

## Supplementary Table 1

Rotation score and other measures of insulin injection rotation (tertiary endpoints) in the 14 participants that completed V0-V4 with type 1 diabetes. Baseline, 1 week and 25- week results are reported.

Supplementary table 1								
Metric	n	Baseline	Intervention week 1			Intervention week 25		
		Mean (+/- SD)	Mean (+/- SD)	Mean change [CI] <sup>a</sup>	p-value <sup>b</sup>	Mean (+/- SD)	Mean change [CI] <sup>a</sup>	p-value <sup>b</sup>
Rotation Score (%)	14	36.9% (+/- 14.6)	46.8% (15.7)	9.9% [1.2%; 18.6%]	0.028	55.5% (16.7)	18.7% [4.3%; 33.1%]	0.015
Percentage of fields used (%)	14	55.8% (+/- 14.2)	70.6% (20.8)	14.8% [3.8%; 25.7%]	0.012	77.6% (18.7)	21.7% [13.3%; 30.2%]	<0.001
Field re-use count (fields)	14	2.5 (+/- 1.7)	4.2 (2.0)	1.8 [0.5; 3.0]	0.011	7.9 (3.0)	5.4 [3.4;7.4]	<0.001
<sup>a</sup> 95% confidence interval, paired z test, compared with baseline <sup>b</sup> paired z test, compared with baseline								

## Supplementary Table 2

**Sub-group analysis of variation in subcutaneous glucose values (CGM) reported as CV values based on whether participants had LH areas present where basal insulin was injected. The table shows values for two subgroups:**

**Subgroup A: LH areas present in thighs where basal insulin was injected. Subgroup B: LH areas not present in thighs**

Supplementary table 2								
Metric	Baseline		Intervention week 1			Intervention week 12		
	N	Mean (+/- SD)	Mean (+/- SD)	Mean change [CI] <sup>a</sup>	p-value <sup>b</sup>	Mean (+/- SD)	Mean change [CI] <sup>a</sup>	p-value <sup>b</sup>
<b>Subgroup A: Thigh LH present</b>								
CGM - (CV, %)	2	38.8 (6.3)	43.4 (2.6)	4.6 [-29.2; 8.5]	0.333	40.2 (3.7)	1.5 [-22.4; 25.3]	0.579
<b>Subgroup B: Thigh LH not present</b>								
CGM - (CV, %)	18	38.8 (9.2)	36.0 (9.8)	-2.8 [-6.7; 1.1]	0.145	35.4 (7.8)	-3.4 [-6.0; -0.7]	0.015
<sup>a</sup> 95% confidence interval, paired z test, compared with baseline <sup>b</sup> paired z test, compared with baseline								

### Supplementary table 3

Clip-on device ease of use questionnaire data for 28 participants with type 1 diabetes (secondary end point). The table shows the percentage of participants, who strongly agrees/agrees/ are neutral/disagrees/strongly disagrees with each statement. Supplementary table data is also visualized in Figure 4.

<b>Supplementary Table 3</b>					
<b>Clip-on device user reported satisfaction</b>					
<b>Question</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
ROTO Track makes it easy to avoid using the same injection area (%) <sup>a</sup>	39.3	42.9	10.7	7.1	0.0
ROTO Track makes it easy to use the whole abdominal injection zone (%) <sup>a</sup>	42.9	32.1	14.3	7.1	3.6
ROTO Track instructions are easy to follow (%) <sup>a</sup>	28.6	50.0	10.7	10.7	0.0
ROTO Track requires a lot of attention to follow (%) <sup>a</sup>	21.4	39.3	25.0	10.7	3.6
Overall satisfaction with ROTO Track (%) <sup>a</sup>	10.7	42.9	32.1	14.3	0.0
Would use ROTO Track after end of trial, if handed out (%) <sup>a</sup>	10.7	32.1	25.0	17.9	14.3

<sup>a</sup> Questionnaire responses after week 12, n=28

## Supplementary Figure 1

The calculation of the rotation score is formally defined by calculating an error score that measures the deviation from a perfect rotation

$$err = \sum_{k=1}^n \sum_{t=2}^i \sum_{j=1}^{\min(t-1, n-1)} \begin{cases} n-j & \text{if } (x_k, t) \in X \\ 0 & \text{otherwise} \end{cases}$$
$$maxErr = \sum_{j=1}^{i-1} \begin{cases} \frac{(n-1) * n}{2} - \frac{(n-j-1) * (n-j)}{2} & \text{if } j < n \in X \\ \frac{(n-1) * n}{2} & \text{otherwise} \end{cases}$$
$$score = \left(1 - \frac{err}{maxErr}\right)^\gamma$$

Where:  $n$  is the number of skin areas,  $i$  is the number of injections registered and  $(x_k, t)$  is a single injection in the skin area  $x_k$  for injection number  $t$ . Thus,  $err$  is the error score for the actual deviation from a perfect rotation;  $maxErr$  is the error score for the worst deviation from a perfect rotation score (all injections in the same field) and  $score$  is the translation to a percentage using a gamma correction. The gamma value is set to 8.3490 for a 4 by 4 grid.

## Rotation score - formal definition of the Rotation Score