AHCL : una soluzione per tutti

Dott.ssa Elisabetta Lovati
Fond. IRCCS Policlinico San Matteo di Pavia

REZZATO (BS)
17 novembre 2025

Il /la dr./sa LOVATI ELISABETTA dichiara di aver ricevuto negli ultimi due anni compensi o finanziamenti dalle seguenti Aziende Farmaceutiche e/o Diagnostiche:

- Movi
- Sanofi
- Theras

Randomized Controlled Trial > Lancet Diabetes Endocrinol. 2022 Oct;10(10):720-731.
doi: 10.1016/S2213-8587(22)00212-1. Epub 2022 Sep 1.

Advanced hybrid closed loop therapy versus conventional treatment in adults with type 1 diabetes (ADAPT): a randomised controlled study

Review > Minerva Pediatr (Torino). 2021 Dec;73(6):474-485.
doi: 10.23736/S2724-5276.21.06531-9. Epub 2021 Jul 26.

Efficacy of advanced hybrid close... the management of type 1 di...

Lucia Ferrito [1], Stefano Passanisi [2], Riccardo ...
Riccardo Schiaffini [6], Andrea Scaramuzz...

> Front Public Health. 2023 Aug 29:11:1249299. doi: 10.3389/fpubh.2023.1249299. eCollection 2023.

Advanced Hybrid Closed Loop users' satisfaction of telemedicine and telenursing in pediatric and young adult type 1 diabetes

Marta Bassi [1 2], Francesca Dufour [2], Marina Fran...
Barbara Lionetti [2], Giordano Spacco [2], Francesc...
Stefano Parodi [3], Giuseppe d'Annunzio [1], Nicc...

PEDIATRIC DIABETES — ISPAD International Society for Pediatric and Adolescent Diabetes

CLINICAL CARE AND TECHNOLOGY

Long-term effectiveness of advanced hybrid closed loop in children and adolescents with type 1 diabetes

...Piccini, Benedetta Pessina, Emilio Casalini, Lorenzo Lenzi, Sonia Toni

...ovember 2022 | https://doi.org/10.1111/pedi.13440 | Citations: 18

Open access — Protocol

BMJ Open

Randomised controlled trial of Advanced Hybrid Closed Loop in an Adult Population with Type 1 Diabet... (ADAPT): study protocol and ...

Simona de Portu, [1] Linda Vorrink, [1] Roseline...
Aklilu Habteab, [3] Ohad Cohen [1]

...Minuto [5],
...Marta Scalas [2],

ORIGINAL ARTICLE | APRIL 16 2024

Sustained Effectiveness of an Advanced Hybrid Closed-Loop System in a Cohort of Children and Adolescents With Type 1 Diabetes: A 1-Year Real-World Study

Stefano Passanisi; Giuseppina Salzano; Bruno Bombaci; Nicola Minuto; Marta Bassi; Riccardo Bonfanti; Francesco Scialabba; Enza Mozzillo; Francesca Di Candia; Sara Monti; Vanna Graziani; Claudio Maffeis; Claudia Anita Piona; Claudia Arnaldi; Davide Tosini; Barbara Felappi; Rosalia Roppolo; Angela Zanfardino; Maurizio Delvecchio; Donatella Lo Presti; Elena Calzi; Carlo Ripoli; Roberto Franceschi; Petra Reinstadler; Ivana Rabbone; Giulio Maltoni; Angela Alibrandi; Stefano Zucchini; Marco Marigliano; Fortunato Lombardo; ISPED Diabetes Study Group Collaborators

Efficacy of automated insulin delivery systems in people with type 1 diabetes: a systematic review and network meta-analysis of outpatient randomised controlled trials

Anna Stahl-Pehe,[a,b,*] Nafiseh Shokri-Mashhadi,[a,b] Marielle Wirth,[a,b,c] Sabrina Schlesinger,[a,b] Oliver Kuss,[a,b,d] Reinhard W. Hall,[b,e] Christina Bächle,[a,b] Klaus-D. Warz,[f] Jutta Bürger-Büsing,[g] Olaf Spörkel,[b,h] and Joachim Rosenbauer[a,b]

eClinicalMedicine
2025;82: 103190
Published Online 11 April 2025
https://doi.org/10.1016/j.eclinm.2025.103190

Intervention	Control	Best estimate	mean difference (95% CI)	CoE	Best estimate	mean difference (95% CI)	CoE
		Time in Range 70-180 mg/dl [%], MID = 5			HbA1c [%], MID = 0.5		
HCL	MDI	NMA	8.0 (4.7; 11.2)	LOW	NMA	-0.1 (-0.3; 0.1)	LOW
HCL	CSII	NMA	19.7 (13.2; 26.1)	MODERATE	NMA	-0.7 (-1.1; -0.3)	LOW
HCL	SAP	NMA	12.3 (6.4; 18.2)	VERY LOW	NMA	-0.3 (-0.9; 0.2)	VERY LOW
HCL	PLGM	NMA	8.1 (2.8; 13.4)	LOW	NMA	0.1 (-0.3; 0.5)	LOW
AHCL	MDI	NMA	12.4 (9.3; 15.4)	MODERATE	NMA	-0.5 (-0.7; -0.3)	LOW
AHCL	CSII	NMA	24.1 (18.2; 29.9)	MODERATE	NMA	-1.0 (-1.4; -0.7)	MODERATE
AHCL	SAP	NMA	16.7 (10.1; 23.3)	LOW	NMA	-0.7 (-1.2; -0.2)	LOW
AHCL	PLGM	NMA	12.5 (7.8; 17.1)	MODERATE	NMA	-0.2 (-0.6; 0.2)	LOW
AHCL	HCL	NMA	4.4 (0.7; 8.1)	LOW	NMA	-0.3 (-0.6; -0.1)	MODERATE
FCL	MDI	NMA	13.8 (0.9; 26.7)	MODERATE	NMA	-	-
FCL	CSII	NMA	25.5 (11.1; 39.9)	HIGH	NMA	-	-
FCL	SAP	NMA	18.1 (3.7; 32.6)	LOW	NMA	-	-
FCL	PLGM	NMA	13.9 (-0.1; 27.9)	MODERATE	NMA	-	-
FCL	HCL	NMA	5.8 (-7.5; 19.2)	MODERATE	NMA	-	-
FCL	AHCL	NMA	1.5 (-11.8; 14.7)	MODERATE	NMA	-	-
						-	-
		Time Above Range >180 mg/dl [%], MID = 5			Time Above Range >250 mg/dl [%], MID = 5		
HCL	MDI	NMA	-4.7 (-8.2; -1.3)	LOW	DIRECT	-3.4 (-4.6; -2.2)	LOW
HCL	CSII	NMA	-14.2 (-20.6; -7.8)	MODERATE	NMA	-10.1 (-16.5; -3.6)	MODERATE
HCL	SAP	NMA	-10.6 (-17.9; -3.2)	VERY LOW	NMA	-3.9 (-11.1; 3	VERY LOW
HCL	PLGM	NMA	-6.0 (-11.6; -0.4)	LOW	NMA	-3.3 (-9.4; 2.8)	LOW
AHCL	MDI	NMA	-10.1 (-13.4; -6.9)	MODERATE	NMA	-7.8 (-10 -4.6)	MODERATE
AHCL	CSII	NMA	-19.6 (-25.1; -14.0)	MODERATE	NMA	-14.3 (-19.8; -8.8)	MODERATE
AHCL	SAP	NMA	-15.9 (-23.7; -8.1)	LOW	NMA	-9.8 (-16.0;	LOW
AHCL	PLGM	NMA	-11.4 (-16.4; -6.5)	MODERATE	NMA	-8.0 (-13.5; -2.5)	MODERATE
AHCL	HCL	NMA	-5.4 (-9.3; -1.4)	LOW	NMA	-4.7 (-8 -0.9)	LOW
FCL	MDI	NMA	-13.9 (-27.5; -0.4)	MODERATE	NMA	-10.2 (-24.2; 2.8)	MODERATE
FCL	CSII	NMA	-23.3 (-38.2; -8.4)	HIGH	NMA	-17.7 (-32.7; -2.8)	HIGH
FCL	SAP	NMA	-19.7 (-35.4; -4.1)	LOW	NMA	-11.5 (-27.0; 4.0)	LOW
FCL	PLGM	NMA	-15.2 (-29.8; -0.6)	MODERATE	NMA	-10.9 (-25.7; 3.9)	MODERATE
FCL	HCL	NMA	-9.2 (-23.2; 4.8)	MODERATE	NMA	-7.6 (-21.5; 6.3)	HIGH
FCL	AHCL	NMA	-3.8 (-17.7; 10.2)	MODERATE	NMA	-2.9 (-16.8; 10.9)	MODERATE
		Time Below Range <70 mg/dl [%], MID = 1			Time Below Range <54 mg/dl [%], MID = 0.5		
HCL	MDI	NMA	-1.5 (-2.2; -0.8)	LOW	NMA	-0.3 (-0.6; -0.1)	LOW
HCL	CSII	DIRECT	-3.6 (-4.8; -2.3)	LOW	NMA	-0.5 (-0.9; 0.0)	VERY LOW
HCL	SAP	NMA	-2.7 (-4.2; -1.2)	LOW	NMA	-0.6 (-1.2; -0.1)	LOW
HCL	PLGM	NMA	-1.5 (-2.8; -0.3)	VERY LOW	NMA	-0.4 (-0.8; -0.1)	VERY LOW
AHCL	MDI	NMA	-1.0 (-1.7; -0.2)	VERY LOW	NMA	-0.2 (-0.4; 0.0)	VERY LOW
AHCL	CSII	INDIRECT	-3.4 (-5.2; -1.6)	LOW	NMA	-0.3 (-0.7; 0.1)	VERY LOW
AHCL	SAP	NMA	-2.1 (-3.7; -0.5)	LOW	NMA	-0.5 (-1.0; 0.1)	VERY LOW
AHCL	PLGM	NMA	-1.0 (-2.1; 0.1)	LOW	NMA	-0.3 (-0.6; 0.1)	LOW
AHCL	HCL	NMA	0.6 (-0.3; 1.5)	MODERATE	NMA	0.2 (-0.1; 0.4)	MODERATE
FCL	MDI	NMA	0.6 (-2.2; 3.3)	MODERATE	NMA	0.0 (-0.7; 0.8)	MODERATE
FCL	CSII	NMA	0.8 (-2.3; 3.9)	MODERATE	NMA	-0.1 (-1.0; 0.8)	MODERATE
FCL	SAP	NMA	-0.1 (-3.7; 3.4)	LOW	NMA	-0.3 (-1.2; 0.7)	LOW
FCL	PLGM	NMA	-0.6 (-2.9; 1.7)	MODERATE	NMA	-0.1 (-0.9; 0.8)	MODERATE
FCL	HCL	NMA	2.1 (-0.7; 4.9)	MODERATE	NMA	0.4 (-0.4; 1.1)	MODERATE
FCL	AHCL	NMA	1.6 (-1.2; 4.3)	MODERATE	NMA	0.2 (-0.6; 1.0)	MODERATE

AHCL: Advanced Hybrid Closed-Loop; AID: Automated Insulin Delivery; CSII: Continuous Subcutaneous Insulin Infusion; FCL: Full Closed-Loop; HbA1c: Haemoglobin A1c; HCL: Hybrid Closed-Loop; MDI: Multiple Daily Injection; MID: Minimal Important Difference; NMA: Network Meta-Analysis; PLGM: Predictive Low Glucose Management; SAP: Sensor-Augmented Pump.
Explanation:

Efficacy of automated insulin delivery systems in people with type 1 diabetes: a systematic review and network meta-analysis of outpatient randomised controlled trials

Anna Stahl-Pehe,[a,b,*] Nafiseh Shokri-Mashhadi,[a,b] Marielle Wirth,[a,b,c] Sabrina Schlesinger,[a,b] Oliver Kuss,[a,b,d] Reinhard W. Holl,[b,e] Christina Bächle,[a,b] Klaus-D. [illegible],[f] Jutta Bergf-Büsing,[g] Olaf Spörkel,[h,i] and Joachim Rosenbauer[a,b]

DIABETES TECHNOLOGY & THERAPEUTICS
Volume 25, Number 5, 2023

DOI: 10.1089/dia.2022.0558

ORIGINAL ARTICLE

A Meta-Analysis of Randomized Trial Outcomes for the t:slim X2 Insulin Pump with Control-IQ Technology in Youth and Adults from Age 2 to 72

Roy W. Beck, MD, PhD,[1] Lauren G. Kanapka, MSc,[1] Marc D. Breton, PhD,[2] Sue A. Brown, MD,[2] R. Paul Wadwa, MD,[3] Bruce A. Buckingham, MD,[4] Craig Kollman, PhD,[1] and Boris Kovatchev, PhD[2]

ORIGINAL ARTICLE

A Meta-Analysis of Randomized Trial Outcomes for the t:slim X2 Insulin Pump with Control-IQ Technology in Youth and Adults from Age 2 to 72

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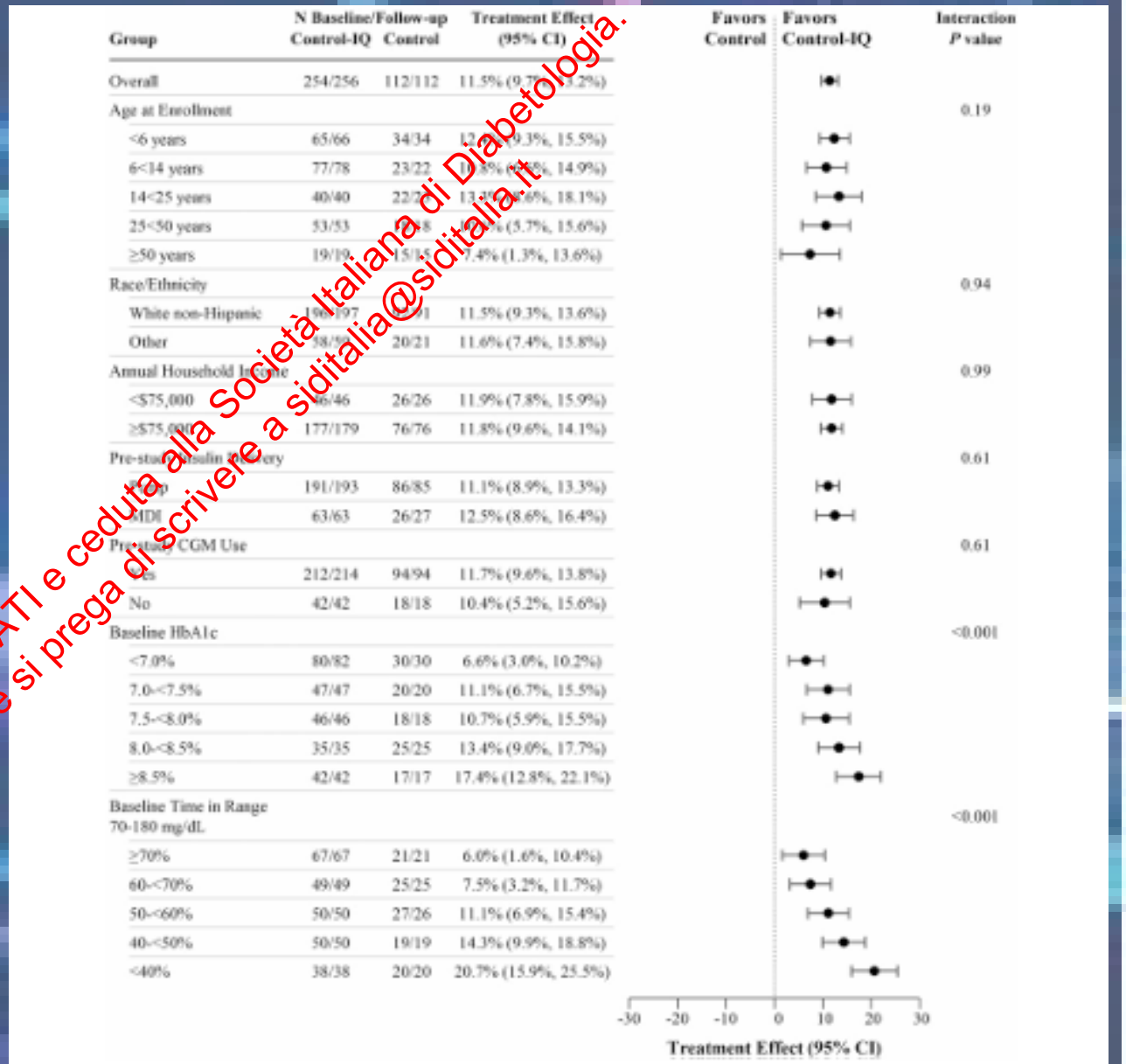


FIG. 2. Time in range 70–180 mg/dL outcome: Forest plot of treatment effect in subgroups based on baseline characteristics. The treatment effect on time in range 70–180 mg/dL is shown numerically and depicted in the figure where the dot represents the point estimate for the treatment group difference and the lines represent the extent of the 95% confidence interval. The vertical dotted line represents a treatment group difference of zero. Point estimates to the right of the vertical line indicate a higher time in range in the Control-IQ group compared with the Control group. It can be seen that time in range was higher in the Control-IQ group than the Control group in all subgroups. The interaction *P*-value is indicative of whether this beneficial treatment effect in all subgroups varied according to the baseline characteristic.

Diabetes/Metabolism Research and Reviews

WILEY

REVIEW ARTICLE OPEN ACCESS

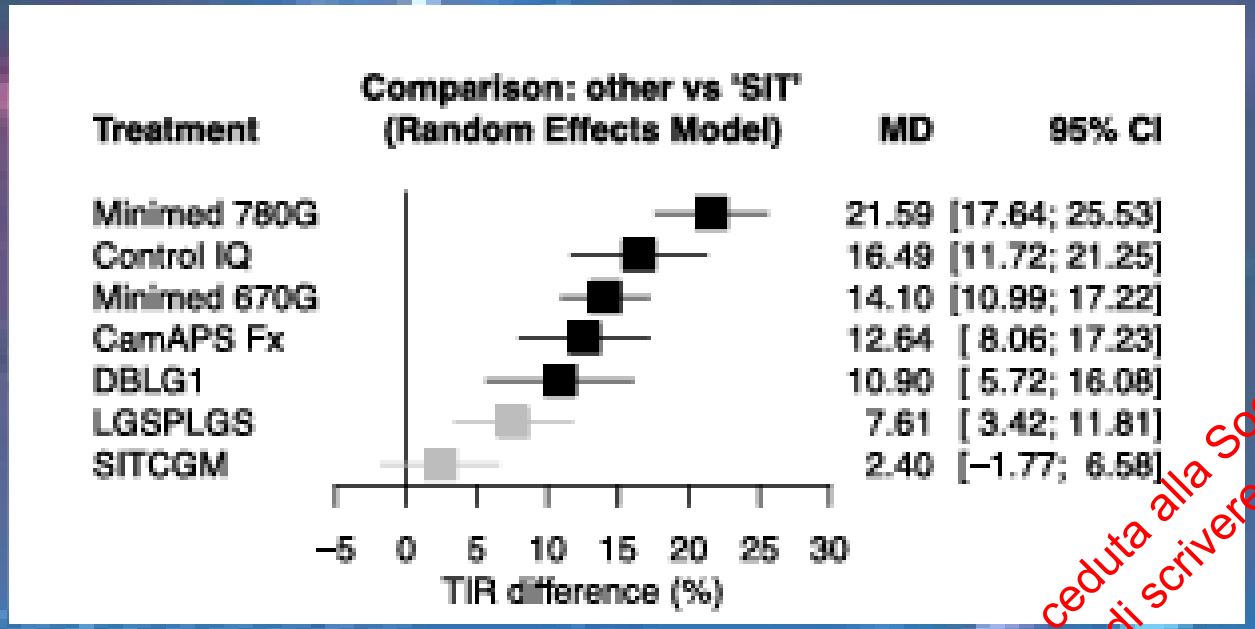
Efficacy and Safety of Different Hybrid Closed Loop Systems for Automated Insulin Delivery in People With Type 1 Diabetes: A Systematic Review and Network Meta-Analysis

Sergio Di Molfetta[1] | Ludovico Di Gioia[1] | Irene Caruso[1] | Angelo Cignarelli[1] | Suetonia C. Green[2] | Patrizia Natale[3,4,5] | Giovanni F. M. Strippoli[3,4,5] | Gian Pio Sorice[1] | Sebastio Perrini[1] | Annalisa Natalicchio[1] | Luigi Laviola[1] | Francesco Giorgino[1]

[1]Department of Precision and Regenerative Medicine and Ionian Area, Section of Internal Medicine, Endocrinology, Andrology and Metabolic Diseases, University of Bari Aldo Moro, Bari, Italy | [2]Department of Medicine, University of Otago Christchurch, Christchurch, New Zealand | [3]Department of Precision and Regenerative Medicine and Ionian Area, University of Bari Aldo Moro, Bari, Italy | [4]Sydney School of Public Health, The University of Sydney, Sydney, Australia | [5]Nephrology, Dialysis and Transplantation Unit, Department of Medical and Surgical Sciences, University of Foggia, Foggia, Italy

Correspondence: Francesco Giorgino (francesco.giorgino@uniba.it)

Received: 11 April 2024 | **Revised:** 25 May 2024 | **Accepted:** 24 July 2024



REVIEW ARTICLE OPEN ACCESS

Efficacy and Safety of Different Hybrid Closed Loop Systems for Automated Insulin Delivery in People With Type 1 Diabetes: A Systematic Review and Network Meta-Analysis

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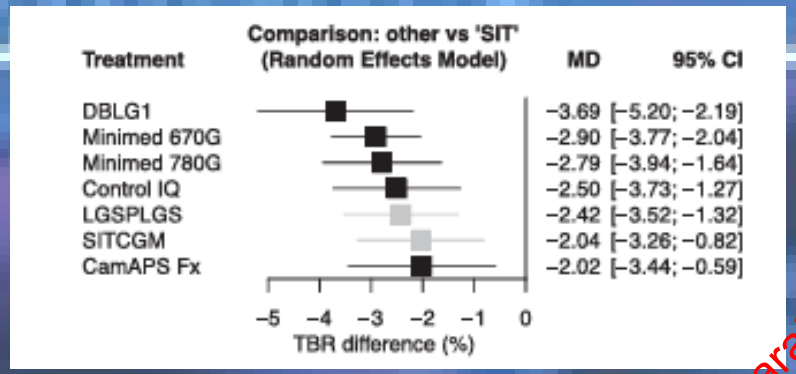

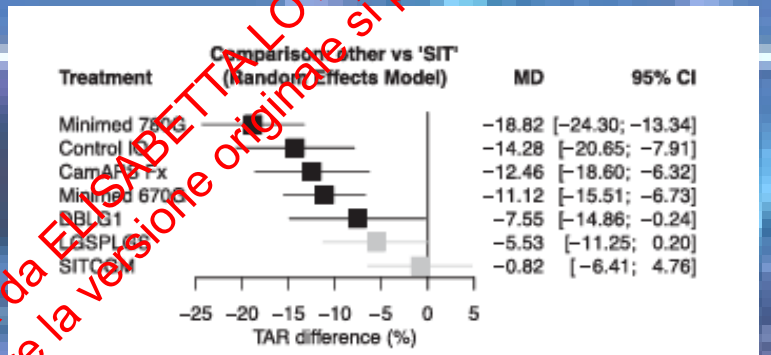

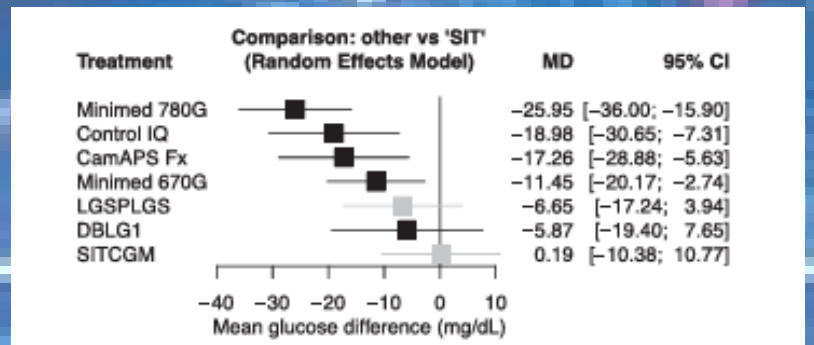

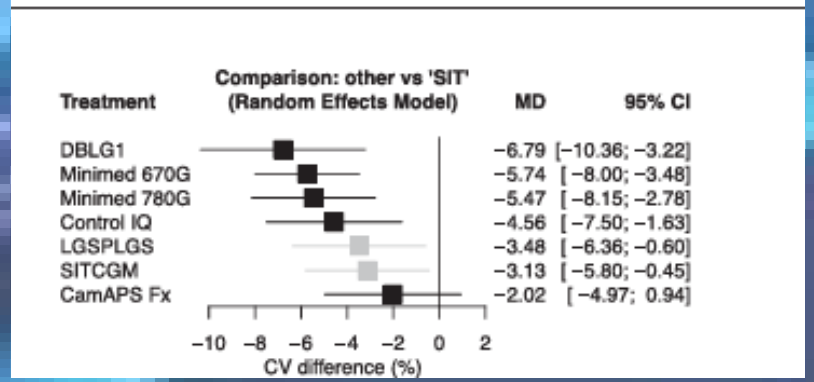

Letter to the Editor

A Randomized Crossover Trial Comparing Glucose Control During Postprandial Moderate Aerobic Activity and High-Intensity Interval Training in Adults With Type 1 Diabetes Using an Advanced Hybrid Closed-Loop System

Guliana Da Prato, PhD[1], Alessandro Csermely, MD[1], Martina Pilati, MD[1], Lorenza Carletti, MD[1], Elisabetta Rinaldi, PhD[1], Silvia Donà, PhD[1], Lorenza Santi, Dr[1], Carlo Negri, MD[1], Enzo Bonora, PhD, Paolo Moghetti, PhD[1], and Maddalena Trombetta, PhD[1]

Journal of Diabetes Science and Technology
2024, Vol. 18(5) 1256–1257

DOI: 10.1177/19322968241258444
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DIABETES TECHNOLOGY & T
Volume 25, Number 7, 2023

Diabetes Technology & Therapeutics > V
Research Article | NO ACCESS | Published O

Temporary Target Versus S Using the MiniMed 780G Advanced Closed-Loop Hybrid System During Aerobic Exercise: A Randomized Crossover Clinical Trial

Authors: Ana María Gómez, Diana Cristina Hernández, Oscar Mauricio Muñoz, Diana Marcela Romero, Julio David Silva León, Pablo Esteban Jaramillo, Evelyn Moscoso, Darío A. Parra Prieto, Sofía Robledo, Mayra García Jaramillo, and Martin Rondón Sepúlveda | AUTHORS INFO & AFFILIATIONS

Symposium/Special Issue

Automated Insulin Delivery Systems in Pediatric Type 1 Diabetes: A Narrative Review

Peter Adolfsson, MD, PhD[1,2], Ragnar Hanas, MD, PhD[1,3], Dessi P. Zaharieva, PhD[4], Klemen Dovc, MD, PhD[5,6], and Johan Jendle, MD, PhD[7]

Journal of Diabetes Science and Technology
2024, Vol. 18(6) 1324–1333

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FROM RESEARCH TO PRACTICE

Practical Aspects and Exercise Safety Benefits of Automated Insulin Delivery Systems in Type 1 Di

Dessi P. Zaharieva,[1] Dale Morrison,[2] Barbora Paldus,[2,3] Rayhan A. Lal,[1,4,5] Bruce A. Buckin
David N. O'Ne[12,3]
[1]Division of Endocrin
Melbourne, Melbou
Diabetes Research C

Diabetes Technology & Therapeutics > Vol. 26, No. 2
Research Article | NO ACCESS | Published Online: 1 January 2024

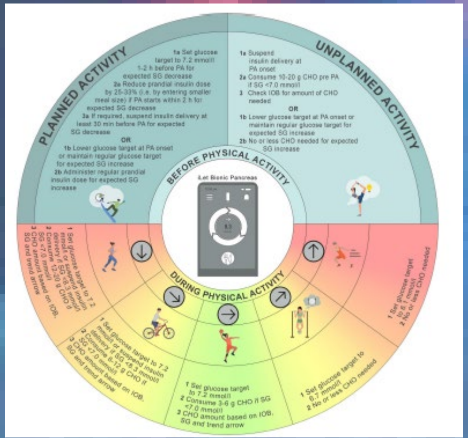
Automated Insulin Delivery Around Exercise in Adults with Type 1 Diabetes: A Pilot Randomized Controlled Study

Olivia M. McCarthy, PhD,[1,2] Merete B. Christensen, MD, PhD,[2] Kasper Birch Kristensen, MD, PhD,[2] Signe Schmidt, MD, PhD,[2] Ajenthen G. Ranjan, MD, PhD,[2,3] Stephen C. Bain, MD, PhD,[4] Richard M. Bracken, MD, PhD,[1] and Kirsten Nørgaard, MD[2,5]

Performance of Tandem Control IQ During Outdoor Physical Activity in Children and Adolescents with Type 1 Diabetes

Authors: Chiara Mameli, Andrea Tagamonti, Barbara Felappi, Antonio Nicolucci, Giuseppe Lucisano, Stefano Baresi, Giorgia Florini, ... SHOW ALL ... , and Riccardo Bonfanti | AUTHORS INFO & AFFILIATIONS

Publication: Diabetes Technology & Therapeutics • https://doi.org/10.1089/dia.2023.0324



Diabetologia (2025) 68:255–280
https://doi.org/10.1007/s00125-024-06308-z

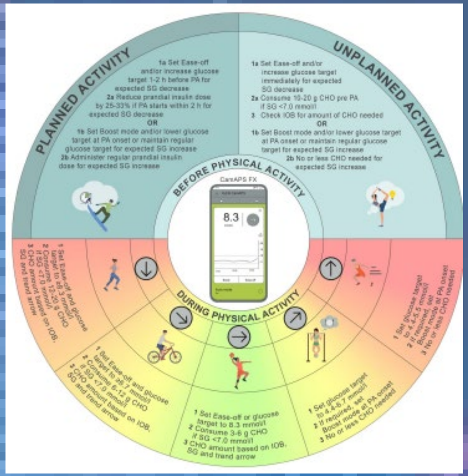
POSITION STATEMENT

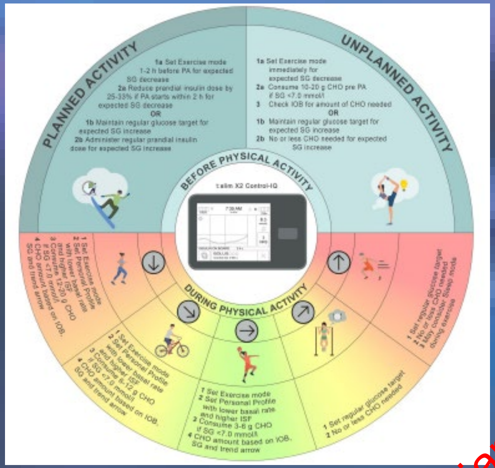
Check for updates

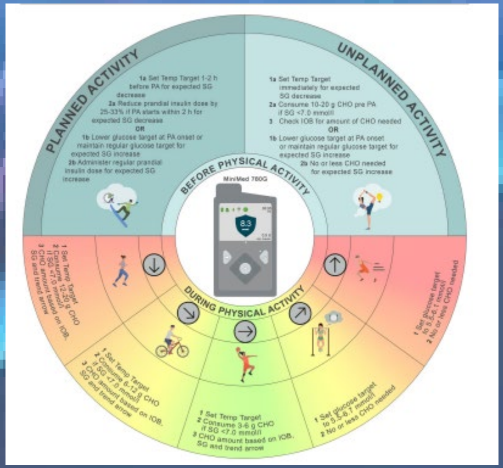
The use of automated insulin delivery around physical activity and exercise in type 1 diabetes: a position statement of the European Association for the Study of Diabetes (EASD) and the International Society for Pediatric and Adolescent Diabetes (ISPAD)

Othmar Moser[1,2,3] · Dessi P. Zaharieva[4] · Peter Adolfsson[5,6] · Tadej Battelino[7,8] · Richard M. Bracken[9] · Bruce A. Buckingham[4] · Thomas Danne[10,11] · Elizabeth A. Davis[12,13,14] · Klemen Dovč[7,8] · Gregory P. Forlenza[15] · Pieter Gillard[16] · Sabine E. Hofer[17] · Roman Hovorka[18,19] · Peter G. Jacobs[20] · Julia K. Mader[2] · Chantal Mathieu[16] · Kirsten Nørgaard[21,22] · Nick S. Oliver[23] · David N. O'Neal[24,25,26] · John Pemberton[27] · Rémi Rabasa-Lhoret[28,29,30] · Jennifer L. Sherr[31] · Harald Sourij[2,3] · Martin Tauschmann[32] · Jane E. Yardley[28,33] · Michael C. Riddell[34]

Published online: 10 December 2024







JDI Journal of Diabetes Investigation Open access
Official Journal of the Asian Association for the Study of Diabetes
SHORT REPORT
J Diabetes Investig 2025
doi: 10.1111/jdi.70141

Using automated insulin delivery to address the clinical challenges of glycemic management in people with type 1 diabetes and kidney failure on maintenance hemodialysis

Panagiotis Pavlou[1,2], Monika Reddy[3,4], Parizad Avari[3,4], Lalantha Leelarathna[3,4], Rachael Tan[1,5], Tahseen A. Chowdhury[6], Rebecca Hyslop[2], Sufyan Hussain[1,2], Thomas Johnston[2], Janaka Karalliedde[1,2]*

[1]King's College London, London, UK, [2]Guy's and St Thomas' NHS Foundation Trust, London, UK, [3]Imperial College Healthcare NHS Trust, London, UK, [4]Imperial College London, London, UK, [5]King's College Hospital NHS Foundation Trust, London, UK, and [6]Barts Health NHS Trust, London, UK

Table 2 | Changes in CGM parameters, HbA1c and weight post-AID

	Mean pre-AID (±SD)	Mean post-AID (±SD)	Difference post-AID (Δ)	*P*-value	Number of patients (*N*)
TIR (%)	39.7 (±17.1)	59.8 (±18.1)	20.1	0.001	9
Time in very high range (%)	30.4 (±19.5)	14.3 (±12.3)	−16.1	0.01	9
TBR (%)	4 (±5.4)	1.4 (±1.3)	−2.6	0.1	9
Mean BG (mmol/L)	13.1 (±2.4)	9.8 (±1.9)	−3.3	0.0002	9
GV (%)[†]	39.8 (±3.8)	33.8 (±6.5)	−6	0.01	6
TDI (IU)[‡]	35.8 (±12.2)	29.6 (±7.1)	−6.2	0.05	6
Hemodialysis day TIR (%)[§]	32.7 (±17.7)	62.3 (±14.9)	29.6	0.002	6
Hemodialysis day TDI (IU)[¶]	27.3 (±7.9)	26.9 (±5.8)	−0.32	0.43	4
HbA1c (mmol/mol)[††]	78.6 (±12.8)	56.1 (±8.5)	−22.5	0.003	8
Weight[‡‡]	74.3 (±19.6)	71.8 (±15.9)	−2.5	0.23	5

BG, blood glucose; GV, glucose variability; HbA1c, glycated hemoglobin A1c; TDI, total daily insulin; TIR, time in range, time below range. [†]GV data were not available for three patients. [‡]TDI data were not available for three patients. [§]Hemodialysis day TIR data were not available for three patients. [¶]Hemodialysis day TDI data were not available for three patients. [††]HbA1c data at suitable time points were not available for one patient. [‡‡]Weight data were not available for three patients.

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SHORT REPORT
J Diabetes Investig 2025
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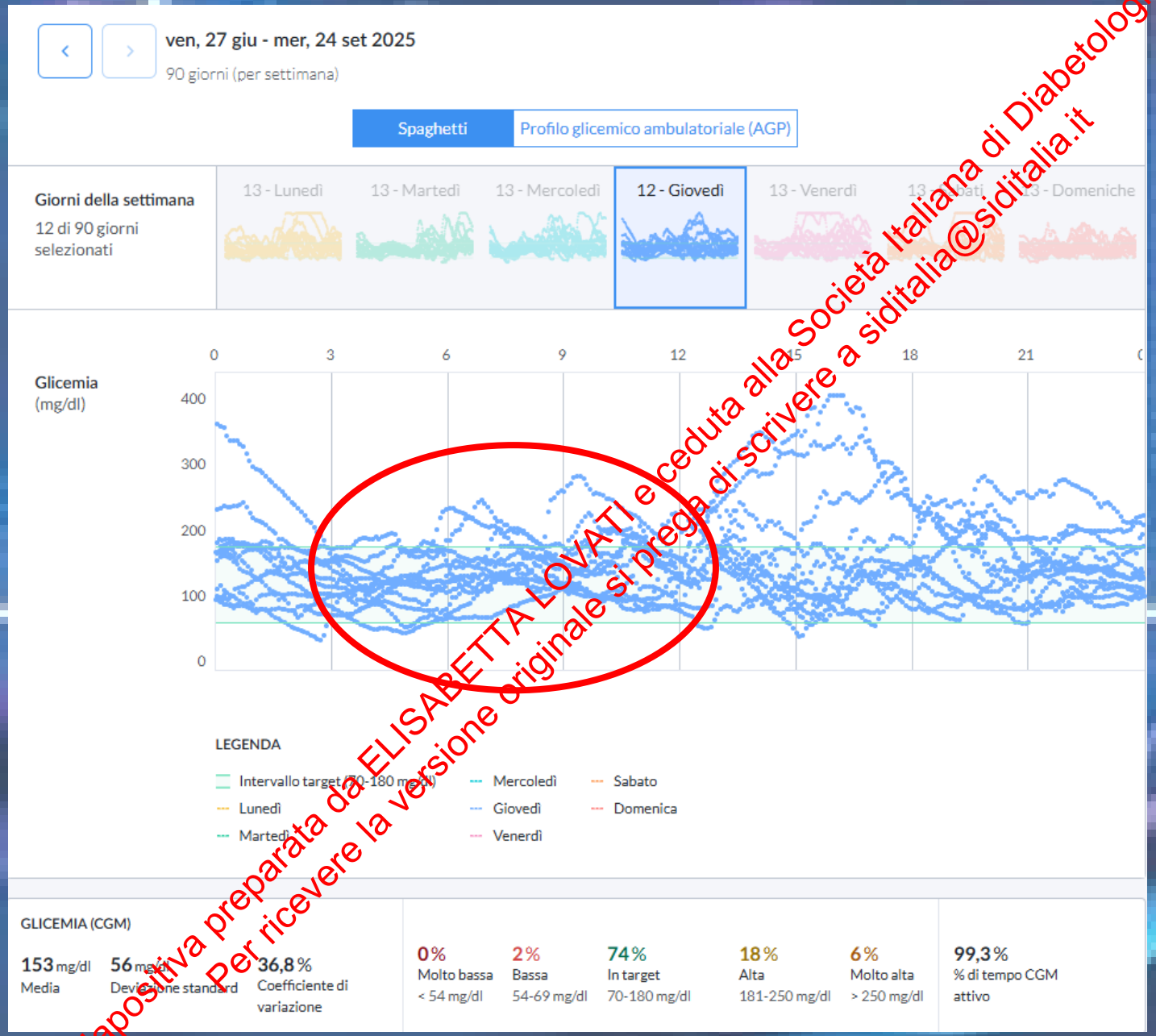
Panagiotis Pavlou[1,2], Monika Reddy[3,4], Parizad Avari[3,4], Lalantha Leelarathna[3,4], Rachael Tan[1,5], Tahseen A. Chowdhury[6], Rebecca Hyslop[2], Sufyan Hussain[1,2], Thomas Johnston[2], Janaka Karalliedde[1,2]*

[1]King's College London, London, UK, [2]Guy's and St Thomas' NHS Foundation Trust, London, UK, [3]Imperial College Healthcare NHS Trust, London, UK, [4]Imperial College London, London, UK, [5]King's College Hospital NHS Foundation Trust, London, UK, and [6]Barts Health NHS Trust, London, UK

Table 2 | Changes in CGM parameters, HbA1c and weight post-AID

	Mean pre-AID (±SD)	Mean post-AID (±SD)	Difference post-AID (Δ)	*P*-value	Number of patients (*N*)
TIR (%)	39.7 (±17.1)	59.8 (±18.1)	20.1	0.001	9
Time in very high range (%)	30.4 (±19.5)	14.3 (±12.3)	−16.1	0.01	9
TBR (%)	4 (±5.4)	1.4 (±1.3)	−2.6	0.1	9
Mean BG (mmol/L)	13.1 (±2.4)	9.8 (±1.9)	−3.3	0.0002	9
GV (%)[†]	39.8 (±3.8)	33.8 (±6.5)	−6	0.01	6
TDI (IU)[‡]	35.8 (±12.2)	29.6 (±7.1)	−6.2	0.05	6
Hemodialysis day TIR (%)[§]	32.7 (±17.7)	62.3 (±14.9)	29.6	0.002	6
Hemodialysis day TDI (IU)[¶]	27.3 (±7.9)	26.9 (±5.8)	−0.32	0.43	4
HbA1c (mmol/mol)[††]	78.6 (±12.8)	56.1 (±8.5)	−22.5	0.003	8
Weight[‡‡]	74.3 (±19.6)	71.8 (±15.9)	−2.5	0.23	5

BG, blood glucose; GV, glucose variability; HbA1c, glycated hemoglobin A1c; TDI, total daily insulin; TIR, time in range, time below range. [†]GV data were not available for three patients. [‡]TDI data were not available for three patients. [§]Hemodialysis day TIR data were not available for three patients. [¶]Hemodialysis day TDI data were not available for three patients. [††]HbA1c data at suitable time points were not available for one patient. [‡‡]Weight data were not available for three patients.



Symposium/Special Issue

Hybrid Closed-loop to Manage Gastroparesis in People With Type 1 Diabetes: a Case Series

Aideen Daly, MB BCh[1], Sara Hartnell, BSc[2], Charlotte K. Boughton, MD PhD[1,2], and Mark Evans, MD[1,2]

Journal of Diabetes Science and Technology
2021, Vol. 15(6) 1216–1223

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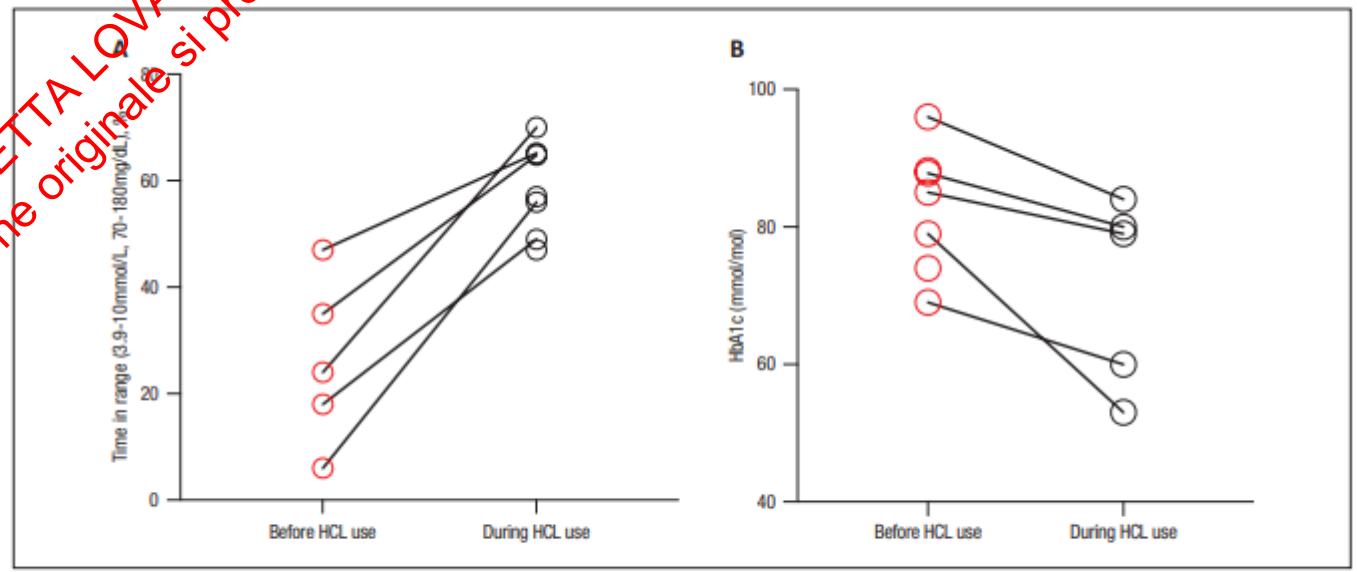


Figure 1. (A) Comparison of time in target glucose range for patients with gastroparesis before and during hybrid closed-loop therapy. (B) HbA1c values for patients with gastroparesis before and during hybrid closed-loop therapy.
*Only 5 patients had available data for both pre-HCL and during HCL therapy.

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Automated Insulin Delivery in Type 2 Diabetes

Y.C. Kudva,[1] D. Raghinaru,[2] J.W. Lum,[2] T.E. Graham,[3] D. Lindengrist,[4] E.K. Spanakis,[5] F.J. Pasquel,[6] A. Ahmann,[7] D.T. Ahn,[8] G. Aleppo,[9] V. Blevins,[10] D. Kruger,[11] S.A. Brown,[12] C.J. Levy,[13] R.S. Weinstock,[14] E.W. Steenkamp,[15] T. Spaic,[16] I.B. Hirsch,[17] F. Broyles,[18] M.R. Rickels,[19] M.A. Tsoukas,[20] P. Raskin,[21] B. Hatipoglu,[22] D. Desjardins,[1] A.N. Terry,[3] L.G. Singh,[3] G.L. Davis,[6] C. Schmid,[7] J. Kravarusic,[9] K. Coyne,[9] L. Casaubon,[10] V. Espinoza,[10] D.K. Jones,[11] K. Estrada,[11] S. Afreen,[12] C. Levister,[13] G. O'Malley,[13] S.L. Liu,[16] S. Marks,[18] A.J. Peleckis,[19] M.-R. Pasqua,[20] V. Tardio,[20] C. Kurek,[1] R.D. Lukes,[5] J. Churchill,[5] F.Z. Tajrishi,[6] A. Dean,[7] B. Dennis,[8] E. Fronczyk,[9] L. Perez,[9] S. Mukhashen,[11] J. Dhillon,[12] A. Ipek,[13] S. Bzdick,[14] A. Atakov-Castillo,[15] M. Driscoll,[16] X. Averkiou,[17] C.V. Dalton–Bakes,[19] A. Moore,[19] L.F. Jordan,[21] A. Lesniak,[22] J.E. Pinsker,[23] R. Sasson-Katchalski,[23] T. Campos,[23] E. Spanbauer,[2] L. Kanapka,[2] C. Kollman,[2] and R.W. Beck,[3] for the 2IQP Study Group*

This article was published on March 19, 2025, at NEJM.org.

DOI: 10.1056/NEJMoa2415948

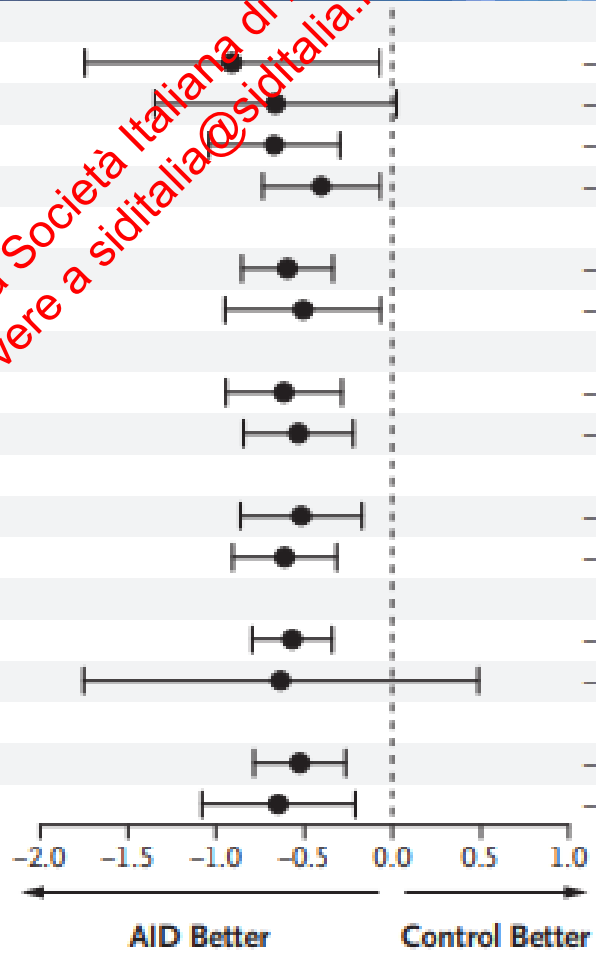
Table 2. Primary and Secondary Hierarchical Efficacy Outcomes.*

Outcome	At Baseline		At 13 Weeks		Adjusted Difference between Groups (95% CI)	P Value
	AID Group	Control Group	AID Group	Control Group		
Primary outcome						
No. of patients evaluated	214†	104	208‡	102‖		
Glycated hemoglobin level — %	8.2±1.4	8.1±1.3	7.3 ±0.9	7.7 ±1.1	−0.6 (−0.8 to −0.4)	<0.001
Secondary hierarchical outcomes:						
No. of patients evaluated	215	104	214¶	104		
Percentage of time with glucose level in range of 70 to 180 mg/dl	48±24	51±21	64±16	52±21	14 (11 to 17)	<0.001
Mean glucose level — mg/dl	194±33	190±35	170±23	188±34	−21 (−26 to −15)	<0.001
Percentage of time with glucose level of >180 mg/dl	51±25	49±21	35±16	48±21	−14 (−17 to −11)	<0.001
Percentage of time with glucose level of >250 mg/dl‖	18.5±18.8	15.8±13.6	9.7±7.8	16.7±14.1	−9.1 (−11.7 to −6.6)	<0.001
No. of prolonged hyperglycemia events per wk‖**	3±1.7	1.6±1.7	0.9±0.9	1.6±1.5	−0.7 (−1.0 to −0.4)	<0.001
Percentage of time with glucose level of <70 mg/dl‖	0.7±0.8	0.3±0.3	0.4±0.4	0.4±0.4	−0.1 (−0.4 to 0.1)	NS††
Percentage of time with glucose level of <54 mg/dl‖	0.16±0.16	0.05±0.05	0.09±0.09	0.09±0.10	−0.02 (−0.09 to 0.04)	NA
No. of CGM-measured hypoglycemia events per wk‖‡‡	0.2±0.3	0.1±0.0	0.1±0.2	0.1±0.2	0.0 (−0.1 to 0.0)	NA
Coefficient of variation in glucose levels — %	28±6	27±5	30±5	29±5	0.3 (−0.5 to 1.2)	NA

Subgroup	Mean Glycated Hemoglobin Level: AID group (no.) percentage at baseline/percentage at 13 wk	Mean Glycated Hemoglobin Level: Control group (no.) percentage at baseline/percentage at 13 wk	Treatment Effect (95% CI) percentage points
Overall	(208) 8.2/7.3	(102) 8.0/7.7	−0.6 (−0.8 to −0.4)
Sex			
Female	(100) 8.4/7.4	(48) 8.0/7.7	−0.5 (−0.8 to −0.2)
Male	(108) 8.0/7.2	(54) 8.0/7.8	−0.6 (−0.9 to −0.3)
Age at enrollment			
<50 yr	(48) 8.7/7.2	(29) 8.0/7.9	−1.0 (−1.5 to −0.6)
50 to <65 yr	(83) 8.3/7.3	(48) 8.0/7.6	−0.5 (−0.8 to −0.1)
≥65 yr	(77) 7.8/7.3	(25) 7.8/7.8	−0.4 (−0.9 to 0.0)
Race or ethnic group			
White, non-Hispanic	(125) 8.0/7.1	(65) 7.9/7.8	−0.7 (−1.0 to −0.4)
Other	(82) 8.6/7.6	(37) 8.2/7.7	−0.3 (−0.7 to 0.0)
Body-mass index			
<30	(98) 8.3/7.4	(30) 8.2/7.7	−0.4 (−0.8 to 0.0)
30 to <35	(71) 8.3/7.3	(24) 8.3/7.9	−0.5 (−1.0 to −0.1)
35 to <40	(32) 7.9/7.1	(26) 7.7/7.5	−0.5 (−1.0 to 0.0)
≥40	(47) 8.3/7.3	(22) 7.9/7.9	−0.9 (−1.4 to −0.4)
Glycated hemoglobin level			
<7.0%	(28) 6.4/6.4	(15) 6.5/6.5	−0.1 (−0.7 to 0.5)
7.0 to <8.0%	(71) 7.5/7.0	(40) 7.5/7.4	−0.4 (−0.7 to 0.0)
8.0 to <9.0%	(65) 8.4/7.5	(24) 8.3/8.1	−0.7 (−1.1 to −0.3)
≥9.0%	(44) 10.3/7.9	(23) 9.7/8.6	−1.0 (−1.5 to −0.5)

Time in glucose range of 70–180 mg/dl			
≥60%	(79) 7.4/7.0	(39) 7.3/7.0	−0.1 (−0.5 to 0.2)
30 to <60%	(77) 8.2/7.4	(44) 8.1/7.9	−0.5 (−0.9 to −0.2)
<30%	(52) 9.5/7.6	(19) 9.4/8.8	−1.2 (−1.7 to −0.8)
Use of noninsulin glucose-lowering medications			
None	(46) 8.7/7.3	(12) 8.7/8.4	−1.0 (−1.6 to −0.4)
Other, but no SGLT2i or GLP-1ra	(48) 8.3/7.3	(20) 8.3/8.0	−0.7 (−1.2 to −0.2)
GLP-1ra, but no SGLT2i	(42) 8.1/7.3	(29) 7.8/7.5	−0.3 (−0.7 to 0.1)
SGLT2i, but no GLP-1ra	(29) 8.2/7.5	(17) 8.8/7.5	−0.3 (−0.8 to 0.3)
Both GLP-1ra and SGLT2i	(43) 7.9/7.1	(24) 7.8/7.7	−0.6 (−1.1 to −0.2)
Total daily insulin intake			
<100 units/day	(125) 8.3/7.3	(57) 7.9/7.6	−0.5 (−0.8 to −0.2)
100 to <150 units/day	(55) 8.1/7.2	(27) 8.2/7.9	−0.6 (−1.1 to −0.2)
150 to <200 units/day	(14) 8.0/7.1	(12) 7.7/7.9	−0.7 (−1.4 to 0.0)
≥200 units/day	(9) 7.8/7.0	(6) 8.7/7.7	−0.1 (−1.0 to 0.8)
Duration of diabetes at enrollment			
<5 yr	(30) 8.5/7.3	(9) 8.3/8.0	−0.9 (−1.7 to −0.1)
5 to <10 yr	(29) 8.5/7.2	(10) 8.4/7.8	−0.7 (−1.3 to 0.0)
10 to <20 yr	(69) 8.2/7.3	(38) 8.1/7.9	−0.7 (−1.0 to −0.3)
≥20 yr	(100) 8.1/7.3	(45) 7.8/7.5	−0.4 (−0.7 to −0.1)

Duration of diabetes at enrollment			
<5 yr	(10) 8.5/7.3	(9) 8.3/8.0	−0.9 (−1.7 to −0.1)
5 to <10 yr	(29) 8.5/7.2	(10) 8.4/7.8	−0.7 (−1.3 to 0.0)
10 to <20 yr	(69) 8.2/7.3	(38) 8.1/7.9	−0.7 (−1.0 to −0.3)
≥20 yr	(100) 8.1/7.3	(45) 7.8/7.5	−0.4 (−0.7 to −0.1)
Use of fixed dosing to calculate meal bolus			
Yes	(158) 8.2/7.3	(75) 8.1/7.8	−0.6 (−0.9 to −0.3)
No	(50) 8.2/7.2	(27) 7.9/7.6	−0.5 (−0.9 to −0.1)
C-peptide level			
<0.8 nmol/liter	(108) 8.3/7.3	(46) 8.[illegible]/7.9	−0.6 (−0.9 to −0.3)
≥0.8 nmol/liter	(100) 8.2/7.3	(55) 7.8/7.6	−0.5 (−0.8 to −0.2)
Score on the subjective numeracy survey			
<4.5	(89) 8.2/7.4	(46) 8.1/7.8	−0.5 (−0.9 to −0.2)
≥4.5	(119) 8.2/7.2	(59) 8.0/7.7	−0.6 (−0.9 to −0.3)
Insulin delivery before enrollment			
Multiple daily injections	(199) 8.2/7.3	(98) 8.0/7.7	−0.6 (−0.8 to −0.3)
Pump	(9) 8.1/7.2	(4) 8.2/7.9	−0.6 (−1.8 to 0.5)
Use of CGM before enrollment			
Yes	(141) 8.1/7.3	(77) 7.9/7.7	−0.5 (−0.8 to −0.3)
No	(67) 8.5/7.3	(25) 8.5/7.9	−0.6 (−1.1 to −0.2)



Randomized Controlled Trial > Diabetes Obes Metab. 2024 Feb;26(2):622-630.
doi: 10.1111/dom.15351. Epub 2023 Nov 3.

Should people with type 2 diabetes treated by multiple daily insulin injections with home health care support be switched to hybrid closed-loop? The CLOSE AP+ randomized controlled trial

Yves Reznik [1], Martin Carvalho [2], Salha Fendri [3], Gaetan Prevost [4], Lucy Chaillous [5], Jean Pierre Riveline [6], Hélène Hanaire [7], Séverine Dubois [8], Patrick Houéto [9], Hélène Puschmann, Beata Mianowska [10], Eric Renard [11]

Results

Age (69.7 vs. 69.3 years) and HbA1c (9.25 vs. 9.0) did not differ in MDI and AID at baseline. Compared with MDI, AID resulted in a significant increase in TIR by 27.4% [95% CI (15.0-39.8); $p < .001$], a decrease in time above range by 27.7% and an unchanged time below range of <1%. The between-group difference in HbA1c was 1.3% favouring AID. Neither severe hypoglycaemia nor ketoacidosis occurred in either group. Patient and caregiver satisfaction with AID was high.

Acta Diabetologica (2021) 58:967–969
https://doi.org/10.1007/s00592-021-01715-9

CASE REPORT

Advanced hybrid closed-loop system: first successful clinical case after total pancreatectomy

A. Rizzi[1] · L. Tartaglione[1] · M. Di Leo[1] · S. Alfieri[2] · D. Pitocco[1]

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Diabetes & Metabolism

Volume 51, Issue 2, March 2025, 101619

Short Report

Early use of hybrid closed-loop following total pancreaticoduodenectomy

Alice Larroumet [a], Arthur Marichez [b d], Marion Lamoin [a], Laurence Baillet-Blanco [a], Jean-Philippe Adam [b], Christophe Laurent [b e], Vincent Rigalleau [a], Kamel Mohammedi [a c], Laurence Chiche [b d]

Short Report

Closed-loop insulin delivery systems in patients with pancreatitis or pancreatectomy-induced diabetes: A case series

Menaouar Touimer [a], Hana Charfi [a], Antonio Sa Cunha [b c], Alfred Penfornis [a c], Coralie Amadou [a c]

Acta Diabetologica (2021) 58:967–969
https://doi.org/10.1007/s00592-021-01715-9

CASE REPORT

Advanced hybrid closed-loop system: first successful clinical case after total pancreatectomy

A. Rizzi[1] · L. Tartaglione[1] · M. Di Leo[1] · S. Alfieri[2] · D. Pitocco[1]

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TYPE Original Research
PUBLISHED 11 June 2024
DOI 10.3389/fendo.2024.1347141

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Efficacy of advanced hybrid closed loop systems in cystic fibrosis related diabetes: a pilot study

Marta Bassi[1,2†], Daniele Franzone[2†], Francesca Dufour[2], Giordano Spacco[2], Federico Cresta[1], Giuseppe d'Annunzio[1], Giacomo Tantari[1], Maria Grazia Calevo[3], Carlo Castellani[1], Nicola Minuto[1*] and Rosaria Casciaro[1]

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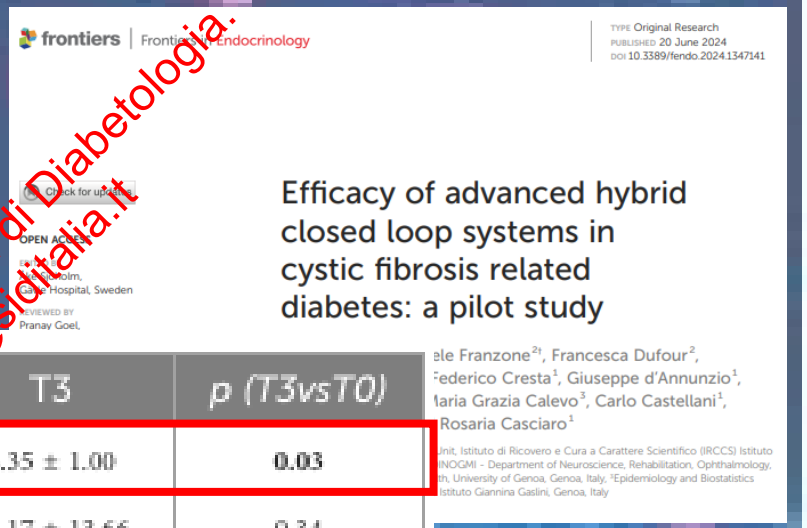
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TYPE Original Research
PUBLISHED 20 June 2024
DOI 10.3389/fendo.2024.1347141

OPEN ACCESS

Efficacy of advanced hybrid closed loop systems in cystic fibrosis related diabetes: a pilot study

ele Franzone[2†], Francesca Dufour[2], Federico Cresta[1], Giuseppe d'Annunzio[1], Maria Grazia Calevo[3], Carlo Castellani[1], Rosaria Casciaro[1]

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	T0	T1	p (T1vsT0)	T2	p (T2vsT0)	T3	p (T3vsT0)
HbA1c %	7.31 ± 0.34	6.81 ± 0.42	0.07	6.57 ± 0.85	**0.01**	6.35 ± 1.00	**0.03**
TIR% (70–180 mg/dL)	60.0 ± 20.0	68.71 ± 16.91	0.17	76.29 ± 13.30	0.06	76.17 ± 13.66	0.34
TAR% (181–250 mg/dL)	22.71 ± 9.39	22.43 ± 10.01	0.53	18.71 ± 10.1	1	18.67 ± 11.55	0.60
TAR% (>250 mg/dL)	15.00 ± 9.93	8.43 ± 8.14	0.14	4.29 ± 3.68	0.06	3.83 ± 4.07	0.07
TBR% (55–69 mg/dL)	1.71 ± 2.14	0.29 ± 0.49	0.07	0.57 ± 0.53	0.13	0.83 ± 0.75	0.27
TBR% (<54 mg/dL)	0.43 ± 0.79	0	0.18	0.03 ± 0.07	0.28	0.33 ± 0.52	0.70
AG (mg/dL)	169.71 ± 32.4	158.86 ± 27.46	0.4	147.57 ± 21.4	0.13	149.0 ± 25.27	0.50
SD (mg/dl)	66.0 ± 17.78	53.50 ± 12.45	0.1	53.67 ± 7.57	0.28	47.00 ± 11.31	0.18
CV (%)	39.00 ± 5.63	33.31 ± 2.94	**0.02**	31.44 ± 3.44	**0.04**	30.23 ± 4.16	**0.05**
Weight (kg)	63.71 ± 11.63			65.69 ± 11.79	0.06	64.30 ± 1.16	0.11
BMI	22.95 ± 3.08			23.66 ± 3.08	0.08	23.38 ± 2.91	0.17
TDI dose (U/kg/day)	0.59 ± 0.29			0.51 ± 0.21	**0.03**	0.50 ± 0.21	**0.03**
FEV1% predicted	79.90 ± 29.62			79.40 ± 30.51	0.81	82.56 ± 30.23	0.81

Case Reports > Diabetes Res Clin Pract. 2024 Aug:214:111789.

doi: 10.1016/j.diabres.2024.111789. Epub 2024 Jul 23.

Managing blood glucose levels with a hybrid closed-loop system in a patient with type 1 diabetes mellitus on enteral nutrition: A case report

Elsa Carnino [1], Sandrine Lablanche [2], Cécile Bétry [3]

Affiliations + expand

PMID: 39053692 DOI: 10.1016/j.diabres.2024.111789

Abstract

The achievement of glycemic management is challenging in patients with diabetes on enteral nutrition, limited literature exists on hybrid closed-loop systems' efficacy in such a situation. We described the case of a patient with type 1 diabetes treated by advanced hybrid closed loop on enteral nutrition with satisfactory glycemic management.

Hybrid closed-loop insulin pump therapy for nocturnal enteral nutrition at home

Timothy William Bodnar [1,2]

BMJ Case Rep 2025

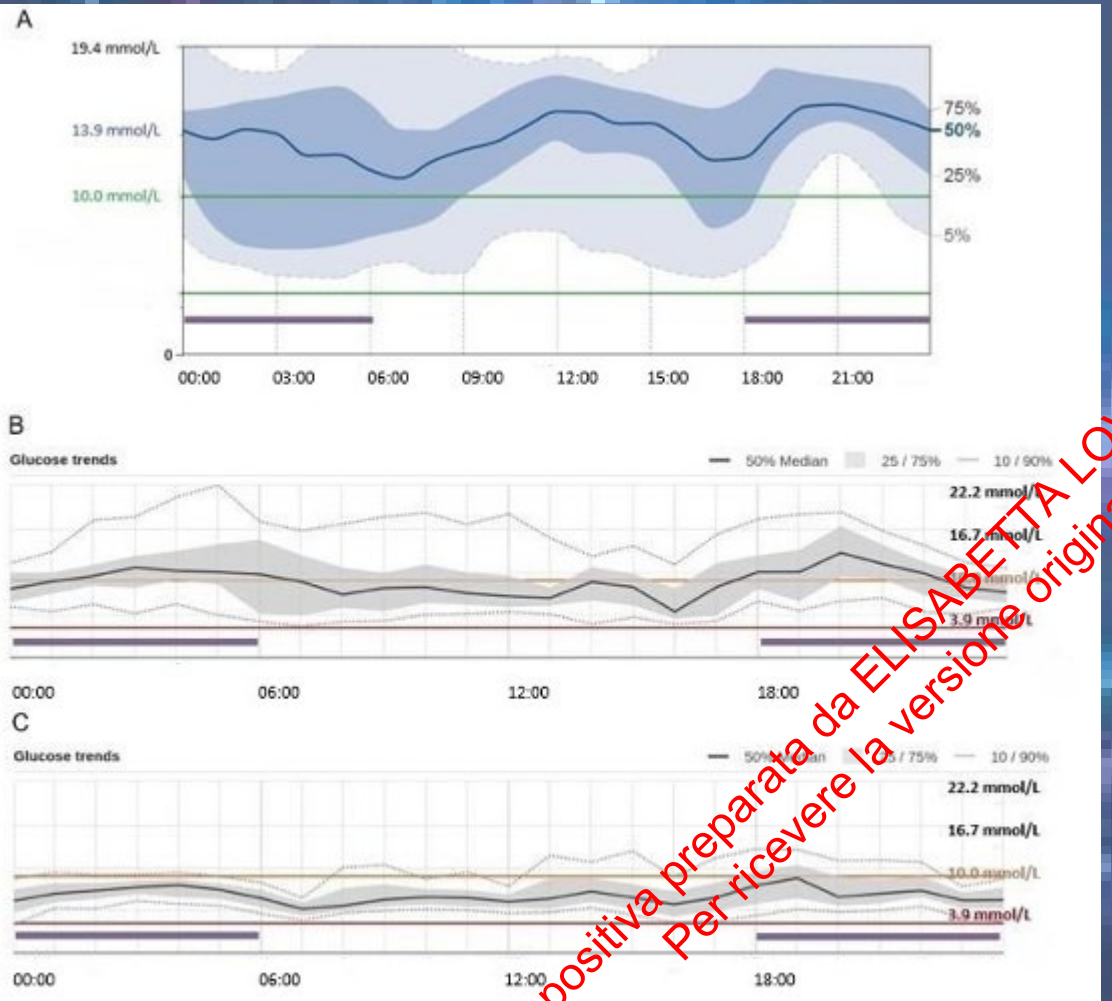

Figure 1 Ambulatory glucose profile from various time points: (A) final 2 weeks on injections (FreeStyle Libre V.2 data); (B) first 2 weeks on insulin pump (Dexcom G6 data); (C) 5th/6th week on insulin pump (Dexcom G6 data). *Purple bars designate hours with enteral tube feeds (18:00–6:00, nightly).*

The patient's transition to the insulin pump led to rapid improvement in glycaemic control. Hemoglobin A1c (A1c) values in the 6 months prior to insulin pump use were 9.1% and 9.4%. 2 months after insulin pump initiation, A1c was 6.9%. There was also a marked reduction in glycaemic lability, especially during the hours of nocturnal tube feed e

Prime due settimane da posizionamento sistema AHCL

Dopo circa 5-6 settimane

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TYPE Case Report
PUBLISHED 31 July 2025
DOI 10.3389/fendo.2025.1611540

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RECEIVED 14 April 2025
ACCEPTED 16 July 2025
PUBLISHED 31 July 2025

Efficacy of an advanced hybrid closed-loop system in a patient with type 1 diabetes and intellectual disability: a case report

Hidetsugu Taka, Keiji Sugai*, Jumpei Shikuma and Ryo Suzuki

Department of Diabetes, M

Donna di 30 anni, dm1 e Sd Shwachman Diamond
Ridotte capacità nelle ADL, Basso quoziente intellettivo
Sempre accompagnata dalla madre alle visite
Scarso compenso glicemico e diversi ricoveri per DKA Tp iniziale MDI, poi CSII, quindi SAP e PLGS all'età di 26 anni
Glicata da 9 a 10%
A 28 anni , in coso di ennesimo ricovero per DKA, posizionato sistema AHCL

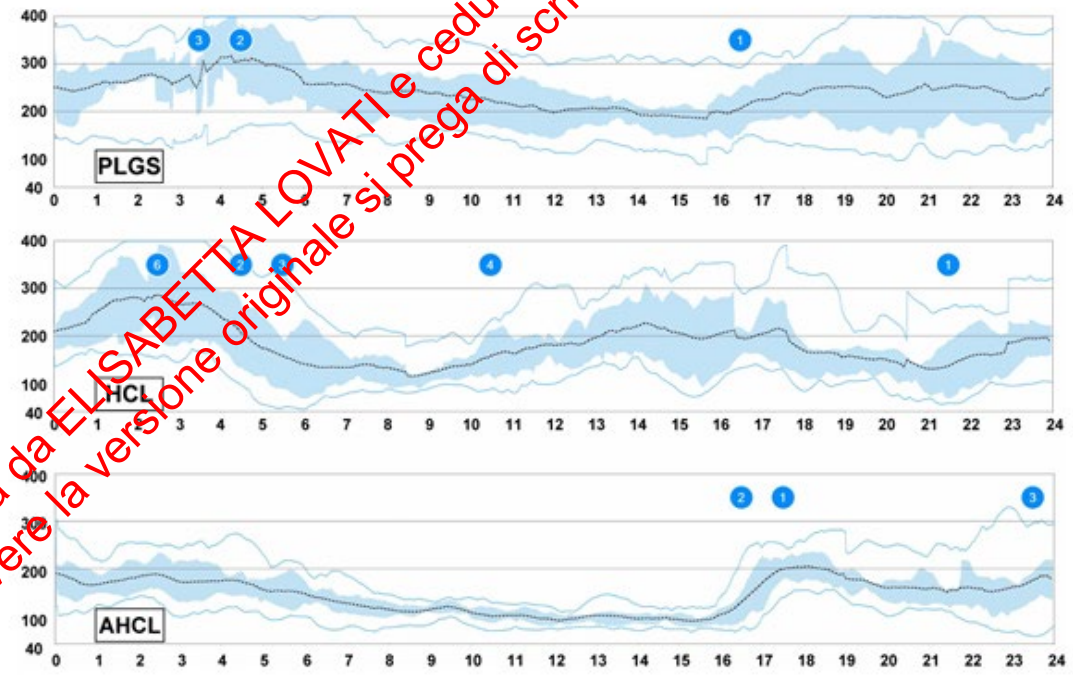

FIGURE
Continuous glucose monitoring graphics under each insulin pump system. The upper panel displays the diurnal glycemic changes under the predictive low-glucose suspend (PLGS) system, the middle panel under hybrid closed-loop (HCL) system (2 months after MiniMed770 initiation), and the lower panel under advanced HCL system (2 months after MiniMed770 initiation). Sensor data were obtained for a period of two weeks. The numbers shown in the graph represent hypoglycemic or hyperglycemic events that are automatically detected by Medtronic's CareLink system. The high and low glucose values are set at the default levels of 180 and 70 mg/dL, respectively.

Grazie per l'attenzione

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Società Italiana di Diabetologia
fondata nel 1964

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1974

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28 NOVEMBRE 2025

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