

Reducing greenhouse gas emissions in a European bariatric surgery unit: Why and how?

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Background

- The « Obesity Epidemic » and the relevance of obesity surgery
- Surgical suites are major actors of Green House Gas emissions
- Recent technical evolutions are rather negative in this respect

GHGe and bariatric surgery: thinking global

- Prejudice n°1: The more the obesity epidemics spreads, the more surgery we need: *NO, it surgery diminishes in proportion*
- Prejudice n°2: Surgery fits to class II obese patients, whereas diet and other treatments (endoscopy/liraglutide) « fill the gap ». *NO, each treatment must demonstrate efficacy*
- Prejudice n°3: Surgery is necessary and sufficient. *NO in the context of world needs, as proven by the Global Surgery Initiative*

Genesis of obesity= excess of consumption

- *Metabolic food waste and ecological impact of obesity in Fao world's region. Frontiers Nut (2019), 6 (126): 1-6. Between the different regions, EU is responsible of the greatest amount of MFW(tons of food) volume (39.2 million tons), followed by NAO (32.5 million tons). In terms of ecological impact, EU and NAO displayed the highest values for all three MFW footprints, about 14 times more than SSA.*
- Cares and bariatric surgery + complications

Bariatric surgery in the context of the environment issue

- Energy spendings in surgical suites, dominance of the disposable surgical devices (stapling and energy).
- Increased proportion of procedures using those items (sleeve gastrectomies & gastric bypass) in the years 2010-2020.

References (1)

*Surgeons must be involved in green house gas emission reduction in the operating room, hospitals and universities. Tuech JJ, J Visc Surg (2020) 157: 273-5

*The impact of surgery on global climate: a carbon footprinting study of operating theatres in three health systems. MacNeill AJ, Lillywhite R, Brown CJ. Lancet Planet Health (2017) 1:e381-8

Références (2)

- *The carbon footprint of surgical operations: a systematic review. Rizan C, Steinbach I, Nicholson R et al (2020) Ann Surg 272(6): 986-95
- *It is possible to reduce the carbon footprint of surgery through improving energy-efficiency of theatres, using reusable or reprocessed surgical devices and streamlining processes.*
- *Carbon footprint of robotically-assisted laparoscopy, laparoscopy and laparotomy: a comparison. Woods DL, McAndrew T, Nevadunsky N et al (2015) Int J Med Robot 11(4): 406-12
- *Greenhouse gas emissions were 40,3 kg CO₂e/patient Vs 29,2 in laparoscopy (+38%), Vs 22,7 in laparotomy (+77%).*

For starters, let us recycle!



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Means at disposal

- **Retrieving anesthetic gas: Recycling SEVOFLURANE** with ZEOZYS cartridges, 15€ for 1 day.
- **Diminishing the need for sterilization:** e.g. ½ box for a Sleeve Gastrectomy if the strict number of instruments is being used, i.e. 6% saving per procedure.
- **Recycling single-use instruments:** decontamination and separation of metallic and plastic parts (trocars, staplers, energy), approx 1,2 kg waste/procedure.
- **Others:** Electricity use, laundry and single-use drapes

Personal series

	Control (N=41)	Action (N=42)
Sleeve gastrectomy	38	42
Gastric Bypass	6	2
Band removal	14	11
Other	1	1

Suggesting an ECOSCORE

- Note from A to E, like Food Open Project
- Leaves open the possibility of sequential strategies, e.g. using endoscopic procedures
- Balancing items
- Operative suites may be singled out within hospitals, taking into account local circumstances and evolutions ahead

ECOSCORE in a bariatric surgical unit: 6 main Items

- 1. Waste and packaging management
- 2. Recycling of single-use instruments
- 3. Decreasing and reemploying surgical instruments
- 4. Recycling anaesthetic gas
- 5. Other: water, laundry, software, etc.
- 6. Energy Mix

ECOSCORE in a bariatric surgical : 5 other Items

- 1. Local obligation in effect
- 2. Local availability with lesser cost, e.g. energy
- 3. Voluntary and targeted/large action, on a temporary or long-term basis, e.g. anaesthetic gas
- 4. Technological breakthrough, e.g. endoscopy, robotics
- 5. Other, e.g. corporate governance in effect