

# The Association of British Clinical Diabetologists: UK Audit of FreeStyle Libre Impact on Hypoglycaemia and Glycaemic control



EMMA G. WILMOT<sup>1</sup>, HARSHAL DESHMUKH<sup>2</sup>, DAVID BISHOP<sup>3</sup>, DAVID W. LIPSCOMB<sup>4</sup>, RUMAISA BANATWALLA<sup>5</sup>, REZA ZAIDI<sup>6</sup>, ZOE V. SMITH<sup>7</sup>, LOUISE OVEREND<sup>8</sup>, SHAFIE KAMARUDDIN<sup>9</sup>, CHERYL M. HALL<sup>10</sup>, ANNE KILVERT<sup>11</sup>, JACQUELINE MACFADYEN<sup>12</sup>, THOZHUKAT SATHYAPALAN<sup>2</sup>, CHRISTOPHER WALTON<sup>2</sup>, ROBERT E. RYDER<sup>13</sup>

1. Derby, United Kingdom, 2. Hull, United Kingdom, 3. Sunderland, United Kingdom, 4. Brighton, United Kingdom, 5. Surrey, United Kingdom, 6. Liverpool, United Kingdom, 7. London, United Kingdom, 8. Carlisle, United Kingdom, 9. Darlington, United Kingdom, 10. Dunedin, New Zealand, 11. Northampton, United Kingdom, 12. North Lanarkshire, United Kingdom, 13. Birmingham, United Kingdom

## Background and Aims

FreeStyle Libre (FSL) is a flash glucose monitoring system which monitors interstitial glucose levels. It 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 displays the interstitial glucose levels.

The aims of the ABCD national FSL audit are to explore UK real world experience of FSL use with respect to:

- HbA1c
- Hypoglycaemia awareness (Gold score)
- Resource utilisation: hospital admissions
- Diabetes related distress

## Methods

- Audit conducted in 114 diabetes centres in the UK. Clinicians using FSL were invited to submit clinical data which they routinely collect in clinic
- A secure IT tool was developed on the NHS computer network, N3, to make this process as easy and user friendly as possible
- Forms were completed in clinic for later online submission, or the online tool could be completed in real time
- Median differences in the HbA1c and GOLD score pre and post FSL were compared using non-parametric tests (Mann-Whitney U tests)
- Whilst the audit collects data on both adult and paediatric FSL users, the data presented here are for adult (>18 years) FSL users

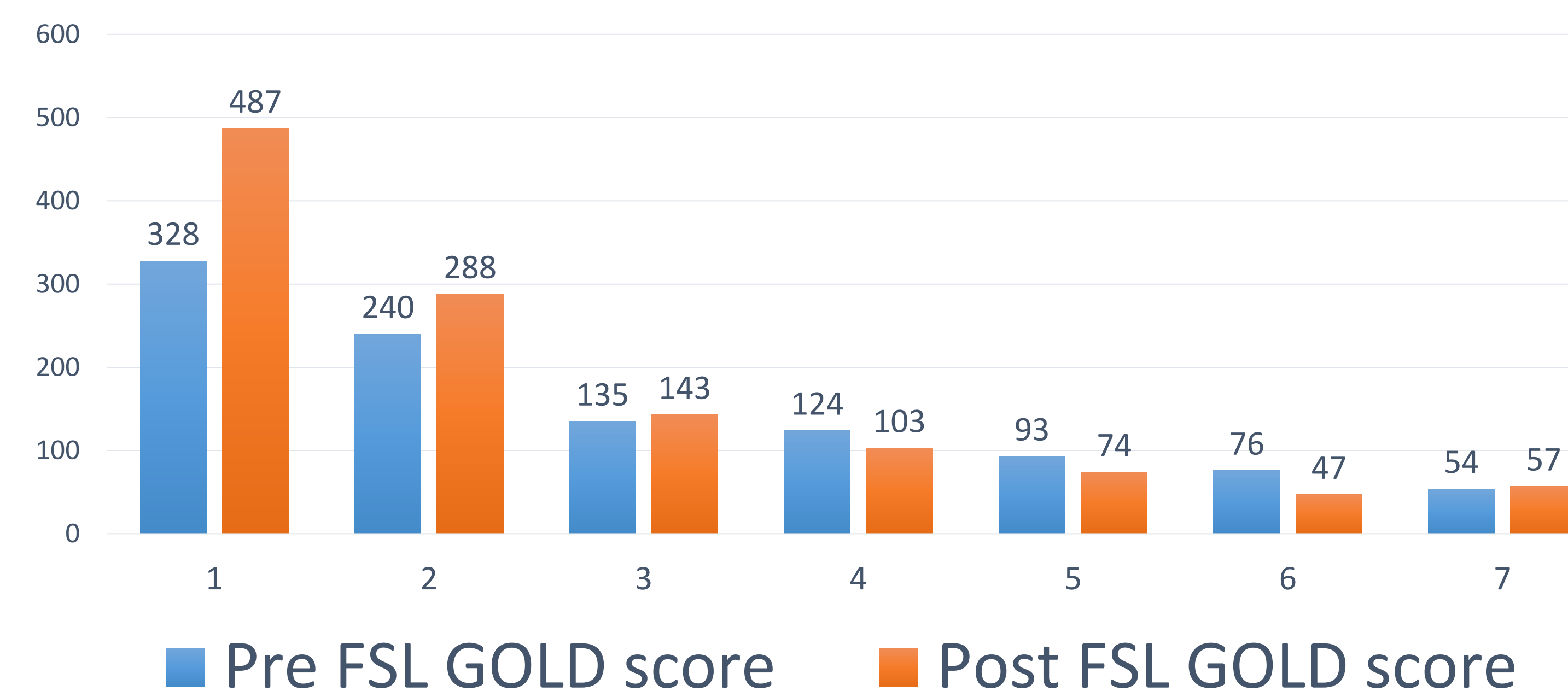
## Results

The audit included data for 4,709 users; 1,299 of which had at least one follow-up visit recorded

### Demographics (n=4,709)

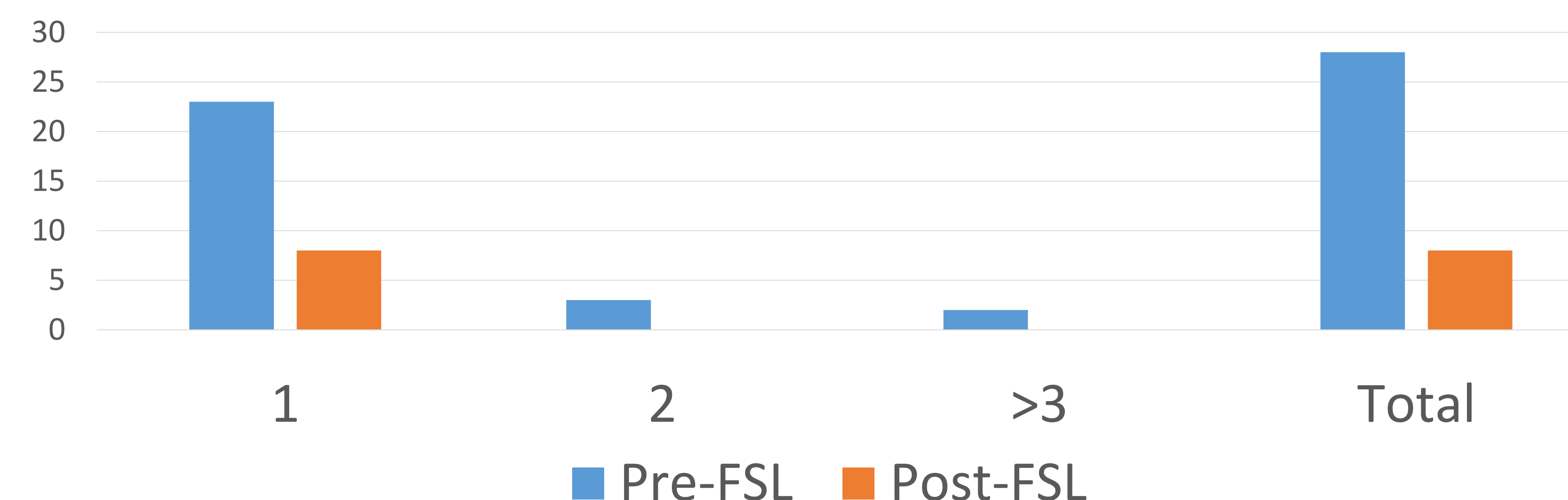
Age (IQR)	44 (31-56)
Type 1 Diabetes	99%
Female (%)	54%
Duration of Diabetes (yrs)	20 (11-23)
BMI (kg/m <sup>2</sup> )	26 (23-29)
Baseline median HbA1c (%)	8.2 (7.4-9.0)
Baseline median HbA1c (mmol/mol)	66 (57-75)
Median HbA1c readings at baseline	2 (1-4)
Median HbA1c readings at follow-up	2 (1-3)
Patients with at least 1 follow-up	1,299
Median follow-up (months)	6 (1-5)

### Change in GOLD score



Mean GOLD score reduced from 2.85 to 2.46 (P<0.0001)  
 FSL use was associated with reversal of impaired awareness of hypoglycaemia (IAH):  
 33% had IAH at baseline; 23% at follow up  
 Hypoglycaemia related admissions reduced from 2.71% to 0.5%

### Hospital admissions for hypoglycaemia



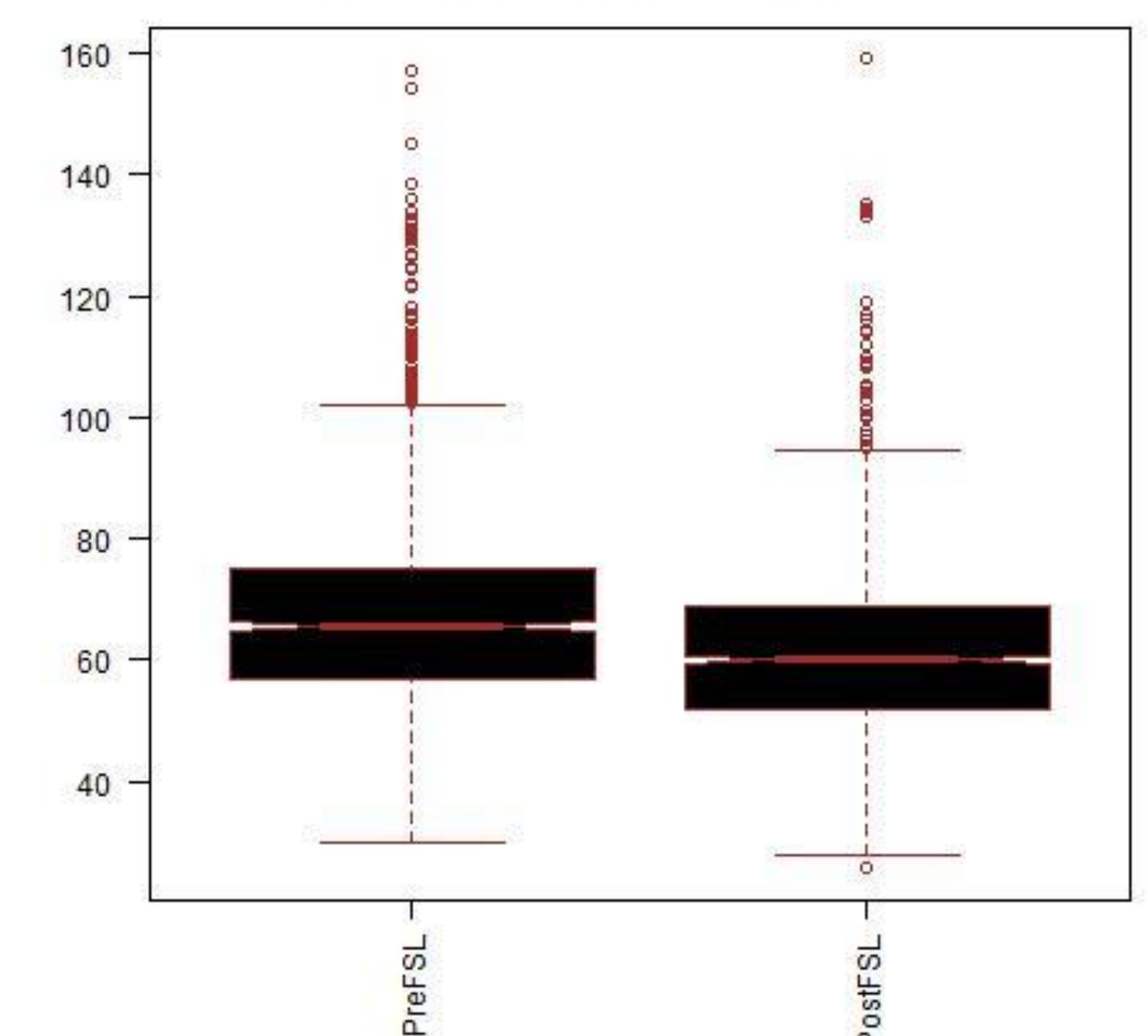
### Hypoglycaemia

- 79% (966/1234) reported that with use of FSL they were able to reduce the proportion of time in hypoglycaemia
- 31% (372/1200) reported a reduced rate of hypoglycaemia
- 39% (380/968) reported reduced nocturnal hypoglycaemia

### Diabetes Distress

- Diabetes Distress Scores improved from 3 (2-4) at baseline to 2 (1-3) at follow-up P<0.0001

Median HbA1c Pre and Post FSL



Change in HbA1c: -0.6% (6 mmol/mol) (P<0.0001)

- Median HbA1c reduced from: 8.2% (7.4-9.0; 66mmol/mol, 57-75) to 7.6% (6.9-8.5; 60mmol/mol, 52-69)

## Conclusion

FSL use associated with

- ✓ Significant improvement in HbA1c
- ✓ Significant improvement in Gold Score
- ✓ Reversal of IAH in 1 in 10
- ✓ Self-reported reduction in hypoglycaemia
- ✓ Possible reduction in hospital admissions for hypoglycaemia (1 year f/u data awaited)
- ✓ Improved Diabetes Distress Scores