

# Self-Reported Hypoglycemia Reduction in Tandem Pump Use Compared to Previous Methods of Diabetes Therapy

Michelle L. Manning, MA, Adam Noar, Garrett Marin, and Betsy Dokken, PhD  
Tandem Diabetes Care, Inc., San Diego, CA 92121

## OVERVIEW

Hypoglycemia continues to be a difficult problem facing most who deal with the management of type 1 diabetes<sup>1</sup>. There are also substantial costs associated with hypoglycemia—The average cost for an inpatient hospital admission for severe hypoglycemia is around \$17,000<sup>2</sup>. The purpose of this study was to understand a more detailed account of the incidence of hypoglycemic events before and after starting on a Tandem pump.

## PURPOSE AND METHODOLOGY

### Procedure

Participants completed an online survey using the survey software, Survey Monkey, which was sent out to current Tandem pump customers via email in August 2016. Participants were required to have at least one full year of Tandem pump use.

### Outcome Measures

Participants responded to a series of questions related to hypoglycemia for two time periods - the most recent year of Tandem pump use and the last year they used a different therapy. The outcome measures examined:

- Number of mild, medium, and severe hypoglycemic events
- Number of ambulance rides to the hospital due to severe hypoglycemia
- Number of days at a hospital due to severe hypoglycemia

### Hypoglycemic Events Definitions

**MILD** I was able to treat the low myself

**MEDIUM** I needed assistance from somebody but did not need to go to the hospital

**SEVERE** I needed assistance from a medical professional and/or needed to go to the hospital

### Participant Analysis Criteria

Participants were excluded if they: (a) did not complete entire survey, (b) indicated that they did not remember the number of hypoglycemic events for either the year before starting their Tandem pump or the year after starting their Tandem pump, and (c) if they had not used their Tandem pump for at least one year.

## DEMOGRAPHICS

**SAMPLE SIZE**  $N = 1,370$

**GENDER** 732 Female (53%) 638 Male (47%)

**DIABETES** **Type 1** 1208 (88%)  
**Type 2** 162 (12%)

**MEAN AGE** 43-years-old

**CGM** **Dexcom** 734 (54%)

**Medtronic** 3 (<1%)

**None** 633 (46%)

### Diabetes Management before Tandem

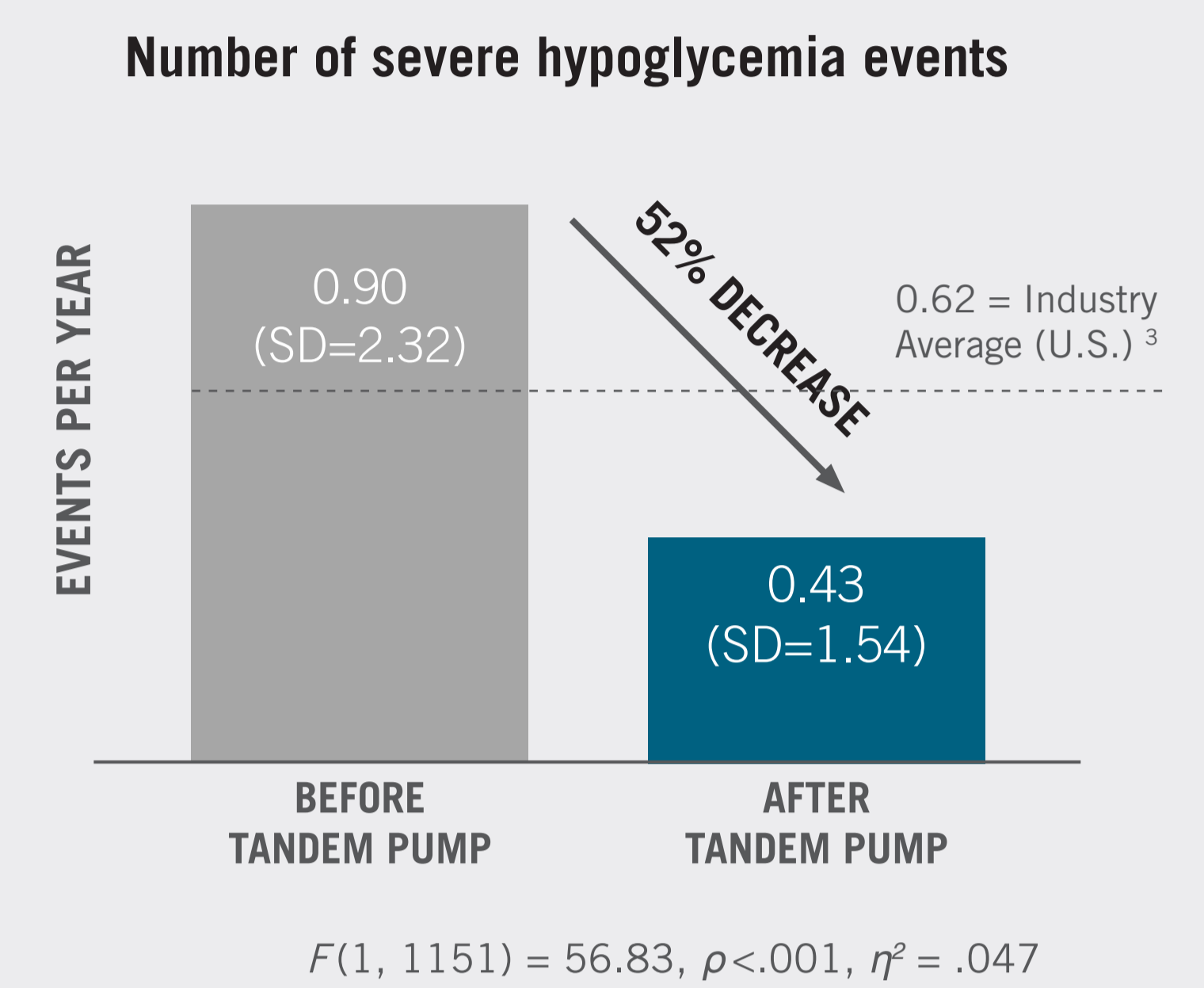
<b>MDI</b>		41%	558
<b>MEDTRONIC</b>		30%	414
<b>OMNIPOD</b>		3%	44
<b>ANIMAS</b>		18%	248
<b>OTHER</b>		8%	106

## RESULTS

- A 2x3 Repeated Measures Analysis of Variance (ANOVA) was conducted for each outcome variable.
- The within-subjects variable compared time periods before Tandem pump use and after Tandem pump use.
- The between-subjects variable measured participants' CGM usage.

### Severe Hypoglycemia

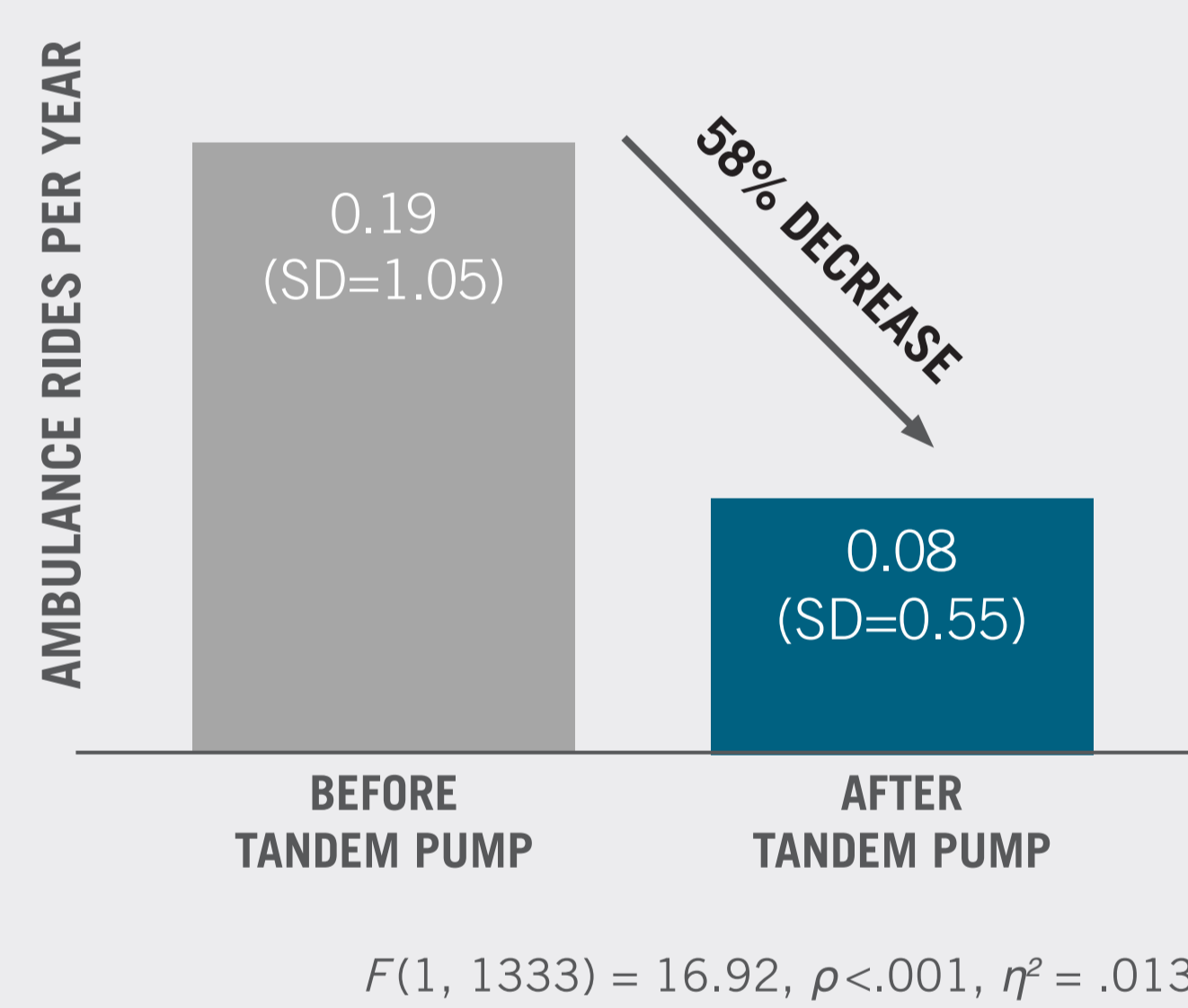
After using a Tandem pump for at least one year, participants reported a significant 52% reduction in severe hypoglycemia, compared to previous methods of diabetes therapy.



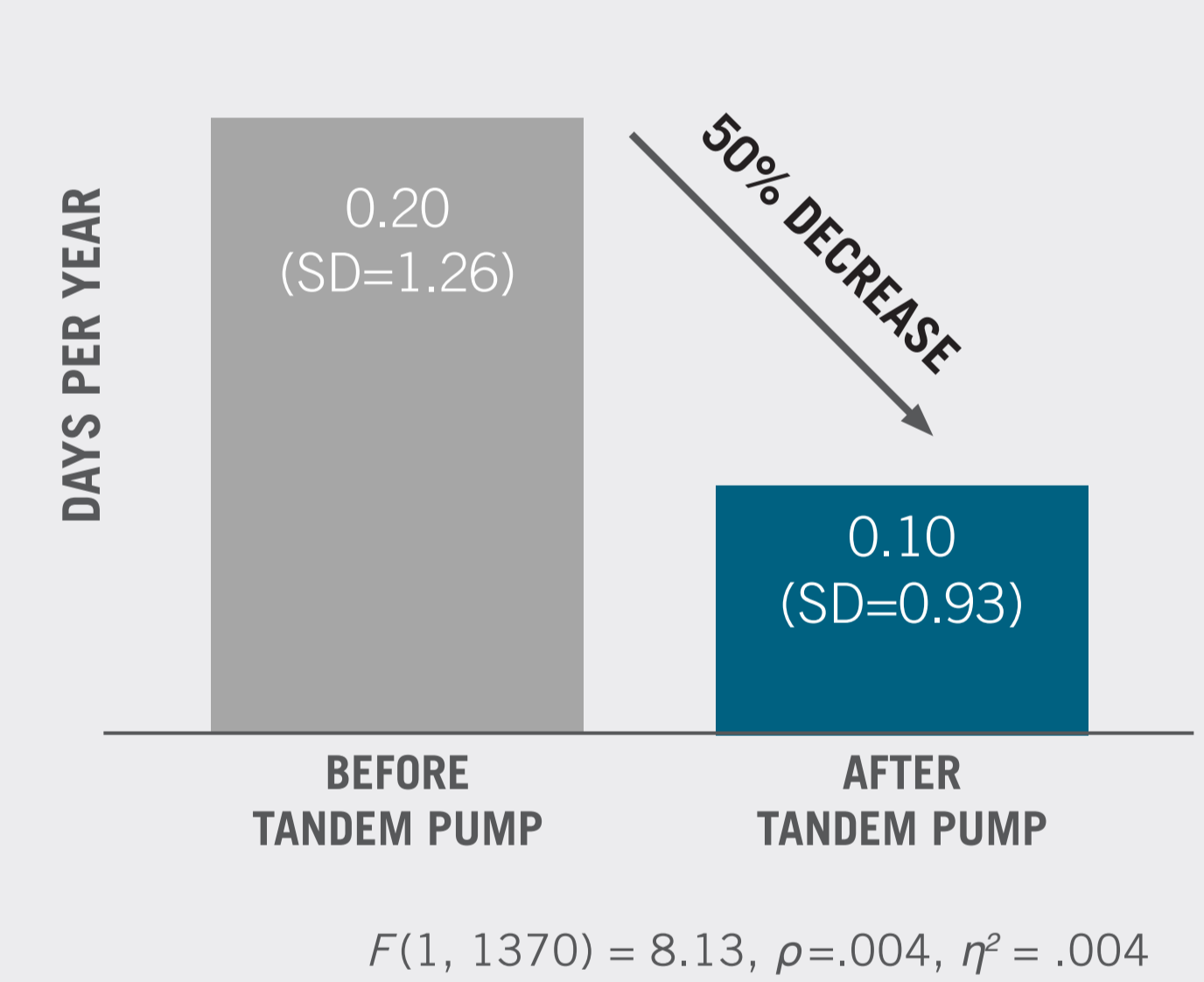
### CGM & Non-CGM users reported similar reductions in severe hypoglycemia

	Before Tandem M (SD)	After Tandem M (SD)	Percent Reduction	$F(1, 1151)$	$p$	$\eta^2$
Non-CGM User	1.10 (2.57)	0.54 (1.54)	51%	36.72	<.001	.031
New CGM User with Tandem Pump	0.82 (2.22)	0.39 (1.50)	52%	16.38	<.001	.014
CGM User	0.70 (2.01)	0.33 (1.20)	53%	10.75	<.001	.009

### Number of ambulance rides due to severe hypoglycemia



### Number of days at the hospital due to severe hypoglycemia



### Medium & Mild Hypoglycemia

#### Tandem customers also reported a reduction in medium and mild hypoglycemia

	Before Tandem M (SD)	After Tandem M (SD)	Percent Reduction	$F$	$p$	$\eta^2$
Medium Hypoglycemia	0.93 (4.88)	0.64 (3.64)	31%	8.39 $F(1, 1199)$	.004	.007
Mild Hypoglycemia	3.82 (4.90)	3.26 (4.68)	15%	21.34 $F(1, 1351)$	<.001	.016

## DISCUSSION AND CONCLUSIONS

- Tandem pump users reported a significant reduction in the incidence of hypoglycemia events when compared to their previous therapy, whether using an insulin pump or multiple daily injections.
- The authors conclude that the demonstrated ease of use of a Tandem pump<sup>4</sup> may have contributed to these differences. Additional research is recommended.