

Patient Safety Award 2023: New measurement approach helps reduce risk of nerve injury during pelvic surgeries

- **Work on intraoperative neuromonitoring receives 2023 Patient Safety in Medical Technology Award from the German Society for Biomedical Engineering (VDE DGBMT) and the Aktionsbündnis Patientensicherheit (APS)**
- **The background: Damage to the autonomic pelvic nerves often occurs during operations on the rectum, prostate or uterus**
- **Award winner Ramona Schuler uses impedance measurements to reduce the amount of time and effort needed for measurement, thus making it possible to avoid consequential surgical damage for patients**

(Frankfurt a. M., Sept. 27, 2023) The Award for Patient Safety in Medical Technology is sponsored by Hans Haindl, MD. The award is aimed at young scientific and technical talent in research institutions, clinics and industry, as well as hospital operators. This year, the EUR 5,000 prize goes to Ramona Schuler, who developed a new neuromonitoring approach for identifying autonomous nerves in the pelvic region in her dissertation and tested its technical and clinical feasibility in two studies.

"Delivering valid results quickly during surgery"

Operations in the pelvic region are demanding in any case, and there is also a very sensitive anatomy: the pelvic floor contains a fine, highly complex plexus of autonomic nerves that supply signals to the smooth muscles of the internal organs. If an operation is performed there, there is a very high risk of damaging this plexus. Consequential damage includes incontinence or sexual dysfunction. "Pelvic nerves are very difficult to identify visually, which is why a surgeon needs technical aids," explains Ramona Schuler. "My motivation was to find a solution that provides valid results quickly and supports the surgeon as best as possible during an operation."

Identify autonomic nerves via electrical tissue resistance of target organs

The only commercially available method to date uses EMG (electromyographic testing), otherwise used for skeletal muscle testing, in combination with bladder pressure measurement. However, before each stimulation, the bladder must be filled and then drained again, which is time-consuming. In contrast, Ramona Schuler's new approach uses bioimpedance measurement, which produces valid results even when the bladder is empty. "Since we are dealing with many impedance changes at the target organs that need to be interpreted, I have developed a software-based analysis tool," Schuler said. AMINA (Automatic Muscle Impedance and Nerve Analyzer) evaluates the acquired data and helps the surgeon quickly and easily identify functional autonomic nerves during surgery.

Innovation for people: The impedance measurement with AMINA as a product

Ramona Schuler started her professional career after completing her medical technology studies in 2016 at neuromonitoring specialist Dr. Langer Medical in Waldkirch (Baden-Württemberg). After a few years in product management with a focus on research and development, she received an offer to do a PhD in 2019. "My master's thesis already focused on neuromonitoring of autonomic nerves, and the dissertation at TU Ilmenau on this topic was the logical continuation," Schuler says. "After the initial feasibility studies, we will now continue to work on the new measurement method as a team at Dr. Langer Medical so that the product can reach the market."

About the German Society for Biomedical Engineering within VDE (VDE DGBMT)

The German Society for Biomedical Engineering in the VDE (VDE DGBMT) is the scientific and technical society for medical technology in Germany. It was founded in Frankfurt am Main in 1961.

The DGBMT in the VDE brings together experts from all areas of technology applications in medicine and deals with the entire range of topics in biomedical technology. It organizes conferences and workshops for expert audiences and is the sponsor of two international scientific journals: Biomedical Engineering and Current Directions in Biomedical Engineering published by Walter de Gruyter. Position papers, statements and expert contributions discuss current topics independently and neutrally. In addition, the DGBMT awards promotional prizes for young scientists, for scientific excellence and innovation, and for patient safety in biomedical engineering. Last but not least, it represents German biomedical engineering in international bodies.

For more information, visit www.vde.com/de/dgbmt

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