

# Improved Glycaemic Control For Patients On a Twice Daily Dosing Regimen of Insulin Glargine Compared To Those On a Once Daily Dosing Regimen

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**Background:** Insulin glargine is a basal insulin that is licensed to be administered once daily. However, it is unclear whether the administration of twice daily glargine results in better glycaemic control when compared to once daily administration

**Objectives:** To determine if HbA1c levels are lower in those people switched to twice daily insulin glargine when compared to when they were on once daily glargine. Furthermore, to compare if HbA1c and other variables differed between those on once or twice daily glargine, twice daily human insulin or a basal bolus regime. In addition to determine if dose per Kg body weight was different on these regimes

**Methods:** This was a retrospective notes review of the practice of a single consultant in a secondary care diabetes clinic at the Norfolk & Norwich University Hospital NHS Foundation Trust. 4 years of data was collected. Patients were included if they had diabetes treated with insulin. Data was collected on gender, age, BMI, insulin treatment, HbA1c and insulin dose. Data was analysed comparing HbA1c, BMI, dose per Kg body weight for those on once daily insulin glargine and twice daily glargine. Comparisons were also made with those on other insulin regimes, including once or twice daily insulin detemir

**Results:** 435 patients were included in the data analysis (268 on insulin glargine, 167 on other regimes). Mean length of follow up was  $4.7 \pm 2.2$  years ( $4.7 \pm 1.7$  years on insulin glargine,  $4.7 \pm 2.8$  years on other regimes). 334 patients were found to be on insulin glargine. Of these 9 (3%) were on twice daily glargine at the start of the data collection period. At the end of the data collection period, this had changed to 172 (64%). In addition, 167 were on twice or three times daily biphasic insulin, the remaining 96 people were on other regimes, usually basal bolus. The mean age of the group on glargine was  $50.4 \pm 15.8$  years, those on biphasic insulin had a mean age of  $71.7 \pm 12.7$  years. Only 1 person was on insulin detemir and their data is not included in this analysis.

For those who switched from once daily to twice daily glargine, HbA1c decreased from  $76 \pm 16$  mmol/mol ( $9.08 \pm 1.48\%$ ) to  $70 \pm 15$  mmol/mol ( $8.53 \pm 1.34\%$ ) over the next few years compared to when they were on once daily injections. This compares with a change from  $72 \pm 17$  mmol/mol ( $8.77 \pm 1.56\%$ ) to  $62 \pm 12$  mmol/mol ( $7.82 \pm 1.14\%$ ) for those who remained on once daily glargine throughout. For those on twice or three times daily biphasic insulin ( $n=167$ ), HbA1c changed from  $71 \pm 18$  mmol/mol ( $8.62 \pm 1.63\%$ ) to  $67 \pm 16$  mmol/mol ( $8.26 \pm 1.51\%$ ). Dose per Kg for those on twice daily glargine was 0.486 units/kg compared with 0.303 units/Kg for once daily glargine, and 0.738 units/Kg for those on twice or three times a day biphasic insulin. In those who went onto twice daily glargine, the drop in HbA1c was greatest in those whose initial HbA1c had been  $>86$ mmol/mol (10%)

**Conclusions:** Our data suggest that those patients who have inadequate glycaemic control who are already on once daily insulin glargine may benefit from splitting their basal insulin dose. However, overall doses per kilogram body weight also increased in the split glargine group. However, we acknowledge that it is not known if those who split their insulin glargine had just increased their dose per kilogram body weight and remained on a once daily dose would have achieved similar improvements in glycaemic control, or whether some other factor was also involved. It is clear that it is not just the dose per Kg that influences glycaemic control, this can be seen by the fact that the dose of twice daily biphasic insulin was substantially higher than those on twice daily glargine (0.738 U/Kg vs 0.486 U/Kg), yet their glycaemic control was not substantially better – a reduction of 6 mmol/mol (0.55%) vs 4 mmol/mol (0.36%)

