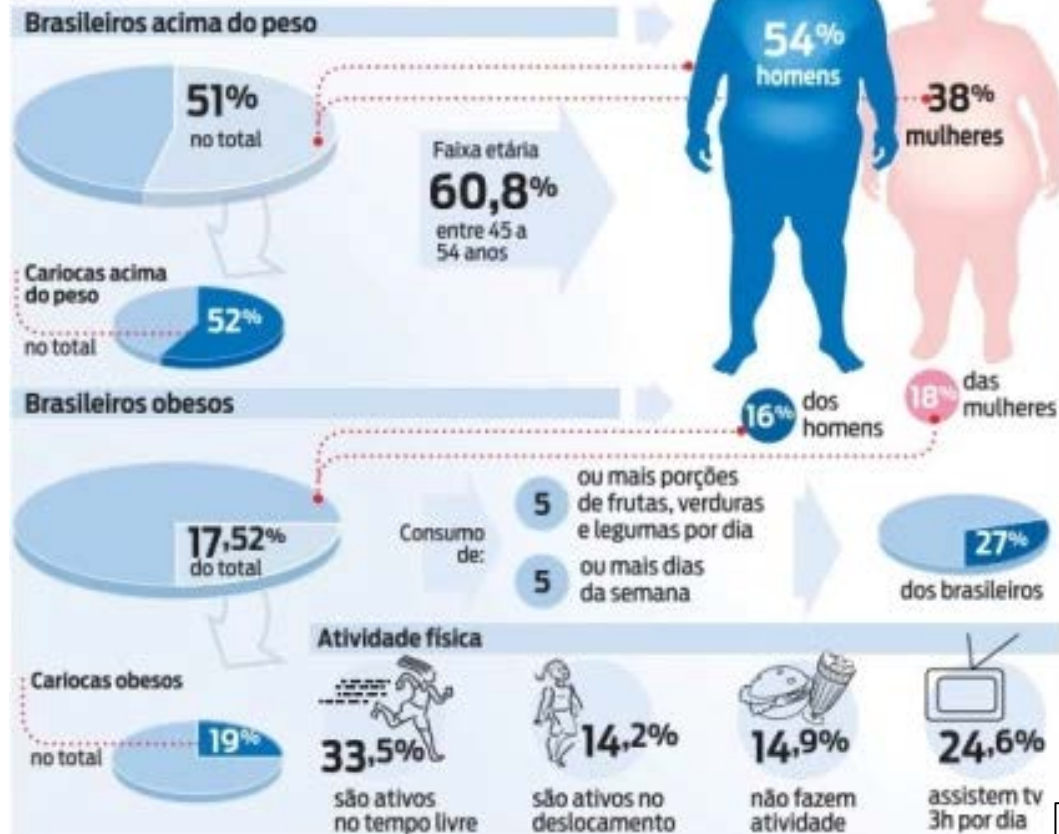


# **Gestação em Situações Especiais - Pós Cirurgia Bariátrica**

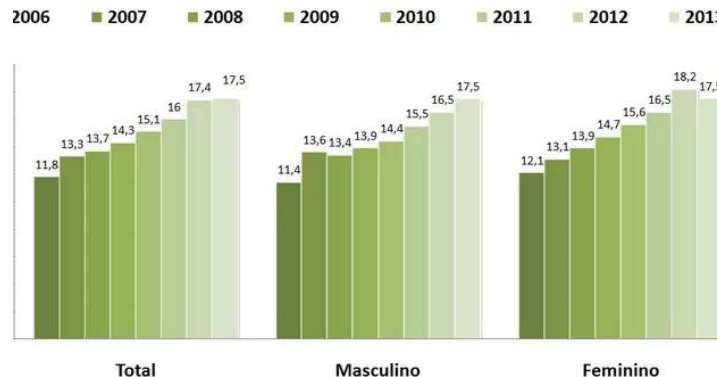
**Prof. Dra. Roxana Knobel**  
**UFSC / 2018**

## País dos gordinhos

Pesquisa do Ministério da Saúde foi feita com 45,4 mil pessoas acima de 18 anos, em todas as capitais, entre julho de 2012 e fevereiro de 2013.



# Obesidade no Brasil

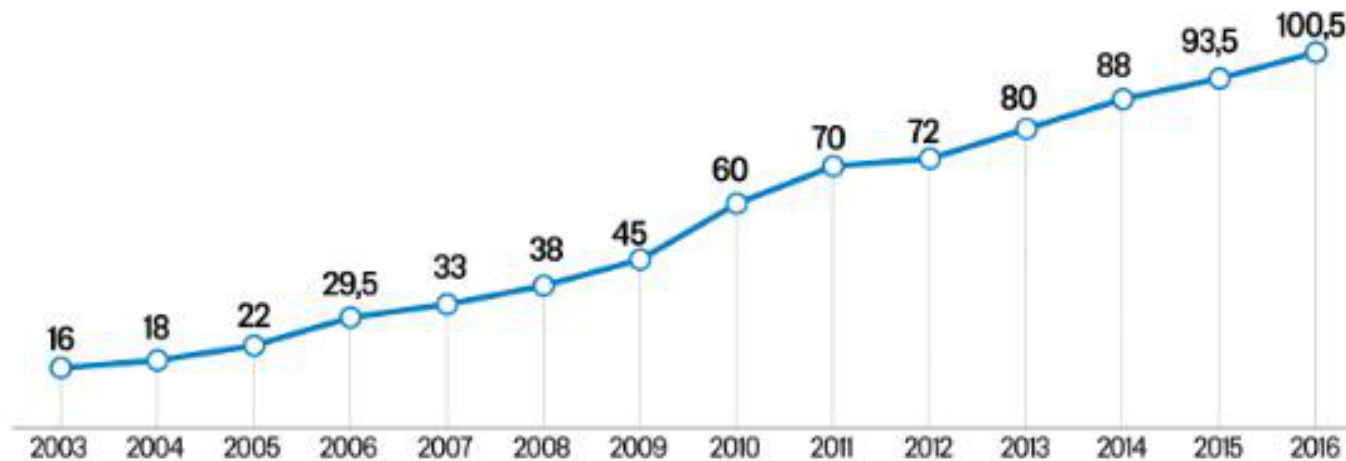


<http://www.sobrepeso.com.br/numero-de-obesos-no-pais-estaciona-mas-ainda-e-alarmanete-diz-pesquisa/grafico-obesidade-no-brasil/>

# Cirurgias Bariátricas - Brasil x 1000

## CIRURGIAS MULTIPLICADAS

Dados da Sociedade Brasileira de Cirurgia Bariátrica e Metabólica mostram grande aumento em 2016 de cirurgias bariátricas no país, em milhares



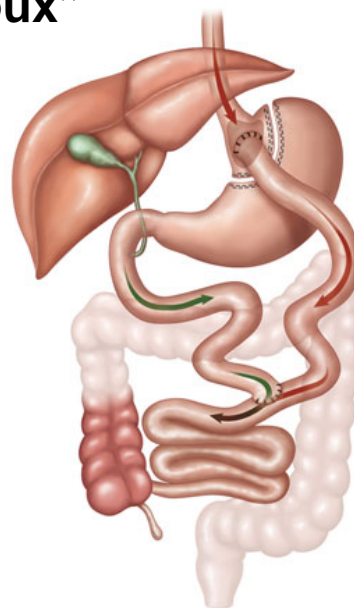
Cerca de  
**80%**  
realizadas em  
mulheres em  
idade  
reprodutiva

# Cirurgia Bariátrica - Tipos

## ***Bypass gástrico***

### **Gastroplastia com desvio intestinal em “Y de Roux”**

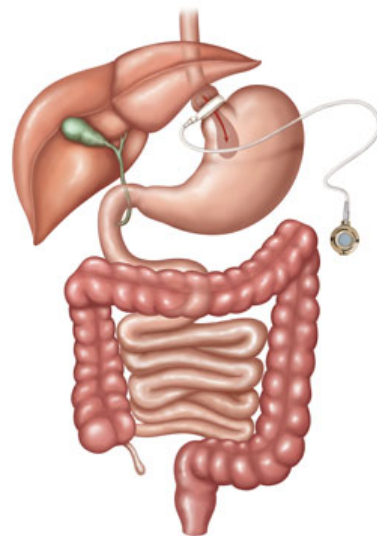
- 75% das cirurgias realizadas
- Perda de 40 a 45% do peso inicial
- Grampeamento do estômago
- Desvio do intestino
- ↑ hormônios da saciedade e ↓ fome
- Restrição e Má absorção



# Cirurgia Bariátrica - Tipos

## Banda gástrica ajustável

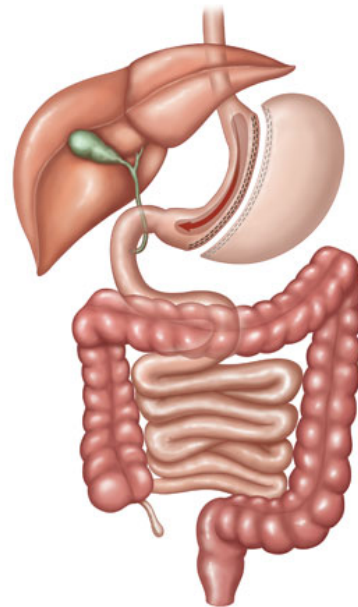
- Início em 1996
- 5% das cirurgias realizadas
- Perda de 20 a 30% do peso inicial
- não altera os hormônios
- Anel de silicone inflável ajustável
- Controla o enchimento do estômago
- Restrição



# Cirurgia Bariátrica - Tipos

## Gastrectomia vertical (Sleeve)

- Início em 2000
- Estômago transformado em um tubo
- Boa perda de peso (> banda gástrica)
- Boa eficácia no controle da hipertensão e
- doenças dos lípidos
- Restritiva

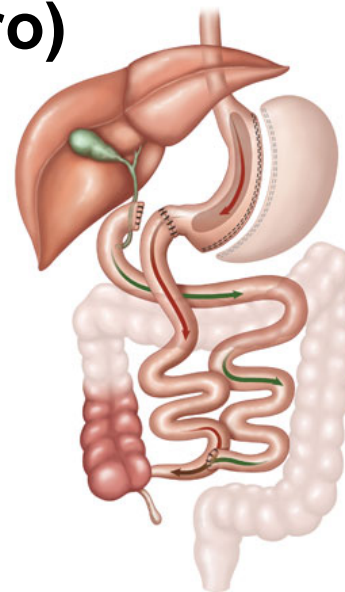


Sociedade Brasileira de Cirurgia Bariátrica e Metabólica

# Cirurgia Bariátrica - Tipos

## Duodenal Switch (cirurgia de Scopinaro)

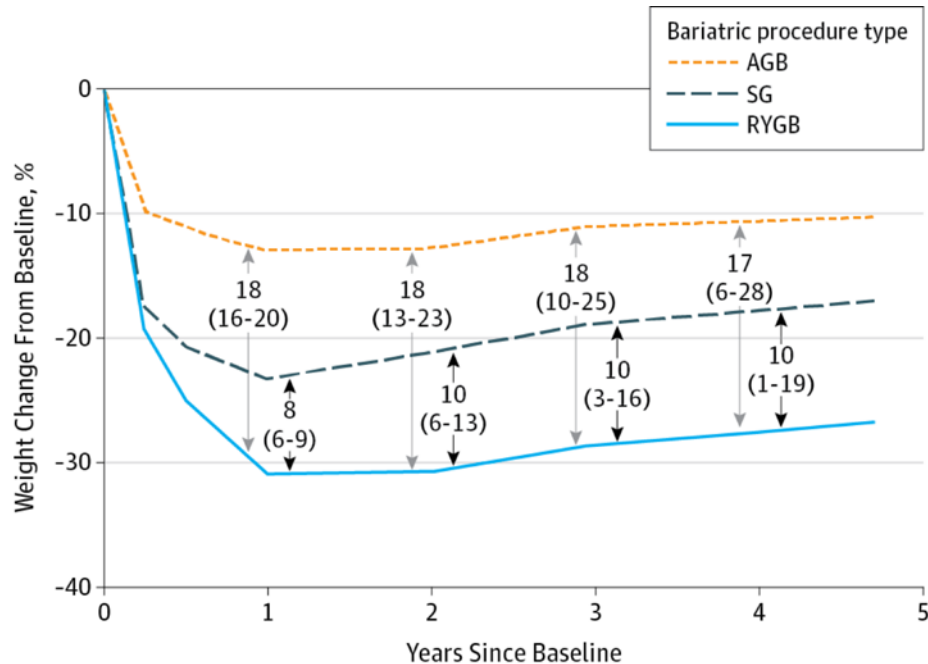
- Início em 1978
- 5% dos procedimentos realizados
- Gastrectomia vertical + desvio intestinal
- Retira 85% do estômago
- Perda de 40 a 50% do peso inicial
- Restrição e má absorção



Sociedade Brasileira de Cirurgia Bariátrica e Metabólica

## From: Bariatric Surgery and Long-term Durability of Weight Loss

JAMA Surg. 2016;151(11):1046-1055. doi:10.1001/jamasurg.2016.2317



Differences in Estimated Percentage of Weight Change From Baseline by Surgical Procedure Type. Estimated values, differences, and 95% CIs (shown in parentheses) were generated from a penalized spline mixed-effects model (2410 patients: 246 in the adjustable gastric banding [AGB] group, 379 in the sleeve gastrectomy [SG] group, and 1785 in the Roux-en-Y gastric bypass [RYGB] group). Numbers and arrows in the center of the figure represent the differences and 95% CIs of the differences between the AGB and RYGB groups (top) and the SG and RYGB groups (bottom) at years 1, 2, 3, and 4. The sample for whom there was follow-up weight data for each year and procedure are as follows: year 1, n = 2373 patients (244 patients undergoing AGB, 374 patients undergoing SG, and 1755 patients undergoing RYGB); year 2, n = 2300 (237 patients undergoing AGB, 363 patients undergoing SG, and 1700 patients undergoing RYGB); year 3, n = 2183 (230 patients undergoing AGB, 325 patients undergoing SG, and 1628 patients undergoing RYGB); and year 4, n = 1845 (202 patients undergoing AGB, 181 patients undergoing SG, and 1462 patients undergoing RYGB).



# **Impacto da gestação na perda de peso**



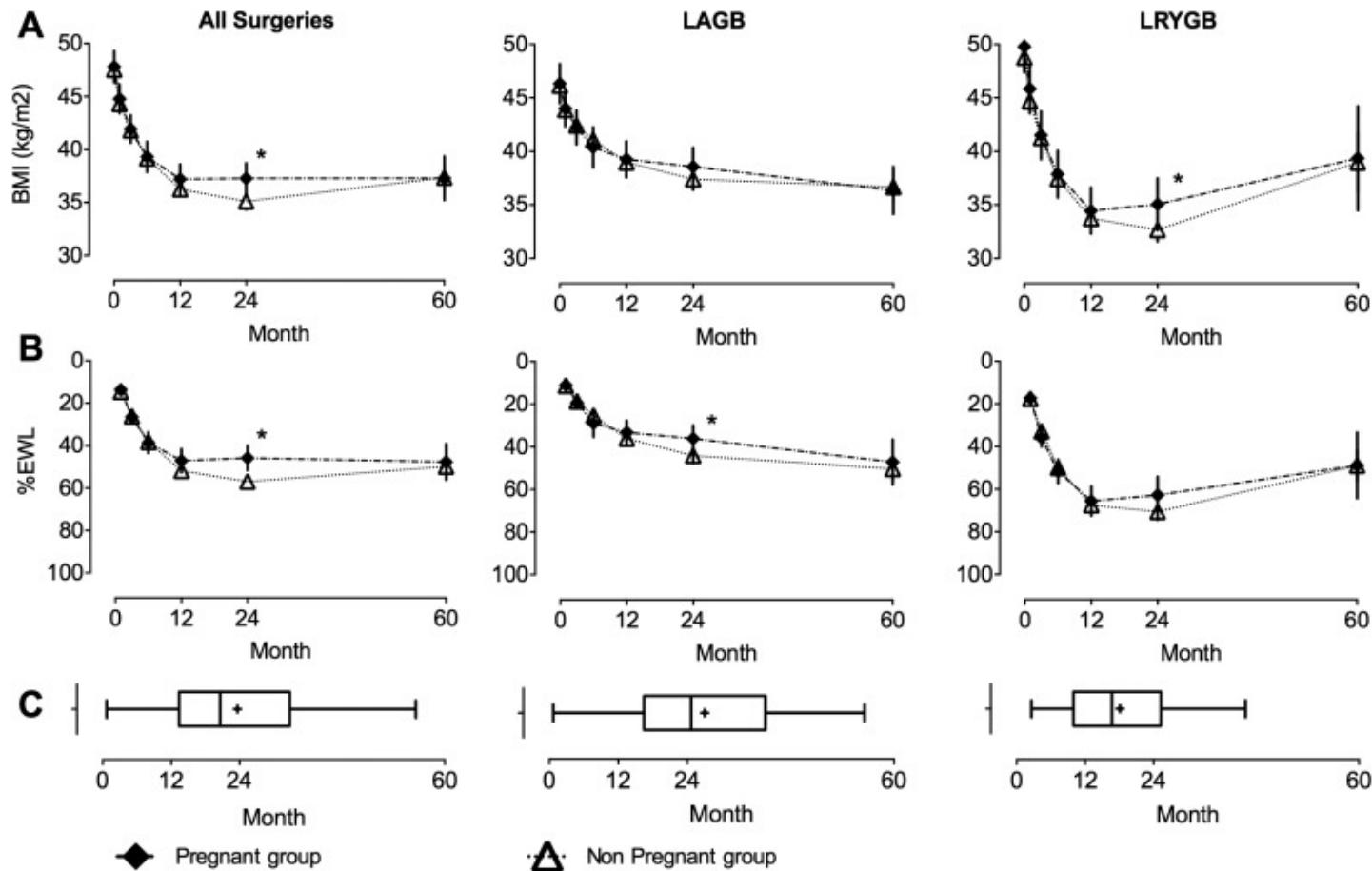


Fig. 1. Mean BMI (A) and %EWL (B) during 5 years evolution in postoperative pregnant patients (black diamonds) and in nonpregnant patients (open triangles). Student t test was used to compare the 2 groups at 2-year and 5-year follow-up. Data on the curves are the mean $\pm$ standard deviation. Delay between surgery and pregnancy is illustrated with a box-plot. (+) represents the mean (C).

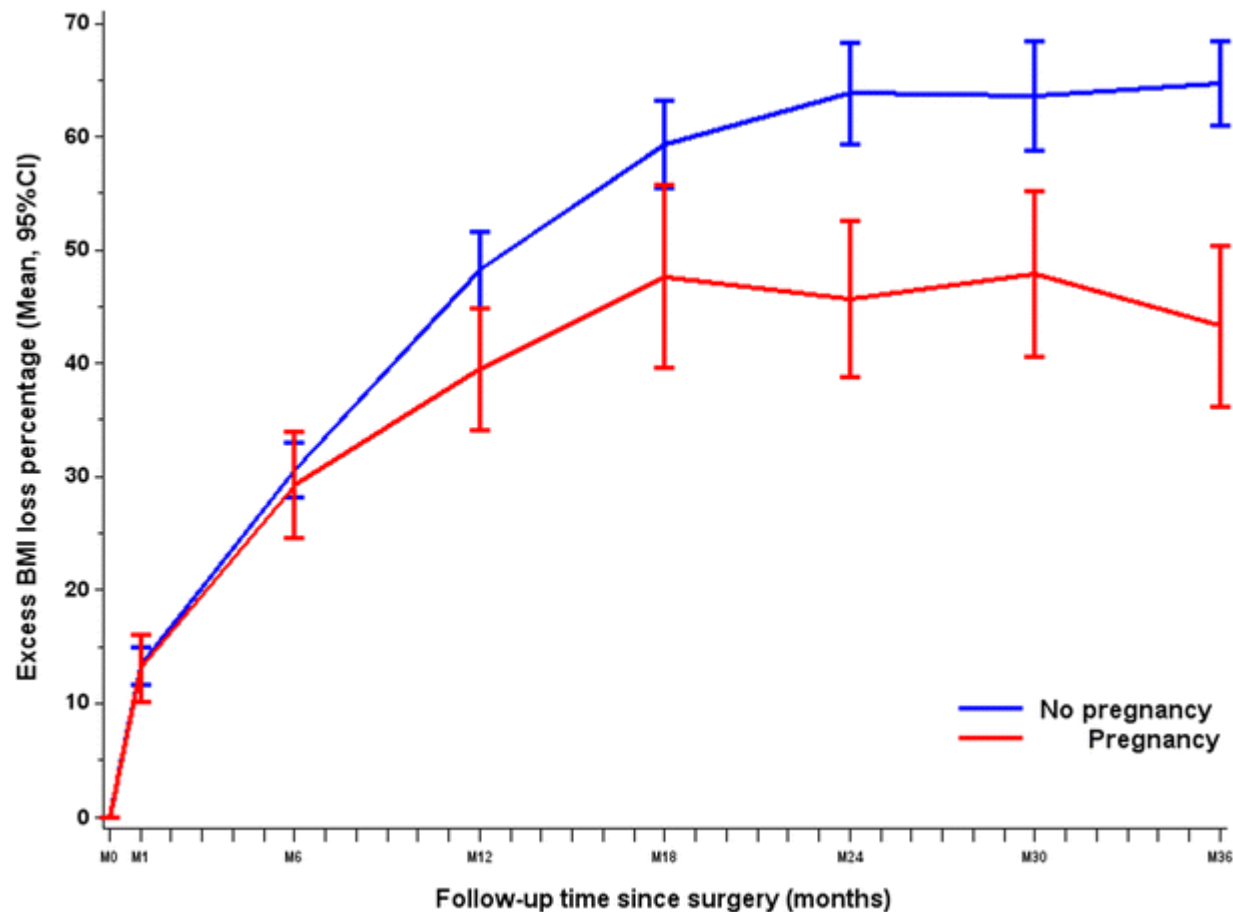


Fig. 2  
Mean excess BMI loss %  
change during 36 months of  
follow-up after surgery  
according to pregnancy status.  
The figure represents the  
different evolution of EBL% of  
all the pregnant and non-  
pregnant women for the  
period of 36 months.

- Sem diferenças para outras questões de qualidade de vida.
- Sem diferença <18 meses ou mais

Papastathi, C. *et al.* Impact of Pregnancy on Weight Loss and Quality of Life Following Gastric Banding. *Obes. Surg.* **26**, 1843–1850 (2016).

# **Impacto da Cirurgia na gestação**



**Table 2.** Gestational Diabetes and Perinatal Outcomes among Women with and Those without a History of Bariatric Surgery.

Variable	Bariatric-Surgery Group (N = 596)	Matched Control Group (N = 2356)	Risk Difference  percentage points (95% CI)	Odds Ratio (95% CI)*	P Value
	no./total no. (%)				
Gestational diabetes†					
Total	11/578 (1.9)	157/2294 (6.8)	-4.9 (-6.5 to -3.4)	0.25 (0.13 to 0.47)	<0.001
Insulin-treated	4/578 (0.7)	83/2294 (3.6)	-2.9 (-3.9 to -1.9)	0.17 (0.06 to 0.49)	<0.001
Large-for-gestational-age infant‡	51/590 (8.6)	523/2336 (22.4)	-13.8 (-16.6 to -11.0)	0.33 (0.24 to 0.44)	<0.001
Macrosomia‡	7/590 (1.2)	221/2336 (9.5)	-8.3 (-9.7 to -6.8)	0.11 (0.05 to 0.24)	<0.001
Small-for-gestational-age infant‡	92/590 (15.6)	178/2336 (7.6)	8.0 (4.8 to 11.1)	2.20 (1.64 to 2.95)	<0.001
Low-birth-weight infant‡	40/590 (6.8)	105/2336 (4.5)	2.3 (0.1 to 4.5)	1.34 (0.88 to 2.04)	0.17
Preterm birth§	59/590 (10.0)	176/2344 (7.5)	2.5 (-0.2 to 5.1)	1.28 (0.92 to 1.78)	0.15
Stillbirth¶	6/596 (1.0)	12/2356 (0.5)	0.5 (-0.4 to 1.3)	1.89 (0.59 to 6.05)	0.28
Neonatal death <28 days after live birth§	4/590 (0.7)	5/2344 (0.2)	0.5 (-0.2 to 1.2)	2.93 (0.57 to 15.14)	0.20
Stillbirth or neonatal death	10/596 (1.7)	17/2356 (0.7)	1.0 (-0.1 to 2.0)	2.39 (0.98 to 5.85)	0.06
Major congenital malformations§					
Total	14/590 (2.4)	83/2344 (3.5)	-1.2 (-2.6 to 0.3)	0.72 (0.40 to 1.29)	0.27
Excluding chromosomal abnormalities§	12/590 (2.0)	79/2344 (3.4)	-1.3 (-2.7 to 0.0)	0.63 (0.34 to 1.18)	0.16

\* Odds ratios were conditioned on the matching set, including one pregnancy after bariatric surgery and up to five controls, with matching for maternal age, parity, presurgery BMI (with the use of early-pregnancy BMI in the controls), smoking, educational level, and delivery year; ad-justments were made for history of coexisting conditions, history of substance abuse, and mother's country of birth.

† Analyses of gestational diabetes excluded women with prepregnancy diabetes (18 women [3%] in the bariatric-surgery cohort and 62 women [3%] in the matched control cohort).

‡ Analyses of large-for-gestational-age infants (>90th percentile), small-for-gestational-age infants (<10th percentile), macrosomia (birth weight >4500 g), and low birth weight (<2500 g) excluded stillbirths and births without data on birth weight. Analyses of large-for-gestation-al-age infants and small-for-gestational-age infants also excluded births without data on gestational age. There were 6 exclusions in the bar-iatric-surgery group (1.0%) and 20 in the matched-control group (0.9%).

§ Analyses of preterm birth, neonatal death, and congenital malformations excluded stillbirths and births without data on gestational age. There were 6 exclusions in the bariatric-surgery group (1.0%) and 12 in the matched-control group (0.5%).

¶ Stillbirth was defined as fetal death at 22 or more completed weeks of gestation on or after July 1, 2008 (97% of pregnancies), and at 28 or more weeks before July 1, 2008 (<3% of pregnancies).

Johansson, K. *et al.* Outcomes of Pregnancy after Bariatric Surgery. *N. Engl. J. Med.* **372**, 814–824 (2015).

**TABLE 2**  
**Results for all study outcomes**

Outcome	Studies, n	Events/ cases, n	Events/control subjects, n	Pooled odds ratio (95% confidence interval)	Number needed to benefit
<b>Benefit</b>					
Gestational diabetes mellitus	5	45/1111	335/2923	0.21 (0.12–0.36)	5
Large for gestational age	3	78/830	777/3094	0.31 (0.17–0.59)	6
Postpartum hemorrhage	2	8/424	25/486	0.32 (0.08–1.37)	21
Macrosomia	5	77/1123	338/2965	0.32 (0.11–0.89)	13
Large babies <sup>a</sup>	6	141/1280	882/3603	0.35 (0.19–0.62)	7
All hypertensive disorders	4	88/686	162/584	0.38 (0.27–0.53)	8
Gestational hypertension	3	14/179	50/283	0.39 (0.2–0.75)	11
Preeclampsia	3	17/179	42/283	0.59 (0.32–1.09)	21
Cesarean delivery	4	176/533	297/629	0.63 (0.39–1.02)	9
<b>Harm</b>					<b>Number needed to harm</b>
Neonatal intensive care unit admission	2	25/153	35/260	1.26 (0.37–4.26)	38
Malformations	4	61/1290	126/3925	1.29 (0.61–2.71)	97
Neonatal deaths	3	16/1451	15/2991	1.31 (0.37–4.71)	447
Preterm delivery	4	95/769	216/2627	1.33 (1.01–1.75)	35
Stillbirth	4	11/859	28/3776	1.4 (0.38–5.23)	370
Intrauterine growth restriction	2	21/533	8/324	1.6 (0.69–3.73)	66
Small for gestational age	6	183/1433	238/3558	2.18 (1.41–3.38)	21
Small babies <sup>b</sup>	6	183/1433	238/3558	2.18 (1.41–3.38)	21

<sup>a</sup> Composite of large for gestational age and macrosomia; <sup>b</sup> Composite of small for gestational age and intrauterine growth restriction.

Kwong. *Obstetric outcomes after bariatric surgery*. *Am J Obstet Gynecol* 2018.

Kwong, W., Tomlinson, G. & Feig, D. S. Maternal and neonatal outcomes after bariatric surgery; a systematic review and meta-analysis: do the benefits outweigh the risks? *Am. J. Obstet. Gynecol.* 1–8 (2018). doi:10.1016/j.ajog.2018.02.003

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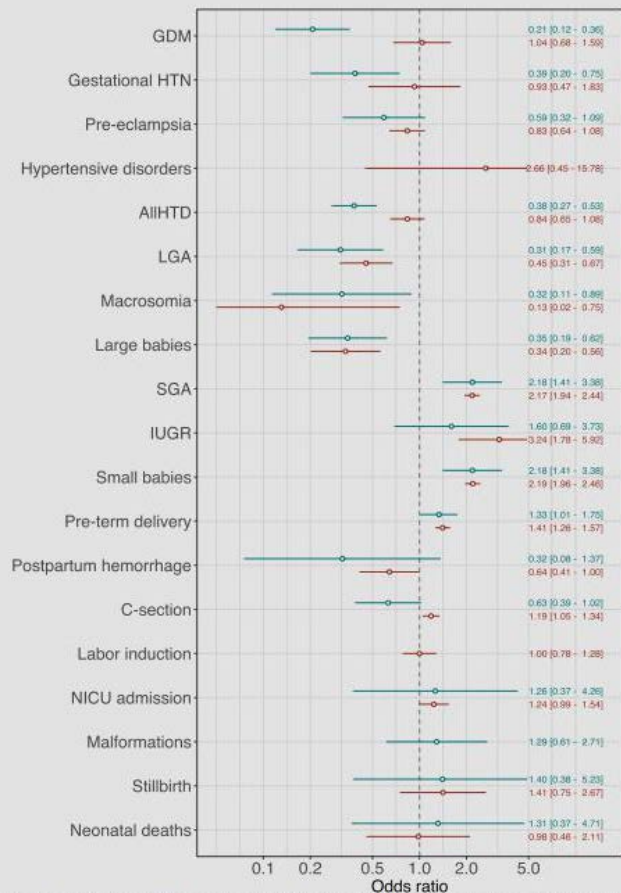
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Kwong. *Obstetric outcomes after bariatric surgery*. *Am J Obstet Gynecol* 2018.

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**FIGURE 2**  
**Maternal and neonatal outcomes post bariatric surgery**

Control groups in analysis → Matched for pre-surg BMI → Matched for pre-preg BMI



Pooled odds ratios and 95% confidence intervals for each of the included outcomes in the primary

AllHTD, all hypertensive disorders; C-section, cesarean delivery; GDM, gestational diabetes mellitus; HTN, hypertension; IUGR, intra- uterine growth restriction; LGA, large for gestational age; NICU, neonatal intensive care unit; SGA, small for gestational age. Kwong.

Kwong, W., Tomlinson, G. & Feig, D. S. Maternal and neonatal outcomes after bariatric surgery; a systematic review and meta-analysis: do the benefits outweigh the risks? *Am. J. Obstet. Gynecol.* 1–8 (2018).  
doi:10.1016/j.ajog.2018.02.003



# Na prática



# Planejamento Familiar

- Muitas mulheres anteriormente inférteis engravidam espontaneamente após a cirurgia.
- Anticoncepcionais orais podem não ser eficazes em mulheres que fizeram cirurgias que atuam por má-absorção.
- Os riscos da gestação com a cirurgia/ obesidade e da cirurgia/obesidade na gestação devem ser discutidos.

# Tempo após a cirurgia

A maioria das associações recomendam esperar até atingir um peso estável

- **12 a 18 meses** - British Obesity and Metabolic Surgery Society and the American Society for Metabolic and Bariatric Surgery
- **12 a 24 meses** American College of Obstetricians and Gynecologists
- **Avaliação personalizada** - levando em conta idade materna, status nutricional e os riscos envolvidos - Royal College of Obstetricians and Gynaecologists

Mahawar, K. K., Graham, Y. & Small, P. K. Optimum time for pregnancy after bariatric surgery. *Surg. Obes. Relat. Dis.* **12**, 1126–1128 (2016).

# Antes da gestação

- Ácido Fólico 5mg
  - Vit A - Cuidado
    - se necessário
- Beta Caroteno!

Slater, C., Morris, L., Ellison, J. & Syed, A. A. Nutrition in Pregnancy Following Bariatric Surgery. *Nutrients* **9**, (2017).

**Table 1.** Summary of global recommendations for supplements post-bariatric surgery.

	Recommendation	Comments
Multivitamin and mineral supplement	1–2 daily	Avoid retinol-based vitamin A during pregnancy and lactation; safe to continue beta-carotene
Calcium	800–1500 mg daily	Calcium citrate may have better bioavailability
Vitamin D	800 units daily	Higher doses may be necessary if pre-existing deficiency
Iron	45–60 mg daily	100 mg elemental iron is recommended for menstruating women
Vitamin B12	1000 micrograms orally daily or 1000 micrograms intramuscular injection 4–12 weekly	
Thiamine (B1)	As contained in Multivitamin or 12–50 mg daily	Additional 200–300 mg if prolonged vomiting is experienced
Folic Acid	As contained in Multivitamin or 400–800 microgram daily	5 mg preconception to 12 weeks of gestation
Vitamin A	As contained in Multivitamin or 5000–1000 IU daily	Additional screening in BPD/DS * or if Steatorrhoea. Increased requirements in pregnancy—avoid retinol and retinyl esters.
Vitamin E	As contained in Multivitamin or 15 mg daily	Additional screening in BPD/DS * or if Steatorrhoea
Vitamin K	As contained in Multivitamin or 90–300 micrograms daily	Additional screening in BPD/DS * or if Steatorrhoea
Zinc	As contained in Multivitamin to meet 100–200% RDA †	Maintain Ratio of 8–15 mg Zinc per 1 mg Copper
Copper	As contained in Multivitamin to meet 100–200% RDA †	Maintain Ratio of 8–15 mg Zinc per 1 mg Copper
Selenium	As contained in Multivitamin	

Global recommendations based on published guidelines from America, the UK and Australia [30–32,34]. In Pregnancy, we recommend a daily oral complete multivitamin and micronutrient (avoiding retinol), calcium with vitamin D, iron and 3-monthly intramuscular Hydroxocobalamin; omeprazole is our preferred choice of proton pump inhibitor. \* BPD/DS, biliopancreatic diversion/duodenal switch. † RDA, recommended dietary allowance.

# Pré-gestacional e durante o pré-natal

- Hemograma completo
- Ferritina
- Vitamina B12
- Ácido fólico
- Cálcio
- Vitamina D (25 Oh vitD)

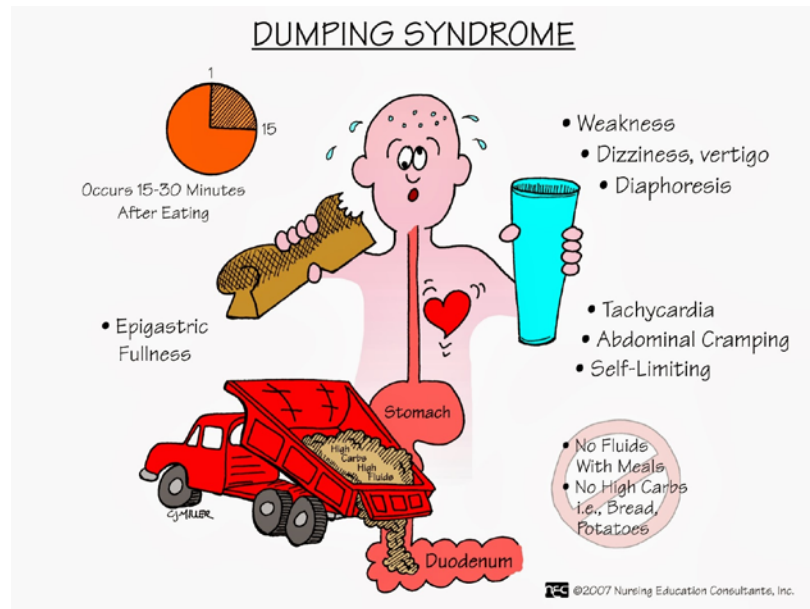
# Gestação



Fotos - comunidade do Facebook - mãe de peso (públicas)

# Durante a Gestação

- Náuseas e vômitos
- Dumping
  - Precoce
  - Tardio - hipoglicemia pós prandial
- Atenção para complicações cirúrgicas
  - Obstrução intestinal
  - Hérnias
  - Erosão/ migração do anel gástrico
  - Colelitíase



# Durante a Gestação

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  - Colelitíase



Não Solicitar  
TTGO!!



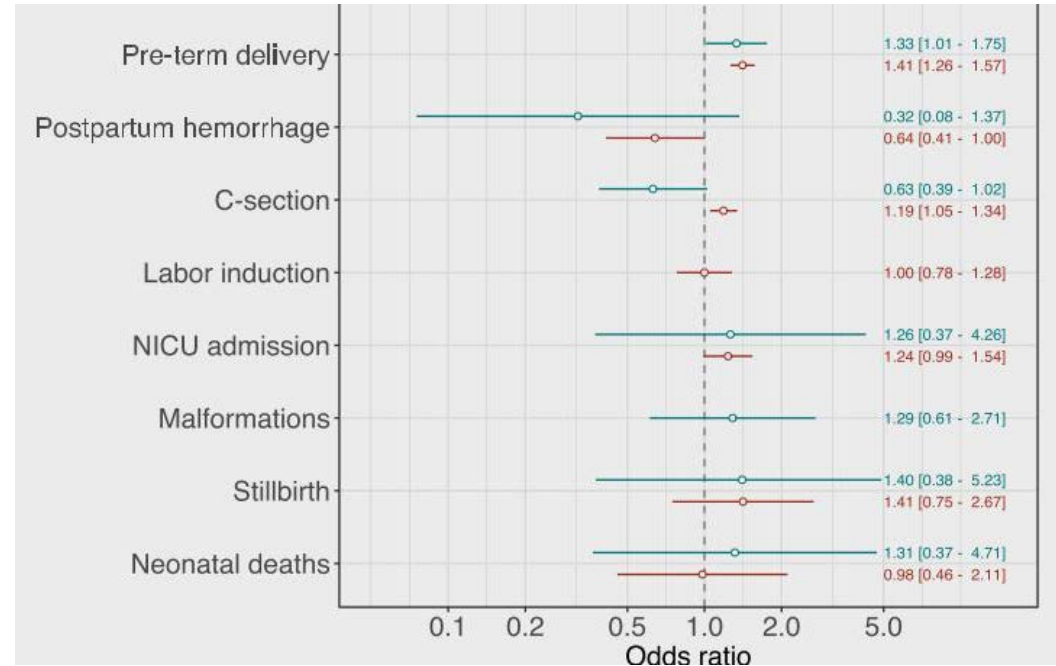
# Durante todo o ciclo-grávido puerperal

Equipe multidisciplinar



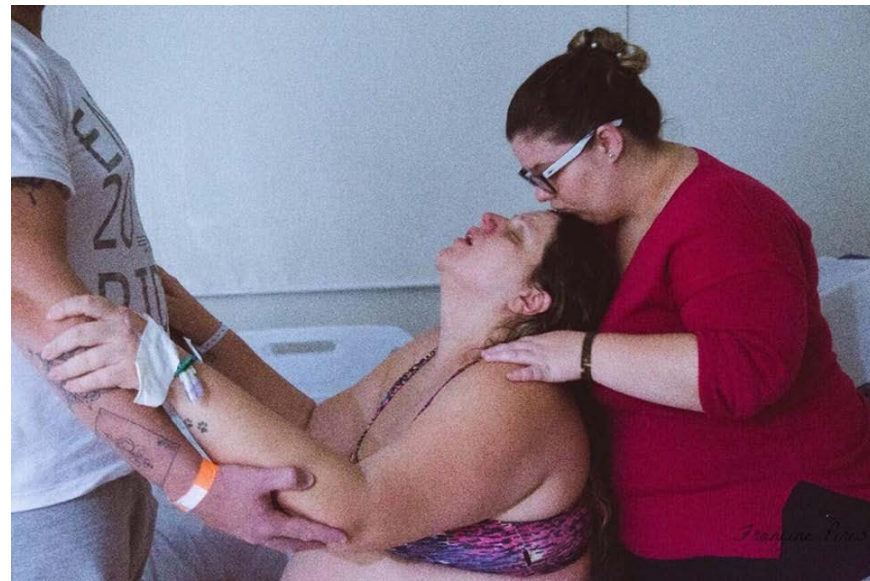
# Parto

- Não há NENHUMA indicação de cesárea
- Via de parto obstétrica



Kwong, W., Tomlinson, G. & Feig, D. S. Maternal and neonatal outcomes after bariatric surgery; a systematic review and meta-analysis: do the benefits outweigh the risks? *Am. J. Obstet. Gynecol.* 1–8 (2018).  
doi:10.1016/j.ajog.2018.02.003

# No parto



Fotos - comunidade do Facebook - mãe de peso (públicas)

# No parto



Fotos - comunidade do Facebook - mãe de peso (públicas)

# Em caso de necessidade de cirurgia

- Incisão Pfannenstiel
- Atenção na extração fetal
- **Tromboprofilaxia pós-parto**
- Por 7d p/ IMC>40 ou IMC >30 + Fator de risco
- 90 a 130 kg: 60mg/d enoxaparina
- 130 a 170 kg: 80 mg/de enoxaparina
- >170kg: 0,6 mg/kg/d

# Pós parto

- Estímulo ao aleitamento
- Atenção à depressão pós-parto



Fotos - comunidade do Facebook - mãe de peso (públicas)

# Obrigada

Contato  
[rknobel@gmail.com](mailto:rknobel@gmail.com)