



Association of British Clinical Diabetologists



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# Association Of Time In Range Over 14 Days On Glycaemic Controls And Hypoglycaemia Unawareness In Patients Using FreeStyle Libre

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Dr Harshal Deshmukh MRCP MPH PhD  
NIHR Clinical Lecturer in Endocrinology and Diabetes

Co-authors: Emma G Wilmot ,Roselle Herring, Jane Patmore, Thozhukat Sathyapalan, Robert E. Ryder, Christopher Walton



## ABCD nationwide audit of FreeStyle Libre

### Disclosures

- EW has received personal fees from Abbott Diabetes Care, Dexcom, Diasend, Eli Lilly, Medtronic, Novo Nordisk, Sanofi Aventis
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- HD TS and CW have no relevant disclosures

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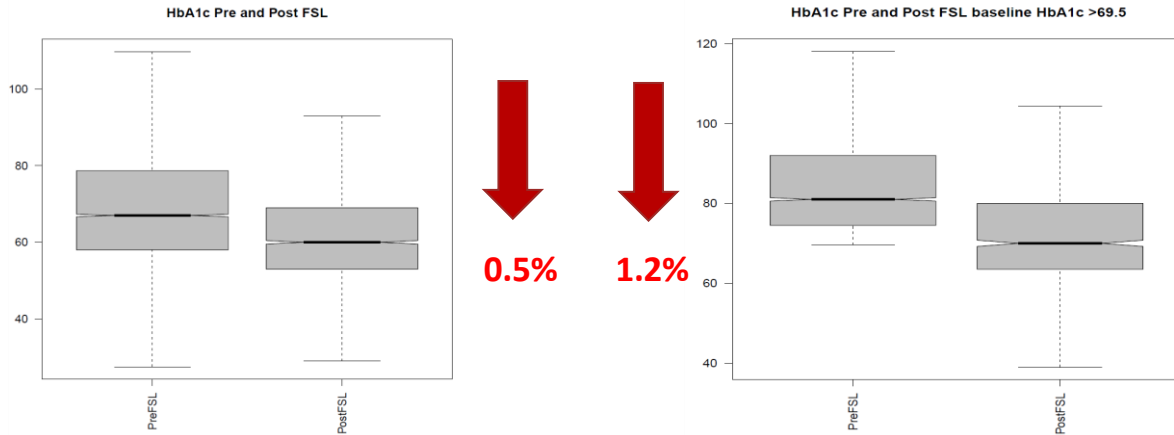
The ABCD nationwide Freestyle Libre audit is supported by a grant from Abbott UK. The audit was independently initiated and performed by ABCD, and the authors remain independent in the analysis and preparation of this report.

## **ABCD nationwide audit of FreeStyle Libre**

- **FreeStyle Libre is a flash glucose monitoring system which monitors interstitial glucose levels**
- **Consists of a sensor with a microfilament, worn on the back of the arm and a hand-held reader**
- **When the reader unit is passed over the sensor, it shows the interstitial glucose levels**
- **The sensor lasts for 14 days, then needs to be replaced**

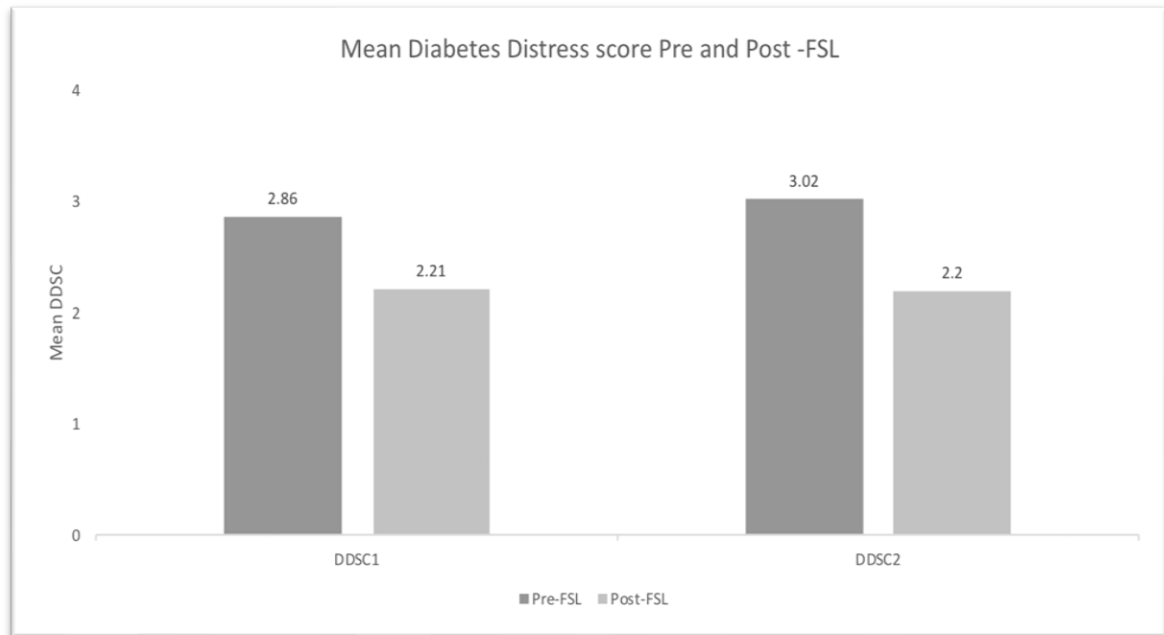
# ABCD nationwide audit of FreeStyle Libre

Results from nationwide audit of FSL



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Results from nationwide audit of FSL



## ABCD nationwide audit of FreeStyle Libre

### Study objective

Association Of individualised Time In Range (*around 3.9 to 10 mmol/l*) Over 14 Days On

- HbA1c
- Hypoglycaemia awareness

## ABCD nationwide audit of FreeStyle Libre

# Methods

## ABCD nationwide audit of FreeStyle Libre



- Audit conducted in 114 centres in the UK
- A secure IT tool was developed on the NHS computer network, N3, to make this process as easy and user friendly as possible



# ABCD nationwide audit of FreeStyle Libre

The ABCD Nationwide FreeStyle Libre audit is an independent audit supported by an unrestricted grant from Abbott

## ABCD Nationwide FreeStyle Libre Audit Pre-FreeStyle Libre Information Collection Form



Hospital Name  Centre ID

Date  /  /

Name of Clinician

Email

NHS Number

Forename

Surname

Date of Birth  /  /

Gender  Male  Female

**Ethnicity**

White	<input type="checkbox"/> British <input type="checkbox"/> Irish <input type="checkbox"/> Any other white background
Asian or Asian British	<input type="checkbox"/> Indian <input type="checkbox"/> Pakistani <input type="checkbox"/> Bangladeshi <input type="checkbox"/> Any other Asian background
Black or Black British	<input type="checkbox"/> Caribbean <input type="checkbox"/> African <input type="checkbox"/> Any other
Mixed	<input type="checkbox"/> White and black Caribbean <input type="checkbox"/> White Asian <input type="checkbox"/> Any other mixed background group
Other ethnic group	<input type="checkbox"/> Chinese <input type="checkbox"/> Any other group <input type="checkbox"/> Not stated

**Driving status**  Does not drive  Standard licence  
 Taxi licence  HGV licence

Height (metres)  Weight (kg)  Body Mass Index  Duration of diabetes  years  
 months

**Type of diabetes**

Type 1  Type 2  MODY

During pregnancy:  Gestational diabetes  Type 1 diabetes during pregnancy  Type 2 diabetes during pregnancy

Other (please specify)

**PATIENT USE OF FREESTYLE LIBRE**

**In this assessment:**

Recorded prior to commencing FreeStyle Libre?  Recorded retrospectively – i.e. after FreeStyle Libre started?

What is the date of FreeStyle Libre start? (best estimate if uncertain)  /  /  If not, intended date of initiation of FreeStyle Libre  /  /

Use of a CGM within the last 6 months before starting FreeStyle Libre?  Yes  No **Funding of FreeStyle Libre**  NHS funded  Non-NHS funded

If non-NHS funded please give details

Professional recommendation  Other (please specify)

Patent initiated

continued overleaf

- Clinicians using FSL were invited to submit the data that they routinely collect
- Forms were completed in clinic for later online submission or the online tool could be completed in real time

## ABCD nationwide audit of FreeStyle Libre

# Results

## ABCD nationwide audit of FreeStyle Libre

### Demographics and audit characteristics (n=**2,191**)

Age (IQR)	42 (26-56)
Type 1 Diabetes	99%
Female (%)	54%
Duration of Diabetes (yrs) (IQR)	18 (6-32)
BMI (kg/m <sup>2</sup> ) (IQR)	25 (21-28)
Time in range % (IQR)	43( 27-56)
Baseline HbA1c (mmol/mol) (IQR)	64.2 (56-66) (8%)
Median HbA1c readings at baseline	2 (1-4)
Median HbA1c readings at follow-up	2 (1-3)
Median follow-up (months) (IQR)	7.5 (1-5)

There were large variations in the individualised target TIR- 14 (Time in range measured across 14 days); however, more than 99% of patients had ranges *in-between* 3.9-10 mmol/mol with a median TIR-14

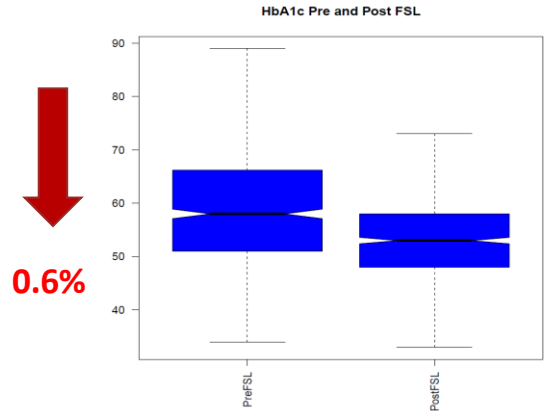
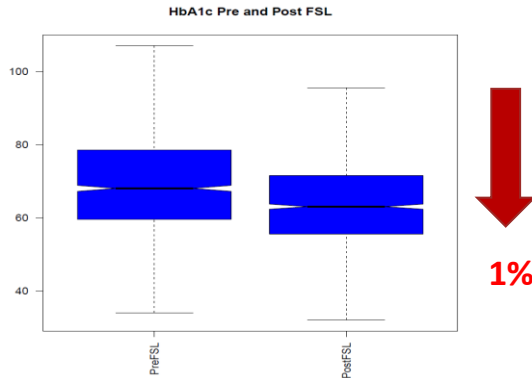
## **ABCD nationwide audit of FreeStyle Libre**

**Association of TIR on HbA1c (mmol/mol)**

# ABCD nationwide audit of FreeStyle Libre

Group 1 TIR  $\leq$  50% of time (n=1422)

Group 2 TIR  $>$  50% of time (n=769)



Group 1 the HbA1c dropped from 8.6% to 7.6% ( $P < 0.0001$ )

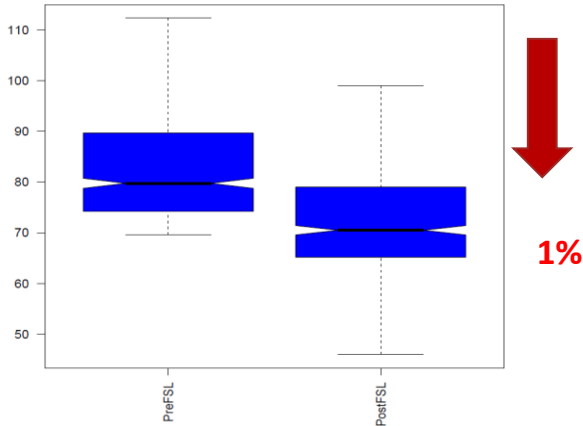
Group 2 the HbA1c dropped from 7.6% to 7% ( $P < 0.0001$ )

# ABCD nationwide audit of FreeStyle Libre

Baseline HbA1c > 8.5%

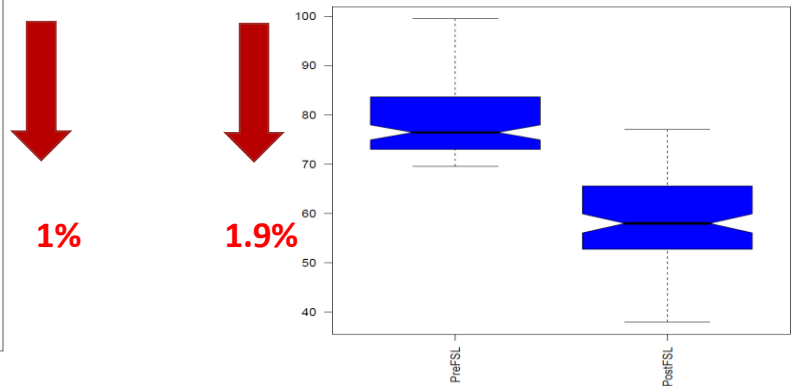
## Group 1 TIR ≤ 50% of time

HbA1c Pre and Post FSL



## Group 2 TIR > 50% of time

HbA1c Pre and Post FSL



Group 1 the HbA1c dropped from 9.8% to 8.8% (P<0.0001)

Group 2 the HbA1c dropped from 9.6 to 7.7 % (P<0.0001)

## **ABCD nationwide audit of FreeStyle Libre**

### **Effect of TIR on Hypoglycaemia**

## ABCD nationwide audit of FreeStyle Libre

Association with Hypoglycaemia (GOLD Score\*)

### Gold Questionnaire

“Do you know when your hypos are commencing?”

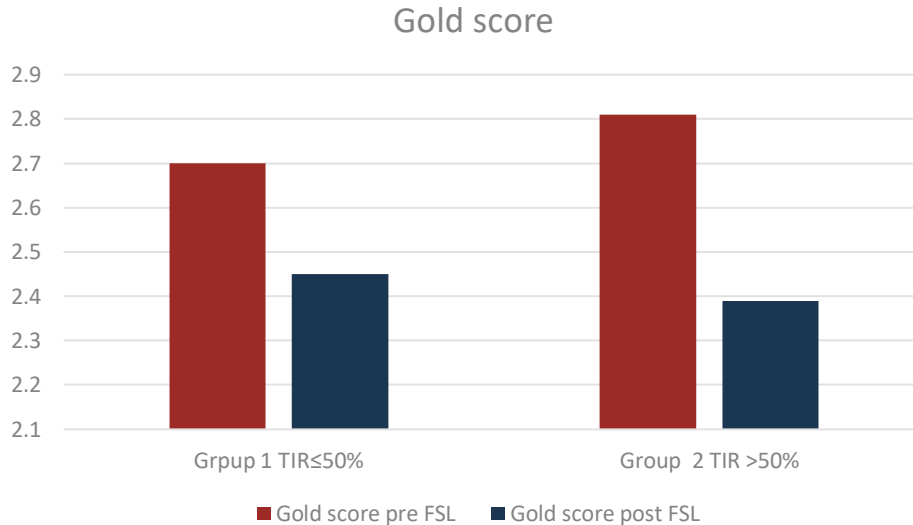


\*Gold AE, MacLeod KM, Frier BM Diabetes Care 1994



## ABCD nationwide audit of FreeStyle Libre

### Association with awareness of hypoglycaemia (GOLD Score)



**In the Group I the GOLD score fell by 0.25 (P=0.0005) units while in Group II the GOLD score fell by 0.45 units (P<0.0001)**

## ABCD nationwide audit of FreeStyle Libre

### Conclusions

Individualized TIR across 14 days of  $\geq 50\%$  associated with

- ✓ Significant improvement in HbA1c in those with high baseline HbA1c
- ✓ Significant improvement in Gold Score

**Need for more follow-up data to see if beneficial effects are sustained**

## **ABCD nationwide audit of FreeStyle Libre**

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