



Direct Mucosal Application: RECET – Electroporation, Reprogramming Metabolism through Mucosal Architecture Alteration

Andras B. Fecso, MD PhD FRCSC FACS

Minimally Invasive & Bariatric Surgery
Therapeutic & Bariatric Endoscopy

Name: **Andras Fecso** - "XXIX World Congress IFSO – May 2026"



XXIX IFSO World Congress

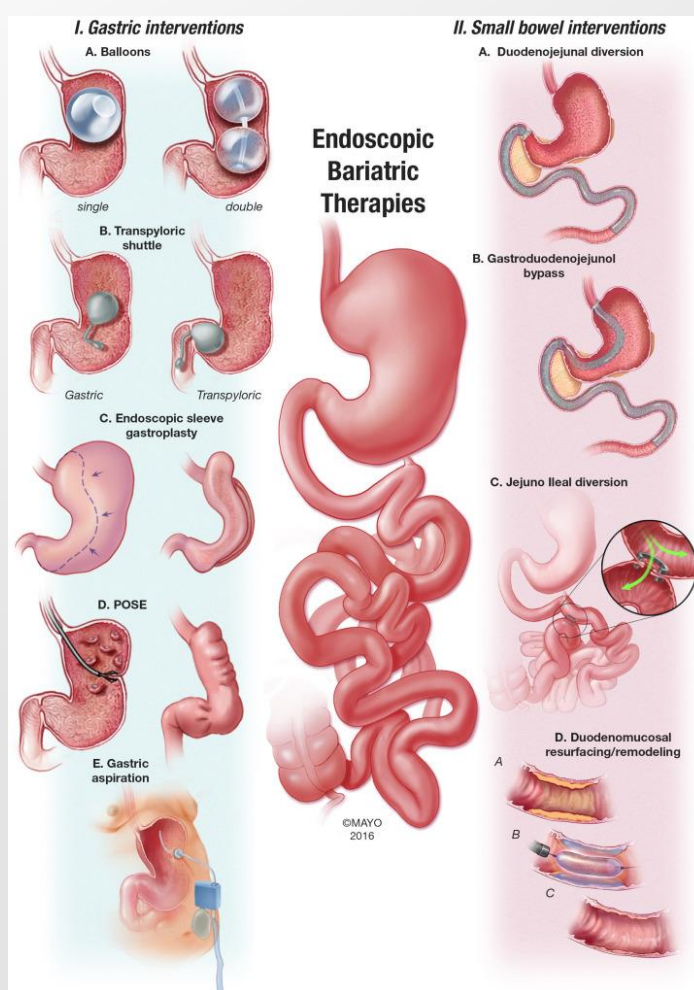
1-4 September 2026
Toronto, Canada

	Speaker	Advisory	Research	Consultant
Boston Scientific				√
Johnson & Johnson				√

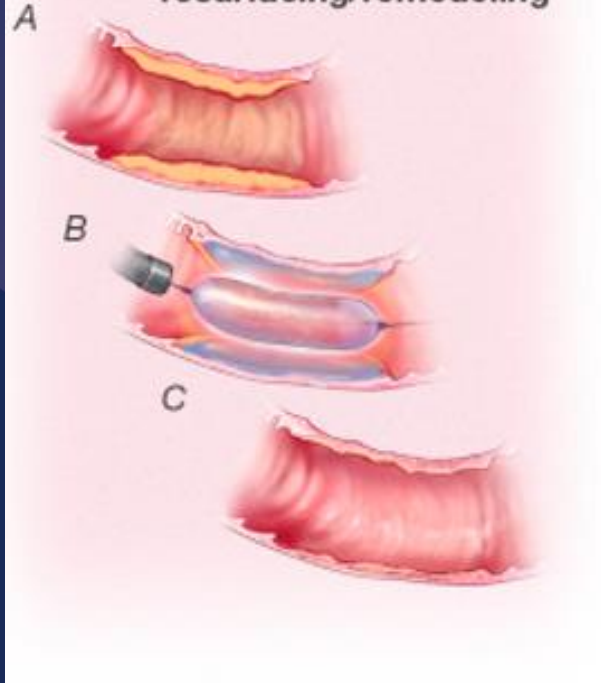
TORONTO2026

**The Future of Obesity Management:
From Weight Loss to Health Gain**



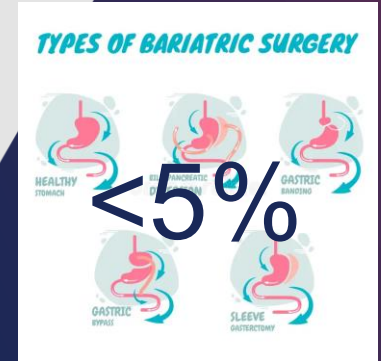


D. Duodenomucosal resurfacing/remodeling



Background

- T2DM  , 500+ Million people by 2030
- Critical physiological and pathophysiological role of small bowel in metabolic homeostasis
- Bariatric surgery has proven to be effective, by altering or excluding the presentation of nutrients to the duodenum



1 - international Diabetes Federation. *IDF Diabetes Atlas*. 6th edn, 2014.

2 - Whiting Dr, guariguata I, Weil c, *et al*. *IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030. Diabetes Res Clin Pract* 2011;94:311–21.

3 - Biertho I, lebel s, Marceau s, *et al*. laparoscopic sleeve gastrectomy: with or without duodenal switch? a consecutive series of 800 cases. *Dig Surg* 2014;31:48–54.

4 - Habegger KM, al-Massadi O, heppner KM, *et al*. Duodenal nutrient exclusion improves metabolic syndrome and stimulates villus hyperplasia. *Gut* 2014;63:1238–46.

5 - Batterham rl, cummings De. Mechanisms of Diabetes improvement Following Bariatric/Metabolic surgery. *Diabetes Care* 2016;39:893–901.

Background

- Target HbA1C < 50 % success



- 1 - Mingrone g, Panunzi s, De gaetano a, *et al.* Bariatric-metabolic surgery versus conventional medical treatment in obese patients with type 2 diabetes: 5 year follow-up of an open-label, single-centre, randomised controlled trial. *Lancet* 2015;386:964–73.
- 2 - Schauer Pr, Bhatt DI, Kirwan JP, *et al.* Bariatric surgery versus intensive medical therapy for diabetes--3-year outcomes. *N Engl J Med* 2014;370:2002–13.
- 3 - Puzziferri n, Roshek TB, Mayo hg, *et al.* long-term follow-up after bariatric surgery: a systematic review. *JAMA* 2014;312:934–42.

Duodenal mucosal resurfacing (DMR)

- Goal is to regenerate the duodenal mucosa to improve glycemia

History of Bariatric Endoscopy

- Garren-Edwards Gastric Bubble FDA approved in 1985 and removed from market in 1992
- Bioenterics Intragastric Balloon (BIB) CE-mark and commercialization; 1997
- Bard EndoCinch Suture System FDA approved for tissue approximation and treatment of symptomatic GERD; 2000

1985-2000



2006

- First instructional DVD on Bariatric Endoscopy (ASGE) - C. Thompson



2012

- First-in-human ESG with Apollo OverStitch - C. Thompson and R. Hawes, India
- ASGE Special Interest Group (SIG) in Bariatric Endoscopy - C. Thompson and N. Kumar
- Launch of Bariatric Endoscopy and Foregut Endosurgery Fellowship at BWH - C. Thompson

2013

- First-in-human Duodenal Mucosal Resurfacing (Revita) - M. Galvao Neto, L. Rodriguez-Grunert and P. Becerra, Chile
- TORe US Multicenter Randomized Sham-controlled Trial (RESTORE Trial) - C. Thompson et al
- First Annual Madrid International Bariatric Endoscopy (MIBE) Course - G. Lopez-Nava
- First Textbook of Bariatric Endoscopy - C. Thompson, Editor



2015

- Founding of the Association for Bariatric Endoscopy (ABE) - N. Kumar, B. Abu Dayyeh, S. Sullivan, S. Jonnalagadda, M. Larsen, C. Thompson (Co-chair), P. Blake (ASGE CEO) and S. Edmundowicz (Co-chair)
- First-in-human ESD-TORe, combining third space and bariatric endoscopy - C. Thompson
- First-in-human Endomina procedure - V. Huberty, Belgium



2018

- Obalon Balloon US Pivotal Trial (SMART Trial) - S. Sullivan et al
- Short-term outcomes of endoscopic sleeve gastropasty in 1000 consecutive patients - A. Alqahtani et al, Saudi Arabia

2022

- ESG US Multicenter Randomized Controlled Trial (MERIT Trial) - B. Abu Dayyeh et al
- FDA Grants De Novo Marketing Authorization to Apollo Endosurgery for Apollo ESGTM and Apollo REVISESM
- Pylorus Sparing Antral Myotomy for weight loss - third space only procedure without suturing - C. Thompson, Boston



- First applications of endoscopic suturing for weight loss
 - First-in-human gastrogastic fistula closure - C. Thompson, Boston
 - First-in-human Transoral Outlet Reduction (TORe) - C. Thompson, Boston
 - First-in-human Endoluminal Vertical Gastropasty (EVG) - R. Fogel, Venezuela
 - 'Director of Bariatric Endoscopy' title created at Brigham and Women's Hospital - C. Thompson



2003



- Predecessor to Endoscopic Sleeve Gastropasty (ESG) - Bard TRIM Clinical Trial; S. Brethauer, B. Chand, P. Schauer and C. Thompson, USA
- First-in-human Primary Obesity Surgery Endoluminal procedure (POSE) - S. Horgan, Argentina
- First-in-human Restorative Obesity Surgery Endoluminal procedure (ROSE) - C. Thompson, Boston
- First-in-human Duodenal Jejunal Bypass Liner (Endobarrier) - L. Rodriguez-Grunert and M. Galvao Neto, Chile

2008



2014

- First US annual Flexible Endoscopic Surgery and Bariatric Endoscopy Course - C. Thompson and L. Swannstrom, Miami Beach
- First-in-human magnetic anastomosis/enteral diversion for metabolic disease - E. Machytko, M. Buzga, M. Ryou, P. Zonca, D. Lautz and C. Thompson, Czech Republic



2017

- Orbera Balloon US Pivotal Trial - A. Courcouas et al
- AspireAssist US Pivotal Trial (PATHWAY Trial) - C. Thompson et al



2021

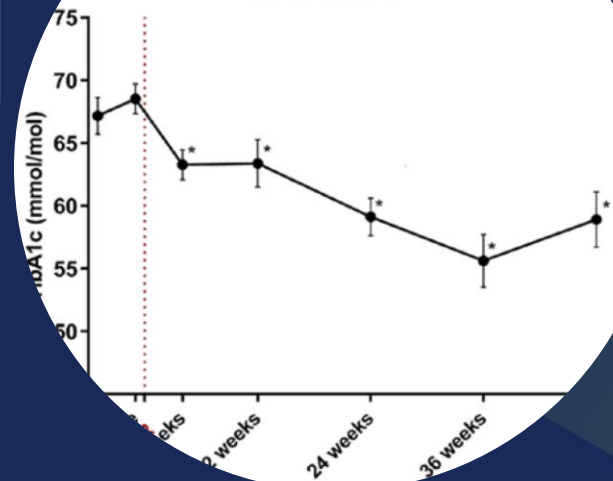
- Five-year Outcomes of ESG - R. Sharaia et al, New York
- First-in-human Gastropasty with Endoscopic Myotomy - combination of third space and primary ESD (GEM) - C. Thompson, Boston
- Spatz Balloon US Pivotal Trial - B. Abu Dayyeh et al

2020

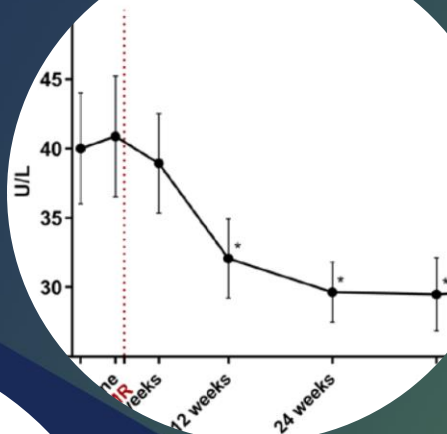
- Bariatric Endoscopy Live (BEL) - Global - E. de Moura, C. Thompson and D. de Moura
- Five-year outcomes of TORe for weight regain after RYGB - P. Jirapinyo et al, Boston



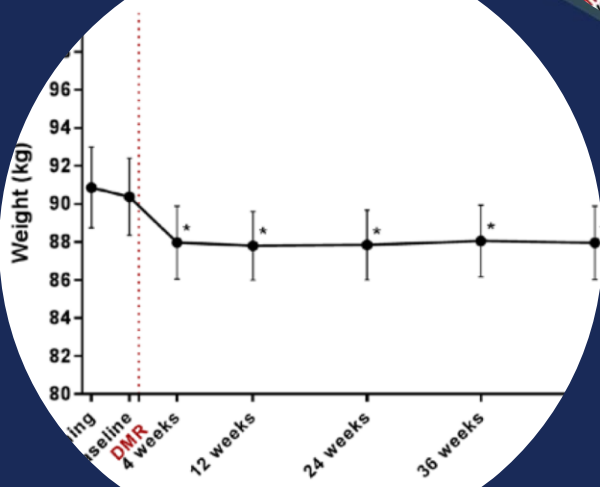
Mean HbA1c



ALT



Weight



[Clinical Trial](#) > [Gut](#). 2020 Feb;69(2):295-303. doi: 10.1136/gutjnl-2019-318349.

Epub 2019 Jul 22.

Endoscopic duodenal mucosal resurfacing for the treatment of type 2 diabetes mellitus: one year results from the first international, open-label, prospective, multicentre study

Annieke C G van Baar¹, Frits Holleman², Laurent Crenier³, Rehan Haidry⁴, Cormac Magee⁵, David Hopkins⁶, Leonardo Rodriguez Grunert⁷, Manoel Galvao Neto^{8,9}, Paulina Vignolo⁷, Bu'Hussain Hayee¹⁰, Ann Mertens¹¹, Raf Bisschops¹², Jan Tijssen¹³, Max Nieuwdorp¹⁴, Caterina Guidone¹⁵, Guido Costamagna¹⁶, Jacques Devière¹⁷, Jacques J G H M Bergman¹

Affiliations + expand

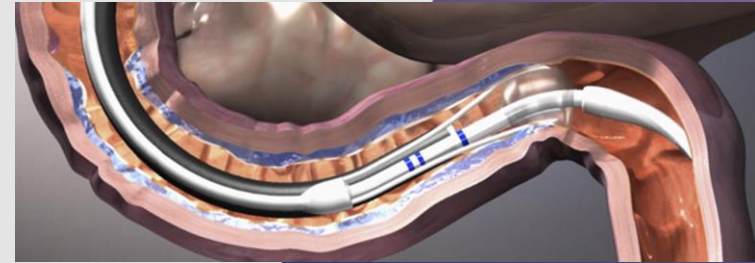
PMID: 31331994 PMID: [PMC6984054](#) DOI: [10.1136/gutjnl-2019-318349](#)



UHN Canada's Hospital

Procedure details

- Single endoscopic session under GA or propofol sedation
- Distal to the ampulla of Vater (marked)
- Insertion of catheter over guidewire, beside the gastroscope
- Submucosal saline injection lift
- Circumferential hydrothermal ablation at 90°C for 10s
- 9-10 cm of duodenum treated, to the Ligament of Treitz



Haidry, Thompson et al. – Duodenal mucosal resurfacing: proof-of-concept, procedural development, and initial implementation in the clinical setting – *Gastrointestinal Endoscopy* – 90:4, Oct 2019, 673-681

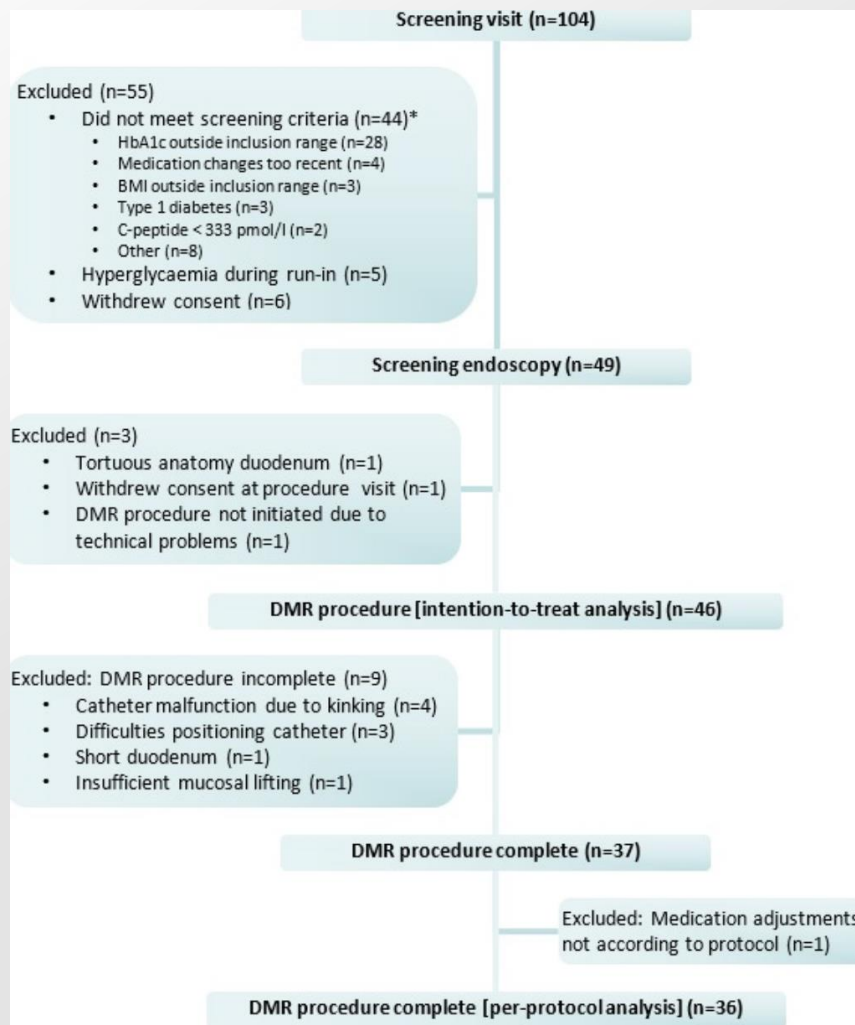


Table 2 Summary of adverse events during study 12 months follow-up period (intention-to-treat population, n=46)

Total number of adverse events (in 44/46 patients)	189 (in 96% of patients)
Not DMR-related adverse events* (in 40/46 patients)	135 (in 87% of patients)
GI symptoms	19
Such as symptoms occurring before DMR or mild abdominal symptoms weeks after DMR	
General symptoms	63
Such as injuries, back pain, headache, pruritus, cough	
Metabolic symptoms	21
Such as hypoglycaemia and hyperglycaemia	
Infections	28
Such as cystitis, common cold, cellulitis	
DMR-related adverse events* (in 24/46 patients)	54 (in 52% of patients)
GI symptoms	40
Such as diarrhoea, abdominal pain, nausea and oropharyngeal pain	
General symptoms	11
Such as malaise, fatigue, musculoskeletal pain and rash	
Metabolic symptoms	3
Such as hypoglycaemia and hyperglycaemia	
Severity of DMR-related adverse events†	54
Mild	44 (81%)
Moderate	10 (19%)
Severe	0 (0%)
Total number of serious adverse events (in 4/46 patients)‡	6 (in 9% of patients)



ELSEVIER

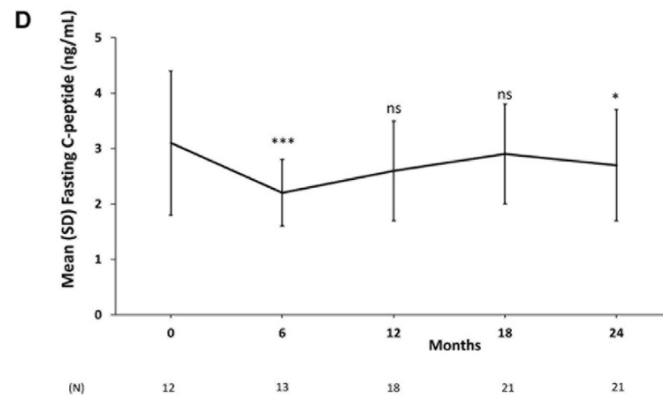
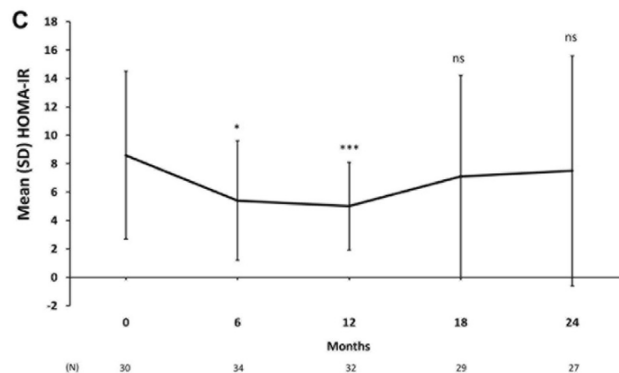
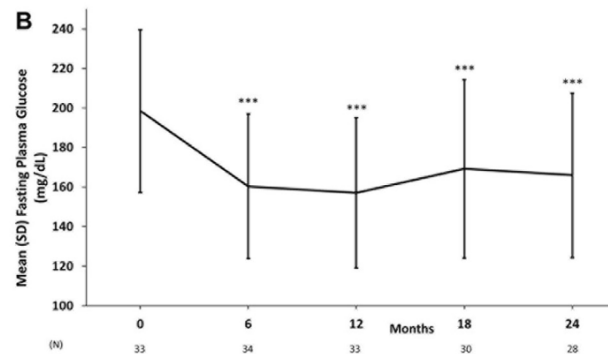
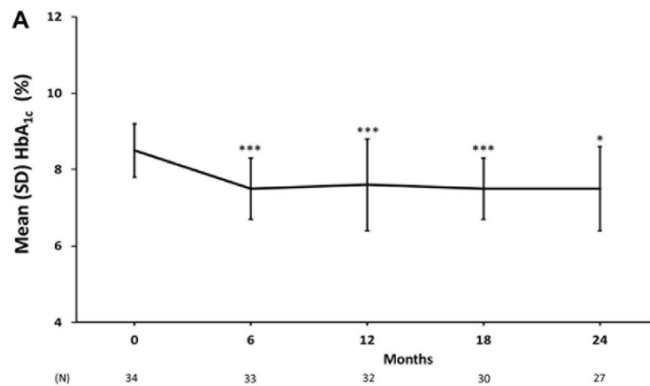
Contents available at ScienceDirect

Diabetes Research
and Clinical Practicejournal homepage: www.elsevier.com/locate/diabresInternational
Diabetes
Federation

Durable metabolic improvements 2 years after duodenal mucosal resurfacing (DMR) in patients with type 2 diabetes (REVITA-1 Study)

Annieke C.G. van Baar^a, Jacques Devière^b, David Hopkins^c, Laurent Crenier^d, Frits Holleman^e, Manoel P. Galvão Neto^f, Pablo Becerra^g, Paulina Vignolo^g, Leonardo Rodriguez Grunert^g, Geltrude Mingrone^{h,i}, Guido Costamagna^{h,j}, Max Nieuwdorp^k, Caterina Guidone^l, Rehan J. Haidry^m, Bu Hayee^c, Cormac Magee^{m,n}, Juan Carlos Lopez-Talavera^o, Kelly White^o, Vijeta Bhambhani^o, Emily Cozzi^o, Harith Rajagopalan^o, Jacques J.G.H.M. Bergman^{a,*}

UHN Canada's
Hospital



Duodenal mucosal resurfacing granted FDA breakthrough label for weight loss maintenance

July 30, 2024 | 1 min read

Recellularization via electroporation therapy of the duodenum combined with glucagon-like peptide-1 receptor agonist to replace insulin therapy in patients with type 2 diabetes: 12-month results of a first-in-human study

[Celine B.E. Busch, MD¹](#) · [Suzanne Meiring, MD, PhD¹](#) · [Annieke C.G. van Baar, MD, PhD](#) ¹  · [Frits Holleman, MD, PhD²](#) · [Max Nieuwdorp, MD, PhD³](#) · [Jacques J.G.H.M. Bergman, MD, PhD¹](#)

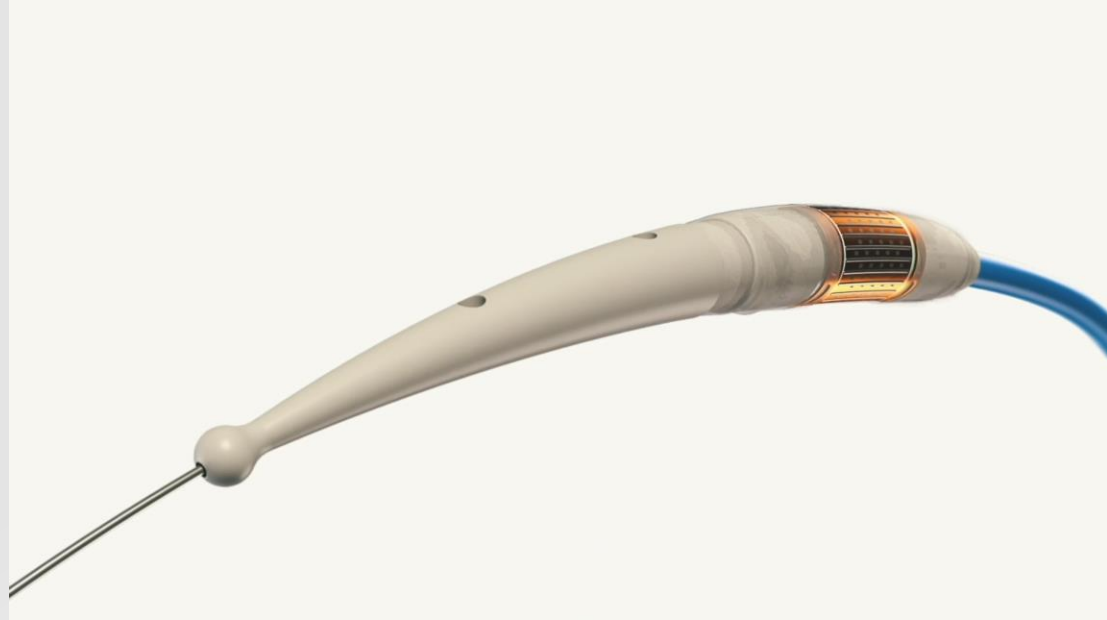
[Affiliations & Notes](#)  [Article Info](#) 

Publication History: Received February 23, 2024; Accepted April 22, 2024; Published online April 28, 2024

DOI: [10.1016/j.gie.2024.04.2904](https://doi.org/10.1016/j.gie.2024.04.2904)  Also available on [ScienceDirect](#) 

ReCET Procedure

- Recellularization via electroporation therapy (ReCET) is an investigational, non-thermal procedure that uses electroporation (PEF – pulsed electric field) to induce cellular apoptosis and subsequent reepithelization



Source – Youtube, Endogenex

In summary...

Collaboration
Vs
Competition



ENDOBIARIATRIC TEAM



Dr. Andras B. Fecso, MD
Surgeon
Endobariatric Program Lead



Dr. Allan Okrainec, MD
Surgeon
Bariatric Program Director



Dr. Tim Jackson, MD
Surgeon
Division Head of General Surgery



Laura Scott, RD, MHM(c)
Patient Care Coordinator
Interdisciplinary EndoBariatric Team Lead



Gifty Mahama, BScN, RN, MN
Bariatric Program Manager



Dr. Sanjeev Sockalingham, MD
Psychiatrist



Intekhab Hossain, MD
Minimally Invasive Surgery Fellow



Kelly Chen, RD
Registered Dietitian



Stella Paterakis, RD
Registered Dietitian



Chau Du, MSc, RP
Psychometrist



Sasha-Ann Winchester, MSW
Social Worker



Mariyam Bajwa, RN
Registered Nurse



Lorraine Whitehead, RN
Registered Nurse



Wei Wang, NP
Nurse Practitioner



Christine Estonilo
Administration

**A Healthier
World**



UHN

**Canada's
Hospital**