



**SICOB FALL MEETING**  
**LIVESURGERY**  
**28 - 29 OTTOBRE 2024**  
MILANO, FONDAZIONE CARIPLO

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# IO SENZA CAPELLI

## Alopecia/Telogen Effluvium

## INQUADRAMENTO E DIAGNOSI

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# Alopecia/Telogen Effluvium

Eccessiva caduta di capelli in fase telogen per un insulto acuto, in genere temporaneo  
Non-cicatriziale

## Classificazione

**PRIMARIA**/idiopatica

**SECONDARIA**

**ACUTA**

entro 3-4 mesi dall'evento  
scatenante, autolimitante

**CRONICA**

(esordio dopo > 6m,  
Maggiore durata)

# Alopecia/Telogen Effluvium

**Table 1** Recognised causes of

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Telogen hair loss

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Diffuse alopecia areata

Acute telogen effluvium, including telogen  
gravidarum

Thyroid disease

Malnutrition

Iron deficiency

Zinc deficiency

Iatrogenic

Chronic kidney disease

Liver disease

Syphilis

Systemic lupus erythematosus

Idiopathic

## Classificazione:

### CAUSE COMUNI

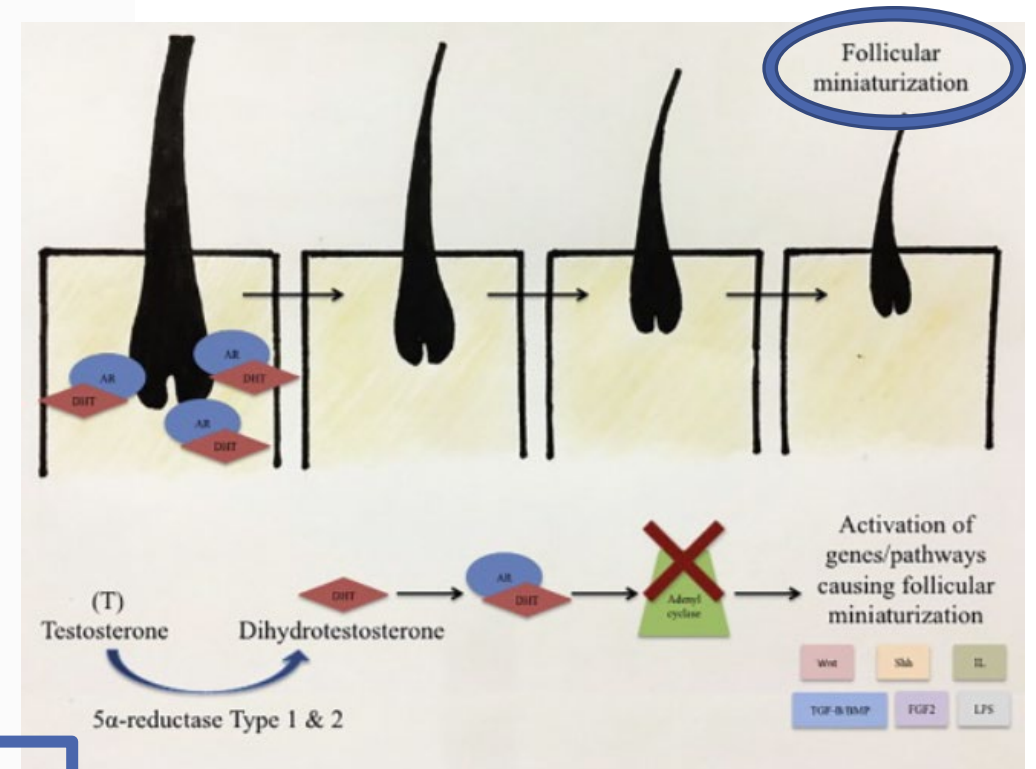
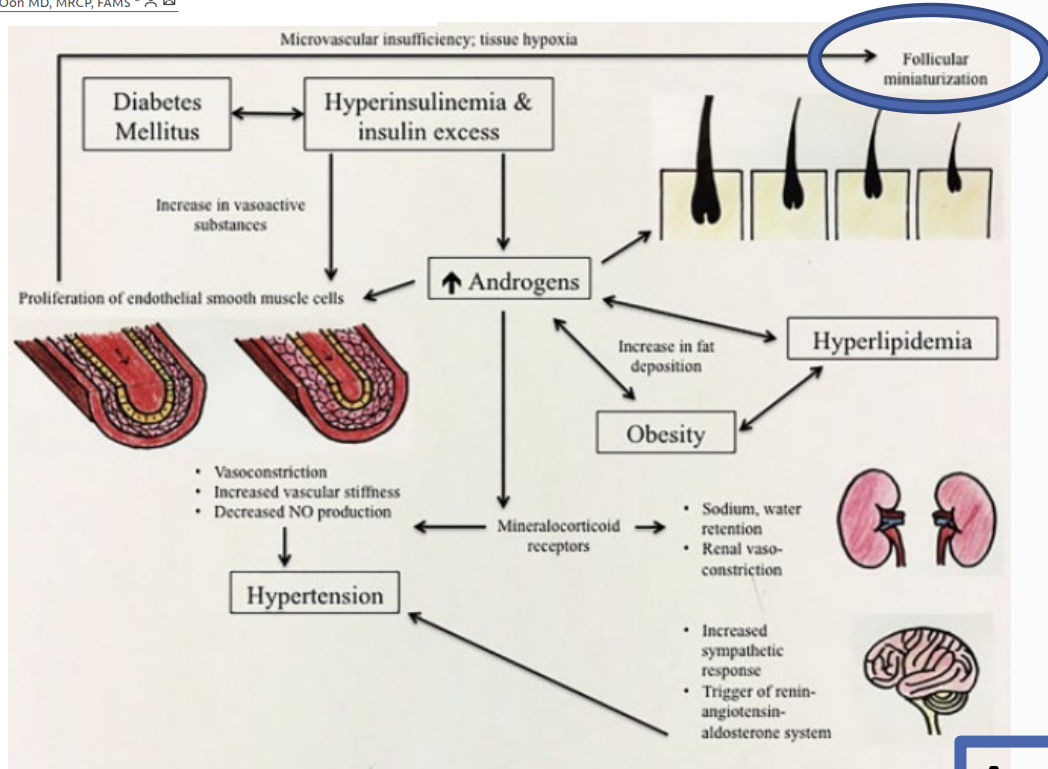
- ✓ Dieta/Restrizione Calorica / Post Chirurgia Bariatrica
  - Carenza di Ferro/Zinco/Vitamine
- ✓ Ansia/Stress/ Patologie psichiatriche
- ✓ Tossicità
  - Farmaci (es. CHT) – Alcool- Fumo
- ✓ Ormonale
  - Tiroide
  - A. Androgenica
  - Sindrome Metabolica
- ✓ Autoimmune (**Alopecia Areata**)

# ALOPECIA ORMONALE

## Alopecia and the metabolic syndrome

Cheryl Lie MBBS<sup>1</sup>, Choon Fong Liew MBBS, MRCP, FAMS<sup>2</sup>,  
Hazel H. Oon MD, MRCP, FAMS<sup>3</sup> ✉

## Sindrome Metabolica & A. Androgenica



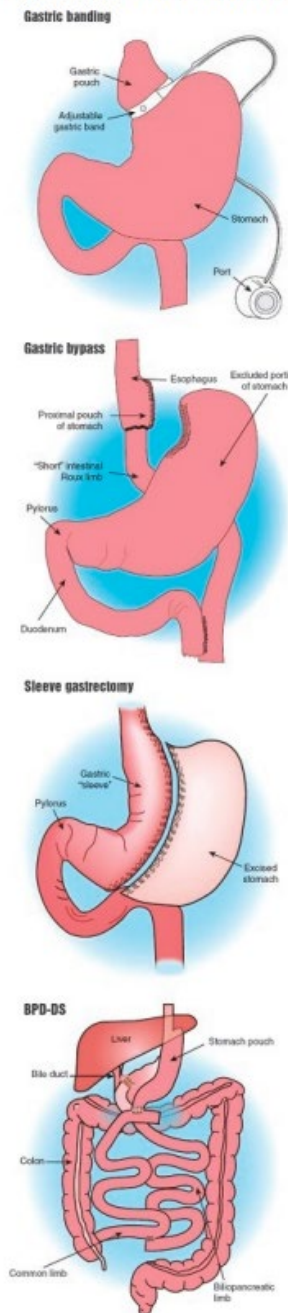
Associazione tra  
- AGA & MetS 25%  
- AGA & PCOS 20-30 %

- Insulino-resistenza
- Ipertensione
- ↑Mineralcorticoidi (cortisolo)
- ↑Diidrotosterone
- SHBG↓

↑DHT

- Disfunzione endoteliale
- Vasocostrizione perifollicolare
- Ipossia
- Insufficienza microvascolare

Figure 1.  
COMMON TYPES OF BARIATRIC SURGERY



# BAR-SITE (Bariatric Surgery Induced Telogen effluvium)

Follicoli Anagen che progrediscono prematuramente alla fase Telogen in seguito all'intervento chirurgico bariatrico

In genere: acuta, secondaria all'intervento chirurgico/calor ponderale  
Si verifica prevalentemente tra le 7 settimane e i 9m successivi  
dura fino 1 anno post-chir

Carenza di Ferro/Zinco/Vitamine  
Ansia/Stress post-chir

2021 Apr 21;13(4):e14617. doi: [10.7759/cureus.14617](https://doi.org/10.7759/cureus.14617)

Eziopatogenesi multifattoriale

# BAR-SITE

**Table 1.** Factors inducing telogen effluvium [9,57].

Factors	Selected Causes
physiological	Postpartum Shedding of the new-born hair Seasonal shedding
infection	COVID-19 Syphilis HIV infection Malaria
endocrine	Hyperthyroidism Hypothyroidism Hormonally active tumors of the ovaries, pituitary, and adrenal glands
organ dysfunction	Renal failure Hepatic failure
stress	Surgery Psychological stress
local causes	Hair transplant Inflammatory disorders of the scalp
Nutritional factors	Crash diets Iron deficiency Zinc deficiency Vitamin B2 or B 12 deficiency Vitamin D3 deficiency
drugs	Antithrombotic drugs: heparin, heparin derivatives, coumarin Cardiology drugs including $\beta$ -blockers ( $\beta$ -adrenolytics), Angiotensin inhibitors, calcium channel blockers. Hypolipidaemic drugs: fibrates, butyrophenone Hormones: androgens, danazole, oral contraceptives
other	Systemic lupus erythematosus Dermatomyositis Systemic sclerosis Keratolytics shampoo Idiopathic causes

**Rapido Calo ponderale** → Malassorbimento  
Insufficiente Intake

**Deficit Nutrizionali**

**Macro e Micro-nutrienti e di Vitamine** →

Proteine

Zinco

Selenio

Rame

Ferro

Vitamine (varie, lipo e idro-solubili)

# BAR-SITE

**Table 2** Logistic regression results showing odds and adjusted\* odds ratios of skin manifestations in patients who had successful versus non-successful weight loss post bariatric surgery

Skin manifestations	Non-successful weight loss patients (N = 24)	Successful weight loss patients (N = 46)	Univariate		Adjusted	
			OR (95%CI)	p-value*	Adjusted OR (95%CI) <sup>a</sup>	Adjusted p-value*
Hair						
Alopecia (%)	10 (41.67%)	31 (67.39%)	2.89 (1.04, 8.02)	0.04*	2.75 (0.88, 8.57)	0.08

Itthipanichpong et al. *BMC Dermatology* (2020) 20:21  
<https://doi.org/10.1186/s12895-020-00120-z>

# BAR-SITE

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Obesity Surgery (2018) 28:3929–3934  
<https://doi.org/10.1007/s11695-018-3433-3>

ORIGINAL CONTRIBUTIONS



## Hair Loss After Laparoscopic Sleeve Gastrectomy

Georgia Katsogridaki<sup>1</sup> · George Tzovaras<sup>1</sup> · Eleni Sioka<sup>2</sup> · Konstantinos Perivoliotis<sup>1</sup> · Eleni Zachari<sup>2</sup> · Dimitrios Magoulitis<sup>1</sup> · Vasiliki Tasiopoulou<sup>1</sup> · Christina Chatedaki<sup>3</sup> · Dimitrios Zacharoulis<sup>1</sup>

56% dei pz dichiarava caduta di capelli

- Zn e Folato si riducevano post-intervento
- B12 bassi livelli pre-intervento

**Table 2** Analysis of variance for hair loss among the groups with and without hair loss

		Hair loss		Total	
		Yes	No		
n		28 (56%)	22 (44%)	50 (100%)	p = 0.23
Gender	Male	5 (10%)	9 (18%)	14 (28%)	p = 0.072
	Female	23 (46%)	13 (26%)	36 (72%)	
Age		38.54 ± 11.04	39 ± 13.1		p = 0.892
BMI	Pre	44.47 ± 6.86	44.49 ± 5.24		p = 0.992
	Post	29.17 ± 5.79	29.52 ± 3.72		
Zinc	Pre	0.61 ± 0.18	0.81 ± 0.16		p < 0.001–0.20 95%CI (– 0.30, – 0.10)
	Post	0.46 ± 0.13	0.73 ± 0.13		
B12	Pre	243.04 ± 69.11	337.41 ± 85.48		p < 0.001–94.37 95%CI (– 138.31, – 50.43)
	Post	261.54 ± 48.83	325.68 ± 76.48		
Hematocrit	Pre	38.96 ± 2.95	40.59 ± 3.59		p = 0.085
	Post	38.93 ± 2.61	39.95 ± 3.15		
Iron	Pre	68.32 ± 22.9	70.86 ± 20.37		p = 0.685
	Post	63.36 ± 22.31	63.91 ± 20.65		
Protein	Pre	6.53 ± 0.41	6.62 ± 0.50		p = 0.487
	Post	6.50 ± 0.40	6.46 ± 0.70		
Albumin	Pre	4.36 ± 0.52	4.51 ± 0.79		p = 0.440
	Post	4.51 ± 0.48	4.62 ± 0.66		
Folic acid	Pre	7.40 ± 3.42	9.75 ± 5.89		p = 0.084
	Post	8 ± 2.81	9.83 ± 3.28		
Postoperative supplements	Yes	20 (40%)	0 (0%)	20 (40%)	p < 0.001
	No	8 (16%)	22 (40%)	30 (60%)	
Iron supplements	Yes	7 (14%)	2 (4%)	9 (18%)	p = 0.146
	No	21 (42%)	20 (40%)	41 (82%)	
Folic acid supplements	Yes	3 (6%)	1 (2%)	4 (8%)	p = 0.425
	No	25 (50%)	21 (42%)	46 (92%)	



# BAR-SITE

**Table 3** Nutritional parameters according to hair loss

## CARATTERISTICHE

### ↑hair-loss

### Donne- Giovani

- Maggior calo ponderale
- Minor apporto calorico e proteico (ST)
- EE sia ST che LT:  
 ↓ urea, creatinina, acido urico, prealbumina  
 ↓ ferritina, emoglobina

**NO differenze** : vit.B6 e altre vitamine, zinco e altri minerali (inclusi selenio, calcio, fosfato, magnesio)

Hair loss	Short term (N = 555)		Long term (N = 494)	
	No	Yes	No	Yes
N (%)	217 (39)	338 (61)	319 (65)	175 (35)
SG/RYGB (%)	48/52	52/48	24/76	20/80
Time from surgery (months)	7.7 ± 2.7	6.7 ± 1.9***	57.6 ± 19.5	58.5 ± 20.1
Men (%)	31	3***	16	2***
Age (years)	44.1 ± 11.5	41.5 ± 10.2*	48.7 ± 10.0	46.1 ± 11.5**
Weight (kg)	93.6 ± 18.4	88.2 ± 16.5***	90.4 ± 19.9	83.2 ± 17.5***
% total weight loss	25.8 ± 7.9	25.2 ± 6.9	27.8 ± 14.1	30.1 ± 10.7
Food intake (Kcal/24 h)	1118 ± 367	977 ± 284***	1327 ± 447	1279 ± 392
Protein intake (g/24 h)	52.1 ± 20.2	44.9 ± 15.2***	58.5 ± 22.8	56.8 ± 21.3
Multivitamins (%)	94.0	96.8	74.9	79.4
Albumin (g/l)	38.6 ± 2.8	38.4 ± 2.5	38.3 ± 3.0	38.1 ± 3.0
Prealbumin (g/l)	0.24 ± 0.07	0.23 ± 0.05**	0.27 ± 0.07	0.25 ± 0.07**
Uric acid (µmol/l)	274 ± 76	254 ± 57**	253 ± 72	233 ± 59**
Plasma urea (mmol/l)	4.68 ± 1.75	4.17 ± 1.25***	5.20 ± 1.63	4.75 ± 1.45**
Urinary urea (mmol/24 h)	307 ± 115	257 ± 97***	348 ± 148	299 ± 104**
Transferrin saturation (%)	25.6 ± 9.8	24.8 ± 9.4	22.9 ± 11.2	19.4 ± 11.7**
Ferritin (µg/l)	119.9 ± 114.3	99.5 ± 82.8*	64.1 ± 61.5	44.8 ± 41.7**
Hemoglobin (g/dl)	13.5 ± 1.4	13.3 ± 1.1	13.2 ± 1.4	12.5 ± 1.6***
Zinc (µmol/l)	12.2 ± 1.9	12.3 ± 1.8	12.6 ± 2.6	12.2 ± 1.9
Vitamin B <sub>6</sub> (nmol/l)	51.1 ± 28.1	59.9 ± 50.5*	46.4 ± 30.7	49.3 ± 16.8
Total number of deficits	3.2 ± 2.1	3.1 ± 1.7	3.3 ± 2.1	3.6 ± 2.3

Data are mean ± SD or % of subjects. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  vs. no hair loss

# BAR-SITE

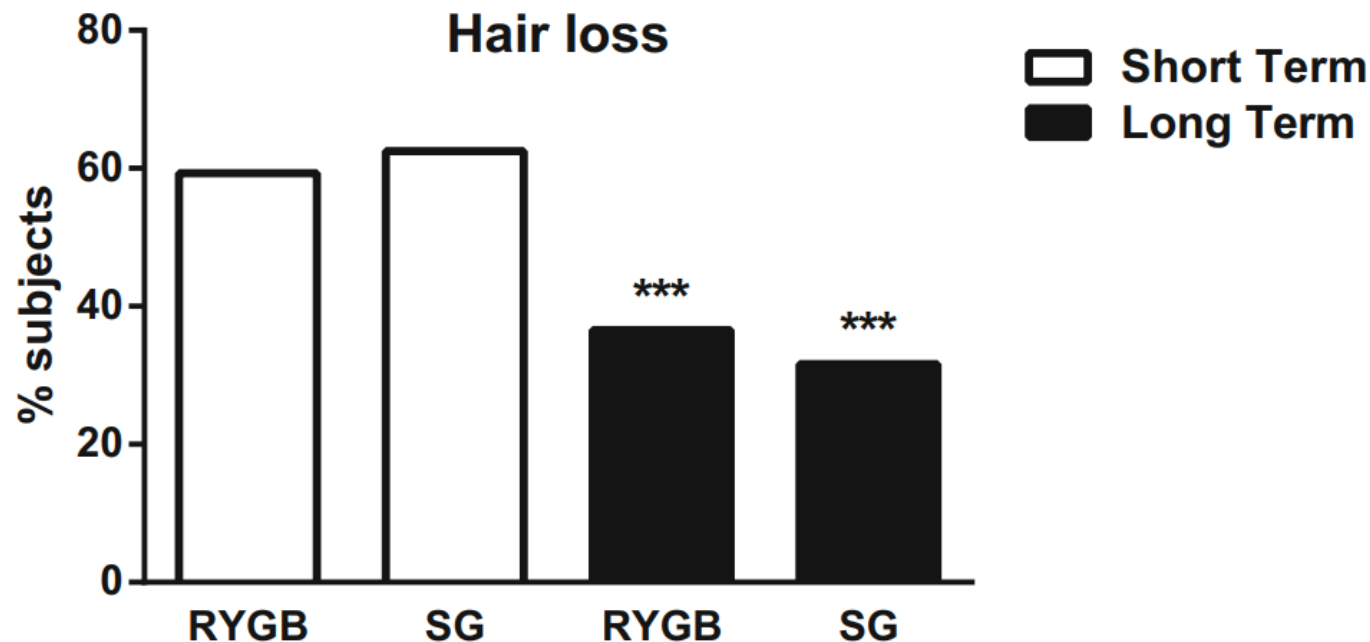
## CARATTERISTICHE

↑ *hair-loss*

### Donne- Giovani

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  - ↓ ferritina, emoglobina

**NO differenze** : vit.B6 e alter vitamine, zinco e altri minerali (inclusi selenio, calcio, fosfato, magnesio)



*ST > LT*

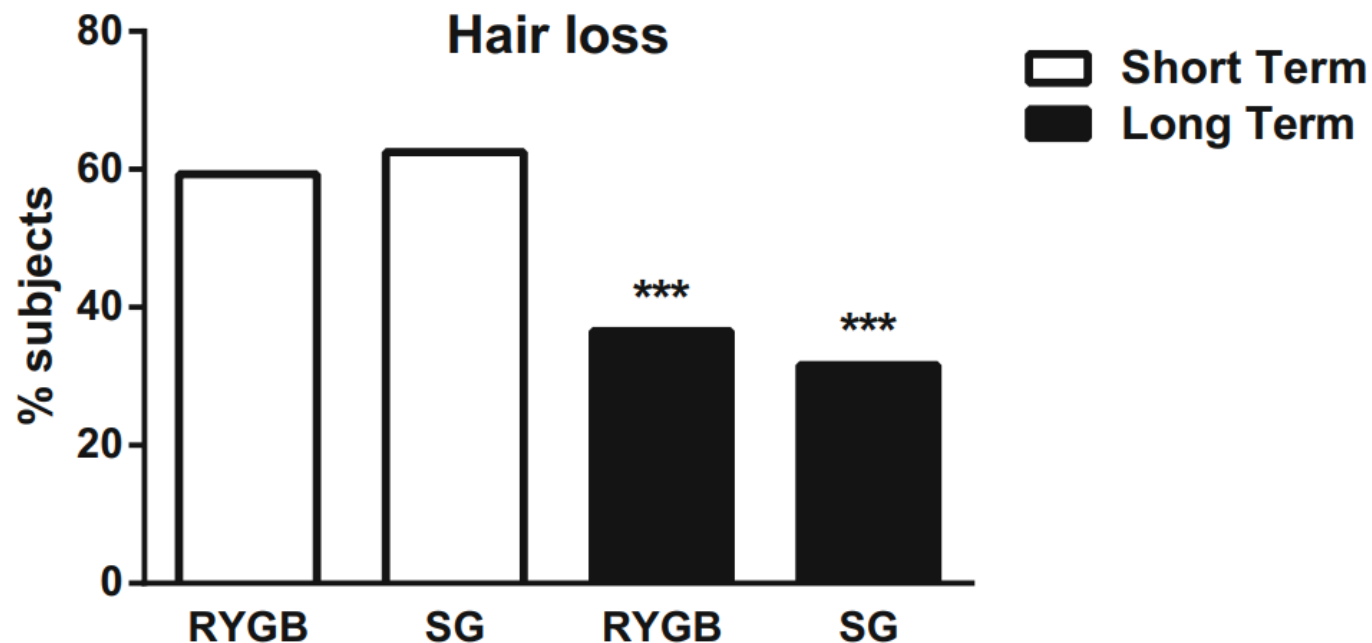
*No differenze tra RYGB e SG*

# BAR-SITE

CARATTERISTICHE

↑hair-loss

Donne- Giovani



*ST > LT*

*No differenze tra RYGB e SG*

- Food intake was lower after SG than after RYGB in the ST but not in the LT and protein intake was significantly lower after SG both in the ST and in LT.
- The number of subjects taking multivitamin and other nutritional complements was lower after SG, especially in the LT

Lupoli R *et al.* Bariatric surgery and nutrition

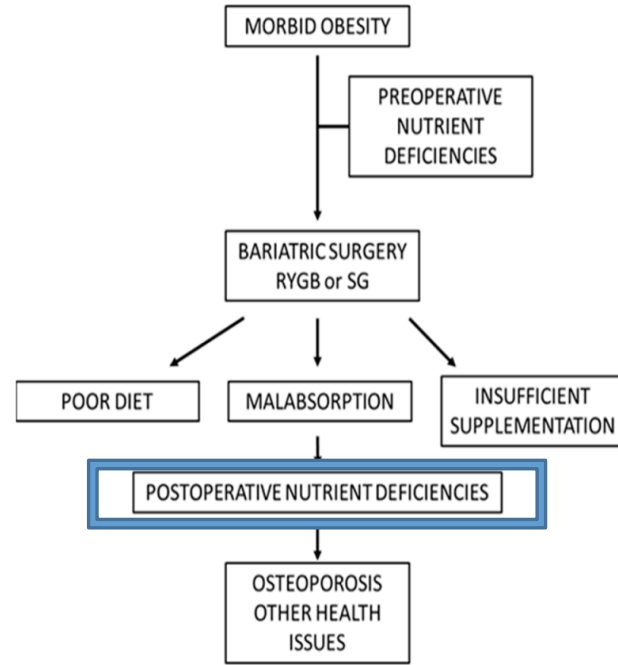


Table 1 Schedule of biochemical and nutritional assessments for the different bariatric procedures

Assessments	Pre-operative	1 mo	3 mo	6 mo	12 mo	18 mo	24 mo	Annually
MOC DEXA							AGB, SG, RYGB, BPD <sup>1</sup>	AGB <sup>3</sup> , SG, RYGB, BPD <sup>1</sup>
Calcium	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>
Magnesium	AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>		RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>
Phosphorus	AGB, SG, RYGB, BPD <sup>1</sup>				AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>
Zinc	AGB, SG, RYGB, BPD <sup>2</sup>		RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>		AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>
Iron	AGB, SG, RYGB, BPD <sup>2</sup>		RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>
Transferrin	AGB, SG, RYGB, BPD <sup>2</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>
Ferritin	AGB, SG, RYGB, BPD <sup>2</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>
Vitamin A	AGB, SG, RYGB, BPD <sup>2</sup>		RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>		RYGB, BPD <sup>1</sup>	RYGB, BPD <sup>1</sup>
Vitamin E	AGB, SG, RYGB, BPD <sup>1</sup>				AGB, SG, RYGB, BPD <sup>1</sup>			
Vitamin D	AGB, SG, RYGB, BPD <sup>2</sup>		RYGB, BPD <sup>2</sup>	RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>		AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>
Vitamin B1	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>		AGB, SG, RYGB, BPD <sup>1</sup>	AGB, SG, RYGB, BPD <sup>1</sup>
Vitamin B6	AGB, SG, RYGB, BPD <sup>2</sup>				AGB, SG, RYGB, BPD <sup>1</sup>			AGB <sup>3</sup> , SG <sup>3</sup> , RYGB <sup>1</sup> , BPD <sup>1,3</sup>
Vitamin B12	AGB, SG, RYGB, BPD <sup>1</sup>			AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>
Parathormone	AGB, SG, RYGB, BPD <sup>2</sup>			AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>	AGB, SG, RYGB, BPD <sup>2</sup>

Reported concentrations of selected elements in human bones

Element	Concentration
Ca	150–250 g/kg
Mg	100–400 mg/kg
Zn	50–260 mg/kg
Cu	0.2–26 mg/kg
Mn	0.1–8 mg/kg

# TAKE HOME MESSAGES

**FU nutrizionale**, preoperatorio prima e successivamente post-operatorio, mirato a correggere TUTTE le deficienze nutrizionali per ridurre il rischio di TE ma non solo

## **BAR-SITE** (Bariatric Surgery Induced Telogen effluvium)

Nella prevenzione e nel trattamento post-operatorio è importante attenzionare e/o supplementare:

- Proteine
- Minerali: Zinco- Selenio- Rame- Ferro
- Vitamine: Folato, B12, liposolubili (nella chir malassorbitiva)

# TAKE HOME MESSAGES

**FU nutrizionale**, preoperatorio prima e successivamente post-operatorio, mirato a correggere TUTTE le deficienze nutrizionali per ridurre il rischio di TE ma non solo

**BAR-SITE (Bariatric Surgery Induced Telogen effluvium)** è frequente:

- nel I anno post-chir
- nelle donne di giovane età (BIAS?)
- nei casi di rapido e maggiore calo ponderale
- L'aumento del rischio è maggiore nelle donne e nei pz con MetS o PCOS (AGA)
- Non si notano differenze nell'incidenza tra RYGB e SG



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*Grazie*

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