

## BACKGROUND AND AIMS

Accuracy of insulin pumps is of current interest, especially with regard to development of closed loop systems. This study evaluated the accuracy of the three most recent durable insulin pumps with regard to bolus and basal rate delivery.

## METHOD

The three durable pumps MiniMed® 670G [670G], t:slim X2 [TS] and mylife™ YpsoPump® [YP] were tested. Experimental testing was based on EN 60601-2-24 which requires a microgravimetric procedure. Basal rates of 0.1 U/h and 1 U/h, and boluses of 0.1 U, 1 U and 10 U were tested in 9 repetitions each. Basal rate delivery was assessed for 72 h evaluating each hour separately. Limits of  $\pm 15\%$  from target were applied.

## RESULTS

The results are shown in the table and figures.

## CONCLUSION

The accuracy of the new pumps fits well into the picture of previously tested durable insulin pumps.<sup>1</sup> In general, accuracy is higher with larger boluses or basal rates.

Table 1: Percentages of 1-h windows (basal rate accuracy) and boluses (bolus accuracy) within  $\pm 15\%$  of target and mean deviation of basal rate and bolus accuracy measurements.

	Basal rate				Bolus					
	Mean deviation		% of 1-h windows within $\pm 15\%$ of target		Mean deviation			% of within $\pm 15\%$ of target		
Volume	0.1 U/h	1 U/h	0.1 U/h	1 U/h	0.1 U	1 U	10 U	0.1 U	1 U	10 U
n	9	9	9	9	225	225	108	225	225	108
670G	10.6%	0.1%	59%	99%	6.0%	0.3%	-0.8%	85%	100%	100%
TS	2.2%	0.6%	63%	100%	2.5%	1.9%	0.4%	96%	100%	100%
YP	4.2%	1.2%	67%	99%	-2.3%	1.1%	0.7%	88%	100%	100%

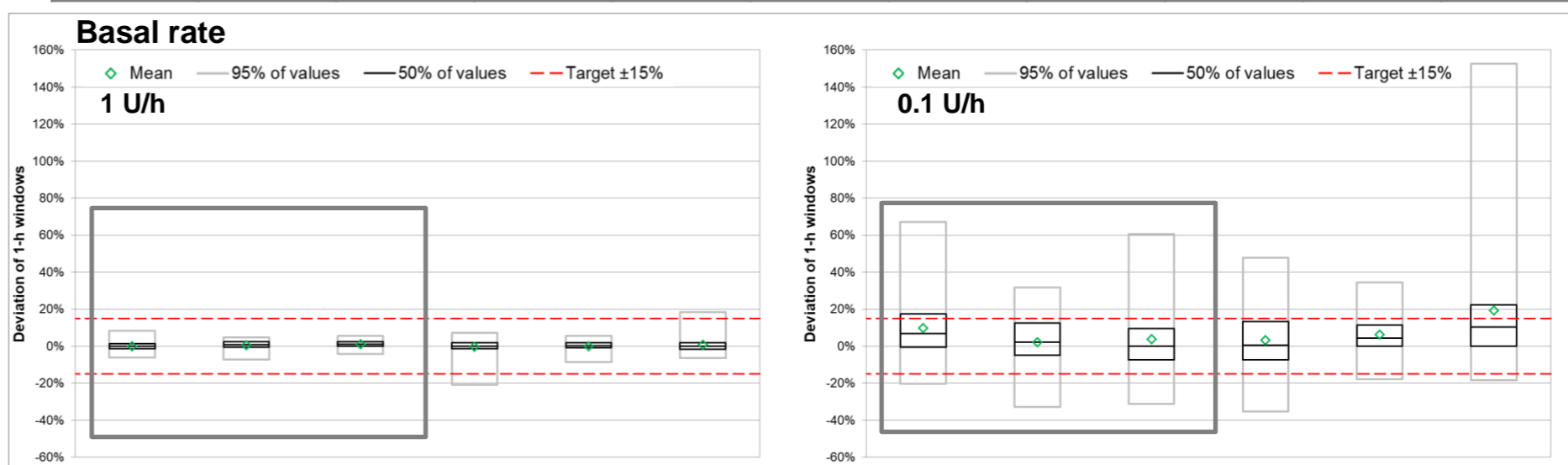


Figure 1: Percentage deviation of 1-h windows over 72 h at a basal rate of 1 U/h and 0.1 U/h. The 3 current durable pumps are in boxes, the other are previously tested durable pumps.<sup>1</sup> ASC = Accu-Chek® Spirit Combo, AI= Accu-Chek® Insight, 640G = MiniMed® 640G.

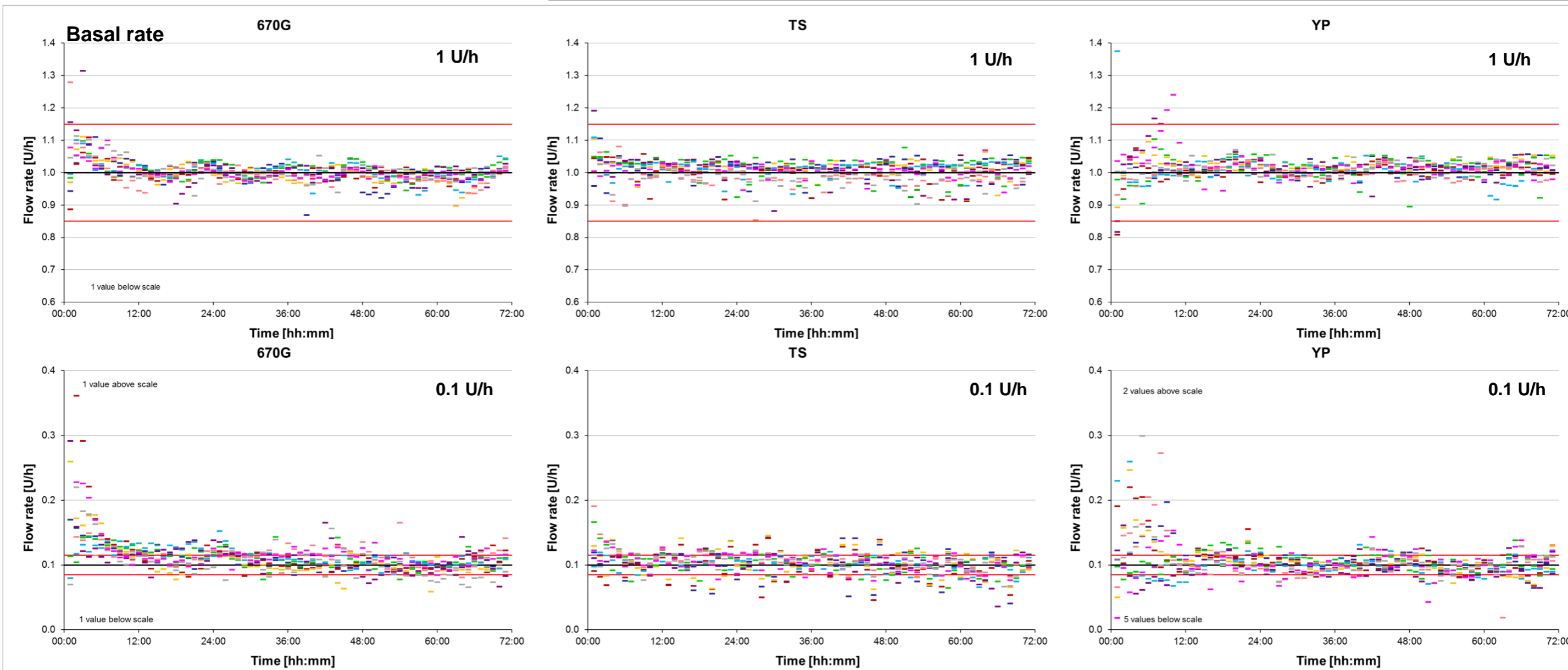


Figure 2: Mean basal delivery over 1-h windows in course of time; for 670G, TS and YP Set rate: 1 U/h and 0.1 U/h. Black line represents target delivery, red lines represent target delivery  $\pm 15\%$ , colored dashes represent the individual measurements.

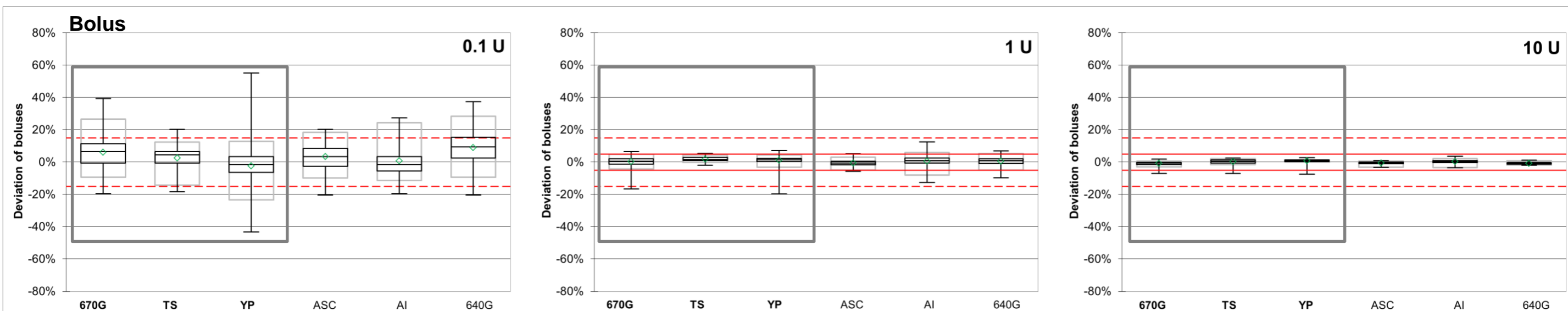


Figure 3: Bolus accuracy for 0.1, 1 and 10 U boluses. Green diamonds show means, black boxes represent 50% of values including median, grey boxes represent 95% of values and antennae show minimum and maximum. The 3 current durable pumps are in boxes, the other are previously tested durable pumps.<sup>1</sup> ASC = Accu-Chek® Spirit Combo, AI= Accu-Chek® Insight, 640G = MiniMed® 640G.