

## PRESS RELEASE

### Strategy to reduce the amount of propofol waste in the operating room

Researchers from Bonn show which procedure reduces the amount of anesthetic discarded

**Bonn, October 29 – Propofol is used in the operating room to induce anesthesia. To maintain anesthesia, a continuous infusion of the agent via a separate syringe pump is the standard procedure for total intravenous anesthesia. However, this is not entirely sustainable: propofol produces about 45 percent of the drug waste in the operating room, and a quarter of the agent remains unused. Researchers at the University Hospital Bonn (UKB) and the University of Bonn have now shown that an alternative method reduces the amount of waste. Instead of a separate syringe for the induction and maintenance of anesthesia, the researchers were able to show that the use of a single syringe pump for the induction and maintenance of anesthesia is more sustainable: propofol waste could be reduced by between 30 and 50 percent. The study has now been published in the British Journal of Anaesthesia.**

In times of climate change, hospitals also need to develop sustainable strategies for the protection of resources. Anesthesiology and intensive care medicine are among the most resource- and energy-intensive areas: they generate a significant proportion of hospital and medication waste, which must be disposed of properly. “Propofol is a leader in terms of medication waste,” explains Prof. Dr. Mark Coburn, Director of the Department of Anesthesiology and Operative Intensive Care Medicine (KAI) at the UKB, who also conducts research at the University of Bonn. The anesthetic is used to induce and maintain anesthesia. It is routinely injected in the operating room first with a syringe to induce anesthesia and, after the patient has fallen asleep, a continuous infusion often follows via a separate automatic syringe pump. The problem: “In some institutions, up to 45 percent of all medication waste in the operating room is propofol,” emphasizes Dr. Florian Windler, a KAI assistant physician at the UKB. In addition, a quarter of the anesthetic prepared remains unused or underused at the end of the operation and goes to waste.

#### Is a single syringe pump more ecological?

A research team in Bonn has now investigated whether the use of a single syringe pump for both induction and maintenance of anesthesia instead of a separate syringe for induction reduces propofol waste. Anesthetists already use this method. There are no known disadvantages for patient safety as a result of this procedure. However, the researchers analyzed whether it is really more environmentally friendly by examining propofol consumption and waste in the anesthesia protocols of over 300 surgeries performed between June 2021 and June 2023. They compared the procedures using the conventional

#### Comm. Chairman of the Management Board

Prof. Dr. Bernd Weber  
Phone: +49 228 287 10900  
Fax: +49 228 287 9010900  
bernd.weber@ukbonn.de

#### Communication and media

Viola Röser  
Management

Tel: +49 228 287-10469  
viola.roeser@ukbonn.de

Bonn University Hospital  
Communication and media  
Venusberg Campus 1  
Geb. 02  
53127 Bonn

method with those using the alternative with only one syringe pump. They also examined whether the propofol discard between the two methods varied in relation to clinical data such as the age, weight and gender of the patients, as well as their alcohol and drug consumption.

The results showed that “on average, around 30 percent less propofol was discarded per operation when anesthesia was administered using a single syringe pump,” says first and corresponding author Dr. Windler. For procedures lasting between 20 and 100 minutes, this procedure without a separate syringe for the anesthesia even resulted in up to almost 50 percent less propofol waste. Patient’s age, gender, weight or pre-existing conditions had no influence on the waste in the operating room. The situation was different for patients who consumed alcohol or other substances on a regular basis. These patients usually require more anesthetic during surgery. The waste in these patients was increased. “Interestingly, this only occurred when we administered an additional syringe. The effect is not visible when using the syringe pump, but rather reduces waste by up to 49 percent,” adds co-author Prof. Coburn.

### **A greener approach to anesthesia in the future**

“Our analysis indicates that the use of a single syringe pump for both induction and maintenance of anesthesia is the best option overall,” Dr. Windler concludes from the results. The method could therefore actually represent a more sustainable method. In addition, this also has an economic effect: if the procedure is used 10 to 15 times a day, around 1,300 of the frequently used 20-milliliter vials of propofol can be saved per year. “From an ecological as well as an economic point of view, the induction of anesthesia with a separate syringe should be reconsidered as the standard method,” appeals Prof. Coburn. He initiated the Green Team at KAI at the UKB: “We want to put more emphasis on sustainability in the clinical focus,” he explains. “The study on propofol waste shows how we can reduce the environmental impact of our work without compromising the quality of patient care.”

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### **Scientific contact:**

Prof. Dr. Mark Coburn  
Director of the Department of Anesthesiology and Operative Intensive Care Medicine  
University Hospital Bonn  
E-mail: [Mark.Coburn@ukbonn.de](mailto:Mark.Coburn@ukbonn.de); Telephone: +49 (0)228-287 14110 (secretary's office)

Dr. Florian Windler  
Department of Anaesthesiology and Operative Intensive Care Medicine  
University Hospital Bonn  
E-mail: [florian.windler@ukbonn.de](mailto:florian.windler@ukbonn.de)

**Image material:**



**Caption:** Strategy to reduce the amount of propofol waste in the operating room: (from left) Prof. Dr. Mark Coburn and Dr. Florian Windler show which procedure reduces the waste of propofol.

**Picture credits:** University Hospital Bonn (UKB) / Rolf Müller

**Press contact:**

Dr. Inka Väth

Deputy Press Officer at the University Hospital Bonn (UKB)

Communications and Media Office at Bonn University Hospital

Phone: (+49) 228 287-10596

E-mail: [inka.vaeth@ukbonn.de](mailto:inka.vaeth@ukbonn.de)

**About Bonn University Hospital:** The UKB treats around 500,000 patients per year, employs around 9,500 staff and has total assets of 1.8 billion euros. In addition to the 3,500 medical and dental students, 550 people are trained in numerous healthcare professions each year. The UKB is ranked first among university hospitals (UK) in NRW in the Focus Clinic List, had over 100 million third-party funds in research in 2023 and has the second highest case mix index (case severity) in Germany. The F.A.Z. Institute awarded the UKB first place among university hospitals in the category "Germany's Training Champions 2024".