight increase by 3kg from 104kg to 107kg

HbA1c and IBW changes at 6 months in 1882 patients on exenatide



Patient E
Female age 63
HbA1c reduction 0.6% from 8.1% to 7.5%, weight reduction 21kg from 99.4kg to 78.4kg (21.1% initial body wt)

HbA1c and IBW changes at 6 months in 1882 patients on exenatide



Patient F
 Female age 70
 HbA1c reduction 0.6%, baseline HbA1c 7.6%, weight reduction 9.9kg from 116.3kg to 106.4kg (8.5% initial body wt)

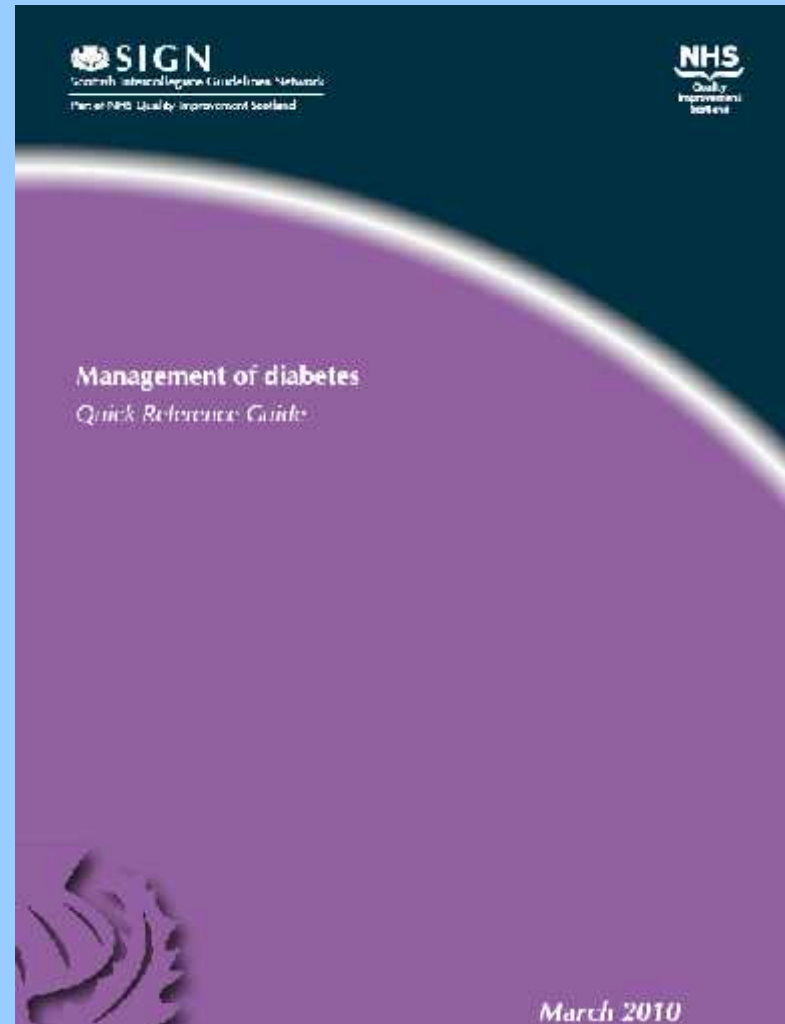
Patient G
 Male age 72
 HbA1c reduction 0.7%, baseline HbA1c 7.9%, weight reduction 7.1kg from 79.3kg to 72.2kg (9.0% initial body wt)

Patient H
 Male 79
 HbA1c reduction 0.8%, baseline HbA1c 7.8%, weight reduction 11.9kg from 105.7kg to 93.8kg (11.3% initial body wt)

Findings 4

- Around 60% of patients starting on exenatide or liraglutide achieve both HbA1c and Weight reduction but less than 30% achieve NICE criteria for a metabolic success
- Many patients achieved significant HbA1c or Weight response, but not both
- Perhaps the Scottish SIGN guidelines are more appropriate than those of NICE

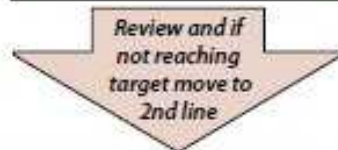
Sign Guideline



REVIEW AND SET GLYCAEMIC TARGET: HbA1c <7% (53 mmol/mol) OR INDIVIDUALISED AS AGREED

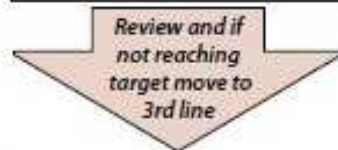
1st LINE OPTIONS In addition to lifestyle measures; **START ONE OF**

Metformin (MF)	Sulphonylurea* (SU) • If intolerant of metformin or • If weight loss/osmotic symptoms
-----------------------	--



2nd LINE OPTIONS In addition to lifestyle measures, adherence to medication and dose optimisation; **ADD ONE OF**

Sulphonylurea* (SU)	Thiazolidinedione* • If hypos a concern (eg driving, occupational hazards, at risk of falls) and • If no congestive heart failure	DPP-IV inhibitor* • If hypos a concern (eg driving, occupational hazards, at risk of falls) • If weight gain a concern
----------------------------	--	---



3rd LINE OPTIONS In addition to lifestyle measures, adherence to medication and dose optimisation; **ADD OR SUBSTITUTE WITH ONE OF**

ORAL (continue MF/SU if tolerated)		INJECTABLE (if willing to self inject; continue MF/SU if tolerated)	
Thiazolidinedione* If no congestive heart failure	DPP-IV inhibitor* If weight gain a concern	Insulin* (Inject before bed) • If osmotic symptoms/rising HbA1c; NPH insulin initially • If hypos a concern, use basal analogue insulin as an alternative • Add prandial insulin with time if required	GLP-1 agonists* • If BMI >30 kg/m ² • If a desire to lose weight • Usually <10 years from diagnosis

Prescribers should refer to the British National Formulary (www.bnf.org) and the Scottish Medicines Consortium (www.scottishmedicines.org.uk) for updated guidance on licensed indications, full contraindications and monitoring requirements.

Usual approach	
Alternative approach: special considerations	
*	Continue medication if EITHER individualised target achieved OR HbA1c falls >0.5% (5.5 mmol/mol) in 3-6 months

PHARMACOLOGICAL MANAGEMENT OF GLYCAEMIC CONTROL IN PEOPLE WITH TYPE 2 DIABETES

SIGN Guideline

GLP-1 agonists*

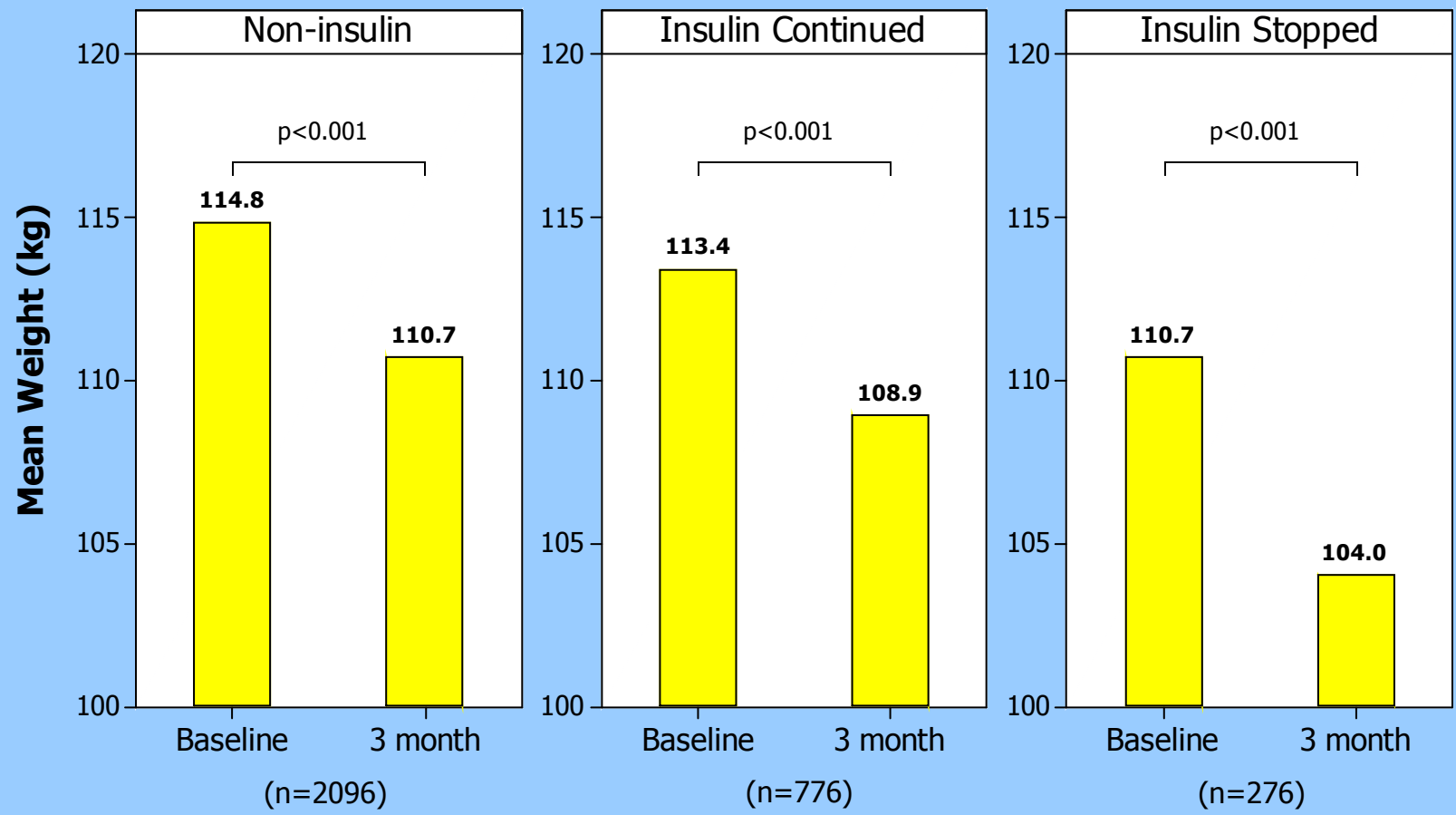
- If BMI >30 kg/m²
- If a desire to lose weight
- Usually <10 years from diagnosis

*

Continue medication if EITHER individualised target achieved OR HbA1c falls $>0.5\%$ (5.5 mmol/mol) in 3-6 months

GLP-1 treatment with Insulin

Baseline vs 3 month Weight with exenatide treatment comparing patient groups



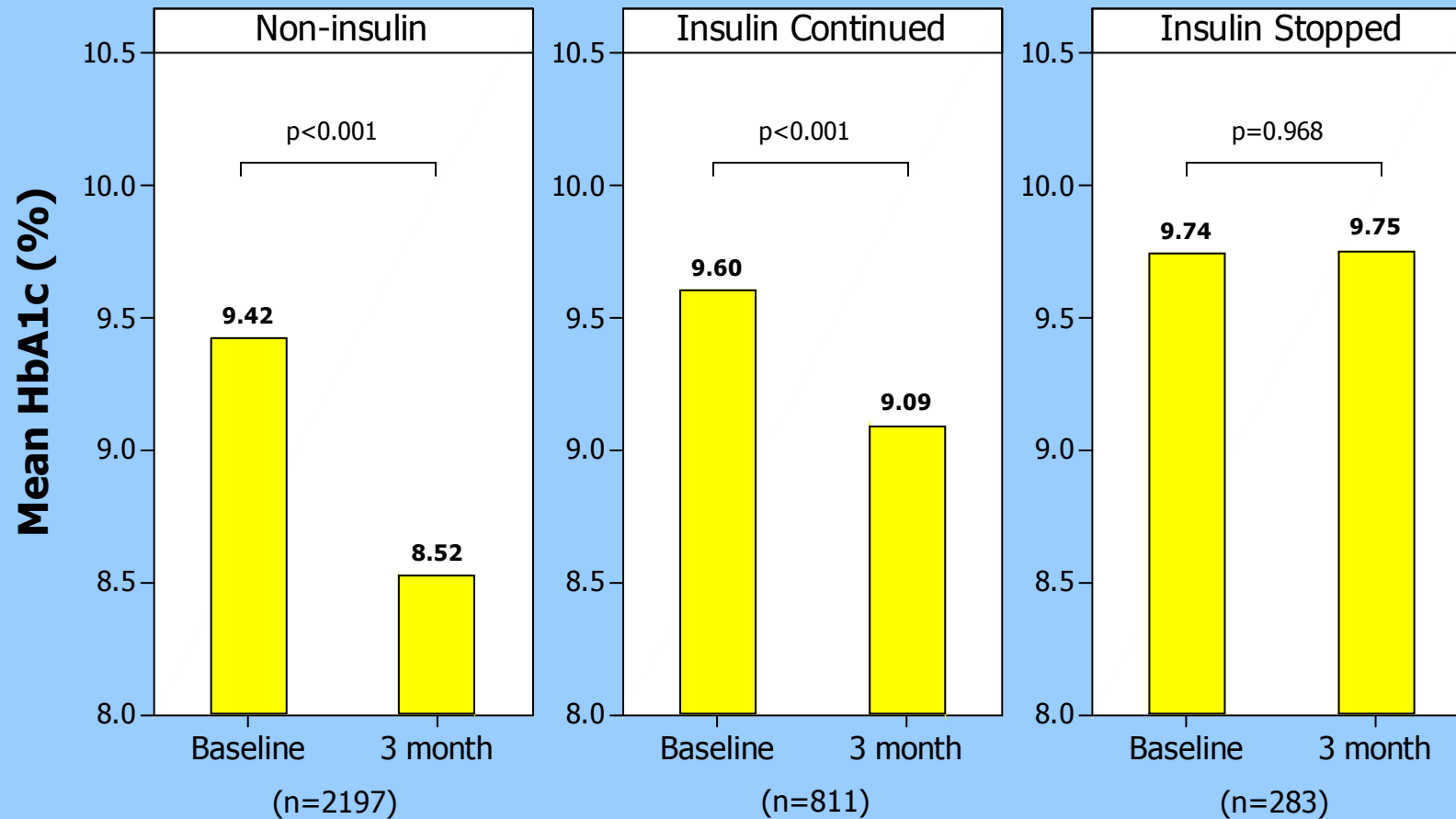
Mean change

-4.1 kg

-4.6 kg

-6.6 kg

Baseline vs 3 month HbA1c with exenatide treatment comparing patient groups



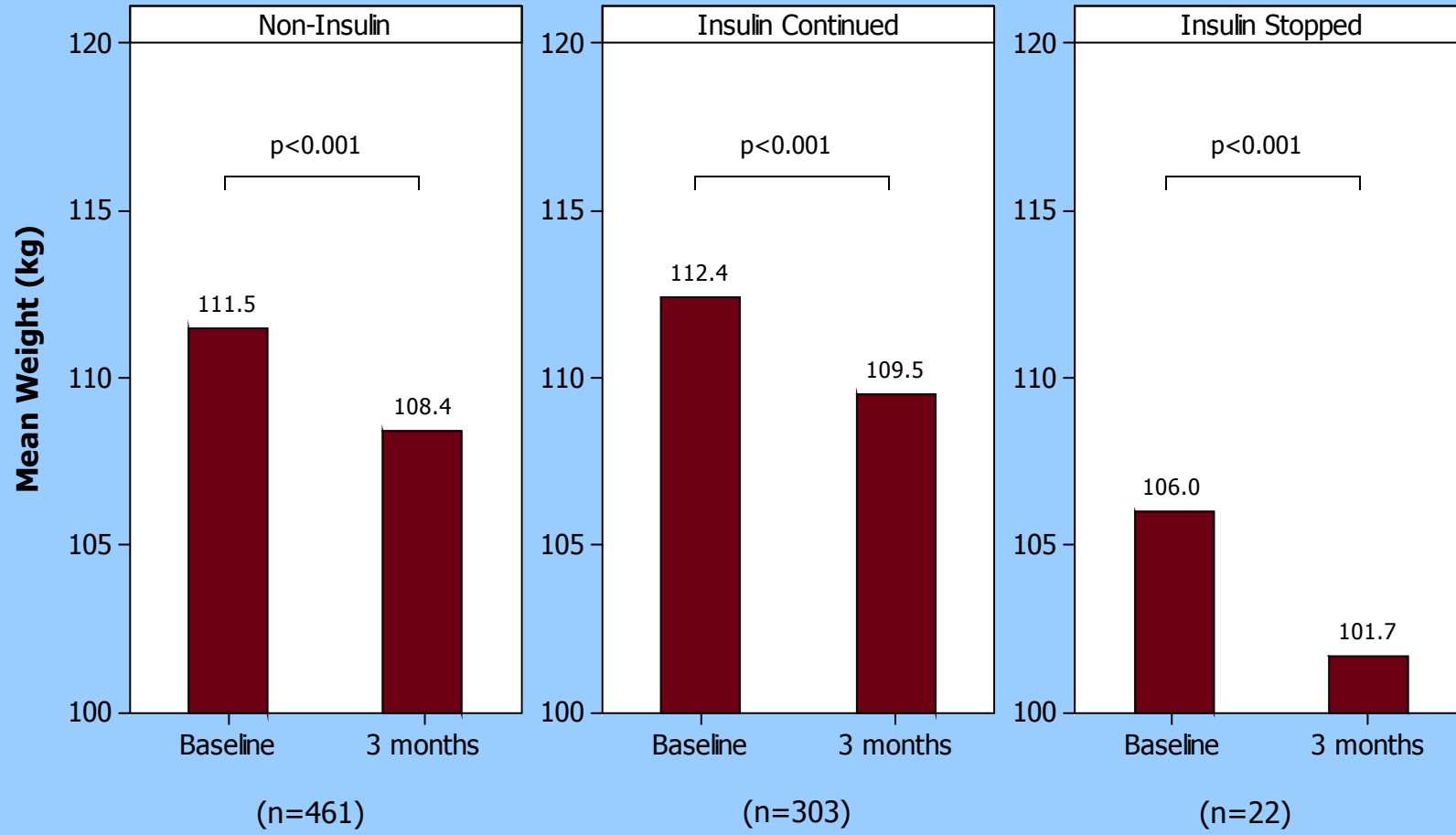
Mean change

-0.90%

-0.51%

+0.00%

Baseline vs 3 month Weight with liraglutide treatment comparing patient groups



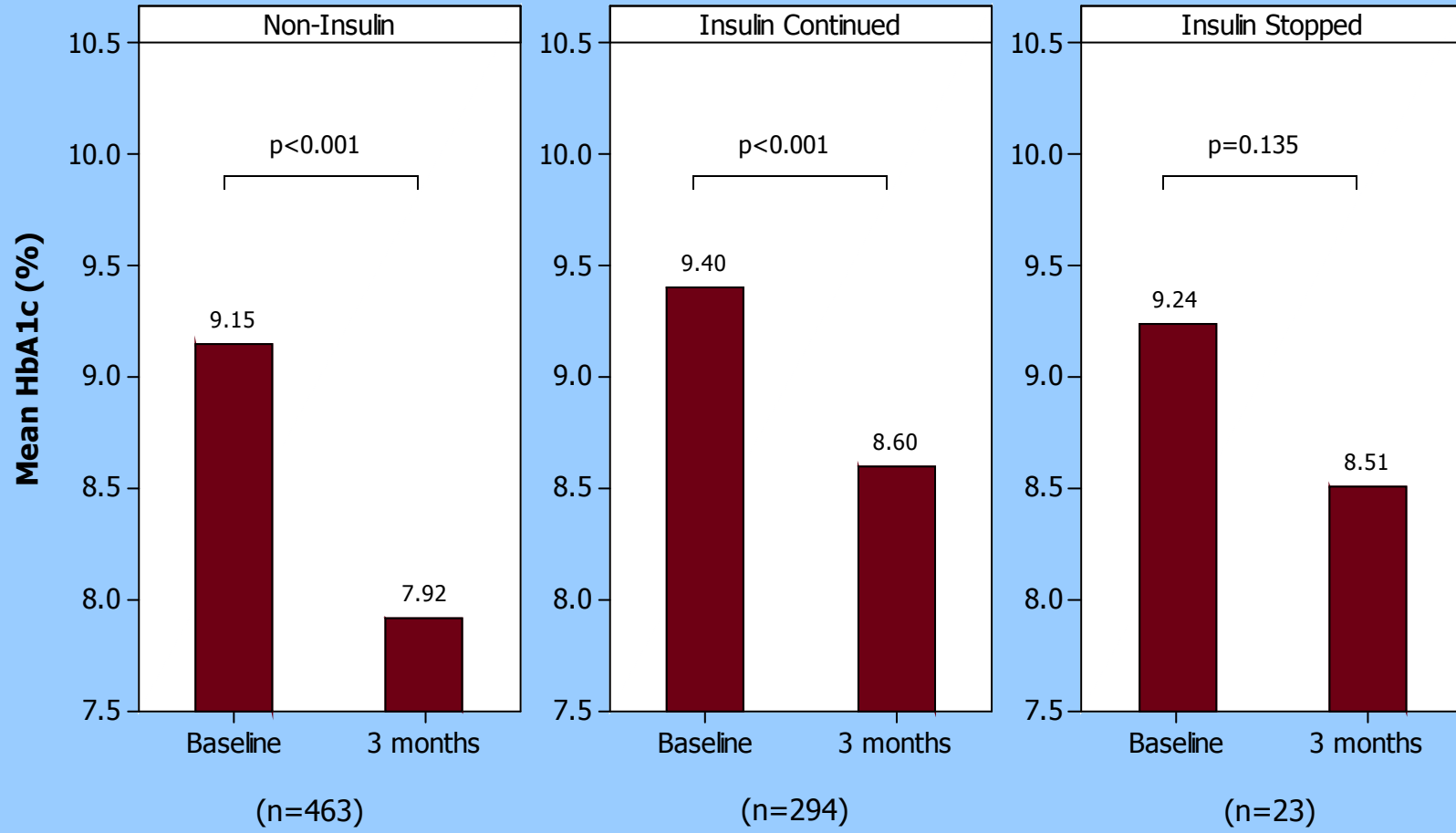
Mean change

-3.1 kg

-2.9 kg

-4.3 kg

Baseline vs 3 month HbA1c with liraglutide treatment comparing patient groups



Mean change

(n=463)

-1.23%

(n=294)

-0.80%

(n=23)

-0.73%

Exenatide discontinuation, adverse events and exenatide treatment satisfaction comparing non-insulin and insulin-treated patients



	Non-insulin-treated % (95% CI)	Insulin-treated % (95% CI)	P value
Exenatide discontinuation			
Whole audit	13.9 (12.7,15.2)	31.0 (28.9,33.1)	<0.001
<i>Lack of efficacy</i>	<i>33.6 (29.0,38.4)</i>	<i>41.0 (37.0,45.1)</i>	<i>0.017</i>
<i>GI side effect</i>	31.9 (27.3,36.6)	35.8 (31.9,39.8)	0.197
Before 3 months	3.5 (2.9,4.3)	12.8 (11.3,14.4)	<0.001
Adverse events			
Pre-exenatide hypo	2.9 (2.3,3.6)	6.6 (5.5,7.8)	<0.001
Post-exenatide hypo	6.1 (5.3,7.1)	8.9 (7.7,10.2)	<0.001
All GI side effects	25.0 (23.4,26.6)	28.4 (26.4,30.5)	0.008
Acute renal failure	0.2 (0.1,0.4)	0.3 (0.1,0.7)	0.459
Patient satisfaction			
Positive response	74.4 (71.7,77.0)	58.0 (53.6,62.3)	<0.001 (group)
Neutral response	19.8 (17.5,22.0)	21.2 (17.7,25.0)	
<i>Negative response</i>	<i>5.7 (4.5,7.3)</i>	<i>20.8 (17.3,24.6)</i>	

adapted from Thong et al accepted for print, Diabetes, Obesity and Metabolism

Latest HbA1c and Weight changes of patients starting exenatide comparing non-insulin-treated patients and patients who continued insulin



	Non-insulin-treated	Continued insulin	p-value
N	2016	839	
Baseline HbA1c %	9.42 (1.68)	9.55 (1.70)	0.058
Latest HbA1c %	8.48 (1.74)	9.04 (1.90)	
HbA1c change %	-0.94 (0.04)	-0.51 (0.06)	<0.001
HbA1c reduction $\geq 1\%$	49.0%	34.2%	<0.001
N	1957	802	
Baseline Weight <i>kg</i>	114.1 (23.9)	112.7 (22.5)	0.161
Latest Weight <i>kg</i>	108.6 (23.2)	106.9 (22.6)	
Weight change <i>kg</i>	-5.5 (0.1)	-5.8 (0.2)	0.278
Weight loss $\geq 3\%$ IBW	59.0%	61.1%	0.613

adapted from Thong et al accepted for print, Diabetes, Obesity and Metabolism

Exenatide and Insulin

- more than 1/3 of insulin-treated patients achieved an HbA1c reduction of $\geq 1\%$
- 1 in 6 discontinued insulin alongside HbA1c reduction
- Insulin dose reduction from 1.0 ± 0.8 U/kg/day to 0.7 ± 0.7 U/kg/day ($p < 0.001$)

GLP-1 (Exenatide) and Insulin – *should we and how?*

- **No evidence of safety concerns** despite statistically higher rates of hypoglycaemia (from background insulin)
- Combination **on average less effective** and **less well tolerated** BUT
- ****A significant proportion of patients obtained significant benefit**
- If starting exenatide – **don't stop insulin** when starting exenatide – aim to **wean off the insulin** in the appropriate patients instead

GLP-1 treatment with Insulin

- *Who?*

- Exenatide insulin stoppers
 - Mean total daily insulin dose = 0.8 U/kg/day
 - Median diabetes duration 10 (6-15) years

- Liraglutide insulin stoppers
 - Mean total daily insulin dose = 0.6 U/kg/day
 - Median diabetes duration 9 (6-13) years

Stepwise regression analyses-factors influencing HbA1c and Weight changes among patients treated with exenatide and liraglutide



Factor	HbA1c reduction, stepwise regression among 3982 patients		Weight reduction, stepwise regression in 3089 patients	
	Adjusted T-value	Adjusted p-value	Adjusted T-value	Adjusted p-value
Baseline HbA1c	30.44	<0.001	-5.94	<0.001
Baseline Weight	-3.79	<0.001	13.29	<0.001
HbA1c change	-	-	-	NS
Weight change	-	NS	-	-
Age	-	-	2.06	0.040
Diabetes duration	-4.16	<0.001	3.25	0.001
Ethnicity	-	-	-	NS
TZD reduction	-7.96	<0.001	7.02	<0.001
Insulin use	-10.02	<0.001	7.06	<0.001
	Stepwise regression among 1134 patients		Stepwise regression among 1002 patients	
Total insulin dose (log)	-3.6	<0.001	-	NS
Insulin dose reduction	-3.5	<0.001	9.21	<0.001

Models of HbA1c change and weight change has been altered to HbA1c reduction and weight reduction, with appropriate changes to T-values to aid interpretation

GLP-1 and Insulin – *Who?*

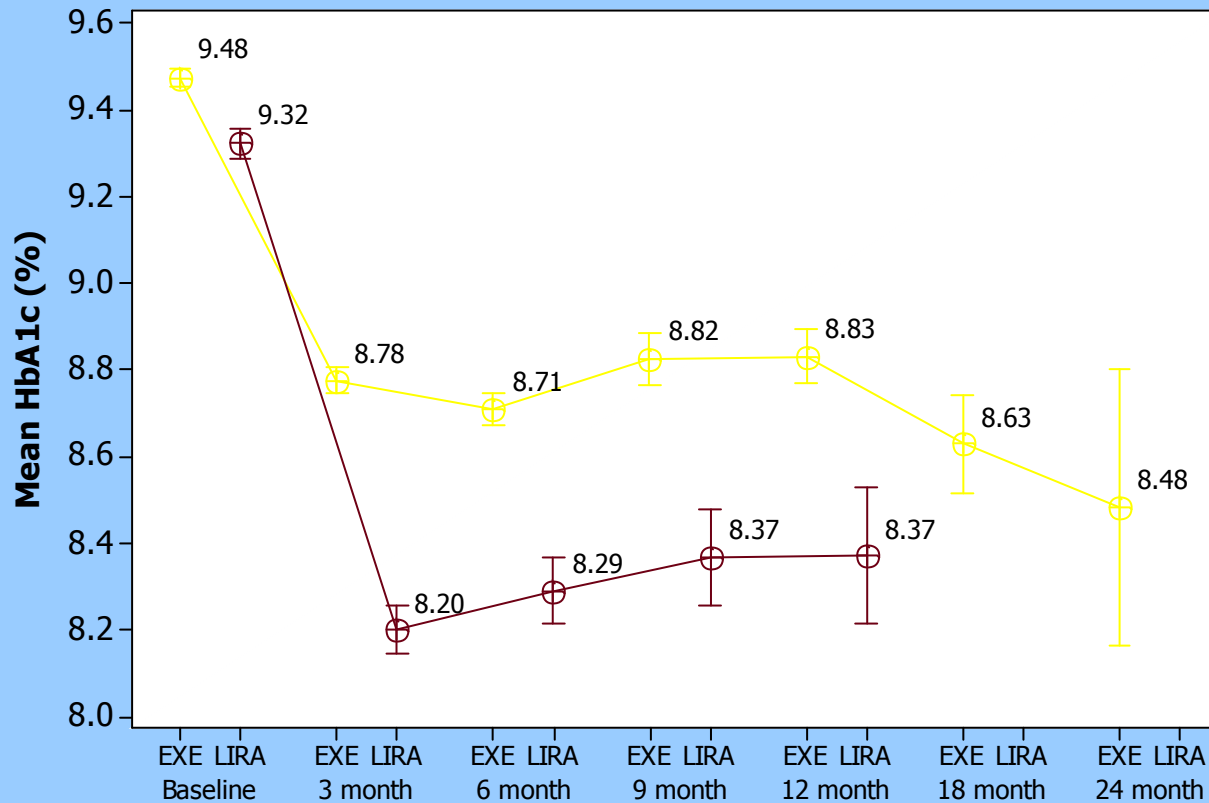
- The data from the GLP-1 audits suggests that patients on insulin who do well are the ones with **smaller total daily insulin dose** and **shorter diabetes duration**

HbA1c and Weight changes - effects with time

HbA1c changes with time: exenatide and liraglutide



Bars are One Standard Error from the Mean



Group
 EXE
 LIRA

All pairwise HbA1c comparisons with baseline for exenatide and liraglutide were $p < 0.001$, except exenatide 0v24m, $p = 0.021$

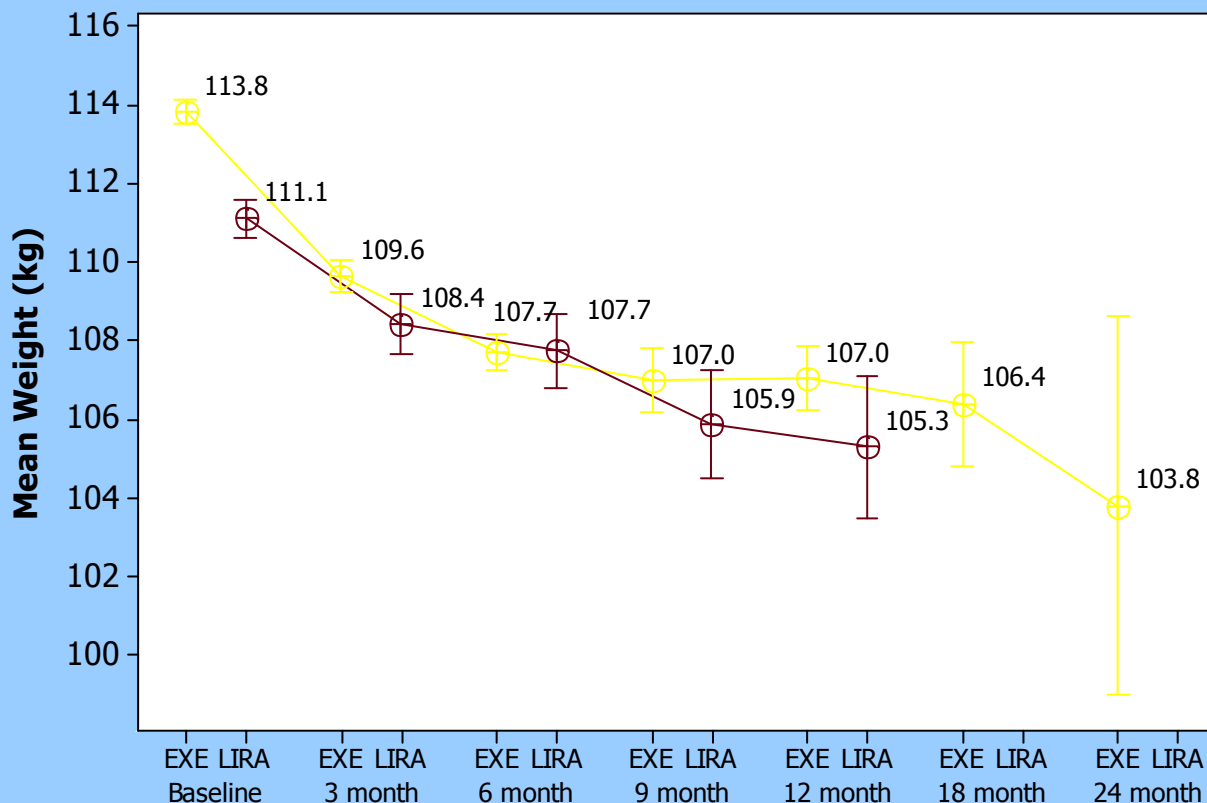
Liraglutide data may include patients who have stopped liraglutide

EXE (n)	6487	3502	2323	966	856	276	35
LIRA (n)	2206	804	522	236	148		

Weight changes with time: exenatide and liraglutide



Bars are One Standard Error from the Mean



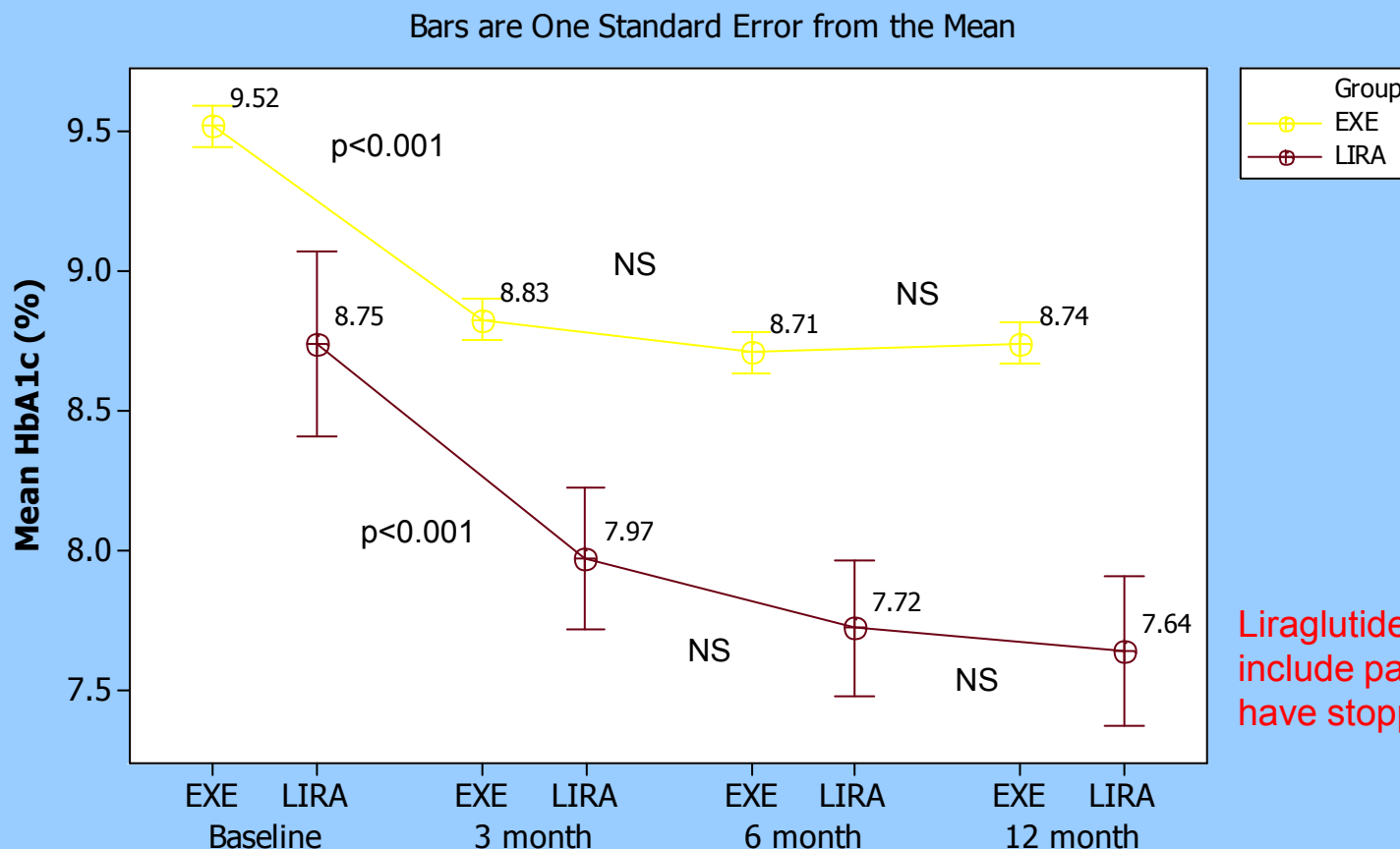
Group
 —○— EXE
 —○— LIRA

All pairwise Weight comparisons with baseline for exenatide and liraglutide were $p < 0.001$

Liraglutide data may include patients who have stopped liraglutide

EXE (n)	6400	3334	2211	825	735	206	34
LIRA (n)	2202	811	560	239	151		

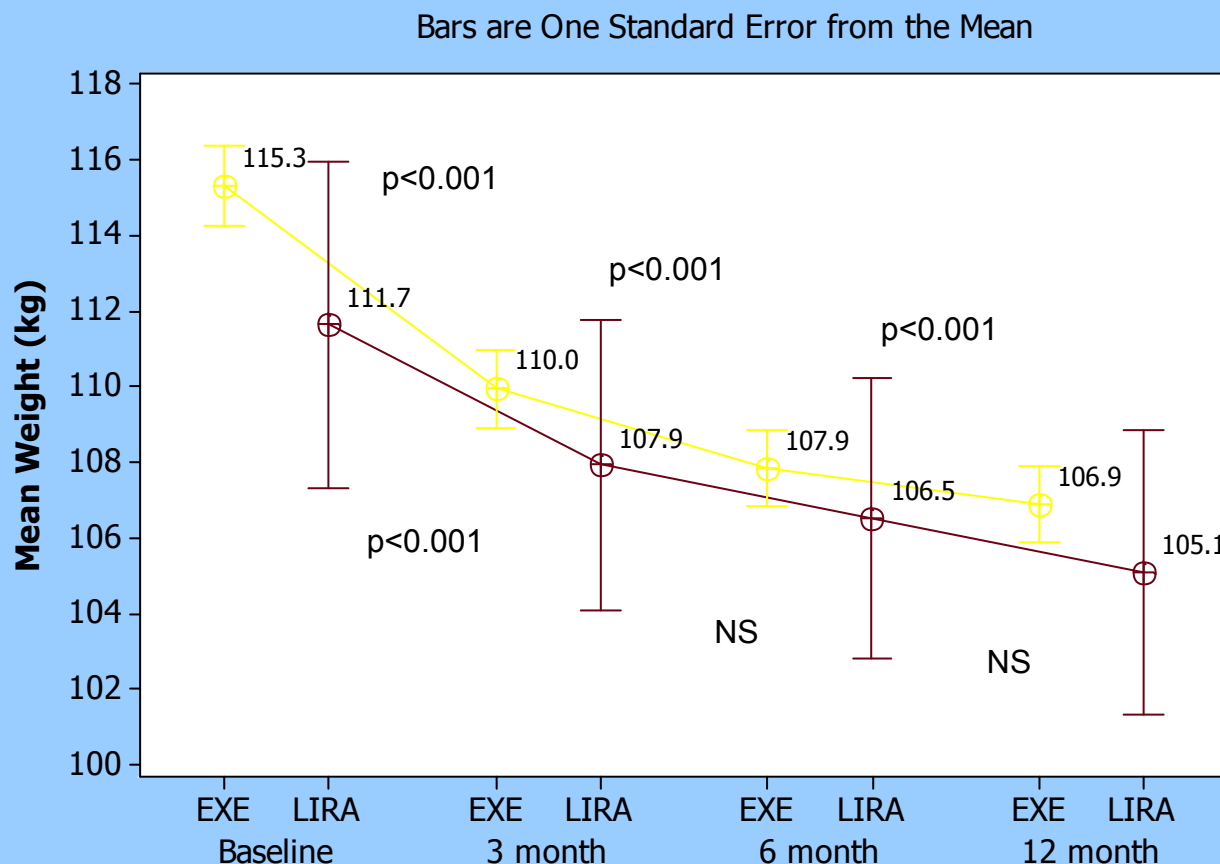
General Linear Model of 584 and 31 patients with baseline, 3 month, 6 month and 12 month HbA1c after exenatide and liraglutide



Liraglutide data may include patients who have stopped liraglutide

HbA1c changes were significant between baseline and 3 months but not between 3 and 6 months, or 6 and 12 months

General Linear Model of 481 and 30 patients with baseline, 3 month, 6 month and 12 month Weight after exenatide and liraglutide



Liraglutide data may include patients who have stopped liraglutide

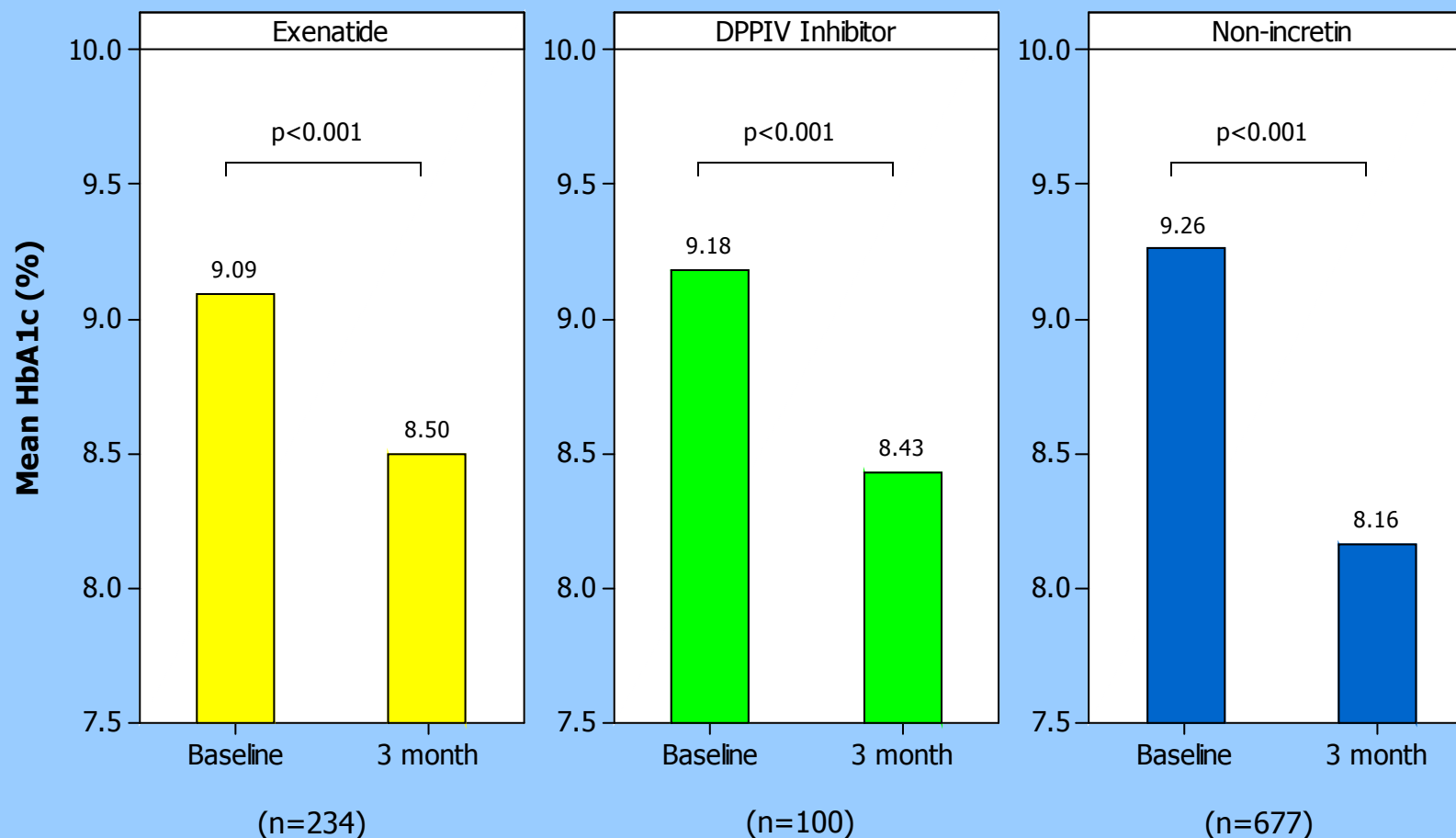
Weight changes were significant between all time intervals for exenatide; and baseline v 3 month for liraglutide

Findings

- Both GLP-1 agents showed remarkably similar HbA1c and Weight effects over time
- HbA1c reduction occur predominantly in the first 3 months after GLP-1 agonist start and then plateaux
- Weight reduction continued to occur until 12 months and appears to continue until 24 months

Effects of exenatide and gliptin switch to liraglutide

Baseline vs 3 month HbA1c among patients on Exenatide, DPPIV inhibitors and Non-incretin therapies starting liraglutide



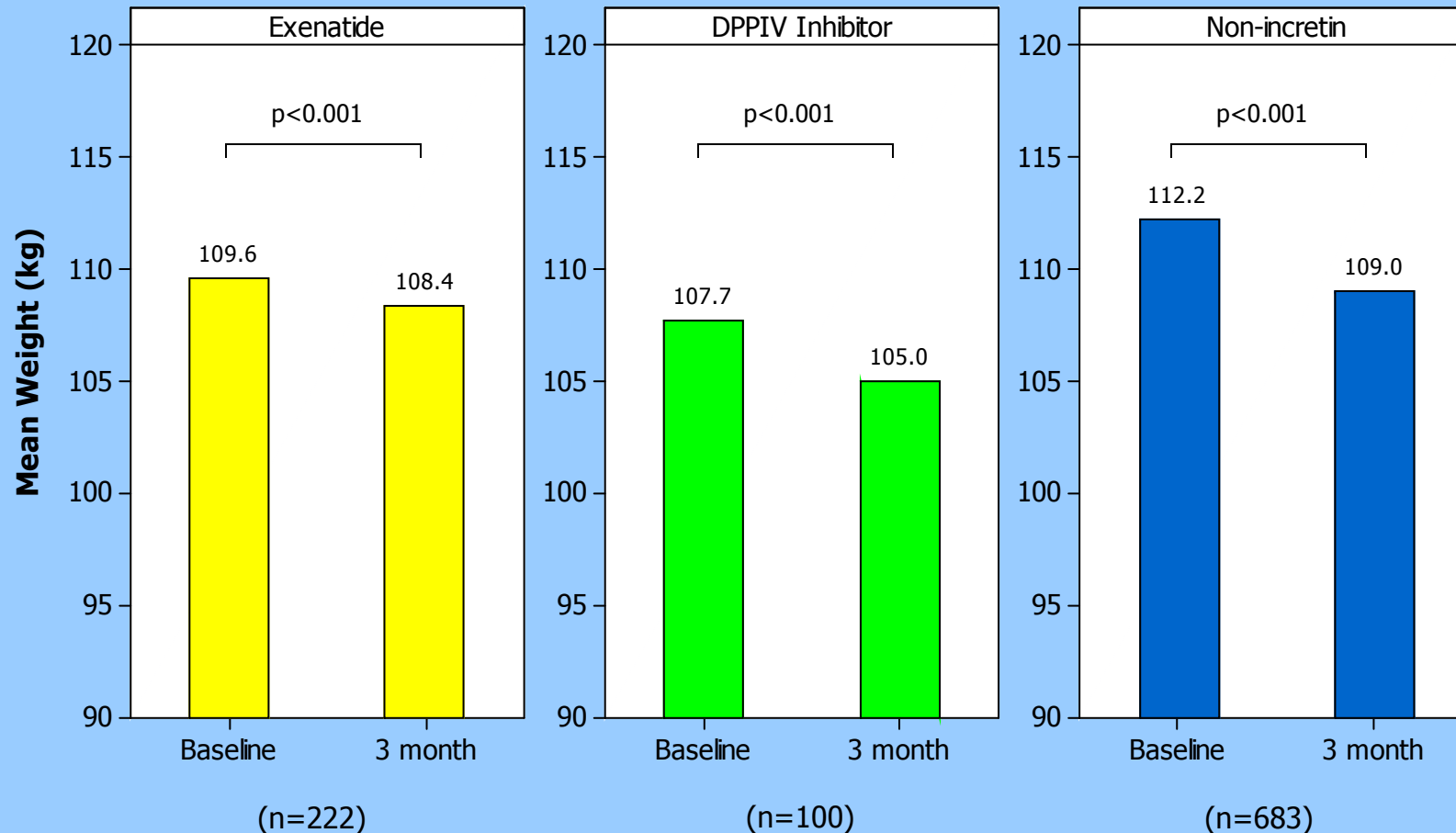
Mean change

-0.60%

-0.75%

-1.10%

Baseline vs 3 month Weight among patients on Exenatide, DPPIV inhibitors and Non-cretin therapies starting liraglutide



Mean change

-1.2 kg

-2.8 kg

-3.1 kg

ABCD nationwide exenatide audit contributors

The following are those whom we know about.



ABCD nationwide exenatide audit project steering group: Ryder REJ, Walton C, Rowles S, Adamson K, Dove D, Thozhukat S

ABCD nationwide exenatide audit – initial setup, maintenance and nationwide analysis: Ryder REJ, Walton C, Winocour P, Cull ML, Jose B, Sukumar N, Mills AP, Sands K, Shafiq W, Rigby A, Thozhukat S, Thong K. Statistician: Blann A.

Addenbrookes Hospital: Adler A, Evans M, Simmons D, O'Rahilly S, Coll T, Farooqi S, Park A. **Altnagelvin Area Hospital:** Lindsay J, Kelly J. **Antrim Area Hospital:** Kennedy A, Rooney D. **Barnsley Hospital:** Uchegbu E. **Basildon University Hospital:** Mulcahy M, Krishnan L. **Basingstoke and North Hampshire NHS Foundation Trust:** Guy R, Turner B, Akester K, Lewis G, Harrison O, Tombling S, Lloyd G, Hughes C, Lowe C. **Bedford Hospital:** Morrish N, Melvin A, Pledger J, Barron R. **Bedfordshire & Hertfordshire PGMS, Luton:** Rehman T, Sinclair A. **Belfast City Hospital:** Henry W. **Bolton Diabetes Centre:** Palin S, Kenz R. **Bristol Royal Infirmary:** Raghavan R, Phillips S, Bradley K. **Bronglais Hospital:** Kotonya C, Premawardhana LDKE. **Chesterfield Royal Hospital:** Mohammad M, Robinson RTCE, MacInerney RM. **Chorley & South Ribble Hospital:** Rajbhandari SM, Acharya S. **City Hospital, Birmingham:** Ryder REJ, Basu A, De P, Lee BC, Jose B, Sukumar N, McAloon CJ, Blann A, Mills AP, Cull ML, Lee A, Rawcliffe C, Ryder B, Burbridge W, Irwin S, Cutler J, Zzinger A, Mehrali T, Bedi T, Stevenson-Mort J. **CMMC Foundation Trust, Manchester:** Jinadev P, Watts R, Abul-Ainina S, Salahuddin S. **Colchester General Hospital:** Bodmer C. **Conquest Hospital, St Leonards on Sea:** Dashora U, Castro E. **Countess of Chester:** Shulwalia R., Ewins D, Goenka N. **County Hospital, Hereford:** Lloyd J. **Craigavon Area Hospital, Co Armagh:** Ritchie C. **Daisy Hill hospital, Newry:** Adil MM. **Derriford Hospital, Plymouth:** English P, Viney T, Laird O, Rigley R, Babu A, Blackmore M. **Dumfries & Galloway Royal Infirmary:** Bell E., Green F, Banerjee S. **East Surrey Hospital, Redhill:** Foster K, Natarajan G. **Eastbourne District Diabetes Centre:** Bending J, Afolayan J, Sheppard P. **Fairfield Hospital, Bury:** Rowles S, Smithurst HJ. **Falkirk and District Royal Infirmary:** Kelly C, Peden N, Currie J., Buchanan L. **Frimley Park Hospital:** Eliwe MH, Bingham E, Tringham JR. **Furness General, Barrow In Furness:** Chuni P, Hay C, Narayan S, Krishnan S. **Gartnavel General Hospital:** Small M, Jones G, McGrane D, Sainsbury G. **George Eliot Hospital Nuneaton:** Shaikh S, Patel V. **Good Hope Hospital, Sutton Coldfield:** Jones SL, Milles JJ, Griffiths U, Colloby M, Harold C, Rangan S, Morrison J. **Glasgow Royal Infirmary, Fisher M, McGrane D. Great Western, Swindon:** Govindan J, Price P, Ahmed S, Gardner A. **Guys & St Thomas Hospital, London:** Brackenbridge A, Reid A, Piper-Smith J, Preston J. **Hammersmith and Charing Cross:** Field BCT, Dornhorst A. **Harrogate Hospital:** Hammond P, Thirumurugan E., **Heartlands Hospital, Birmingham:** John R, Patel M, Ulnaf S, Begum S. **Hillingdon Hospital, Uxbridge:** Edwards M, Doolittle H, Currie A, O'Sullivan S, Lillystone R. **Hinchinbrooke Hospital, Huntingdon:** Mathews AA. **Hull Royal Infirmary:** Walton C, Ng B, Kumar BK, Bosomworth A. **Ipswich Hospital:** Srinath A, Parkinson C, Fowler D, Morris D, Rayman G, Scott A. **James Paget Hospital, Great Yarmouth:** Grinnell F, Huston N, MacMillian C. **King's College Hospital, London:** Lee M, Amiel S, Nathan Y. **Kingston Hospital:** Oldfield M. **Lagan Valley Hospital, Lisburn:** Au S, Turtle EJ. **Leicester General Hospital:** Tarigopula G, Braithwaite J, Kong M-F, Jackson S, Gregory R. **Leicester Royal Infirmary:** Nisal K, Gallagher A, Davies MJ, McNally PG, Lawrence IG. **Lincoln County:** Sands K. **London Medical:** King L, Abraham R, Tomeu J. **Mayday University Hospital, Croydon:** Prentice M. **Medway Maritime Hospital, Gillingham:** Scobie IN. **Monklands Hospital, Airdrie:** Sandeep T. **Morrison Hospital, Swansea:** Stephens JW. **Newcastle General:** Taylor R. **New Cross Hospital, Wolverhampton:** Singh BM, Nayak UA, Govindan J, Kalupahana DN. **Newham University Hospital, London:** Gelding S, Rayanagoudar G.. **Ninewells, Dundee:** Petrie J, Al-Dahlaki M. **Nobles Hospital, Isle of Man:** Khan EG, Krishnan A, Clark J, Thondam S. **North Manchester General Hospital:** Rathur H, Savage M, Wiles P, Prakash P. **North Tees & Hartlepool Trust:** MacLeod J, Anthony S, Mehaffy J. **North Wales NHS Trust, Wrexham:** White H. **Northampton General Hospital:** Htike ZZ, Kilvert A, Mtemererwa B, Nisal K, Fox C, Rippin J. **Bromley PCT:** Casiglia D. **Pinderfields General, Wakefield:** Nagi DK. **Poole Hospital NHS Foundation Trust:** Masding M, Osborne K, Wallace P. **PRH, Haywards Heath:** Smith A, Mabrook J. **Prince Philip Hospital, Llanelli:** Williams M, Aggarwal N. **Princess Royal, Bromley:** Lulsegged A. **Queen Alexandra, Portsmouth:** Cranston I, Darzy K. **Queen Elizabeth II Hospital, Welwyn Garden City:** Winocour PH. **Queen's Hospital, Burton:** Benn J. **Raigmore Hospital, Inverness:** McLaren L. **Rotherham General:** Franke B. **Royal Berkshire Hospital, Reading:** Simpson H, Reddy N, Barber T. **Royal Blackburn Hospital:** Astin J, Faina J, Whalley G, Ramtoola S, Jones G, Wilkinson R. **Royal Bournemouth:** Richards J, Richardson T. **Royal Cornwall Hospital, Trerise:** Fox T., Foote J, Browne D, Pinkney J. **Royal Devon & Exeter:** Bowman P, Hattersley A, Vadiya B. **Royal Glamorgan Hospital, Llantrisant:** Evans P. **Royal Gwent Hospital, Newport:** Obuobie K. **Royal Infirmary of Edinburgh:** Jaap A, Noh R, Richards M. **Royal Liverpool University Hospital:** Vora J, Brake J. **Royal Oldham Hospital:** Mishra BM. **Royal Surrey County Hospital, Guildford:** Hordern V. **Royal United Hospitals, Bath:** Higgs E, Gouni R, Taylor P, Wylie S, Hall B, Hillier N, Neathercote D. **RSCH, Brighton:** Quin J, Robinson N. **Sandwell Hospital, West Bromwich:** Ibrahim H, Robertson D, Davies P, Banerjee P, Li YK, Wong KH, Barker N, Dhallu J, Farell D., R.M. Iqbal. **Scunthorpe General:** Moisey R, Malik M, Dromgoole P, Elmalti A. **Selly Oak Hospital, Birmingham:** Creely S, Gough S, Hanif W. **Sheffield Teaching Hospitals:** Elliott J, Scott A. **Smethwick Health Centre:** Pall N, Harrington J. **South East CHCP, Glasgow:** Carson L-A. **Southampton General Hospital:** Sharp P, Brown B. **Southern General Hospital, Glasgow:** Semple C. **St John's Hospital, Livingston:** Adamson K, Green F. **St Mary's Hospital, Isle of Wight:** Kaklamanou M, Al-Mrayat M. **St Peter's Hospital, Chertsey:** Sennik D, Baxter M, Naqvi S, Suresh D, Miras A. **Staffordshire DGH, Stafford:** Coates P, Daggett P, Green F. **Stirling Royal Infirmary:** Kelly C, Mackenzie A, Peden N. **Bronglais Hospital, Aberystwyth:** Kotonya CA. **Sunderland Royal:** Nayar R, Carey P, Aspray T. **Taunton & Somerset:** Close C, Andrews R, Douek I, Watson J., Lambert P. **Torbay Hospital, Torquay:** Paisey R. **University Hospital Coventry Warwickshire:** Anderson S. **Ulster Hospital, Belfast:** Brennan U, Satti N, Harper R, Harding J. **Victoria Infirmary, Glasgow:** Stewart A. **Warwick Hospital:** Rao RK, Gopinathan KP, Horrocks P. **Watford General Hospital:** Tharakan G, Simpson K. **West Suffolk Hospital, Bury St. Edmunds:** Majeed J, Clark J, Wijenaike N, Gurnell E, Hartley L, Abdullah H, Marath H. **Western General Hospital, Edinburgh:** Aniello L, McKnight JA, Strachen M, Reynolds R, Nyrenda M. **Berkshire East PCT:** Dove D, Aung T. **Whipps Cross University Hospital, London:** Lakhdar A, Manogaraan B. **Wirral Teaching Hospital, Upton Wirral:** Leong KS, Leong K, Lorains J, Joseph P, Leach J, Fenna I. **Whiteabbey Hospital:** Andrews J, Strzelecka A. **Wishaw General, Lanarkshire:** O'Brien I, Davidson E. **Worcestershire Acute Hospitals, Worcester:** Newrick P, Jenkins D. **Wrexham Maelor:** Dixon AN, Munigoti S, Stanaway S, Harvey JN. **Wythenshawe Hospital, Manchester:** Younis N. **Yeovil District Hospital:** Bickerton AST, Crocker M, Down S. **York Hospital:** Jennings P, Hudson N.

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ABCD nationwide prospective liraglutide audit contributors

The following are those whom we know about.



ABCD nationwide liraglutide audit – initial setup, maintenance and nationwide analysis: Ryder REJ, Walton C, Thong KY, Cull ML, Mills AP. Statistician: Blann A.

Addenbrookes Hospital: Simmons D, Bejinariu E. **Altnagelvin Area Hospital:** Lindsay J, O'Kane M, Black N, Moles K, Williams L, Caskey H, McDaid A-M, King L, McIlvor E, Hamilton L, Early R, Morahan S, Giff K, Johnston S. **Basildon University Hospital:** Mulcahy M, Krishnan L. **Belfast City Hospital:** Henry RW, Nugent A, McMullan P. **Benhsam General Hospital:** Narayanan KR. **Birmingham Community Healthcare NHS Trust:** Muralidhara K, Shahid S, Thomas A, Cunningham B, Haughton K. **Bristol General Hospital:** Croxson S. **Bristol Royal Infirmary:** Richards G, Pople J-A, John H, Jones L. **Bronglais Hospital:** Kotonya C, Phillips L, Saunders H, Powell P. **Cape Hill Medical Centre (GP):** Gardner G, Chitnis J, Merali A, Maan P. **Causeway Hospital:** Kassim SB, Ryan MF, Diong KL, Hutchinson K, Glass M, Spiers K, Woodend J, Davidson E. **Chorley Hospital:** Rajbhandari SM, Acharya S, Whittaker J, Caunce K. **City Hospital, Birmingham:** Ryder REJ, Basu A, De P, Lee BC, Thong KY, Blann A, Mills AP, Cull ML, Burbridge W, Irwin S, Cutler J, Zzizinger A, Mehrali T, Guthrie S, Bedi T, Stevenson-Mort J. **Dewsbury Hospital:** Bissell J. **East Lancashire Hospital NHS Trust:** Ramtoola S, Ali A, Jones G, Wilkinson R, Littley M, Mishra M, Glew M, Jostel A, Demssie Y. **East Surrey Hospital, Redhill:** Sennik D, Prajapati C, Chinnasamy E. **Forth Valley Hospital:** Buchanan L, Mackintosh L. **Friarage Hospital, Northallerton:** Owen K, Kamaruddin MS, Leek C. **Furness General Hospital:** Banerjee M, Obale O. **Huddersfield Royal Infirmary:** Moisey R. **Hull Royal Infirmary:** Sugunendran S, Sathyapalan T, Walton C. **King's College Hospital, London:** Vitello S, Hunt K. **Lagan Valley Hospital, Lisburn:** Au S. **Leicester General Hospital:** Tarigopula G, Kong M-F, Gregory R, Jackson S. **Leicester Royal Infirmary:** Htike ZZ. **Monklands Hospital, Airdrie:** Sandeep TC, White A. **New Cross Hospital, Wolverhampton:** Singh BM, Khalid Y, Nayak AU, Katreddy V. **Newham University Hospital, London:** Gelding S, Menon R, Balakumar Y. **Ninewells, Dundee:** George P. **North Tees & Hartlepool Trust:** Robinson M, Dobson M, Presgrave M, Mehaffy J, Roper N, Pye S, Macleod J, Worrall E, Sinclair J, Anthony S, Jones S. **Pendyffryn Medical Group (GP):** Morrison CL. **Pennine Acute Hospitals Trust:** Smith G. **Pilgrim Hospital, Boston:** Jacob K, Htwe N. **Pinderfields General, Wakefield:** D'Costa R. **Pontefract General Infirmary:** Bissell J. **Queen Elizabeth II Hospital & Lister Hospital, Welwyn Garden City:** Winocour PH, Darzy K, Qureshi SA, Ford M, Barker L, O'Donnell L. **Royal Blackburn Hospital:** Ramtoola S, Ali A, Jones G, Wilkinson R, Littley M, Mishra M, Glew M, Jostel A, Demssie Y. **Royal Devon & Exeter:** Lockett H. **Royal Infirmary of Edinburgh:** McLaren J. **Royal United Hospitals, Bath:** Allen K, Higgs E, Robinson A, Ward A, Hall B, Hillier N, Catchpole S, Wylie S. **Royal Sussex County Hospital, Brighton:** Burberry A. **Royal Victoria Hospital, Belfast:** Cooke B, Hunter S, Mcerlean U. **Sandwell Hospital, West Bromwich:** Davies P, Rock K. **Singleton Hospital, Swansea:** Udiawar M. **Smethwick Health Centre:** Harrington J. **Southern General Hospital, Glasgow:** Semple C, Struthers S, Kennon B. **St George's Hoapital, London:** Ahmed FW, Bano G, Patel N, Flanagan A, Wilson Z, O'Brien J, Firth P. **St John's Hospital, Livingston:** Teoh WL, Adamson K. **St Stephens Gate Medical Practice (Norfolk PCT) (SSGMP):** Haylock C. **Stirling Royal Infirmary:** Kelly C, Mackenzie A, Ryan L, Dewar L. **Stobhill Hopsital:** Smith C, Gordon D. **Sunderland Royal:** Nayar R, Carey P, Aspray T. **Torbay Hospital, Torquay:** Paisey R, Smith J, Lissett K, Dyer R, Dimitropoulos I, Weekes C. **Trafford General Hospital:** Snell A, Stephens WP, George A, Hopewell L. **Tyrone County Hospital:** Helmy A, Hameed A, McGirr B, Patterson H, Monaghan S, Bradley P, Evan H. **Ulster Hospital, Belfast:** Harper R, Carr S, McDonald P, Harding J, McIlwaine W, McLaughlin D, Whitehead H. **Victoria Hospital, Kirkcaldy:** Duncan C, Chalmers J. **Western General Hospital, Edinburgh:** Zammitt N. **Westmoreland General Hospital:** Banerjee M, Obale O. **Wharfedale Hospital:** Amery C. **Wrexham Maelor:** Dixon AN. **Yeovil District Hospital:** Bickerton AST, Pramodh S, Crocker M.

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Exenatide audit - top contributors > 100 patients

1.	B.M. Singh, U. A. Nayak, J. Govindan, D.N.Kalupahana, New Cross Hospital, Wolverhampton	438
2.	Bob Ryder, Hisham Ibrahim, Peter Davies et al, SWBH NHS Trust	231
3.	Shenaz Ramtoola & Geraint Jones et al, Royal Blackburn Hospital, Blackburn	209
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7.	Jackie Elliott et al, Sheffield Teaching Hospitals, Sheffield	154
8.	Mark Edwards, Helen Doolittle et al, The Hillingdon Hospital, Uxbridge	136
9.	Keith Sands, Lincoln County Hospital, Lincoln	132
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11.	Zin Zin Htike, Anne Kilvert, Brian Mtemererwa et al, Northampton General Hospital	115
12.	Roland Guy et al, Basingstoke and North Hampshire NHS Foundation Trust, Hampshire	111
13.	Jeffrey W Stephens et al, Morriston Hospital, Swansea	110
14.	Richard Paisey et al, Torbay Hospital, Torquay	106
15.	Patrick English et al, Derriford Hospital, Plymouth	104
16.	Alison Melvin, Julia Pledger & Nick Morrish et al, Bedford Hospital, Bedford	103
17.	Phil Coates, Peter Daggett, Gill Green et al, Staffordshire DGH, Stafford	102
18.	Mark Savage, Phil Wiles & Parmeshwara Prakash et al, North Manchester General	101



Liraglutide audit - top contributors ≥ 50 patients

1.	Roy Harper, Darren McLaughlin, Simon Au, Barbara Cooke et al, South Eastern HSC, Belfast	310
2.	Gordon Smith, Philip Wiles, Mark Savage et al, Pennine Acute Hospitals, Manchester	261
3.	Jo Bissell, Chinnodari Rajeswaran, Jill Howell et al, Mid Yorkshire Hospitals	230
4.	Bob Ryder, Peter Davies, Greg Gardner, Niti Pall et al, Sandwell and West Birmingham	208
5.	Chris Kelly, Alison Mackenzie, Linda Buchanan et al, NHS Forth Valley, Stirling	177
6.	Saiful Kassim, Adele Kennedy et al, Northern HSC, County Antrim	146
7.	John Lindsay, Maurice O'Kane, Kenneth Moles et al, Altnagelvin Hospital, Derry	130
8.	Karen Adamson, Nicola Zammit et al, NHS Lothian, Edinburgh	89
9.	Ian Lawrence, Zin Zin Htike, Marie-France Kong et al, University Hospitals of Leicester	86
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11.	Cartriona Duncan, John Chalmers, Victoria Hospital, Kirkcaldy	73
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13.	Colin Semple, Brian Kennon et al, Southern General Hospital, Glasgow	69
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16.	Priya George, Ninewells Hospital, Dundee	60
17.	Richard Paisey, Jamie Smith, Kate Lissett et al, Torbay Hospital	60
18.	Gul Bano, Natasha Patel, Fahad Ahmed et al, St Georges Hospital, London	59
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21.	Michael Mulcahy et al, Basildon University Hospital	56
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