



Editorial

Towards a greener endoscopy: Considerations on the strategies to improve sustainability



'We do not inherit the earth from our ancestors; we borrow it from our children.' – Anonymous

Bortoluzzi *et al.* provided an insightful set of recommendations aimed to delineate the strategies to achieve sustainability in gastroenterology and digestive endoscopy, on behalf of the Italian association of hospital gastroenterologists and digestive endoscopists (AIGO) [1]. We congratulate the authors for providing such an important position paper, as it assembles key measures and suggestions, at different levels within the scope of endoscopy. These courses of action should be faced consciously in order to reduce the burden of the environmental impact of endoscopic procedures.

Reduction of the carbon footprint of endoscopy must start prior to the procedure itself, by lessening the amount of inadequately performed endoscopies. This is probably the most needed action in the short term to achieve a 'greener' endoscopy. We acknowledge the authors for emphasizing the importance of prioritizing non-invasive alternatives and screening tools, but other strategies to safeguard the appropriateness of endoscopic procedures should also be considered. These include: 1) ensuring a dedicated time for triage, to allow a more comprehensive selection of patients requiring endoscopy, 2) implementation of periodic updates for adequate endoscopy performance, 3) periodic educational programs to all endoscopy petitioners, and 4) establishment of guideline-supported recommendation pathways [2–4].

Furthermore, we acknowledge the authors for recommending the use of single-use devices only when necessary. A steep upsurge of endoscopic single-use accessories has been perceived in the last two decades. This transition (from reusable to single-use) lacks solid scientific background. Indirect data suggest that the reduction in infection risk is not clinically relevant but carries a greater economic and environmental cost [5]. It is paramount to define specific strategies to reduce the actual use of single-use items. For example, this can be achieved by reusing endoscopic accessories between procedures, when combining upper endoscopy followed by colonoscopy within the same patient (e.g., biopsy forceps or polypectomy snare), and by planning and auditing what will be required for each endoscopic procedure [3].

Bortoluzzi *et al.* also highlighted that structural remodelling with energy-saving strategies could transform our endoscopy suites into 'greener' places [1]. Besides establishing power-down initiatives to reduce unnecessary energy use in the endoscopy room, it is also essential to consider the energy efficiency of the equipment. As such, switching to double basin wash machines, with both basins working simultaneously, will grant a 25% decrease in energy use [6].

As stated by the authors, endoscopic waste represents a minor proportion of the carbon footprint of endoscopy. Still, strategies to reduce, reuse and recycle endoscopic waste are considered low cost and easy to implement, and have the potential to significantly reduce the waste carbon footprint of endoscopy [7,8]. Personal protective equipment (PPE) can contribute to up to 35% of overall endoscopic waste [7], and alternatives like reusable gowns may help reduce the carbon footprint generated by PPE by 66% [9]. The authors also stress the need to invest in adequate waste segregation and disposal. It has been proved that correct waste management in the endoscopy unit lead to a significant and sustained reduction of the waste carbon footprint [7]. Nevertheless, this can only be achieved by raising awareness of the staff and by identifying potential sustainability improvement areas. For this, we suggest that every endoscopy suite needs to elect an individual responsible for staff training, leading interventions and conducting regular audits – a 'Green Endoscopy Champion' [3,4].

We agree that telemedicine is of the utmost importance for remote consultation, particularly to reduce waiting times and Greenhouse gases emissions related to travelling. Do we really need in-person visits to communicate non-malignant histology results or explain low-risk endoscopic procedures? Nevertheless, careful selection of patients and contexts is required to avoid health inequalities [3,4].

We also acknowledge the authors for stressing that guidance towards a more sustainable endoscopy should start from and be focused on the 3R principles of sustainability (Reduce, Reuse, Recycle) [1]. However, two additional R strategies may also be taken into consideration: Rethink and Research [10]. It is essential to review and rethink strategies for further improvement of sustainability in endoscopy, such as encouraging manufacturers to fully disclose the lifecycle of endoscopic accessories. This will impel endoscopists on a more balanced decision-making process of when and how to properly use single-use devices. Also, research in sustainability is imperative. We agree with the authors that sustainability research should focus on four main pillars: 1) disease prevention, 2) minimisation of unnecessary and wasteful procedures, 3) prioritisation of low carbon alternative procedures, and 4) patient involvement [1,11,12]. The latter, which encompasses patients' perspectives and self-empowerment has been scarcely investigated. The authors stress that involving and educating patients towards a more sustainable health management is crucial for the development of future strategies [1,10–12]. Advocating sustainability is no 'one-man show'. Industry is a key player and must play a proactive role. A joint effort between researchers,

patients and manufacturing companies is essential to ensure that stakeholders actively participate in sustainability initiatives [1,11,12]. Governments and institutions can also contribute by purchasing products whose carbon footprint has been found to be more eco-friendly when compared to other alternatives.

Lastly, endoscopy societies should acknowledge their vital role as propellers of high-quality research. A recent survey of global gastroenterology leadership highlighted an urgent need of collaboration between scientific organisations to effectively respond to the current climate crisis [13]. With this position paper, AIGO has joined other scientific societies in their endeavour to achieve a more sustainable future for healthcare [3,4,11,12]. Ultimately, the development of quality guidelines with sustainability key performance measures (KPM) is critically required, as the fulfilment of these KPMs will gift us with the true definition of 'green endoscopy', by reducing inappropriate endoscopic procedures, allowing a better readdress of equipment and supplies, and ultimately leading to the safeguard of patients' well-being.

Conflict of interest

The authors have no conflict of interests to disclose.

Financial disclosure

The authors have no funding or grant sources to declare.

João A. Cunha Neves**, Joana Roseira

Department of Gastroenterology, Algarve University Hospital Centre,
Portimão, Portugal
ABC – Algarve Biomedical Centre, University of Algarve, Faro,
Portugal

Miguel F. Cunha

ABC – Algarve Biomedical Centre, University of Algarve, Faro,
Portugal

Colorectal Disease Group - Department of General Surgery, Algarve
University Hospital Centre, Portimão, Portugal
Biomedical Sciences and Medicine, Algarve University, Gambelas,
Portugal

Gianluca Pellino*

Department of Advanced Medical and Surgical Sciences, Università
degli Studi della Campania "Luigi Vanvitelli, Naples, Italy
Colorectal Surgery, Vall d'Hebron University Hospital, Barcelona,
Spain

Gianluca M. Sampietro¹

Division of General and HPB Surgery, ASST Rhodense Rho Memorial
Hospital, Milan, Italy

Enrique Rodríguez de Santiago¹

Department of Gastroenterology and Hepatology, Hospital
Universitario Ramon y Cajal, University of Alcalá, IRYCIS, Madrid,
Spain

*Corresponding author at: Department of Advanced Medical and
Surgical Sciences, Università degli Studi della Campania "Luigi
Vanvitelli", Naples, Italy.

**Corresponding author at: Department of Gastroenterology,
Algarve University Hospital Centre, Portimão, Portugal.
E-mail addresses: joaoacunhaneves@gmail.com (J.A. Cunha Neves),
gianluca.pellino@unicampania.it, gipe1984@gmail.com (G. Pellino)

¹ Sampietro GM and Rodríguez de Santiago E share last/senior
authorship

References

- [1] Bortoluzzi F, Sorge A, Vassallo R, et al. Sustainability in gastroenterology and digestive endoscopy: position paper from the Italian association of hospital gastroenterologists and digestive endoscopists (AIGO). *Dig Liver Dis* 2022;54(12):1623–9.
- [2] Rodríguez-de-Santiago E, Frazzoni L, Fuccio L, et al. Digestive findings that do not require endoscopic surveillance - reducing the burden of care: European Society of Gastrointestinal Endoscopy (ESGE) position statement. *Endoscopy* 2020;52(6):491–7.
- [3] Sebastian S, Dhar A, Baddeley R, et al. Green endoscopy: British Society of Gastroenterology (BSG), Joint Accreditation Group (JAG) and Centre for Sustainable Health (CSH) joint consensus on practical measures for environmental sustainability in endoscopy. [published online ahead of print, 2022 Oct 13]. *Gut* 2022 gutjnl-2022-328460.
- [4] Rodríguez de Santiago E, Dinis-Ribeiro M, Pohl H, et al. Reducing the environmental footprint of gastrointestinal endoscopy: European Society of Gastrointestinal Endoscopy (ESGE) and European Society of Gastroenterology and Endoscopy Nurses and Associates (ESGENA) position statement. *Endoscopy* 2022;54(8):797–826.
- [5] Reynier T, Berahou M, Albaladejo P, et al. Moving towards green anaesthesia: are patient safety and environmentally friendly practices compatible? A focus on single-use devices. *Anaesth Crit Care Pain Med* 2021;40(4):100907.
- [6] Siau K, Hayee BH, Gayam S. Endoscopy's current carbon footprint. *Tech Innov Gastrointest Endosc* 2021;23(4):344–52.
- [7] Cunha Neves JA, Roseira J, Queirós P, et al. Targeted intervention to achieve waste reduction in gastrointestinal endoscopy. *Gut* 2023;72(2):306–13.
- [8] Siddhi S, Dhar A, Sebastian S. Best practices in environmental advocacy and research in endoscopy. *Tech Innov Gastrointest Endosc* 2021;23(4):376–84.
- [9] Rizan C, Reed M, Bhutta MF. Environmental impact of personal protective equipment distributed for use by health and social care services in England in the first six months of the COVID-19 pandemic. *J R Soc Med* 2021;114(5):250–63.
- [10] Cunha MF, Pellino G. Environmental effects of surgical procedures and strategies for sustainable surgery. [published online ahead of print]. *Nat Rev Gastroenterol Hepatol* 2022:1–12.
- [11] ESCP ECOS-Surgery Study Committee. The European society of coloproctology collecting opinions on sustainable surgery study. *Dis Colon Rectum* 2022;65(11):1297–300.
- [12] Kenington J, Consultant JL, Papalois V. ASGBI surgical sustainability survey. *Bull R Coll Surg Engl* 2022;104(7):340–4.
- [13] Leddin D, Omary MB, Metz G, et al. Climate change: a survey of global gastroenterology society leadership. [published online ahead of print, 2022 Jun 10]. *Gut* 2022 gutjnl-2022-327832.