

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

Five Recommendations from the Italian Centre for Sustainable Healthcare APS (CSH Italia) *Green Operating Room*

<p>1</p>	<p>Do not perform surgical hand scrubbing with water and antiseptic soap before every procedure; instead, after the first wash of the day, prefer the use of alcohol-based hand rubs, if hands are not visibly contaminated.</p> <p>Surgical hand scrubbing has a significant environmental impact, consuming an average of 16-30 litres of water per operator for each wash. World Health Organization (WHO) and National Institute for Health and Care Excellence (NICE) guidelines recommend the “Rub don’t Scrub” protocol: after the first wash of the day with water and antiseptic soap, switch to alcohol-based hand rubs (ABHR) between procedures unless hands are visibly soiled. This drastically reduces water and energy consumption and preparation time (90 seconds instead of 3-5 minutes), while ensuring equal or superior efficacy in decontamination.</p>
<p>2</p>	<p>Do not perform routine clinical interventions in the perioperative pathway, such as antibiotic prophylaxis, histological examinations, and other procedures; instead, apply Lean Management and Sustainable Healthcare principles to ensure clinical appropriateness and rational resource use.</p> <p>In line with the principles of Lean Management and Sustainable Healthcare, reducing waste in clinical processes is a fundamental lever for sustainability of healthcare systems. The routine provision of services lacking real clinical appropriateness does not bring health benefits to the patient but potential harm, generates a significant environmental and clinical impact and consumes essential resources. Pharmaceutical products account for approximately 20% of total healthcare emissions; in particular, antibiotic overuse fuels antimicrobial resistance (AMR) and substantially contributes to soil and marine water pollution. Similarly, laboratory investigations have a significant carbon footprint and, in low-risk elective settings, up to 70% of routine histological exams could be avoided without affecting clinical outcomes, reducing laboratory workload, the use of toxic chemical reagents and the generation of special waste.</p>
<p>3</p>	<p>Do not use oversized surgical sets or open unnecessary single-use materials; instead, adopt custom sets, assembled for specific procedures and follow the “Do not open it if you don’t need it” rule, according to Circular Economy principles.</p> <p>The healthcare supply chain is responsible for approximately 60% of the sector’s total emissions. Adopting Circular Economy principles (Rethink, Reduce, Reuse, Recycle) reduces the quantity of material used and drastically mitigates the carbon footprint in the operating room. Using customized procedural packs and separating necessary devices from those that are optional, to be kept only “on standby” represent concrete actions to reduce the opening of unnecessary materials and thus cut down on waste, according to the “Do not open it if you don’t need it” principle. Likewise, rationalizing surgical kits by removing unused instruments and optimizing sterilization cycles is an effective action from an environmental perspective. Introducing these principles does not compromise clinical safety; on the contrary, it reduces the inappropriate opening of supplies, counting times, and the risk of injury to staff, thereby improving efficiency. Effective communication within the surgical team, standardization of procedures, and adherence to operative scheduling are also fundamental.</p>
<p>4</p>	<p>Do not dispose of healthcare waste as “hazardous/infectious waste” unless strictly necessary; instead, ensure correct separation and recycle, choosing the disposal method with the lowest carbon footprint.</p> <p>The environmental impact of healthcare waste disposal is estimated to be around 5% of the sector’s total emissions. The WHO estimates that only 15% of healthcare waste is considered hazardous; the remaining 85% is comparable to landscape waste. The disposal method chosen by staff has therefore a significant impact on the climate: incineration is the method with the highest environmental impact, while recycling has the lowest, being up to 50 times less polluting. In Italy, healthcare waste management is regulated by Presidential Decree (D.P.R.) 254/2003, which promotes the separation of non-contaminated waste from infectious waste and encourages recycling within the operating department.</p>
<p>5</p>	<p>Do not unnecessarily leave lights, computers, electromedical equipment, and Anaesthetic Gas Scavenging Systems (AGSS) turned on when operating rooms are not in use; instead, implement energy-saving strategies (set-back mode) when indicated.</p> <p>The operating department is among the most energy-intensive areas of a hospital: it is essential to turn off lights, computers, and electromedical devices when not in use. The Heating, Ventilation, and Air Conditioning (HVAC) and the Anaesthetic Gas Scavenging System (AGSS) alone account for 90% of the total energy consumed in an operating room. Therefore, activating energy-saving modes (set-back mode) during periods of inactivity can reduce energy consumption and costs without compromising environmental sterility when activities resume. Further energy-saving strategies include using LED lighting and installing motion sensors in common areas and accessory rooms.</p>

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.

How this list was created

The carbon footprint of healthcare systems accounts for approximately 5% of global emissions, with the surgical sector and operating theatres being among the primary contributors. In Italy, the high volume of surgical activity also results in a significant environmental burden that requires an urgent and coordinated response. Healthcare professionals have ethical and professional responsibilities to promote sustainability-oriented changes; however, there is often a lack of the specific knowledge and skills needed to translate sustainability principles into concrete initiatives. To fill this gap, the “Intercollegiate Green Theatre Checklist” (GTC) was introduced in 2022, developed by the Royal Colleges of Surgeons of Edinburgh, Glasgow, England, and Ireland. This operational tool synthesizes scientific evidence and provides practical recommendations to assess and improve the environmental sustainability of the operating department. With the aim of promote cultural change and overcoming linguistic barriers in our country, the “Green Theatre Checklist - Italian Version” was established in 2025, the result of a rigorous process of translation, validation, and adaptation to the national regulatory and cultural context. From this tool, CSH Italia has selected 5 key recommendations, chosen for their impact on daily clinical practice nationwide.

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, Altroconsumo, the Federation for Social Services and Healthcare of Aut. Prov. of Bolzano, Zadig. www.choosingwiselyitaly.org www.slowmedicine.it

The Italian Centre for Sustainable Healthcare APS (CSH Italia) is no profit organisation founded in 2024. It is dedicated to promoting environmental sustainability within the healthcare sector and clinical pathways, to foster an ecological transformation of healthcare. The mission of CSH Italia is to support health professionals, healthcare organizations, and institutions in developing knowledge and practical tools needed to reduce the environmental impact of clinical care, while maintaining the efficacy and safety of treatments as a priority. The association promotes research, training, and the dissemination of low-carbon operational models. CSH Italia actively collaborates with scientific societies and national and international healthcare organizations, such as the Centre for Sustainable Healthcare UK, Healthcare Without Harm Europe, and the University of Turin (UNITO). For further details, visit: www.cshitalia.it