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Solutions that minimise clinical waste and maximise recycling

How can the transformation to increase sustainability in hospitals succeed? Participants in the SustainMed project presented their answers at the closing event on 27 June 2025 in Stuttgart. BG Hospital Tübingen, Novis GmbH in Tübingen and FREESIXTYFIVE GmbH in Bad Kreuznach are the partners in this project, which has been coordinated by BioRegio STERN Management GmbH over the past 18 months. The Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg provided approximately 500,000 euros in funding to develop solutions for goals such as reducing volumes of waste in hospitals, which can total up to eight metric tons every day for a medium-sized facility.

The partners worked together on creating waste and resource management concepts for medical products and processes in order to minimise the consumption of disposable materials and maximise the recycling rate, with BG Hospital Tübingen acting as the pilot user. The SustainMed market compass study that was published at the end of this project puts forward some surprisingly simple solutions. In an everyday clinical setting, for example, there is no need to wear disposable gloves when making phone calls, measuring a patient's blood pressure or making up beds. Furthermore, the sterile packaging of products that are used to prepare operating theatres can simply be disposed of in the standard yellow bags used for recycling.

Like almost all disposable surgical instruments, a small syringe or a scalpel that is used only briefly is discarded and incinerated as contaminated waste. It is therefore hardly surprising that hospitals are currently the fifth largest producer of waste in Germany. That doesn't need to remain the case, though. The SustainMed project partners accepted the challenge of developing innovative and sustainable approaches to running hospitals in ways that will generate much less waste in the future. It goes without saying that this must not result in hygiene and sterility requirements or everyday practicability for hospital staff being relativised.

The Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg provided the four project partners with funding totalling approximately 500,000 euros to create a sustainability tool that will help bring about an allencompassing ecological transformation in the healthcare sector. Novis GmbH, a developer of bio-based technology concepts for utilising residual materials, analysed flows of recyclables and user behaviour, while FREESIXTYFIVE created an online platform to collate, analyse and visualise all the data collected. This provided the basis for a digital twin of the clinical processes. BG Hospital Tübingen served as the pilot user and BioRegio STERN Management GmbH as the project coordinator.

For the purposes of the SustainMed market compass study on the sustainability transformation in the healthcare sector, which has now been published, the project team put questions to staff at BG Hospital Tübingen and managers of medical technology companies. BG Hospital Tübingen's product portfolio was also closely scrutinised. During this process, the digital twin first mapped the hospital's entire value chain, using AI to supply all data relating to inventories and consumption volumes in real time. It also helped with the employee survey relating to sustainability, the associated challenges and proposed improvements during the day-to-day hospital routine.

On the basis of the survey results and the analysis of the product portfolio, four typical products were selected for the study – examination gloves, disposable surgical instruments, sterile packaging in the operating theatre and folded hand towels. In terms of the quantity consumed, the last of these four is the most frequently used product – the hospital got through over six million of them during the three-month survey period. An examination of the potential for savings and reuse produced some surprising results. For example, the hospital switched from disposable folded hand towels to recyclable hand towel rolls. Training on the correct use of disposable gloves – which have a higher carbon footprint than someone washing and disinfecting their hands – reduced consumption, while still ensuring compliance with all hygiene regulations. When carrying out administrative tasks, administering tablets or measuring the blood pressure of a patient who does not have open wounds, the wearing of single-use gloves can easily be dispensed with.

As for disposable surgical instruments, the metal left behind following incineration has previously had to be removed from the slag and disposed of separately. For one single ward at BG Hospital Tübingen, this corresponds to over 250 kilos of metal – a reusable raw material – each year. In the long term, the possibility of switching to

reusable products is to be examined, taking into account the personnel and energy costs associated with sterilisation. The analysis of operating theatre waste led to an impressive finding. All packaging has to date been treated as waste to be incinerated, despite the fact that much of the packaging that comes with items for preparing operating theatres is not contaminated if patients are not even in the theatre yet. Collecting this separately would mean large volumes of waste could simply be disposed of in the standard yellow bags and subsequently recycled. The project findings relating to the improvement of waste separation in operating theatres will now be put into practice across all theatres and anaesthesia preparation rooms at BG Hospital Tübingen.

A qualitative online survey revealed that sustainability is very important to staff at BG Hospital Tübingen. Many of them see potential for reducing waste – despite the fact that a lack of time and predictability makes it difficult to adopt sustainable practices in an everyday clinical setting. The medtech companies that took part in the survey also emphasised the importance of social responsibility, resource efficiency and waste management. However, they regard regulatory requirements and the associated high production and development costs as obstacles to implementing sustainability strategies. Manufacturers share the view of BG Hospital Tübingen staff that training and improved know-how regarding waste avoidance and recyclability offer considerable potential.

All this means that the end of the SustainMed project is first and foremost a starting point for everyone involved. The study clearly proves that there is a desire for greater sustainability, but innovative and practical solutions need to be developed and expertise built up in order to achieve this goal. All four partners provided answers to the question of how sustainability can be successfully transformed in the healthcare sector. The key is targeted use of digital tools and the close involvement of all stakeholders – from hospital procurement to use of the medical product, from manufacture to disposal, and from staff to patients.

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Further information

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