LONG-TERM OUTCOMES AFTER ENDOSCOPIC REVISIONS FOR RECURRENT WEIGHT REGAIN AFTER BARIATRIC SURGERY –

RISING THE DATA & PUTTING THE EVIDENCE

Christine Stier
Germany

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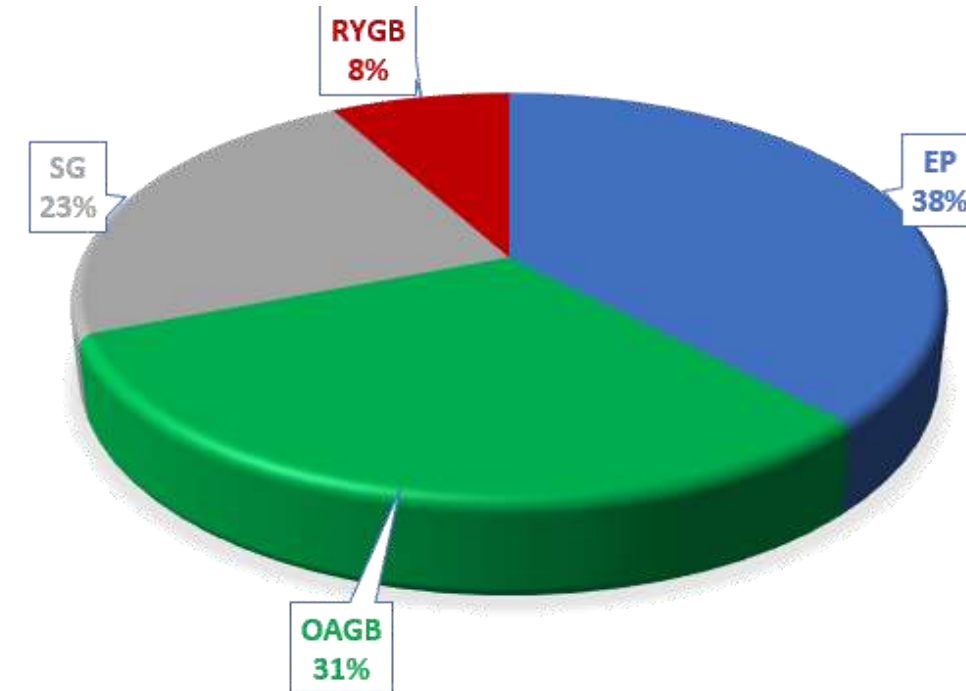NAPOLI
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COIs in accordance with 'EACCME criteria'.

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- Apollo EndoSurgery,   TEXAS
- Johnson & Johnson   Europe & USA
- Lohmann & Rauscher   Germany
- Cranax Medical   France
- NitiNotes   Israel

There was no funding or mutual benefit regarding this presentation
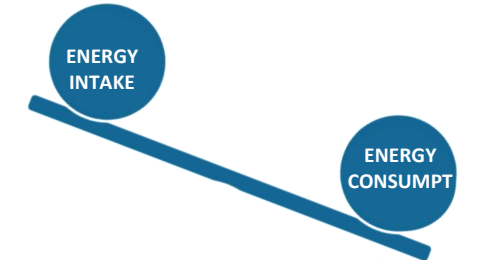
CASE MIX DISCLOSURE. PROCEDURES >> 5000

RYGB 8%
SG 23%
EP 38%
OAGB 31%

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DEFINITION OF RECURRENT WEIGHT REGAIN - INDICATION FOR A REVISIONAL PROCEDURE?
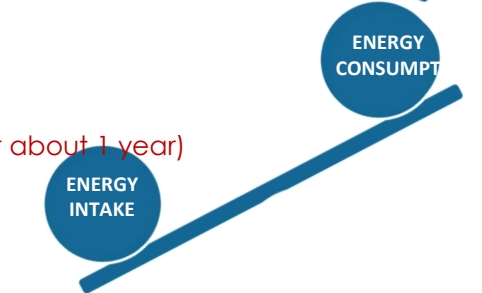
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OBESITY => **CHRONIC ANABOLISM**

BMS => **INDICATES CATABOLISM** (for about 1 year)

NADIR => **WEIGHT EQUILIBRIUM**

WEIGHT REGAIN AFTER BMS => **RECURRENT ANABOLISM**
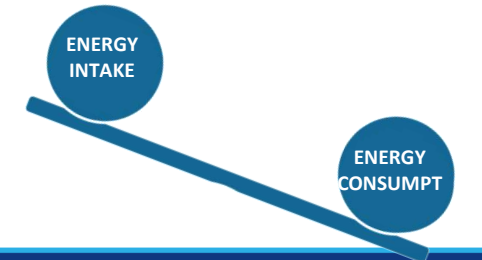
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SUCCESS AND FAILURE OF BMS ARE NOT WELL UNDERSTOOD AND - THEREFORE NOT SOUNDLY DEFINED.

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ORIGINAL CONTRIBUTIONS

Check for updates

Defining Weight Loss After Bariatric Surgery: a Call for Standardization

Brandon T. Grover[1] · Michael C. Morell[2] · Shanu N. Kothari[1] · Andrew J. Borgert[3] · Kara J. Kallies[3] · Matthew T. Baker[1]

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SUCCESS AND FAILURE OF BMS ARE NOT WELL UNDERSTOOD AND - THEREFORE NOT SOUNDLY DEFINED.
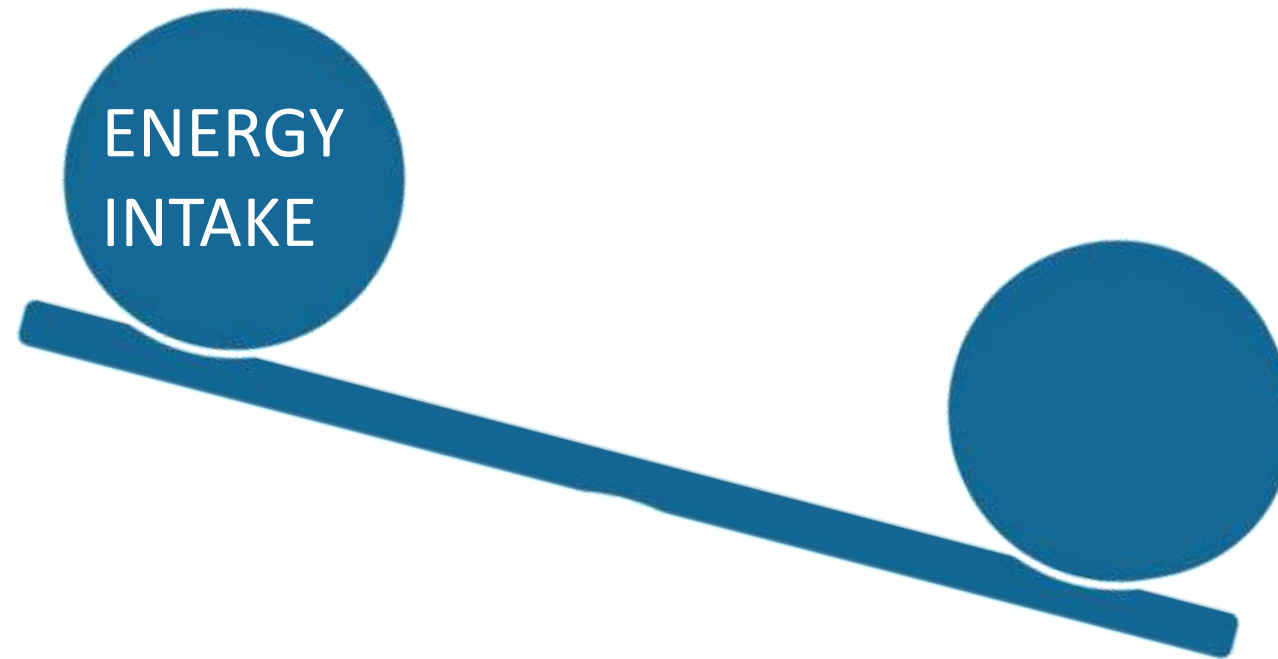
DEFINING THRESHOLDS FOR RE-INTERVENTION

Follow-up interval, years	Maintained BMI $\leq 35 \ kg/m^2$	Did not regain > 25% of nadir EWL	Maintained $\geq 50\%$ EWL	Maintained $\geq 20\%$ TWL
	N met criteria at follow-up/N met at nadir or nadir value available (%)			

DEFINITION OF DISEASE REURRENCE: RE-SWITCH TO ANABOLISM?

BMI, body mass index; EWL, excess weight loss; TWL, total weight loss

Grover et al. Defining Weight Loss After Bariatric Surgery: a Call for Standardization. Obes Surg. 2019 Nov;29(11):3493-3499.

PHYSIOLOGY OF WEIGHT REGULATION AND WEIGHT REGAIN

ENERGY INTAKE

HUNGER.

METABOLIC EATING.
Hypothalamus

=> based on **physical energy requirements**
various neurotransmitters

APPETIT.

HEDONIC EATING
Nucleus accumbens,
Amygdala

=> pleasure-, reward- and impulse- driven

mesolimbic system -> **Dopamin**

Nucleus accumbens
Amydala
Hippocampus

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EQULIBRLIBRIUM

SATIETY   .   **NO FOOD INTAKE**   **=> central effect (hypothalamus, mesolimbic s.)**
SATIATION

    => Primairly **vagal.**   **=> distension** of the **stomach wall**
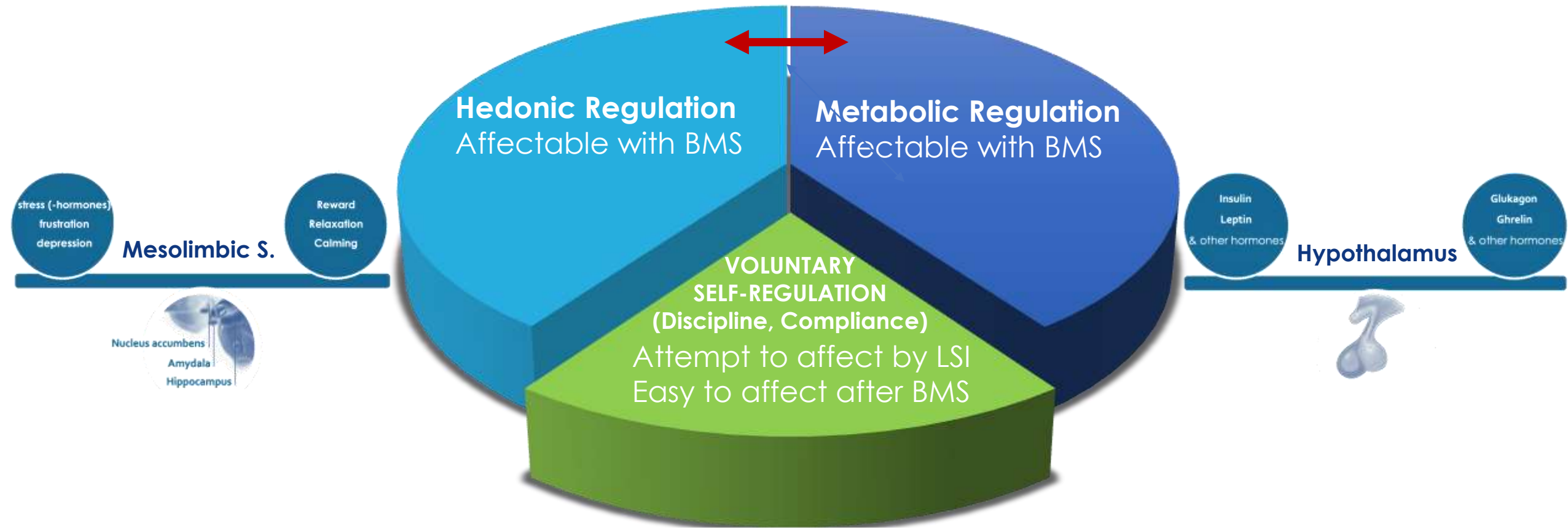   feeling of fullness
                                    => gastric accomodation
                                      gastric emptying speed
                                      depot effect

Restriction

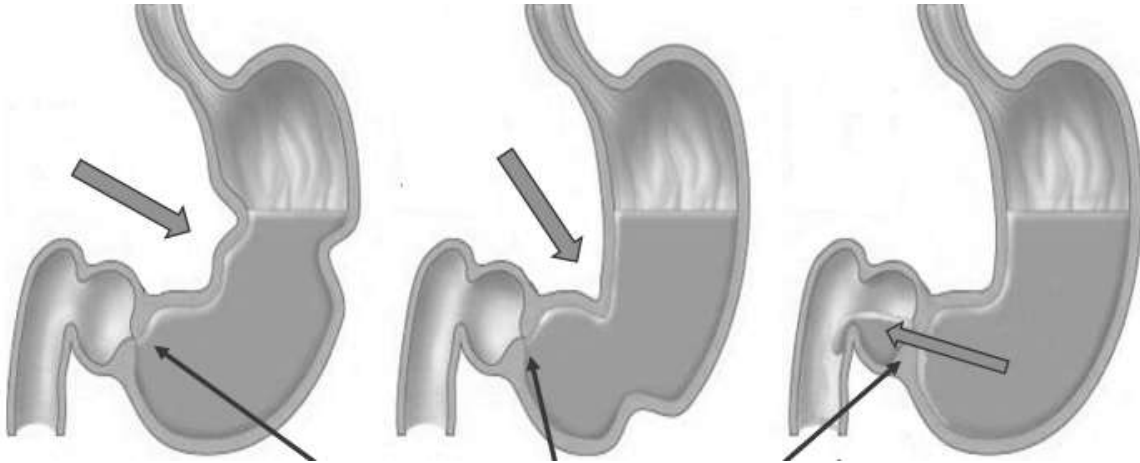   => **hormonal.**   => Inkretins, Adipokine, others.
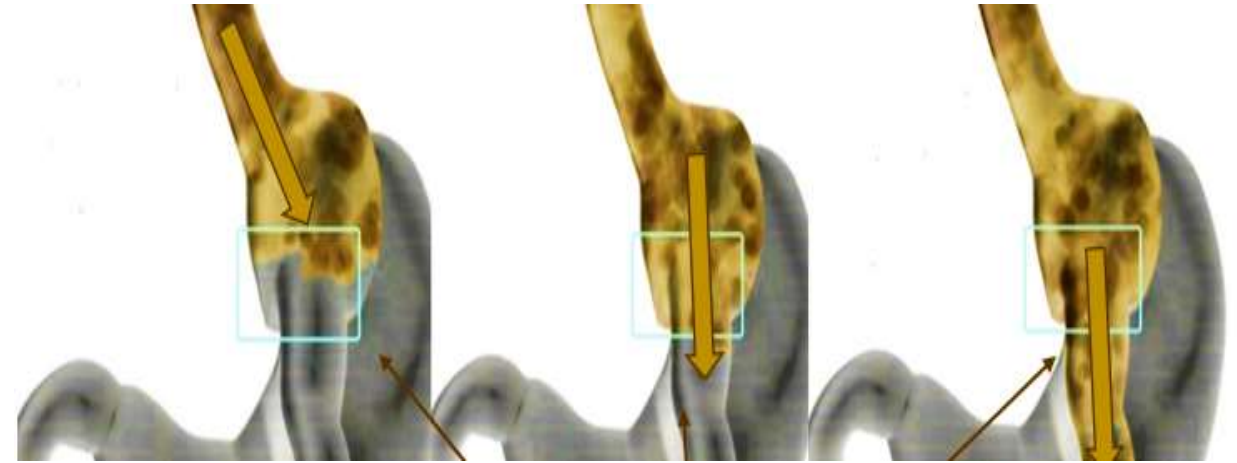
REGULATION OF FOOD INTAKE

ANATOMICAL REASONS FOR WEIGHT REGAIN (RYGB)

WITH BYPASS RECONSTRUCTION, THE MUSCULAR DEMARCATION (PYLORUS) BETWEEN STOMACH AND DUODENUM IS OMITTED.

NATURAL ANATOMY

ACTIVE DEMARCATION AND DISTRIBUTION
PYLORUS

POUCHO-JEJUNOSTOMY

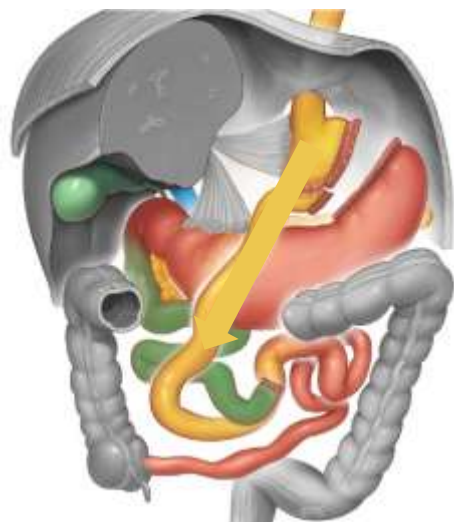PASSIVE OBSTRUCTION, NO DEMARCATION OUTLET

Witdth and resistance of gastric outlet

$\Rightarrow$ **DETERMINES GASTRIC EMPTYING SPEED <=**
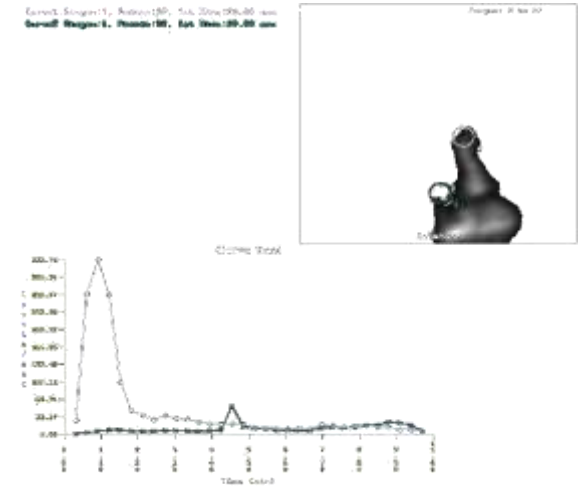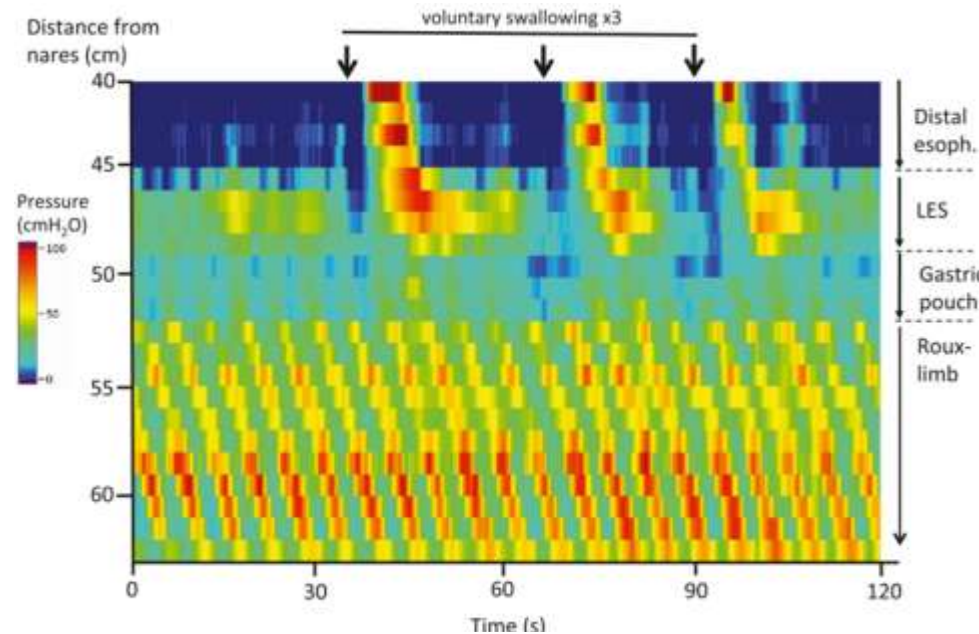
$\Rightarrow$ **CREATES NO VAGAL FEEDBACK**

POUCH AND ROUX LIMB. ONE COMMON PRESSURE SYSTEM

Björklund et al. High-resolution Impedance Manometry after RY-Bypass: Pouch and Roux-Limb act as one system Obes sur 2015: 25 (9)

Figures: Courtesy of IFSO; © Efe Levent

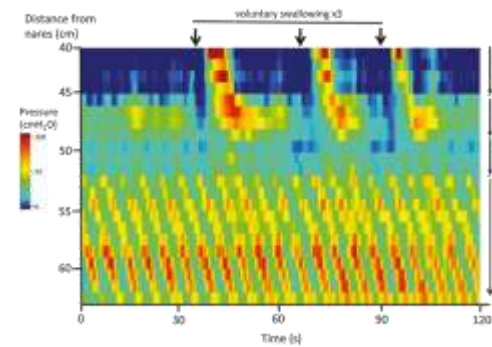**WITH TIME OUTLET DIAMETER ENLARGES AND ADAPTES TO THE DIAMETER OF THE SMALL INTESTINE**

Loss of restriction /obstruction (outlet)   **=>**   **Reduced gastric accommodation**

=>   **Mitigates gastric wall tension**

Grover et al. Defining Weight Loss After Bariatric Surgery: a Call for Standardization.   Obes Surg. 2019 Nov;29(11):3493-3499.

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CONSQUENCES OF AN ENLARGED OUTLET

- abbreviates gastric accomodation

⇒ **Risk of developing dumping symptomes**

- mitigates gastric wall tension

⇒ **Lost of satiety**

⇒ **Regain of weight**

3D-CT-Volumetry

NATURAL EVOLUTION. WITH TIME OUTLET DIAMETER ENLARGES AND ADAPTES TO THE DIAMETER OF THE SMALL INTESTINE

Björklund et al. **High-resolution Impedance Manometry after RY-Bypass: Pouch and Roux-Limb act as one system**. Obes Surg 2015; 25 (9)

Weight regain 2a after BMS – 'DON'T BLAME THE PATIENT!' – RYGB has a functional shortened bowel, and therefor will adapt with hypertrophy

Glucose-like Peptid-2 (GLP-1) => (L-cells)

	Time (minutes)	Preoperative	Postoperative	p
GLP-1 curve (ng/ml)	-15	3.4±0.5	3.3±3	0.853
	0	3.7±0.5	3.2±3	0.674
	15	3.8±0.5	11.2±13.7	0.077
	30	4.2±0.7	13±17.8	0.107
	45	3.6±0.5	7.1±5.4	0.048
	60	3.9±0.7	5.9±5.9	0.297
	90	3.8±0.6	4.2±2.6	0.703
	120	4±0.6	3.9±2.1	0.866
	150	3.7±0.6	3.8±2	0.616
	180	4±0.7	3.3±1.8	0.455
GLP-2 curve(ng/ml)	-15	4.6±3.4	4.5±0.9	0.941
	0	4.7±2.8	4±0.8	0.582
	15	4.8±3	13.9±1.4	<0.0001
	30	5±2.6	14.8±1.7	<0.0001
	45	5±2.7	12.9±1.7	<0.0001
	60	5±2.4	11.5±1.3	<0.0001
	90	5.1±2.8	9.7±1.1	0.002
	120	4.6±2.3	9.1±1	0.001
	150	4.3±2.1	6.9±0.9	0.031
	180	4.6±2.5	7±0.9	0.044
GLP-1 AUC		709.6±320.4	1026±714.3	0.543
GLP-1 IAUC		79.4±108.3	438.2±889	0.1414
GLP-2 AUC		945.3±449.1	1787.9±602.7	0.0037
GLP-2 IAUC		44±306.1	947.5±604	0.0003
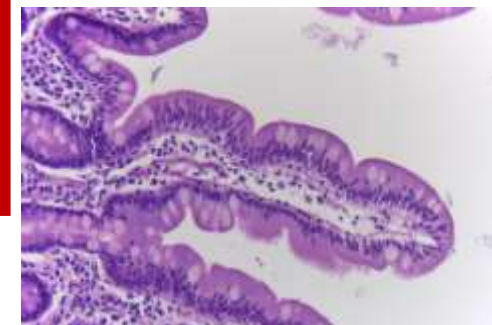
Cazzo E, et al. CORRELATION BETWEEN PRE AND POSTOPERATIVE LEVELS OF GLP-1/GLP-2 AND WEIGHT LOSS AFTER ROUX-EN-Y GASTRIC BYPASS: A PROSPECTIVE STUDY. Arq Bras Cir Dig. 2016 Nov-Dec;29(4):257-259.

Lutz TA, Bueter M. The physiology underlying Roux-en-Y gastric bypass: a status report. Am J Physiol Regul Integr Comp Physiol. 2014 Dec 1;307(11):R1275-91.

GLP-2 level increase after bypass surgery -   **INDICATING BOWEL GROWTH**
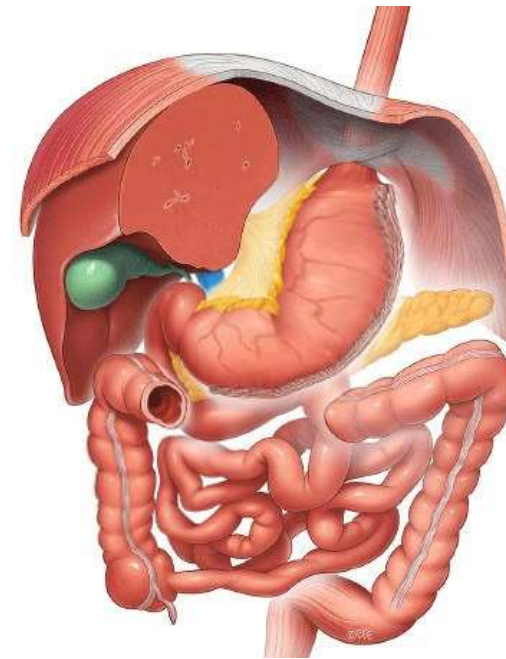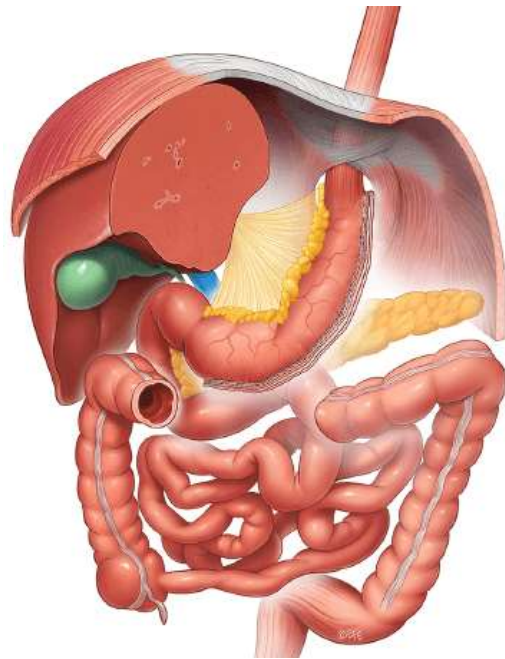
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ANATOMICAL REASONS FOR WEIGHT REGAIN (SG)

anterior view

lateral view

LOST of RESTRICTION

3D-CT-Volumetry

10 cm

DILATATION OF SLEEVE GASTRECTOMY
Lost of restriction   =>   **Mitigates gastric wall tension (vagal mediation)**

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DIAGNOSTICS

DIAGNOSTICS

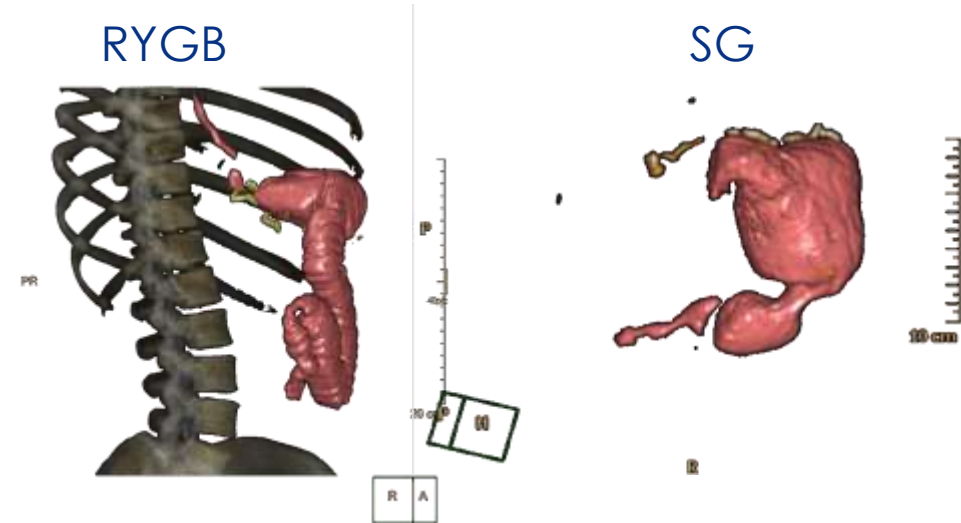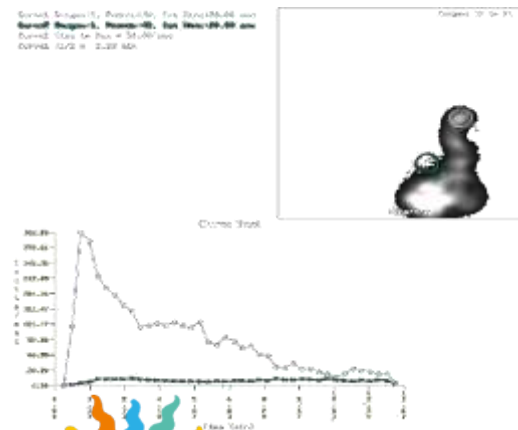RYGB   SG

- **Patient's history**
  - Dumping Score(Sigstad, Art)

- **Nutritional counselling**

- **Upper GI-series** / 3D-CT volumetry

- **Upper endoscopy**

ENDOSCOPIC REVISION FOR RECURRENT WEIGHT REGAIN - RYGB

Transoral OUTLET REPAIR (TORe) – Creation of a Neo-Anastomosis
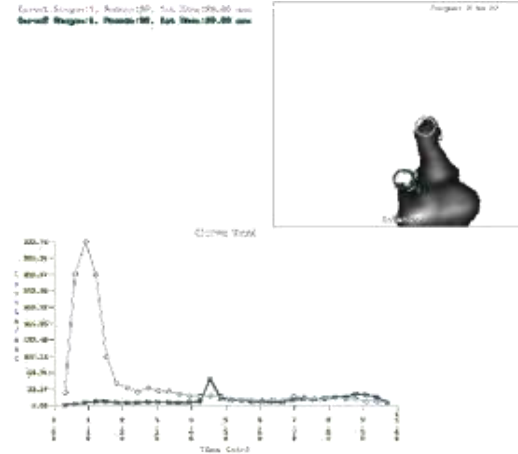
ENDOSCOPIC REVISION FOR RECURRENT WEIGHT REGAIN - SG

REVISIONAL-ESG (R-ESG) after SG

R-ESG as a revisional procedure following enlarged volume in sleeve gastrectomy

REVISIONAL-ESG (R-ESG) after SG

RAISING THE DATA

Research concerning endoscopic re-intervention is promising, and ongoing studies will further substantiate their utility and beneficials.
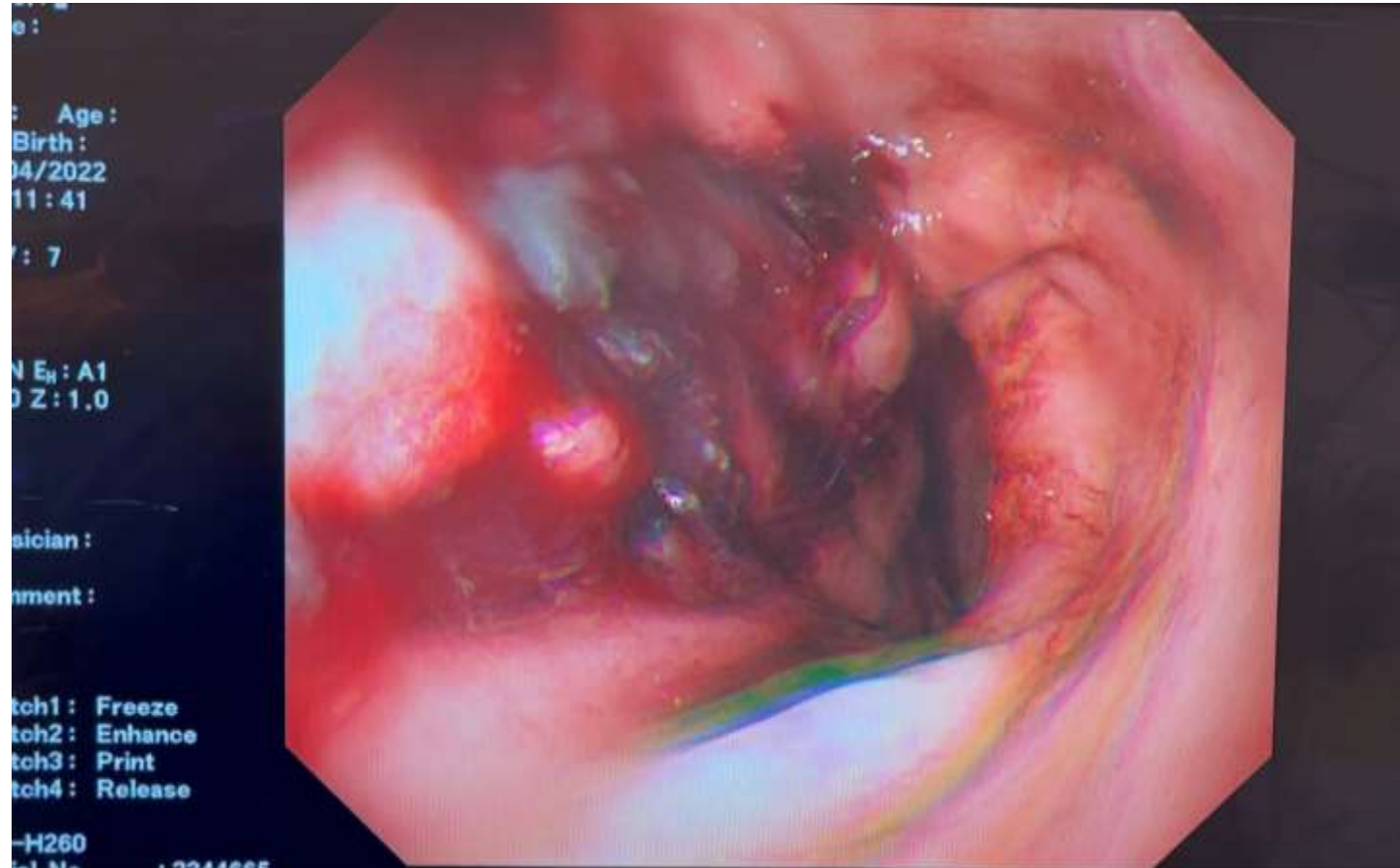
WEIGHT REDUCTION   Results of creating a neo-anastomosis

Endoscopic management of dumping syndrome after Roux-en-Y gastric bypass: a large international series and proposed management strategy

Eric J. Vargas, MD,[1] Barham K. Abu Dayyeh, MD, MPH,[1] Andrew C. Storm, MD,[1] Fateh Bazerbachi, MD,[2] Reem Matar, BSc,[1] Adrian Vella, MD,[3] Todd Kellogg, MD,[4] Christine Stier, MD[5]

Results: One hundred fifteen patients across 2 large academic centers in Germany and the United States underwent TORe for dumping syndrome. Patient age was mean 8.9 ± 1.1 years from their initial RYGB with an average percent total body weight loss of 31% ± 10.6% at the time of endoscopy. Three months postprocedure, the Sigstad score improved from a mean of 17 ± 6.1 to 2.6 ± 1.9 (paired t test $P = .0001$) with only 2% of patients (n = 2) experiencing weight gain. Mean weight loss and percentage of total body weight loss 3 months post-TORe were 9.47 ± 3.6 kg and 9.47% ± 2.5%, respectively. Six patients (5%) failed initial endoscopic therapy, with 50% (n = 3) successfully treated with a repeat TORe. Three patients underwent surgical reversal, indicating an overall 97% endoscopic success rate.

TABLE 2. Baseline characteristics

Variable	Value
Age, y	44.9 ± 9.2
Weight, kg	98.4 ± 22.7
Female, %	84
Baseline weight at time of Roux-en-Y gastric bypass, kg	143.5 ± 26.8
Weight at intervention, kg	98.2 ± 22.6
Baseline Sigstad score	17.02 ± 6.1

Values are mean ± standard deviation unless otherwise defined.

TABLE 3. Postintervention results

Variable	At 3 months	Mean difference	P value
Sigstad score	2.55 ± 1.87	−14.5 ± 5.5	<.0001
Weight, kg	89.4 ± 1.96	−9.3 ± 3.8	<.0001

Values are mean ± standard deviation.

ADDITIONAL TBWL. 10%

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WEIGHT REDUCTION

Five-year outcomes of transoral outlet reduction for the treatment of weight regain after Roux-en-Y gastric bypass

Pichamol Jirapinyo, MD, MPH[1], Nitin Kumar, MD[2], Mohd Amer AlSamman, MD[3], Christopher C. Thompson, MD, MSc[1]

Methods: This was a retrospective review of prospectively collected data on RYGB patients who underwent TORe for weight regain or inadequate weight loss. The primary outcome was efficacy of TORe at 1, 3, and 5 years. Secondary outcomes were procedure details, safety profile, and predictors of long-term weight loss after TORe.

Results: A total of 331 RYGB patients underwent 342 TORe procedures and met inclusion criteria. Of these, 331, 258, and 123 patients were eligible for 1-, 3- and 5-year follow-ups, respectively. Mean body mass index (BMI) was 40 ± 9 kg/m^2. Pre-TORe GJA size was 23.4 ± 6.0 mm, which decreased to 8.4 ± 1.6 mm after TORe. Patients experienced $8.5 \pm 8.5\%$, $6.9 \pm 10.1\%$, and $8.8 \pm 12.5\%$ total weight loss (TWL) at 1, 3, and 5 years with follow-up rates of 83.3%, 81.8%, and 82.9%, respectively. Of 342 TORe procedures, 76%, 17.5%, 4.4%, and 2.1% were performed using single pursestring, interrupted, double-pursestring, and running suture patterns, respectively, with an average of 9 ± 4 stitches per GJA. Pouch reinforcement suturing was

ADDITIONAL TBWL. 8.8% AFTER 5 YEARS

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ENDOSCOPIC THERAPY OPTIONS SG

Revisional endoscopic sleeve gastroplasty of laparoscopic sleeve gastrectomy: an international, multicenter study

Daniel B Maselli [1], Aayed R Alqahtani [2], Barham K Abu Dayyeh [1], Mohamed Elahmedi [2], Andrew C Storm [1], Reem Matar [1], Jose Nieto [3], Andre Teixeira [4], Maryam Al Khatry [5], Manoel Galvao Neto [6], Vivek Kumbhari [7], Eric J Vargas [1], Veeravich Jaruvongvanich [1], Manpreet S Mundi [8], Ameya Deshmukh [3], Mohamad I Itani [7], Jad Farha [7], Christopher G Chapman [9], Reem Sharaiha [10]

Results: Eighty-two adults (92.7% female) experienced 27.9 ± 20.7 kg weight regain from post-LSG nadir weight, prompting R-ESG (mean age, 42.8 ± 10.4 years) at a mean weight of 128.2 ± 57.5 kg. Mean R-ESG procedure duration was 48.3 ± 20.5 minutes, and the median number of sutures used was 4 (interquartile range, 3-4). After R-ESG, TBWL (follow-up %) was 6.6% ± 3.2% at 1 month (81.7%), 10.6% ± 4.4% at 3 months (74.4%), 13.2% ± 10.1% at 6 months (63.4%), and 15.7% ± 7.6% at 12 months (51.2%). In a per-protocol analysis, ≥10% TBWL was achieved by 37 of 51 patients (72.5%) at 6 months and 34 of 42 patients (81.0%) at 12 months; ≥15% TBWL was achieved by 20 of 46 patients (43.5%) at 6 months and 22 of 42 patients (52.4%) at 12 months. Only 1 moderate adverse event occurred in the form of a narrowed gastroesophageal junction, which resolved after a single endoscopic dilation.

Conclusions: R-ESG is a safe and effective means of facilitating weight loss for weight recidivism after LSG, with sustained results at 1 year. R-ESG should be considered before pursuing more-invasive surgical revisional options.

ADDITIONAL TBWL. 15.7% AFTER 12 Months

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ENDOSCOPIC REVISION FOR POOR WEIGHTLOSS AFTER ESG – SINGLE CENTRE (LOPEZ-NAVA G., MADRID)

ORIGINAL CONTRIBUTIONS

Check for updates

Effects of Laparoscopic Sleeve Gastrectomy on Gastric Structure and Function Documented by Magnetic Resonance Imaging Are Strongly Associated with Post-operative Weight Loss and Quality of Life: a Prospective Study

Claudio Fiorillo [1,2] · Giuseppe Quero [1,2] · Bernard Dallemagne [3] · Jelena Curcic [4] · Mark Fox [4,5] · Silvana Perretta [1,3,6]

The controversal discussion about restriction following restriction -

Does only restriction count?   => Yes, it does count most! <=

Remark: Don't forget about the **reduction in metabolic rate**,

          which will **decrease with each episode of weight loss!**

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CONCLUSIONS AND TAKE HOME

- **RESEARCH CONCERNING ENDOSCOPIC REVISIONS IS PROMISING**

- **ONGOING STUDIES WILL FURTHER SUBSTANTIATE THEIR UTILITY AND BENEFICIAL EFFECTS**

- **KEEP ALWAYS IN MIND. OBESITY IS A INCURABLE, CHRONIC DISEASE! WE CAN ONLY PERFORM TO THE BEST OF OUR KNOWLEDGE.**

- **LAST NOT LEAST. RESTRICTION COUNTS A LOT**

THANK YOU FOR YOUR KIND INTEREST