

Tests, treatments and procedures at risk of inappropriateness in Italy that Physicians and Patients should talk about.

Five Recommendations from the Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care (SIAARTI) on GREEN ANESTHESIA

1	Don't use inhaled anesthetic agents with high global warming potential, such as desflurane and nitrous oxide. Desflurane and nitrous oxide can be effectively replaced with equally efficient but less environmentally harmful inhaled anesthetics, or with alternative anesthetic techniques such as total intravenous anesthesia or regional anesthesia. Starting from January 1, 2026, the use of desflurane as an inhaled anesthetic—whose Global Warming Potential (GWP) is more than 2,500 times that of CO₂—will be banned in the EU, except for justified medical reasons. Among currently available volatile anesthetics, sevoflurane has the lowest GWP. In general, inhalational anesthesia should always be administered using closed circuits and low fresh gas flows to optimize anesthetic consumption. Where feasible, scavenging and/or recycling systems for inhaled anesthetics should also be used.
2	Don't use high fresh gas flows; prefer low flows and the minimum effective oxygen concentration. High fresh gas flows unnecessarily increase the consumption of halogenated anesthetic gases, thereby amplifying greenhouse gas emissions with a significant environmental impact. The administration of inhaled agents is now safer thanks to modern systems for monitoring exhaled gases and anesthetic depth. Reducing fresh gas flows to ≤ 0.5 L/min, when clinically safe and technically feasible, significantly decreases the consumption of halogenated agents and oxygen, resulting in both economic and environmental benefits. Routine oxygen use should be reserved for clinical conditions where it provides real benefit, contributing to a more responsible anesthetic practice.
3	Don't choose unsustainable anaesthetic techniques, materials/devices or behaviours. Whenever possible, prefer regional anaesthesia over general anaesthesia. Prescribe and administer only drugs that are truly useful and necessary; prefer oral administration whenever possible. Limit the advance preparation of medications to what is strictly necessary, giving preference to preparation at the time of administration; whenever possible, use prefilled syringes and ensure proper disposal of drugs. Prefer biodegradable or recyclable and more economical products for drug sheets and trays. Use sterile materials only when indicated, avoiding unnecessary use; alcohol-based hand disinfectants are equally effective and more sustainable. Finally, promote responsible waste management, reduce water consumption and turn off lights, computers and ultrasonic machines at the end of the day: simple actions that support peer education and collective efforts to reduce waste.
4	Don't use disposable materials unless strictly necessary, and do not neglect proper separate waste collection. Operating theatres generate at least 25 per cent of total hospital waste and about 25 per cent of this waste is related to anaesthetic practices. Proper waste management is therefore essential to reduce environmental impact and contain costs. Materials not contaminated with biological fluids (paper, plastic, glass, and aluminium) should be disposed of as municipal waste and sent for recycling, rather than being placed in contaminated waste containers. The 'reduce-reuse-recycle' strategy should be implemented and monitored in all surgical blocks. Reusable gowns, drapes and devices are just as 'safe' and more cost-effective than disposable alternatives. In anaesthesia practice, the use of single-use devices should be limited, giving preference to reusable products when clinically appropriate, or at least to single-use materials with a lower environmental impact, such as polyethylene or polypropylene. Pre-filled syringes can help reduce drug waste, but require proper disposal of residues to avoid water pollution. It is therefore essential that healthcare personnel and cleaning staff are properly trained to ensure proper waste management, in accordance with Presidential Decree 254/2003, which requires healthcare facilities to minimise the risk of waste and to promote recovery and recycling.
5	Every anaesthetist-intensivist must not forget to be, with the support of scientific societies, a protagonist and promoter of sustainable practices in the operating theatre and intensive care unit. Scientific societies play a key role in reducing the environmental impact of current clinical practices. Through courses, seminars and workshops, they educate anaesthetists, surgeons and other healthcare professionals on the importance of adopting sustainable techniques and behaviours, such as choosing environmentally friendly anaesthetic gases, managing gas disposal and reuse, selecting sustainable anaesthetic techniques and materials, and responsible waste management. Scientific societies also promote certification and continuing education programmes, accredit facilities that implement eco-friendly practices, and develop and disseminate guidelines and recommendations to optimise resource use and support research into more sustainable technologies. At the same time, anaesthesiologists-intensivists, through their daily choices, can make a significant contribution to the adoption of more sustainable practices by turning knowledge into concrete actions.

Please note that these items are provided only for information and are not intended as a substitute for consultation with a clinician. Patients with any specific questions about the items on this list or their individual situation should consult their clinician.

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How this list was created

The five recommendations related to the field of anesthesia and intensive care were developed by a working group (WG) composed of anesthesiologists from SIAARTI (Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care) with expertise in sustainability. The WG, made up of members of the 2022–2024 SIAARTI Communication Committee, the then incoming president, and anesthesiologists with specific expertise in sustainability and green policies, drafted a list of five recommendations focused on the practices with the highest environmental impact in anesthesia. The recommendations, which embrace the “5 Rs” waste strategy (Reduce, Reuse, Recycle, Separate collection, and Recovery), were developed through a thorough review of the international literature on the subject and shared with the 2025–2027 SIAARTI Board of Directors, which reviewed them.

Sources

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Slow Medicine ETS, an Italian Third Sector organization of health professionals, patients and citizens promoting a Measured, Respectful and Equitable Medicine, launched the campaign “**Doing more does not mean doing better- Choosing Wisely Italy**” in Italy at the end of 2012, similar to Choosing Wisely in the USA. The campaign aims to help physicians, other health professionals, patients and citizens engage in conversations about tests, treatments and procedures at risk of inappropriateness in Italy, for informed and shared choices. The campaign is part of the Choosing Wisely International movement. Partners of the campaign are the National Federation of Medical Doctors' and Dentists' Orders (FNOMCeO), that of Registered Nurses' Orders (FNOPI), the Academy of Nursing Sciences (ASI), National Union of Radiologists (SNR), Tuscany regional health agency, PartecipaSalute, Altroconsumo, the Federation for Social Services and Healthcare of Aut. Prov. of Bolzano, Zadig. www.choosingwiselyitaly.org; www.slowmedicine.it

The Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care (SIAARTI) is represented throughout the country with over 10,000 members, active in universities, hospitals and territorial services. SIAARTI is a professional society recognized by the Ministry of Health in implementation of Article 5 of Law 8 March 2017, n. 24 (Gelli Law) and the Ministerial Decree 2 August 2017. It has been dedicated, since its foundation in 1934, to the constant strengthening of the combination of clinical activity and research to improve guidelines, therapeutic protocols and patient safety. It allows and facilitates comparison and discussion among thousands of Anesthesiologists-Resuscitators and contributes to growth in the most diverse cultural areas that characterize such a complex, fascinating and responsible profession: Anesthesia and Perioperative Medicine; Resuscitation and Intensive Care; Emergency Critical Medicine; Pain and Palliative Care; Hyperbaric Medicine; Maternal and Child Care. www.siaarti.it