

Accuracy of Dexcom G5 on Pediatric Patients in Three Insertion Sites: Arm, Abdomen and Gluteus

S. Faccioli, MSc¹, S. Del Favero, PhD¹, R. Bonfanti, MD², D. Iafusco, MD³, I. Rabbone, PhD⁴, A. Sabbion, MD⁵, R. Schiaffini, MD⁶, D. Bruttomesso, PhD⁷, C. Cobelli, PhD¹ (on behalf of the PedArPan Study Group)

¹Department of Information Engineering - DEI, University of Padua, Italy; ²Hospital San Raffaele, Milan, Italy; ³II University of Naples, Italy; ⁴University of Turin, Italy; ⁵Azienda Ospedaliera Universitaria Integrata di Verona, Italy; ⁶Bambino Gesù, Children's Hospital, Rome, Italy; ⁷Department of Internal Medicine - DIMED, University of Padua, Italy.

1. INTRODUCTION

- In **pediatric** patients, **Dexcom® G5** CGM system is **approved** for sensor placement only on the **abdomen** or **upper gluteus** area.
- **Nonetheless**, patients **often use** it on their **arm**.

2. AIM

Compare the **accuracy** of this sensor in three different sites: **abdomen**, **gluteus** and **arm**.

3. DESIGN & METHODS

- **30 T1D children (5-9 year old)** wore the **G5** sensor for **2 sessions** of **4 days** each, during a closed-loop study [1].
- **Frequent** self-monitoring of blood glucose (**SMBG**) measurements were collected.
- **Sensor** placed in **different sites** according to the patient habit.
- **Accuracy** (w.r.t. SMBG) **outcomes**:
 - ✓ Absolute Deviation (**AD**);
 - ✓ Absolute Relative Deviation (**ARD**).
- Statistical method:
 - ✓ Three-arms **ANOVA**;
 - ✓ **Pair-wise comparison**.

4. RESULTS

- **No difference overall**;
- **No difference** in **hypo-** and **eu-glycemia**;
- **Significant difference** in **hyper-glycemia**.
- Pair-wise comparison**:
 - ✓ **abdomen vs gluteus**:
abdomen significantly better,
 $\Delta\text{ARD} = -2.38\%$ [CI: -4.55%; -0.22%], $p=0.035$.
 - ✓ **arm vs gluteus & arm vs abdomen**:
comparisons not significant.

➤ **ARD Boxplot**:

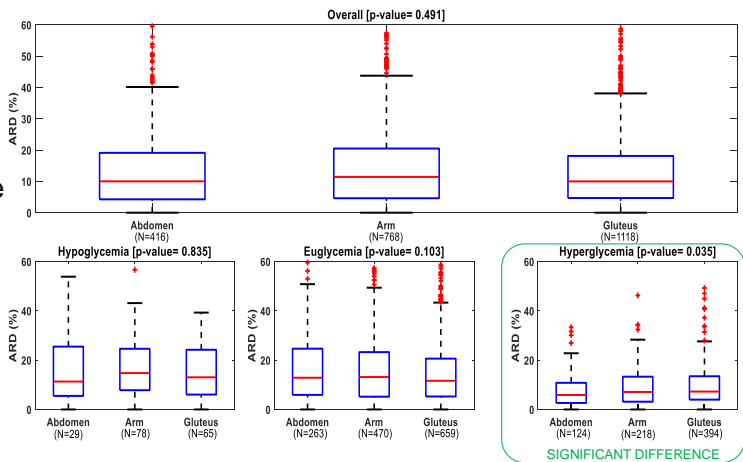


Figure 1: Distributions of Absolute Relative Deviation (ARD) of the CGM in the three glycemic ranges

	Metric	unit	ALL	ABDOMEN	ARM	GLUTEUS	ANOVA p-value
OVERALL	Matched pairs	#	2302	416	768	1118	
	ARD	%	14.19 (17.63)	14.30 (15.23)	14.74 (13.97)	13.76 (20.48)	0.491
	AD	mg/ml	19.02 (18.64)	18.04 (18.17)	18.74 (17.77)	19.57 (19.38)	0.315
HYPO-GLYCEMIA	Matched pairs	#	172	29	78	65	
	ARD	%	20.85 (45.83)	19.17 (25.05)	19.22 (19.73)	23.56 (69.69)	0.835
	AD	mg/ml	11.15 (15.20)	10.41 (10.50)	10.83 (9.59)	11.86 (21.38)	0.886
EU-GLYCEMIA	Matched pairs	#	1392	263	470	659	
	ARD	%	15.85 (13.89)	16.91 (15.78)	16.40 (14.03)	15.04 (12.92)	0.103
	AD	mg/ml	17.83 (16.50)	18.76 (19.52)	17.93 (15.80)	17.38 (15.66)	0.512
HYPER-GLYCEMIA	Matched pairs	#	736	124	218	394	
	ARD	%	9.51 (9.00)	7.63 (6.68)	9.67 (9.25)	10.02 (9.42)	0.035
	AD	mg/ml	23.14 (22.01)	18.28 (16.18)	23.44 (22.28)	24.51 (23.25)	0.022

Table 1: Accuracy metrics evaluated on all available CGM-SMBG data pair, regardless the patient in which they were collected

5. LIMITATIONS & CONCLUSIONS

Main limitations:

- **No randomization**;
- **Uneven sample size** in the 3 arms;
- **Relatively small sample size**;
- Accuracy evaluated **against SMBG**.

Conclusions:

- This report supports that the **Dexcom® G5 accuracy** when placed **on the arm** is **comparable** with the accuracy in the **two** approved **insertion sites**.