HoloLase MD: Advancing Precision and Ergonomics in Urological Surgery

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Introduction

In today's surgical landscape, achieving optimal precision, efficiency, and ergonomic support is crucial for improving patient outcomes and enhancing the surgeon's experience. At the forefront of this transformation is the HoloLase MD, an innovative augmented reality (AR) laser safety glass developed by Innotonix GmbH. This cutting-edge technology represents a major leap in laser-based urological procedures, combining AR capabilities with advanced safety features to redefine the standards of modern surgery. In collaboration with Asklepios West Klinikum Hamburg we are setting new standards in urological surgery where the HoloLase MD was tested in real life scenarios for the first time. Dr. Giuseppe Magistro used these innovative glasses during a HOLEP operation – and the results are promising.

The Unique Capabilities of HoloLase MD

The HoloLase MD offers a range of unique features that elevate it above conventional laser safety equipment. This headset provides surgeons with an immersive AR experience by projecting essential surgical information directly into their line of sight, thereby minimizing the need to glance away at external monitors. This technology not only enhances focus and accuracy but also supports a more comfortable and efficient workflow.

Key capabilities of the HoloLase MD include:

1. **Enhanced Ergonomics**: With important data and visual feeds available in real time within the surgeon's view, HoloLase MD reduces unnecessary head and body movements, thus lowering physical strain during extended procedures.
2. **Real-Time Video Transmission**: The headset provides a high-resolution, latency-free transmission (<10 milliseconds) of endoscopic video, allowing the surgeon to continuously monitor the operative field with minimal delay. This fluid video experience ensures that the surgeon's focus remains uninterrupted.
3. **Comprehensive Laser Safety**: Designed specifically for laser-based surgery, HoloLase MD offers complete laser protection. This is essential for both the safety of the surgeon and the patient, ensuring that AR technology can be safely applied in laser-focused environments.
4. **Facilitation of Team Collaboration**: The headset's real-time data sharing allows team members to view the same critical information as the surgeon, fostering a more collaborative and synchronized approach to complex procedures.

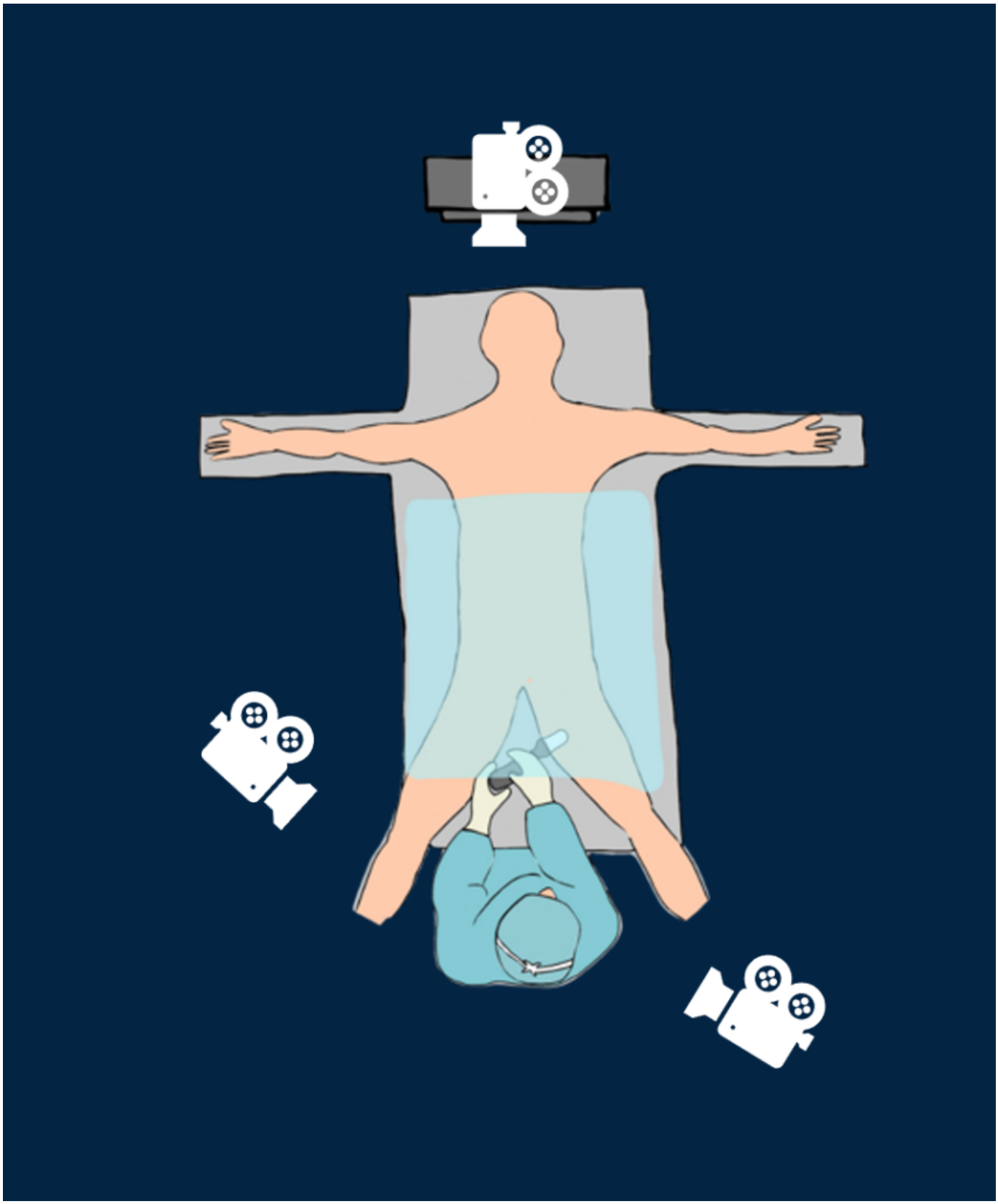
Applications in Urological Surgery

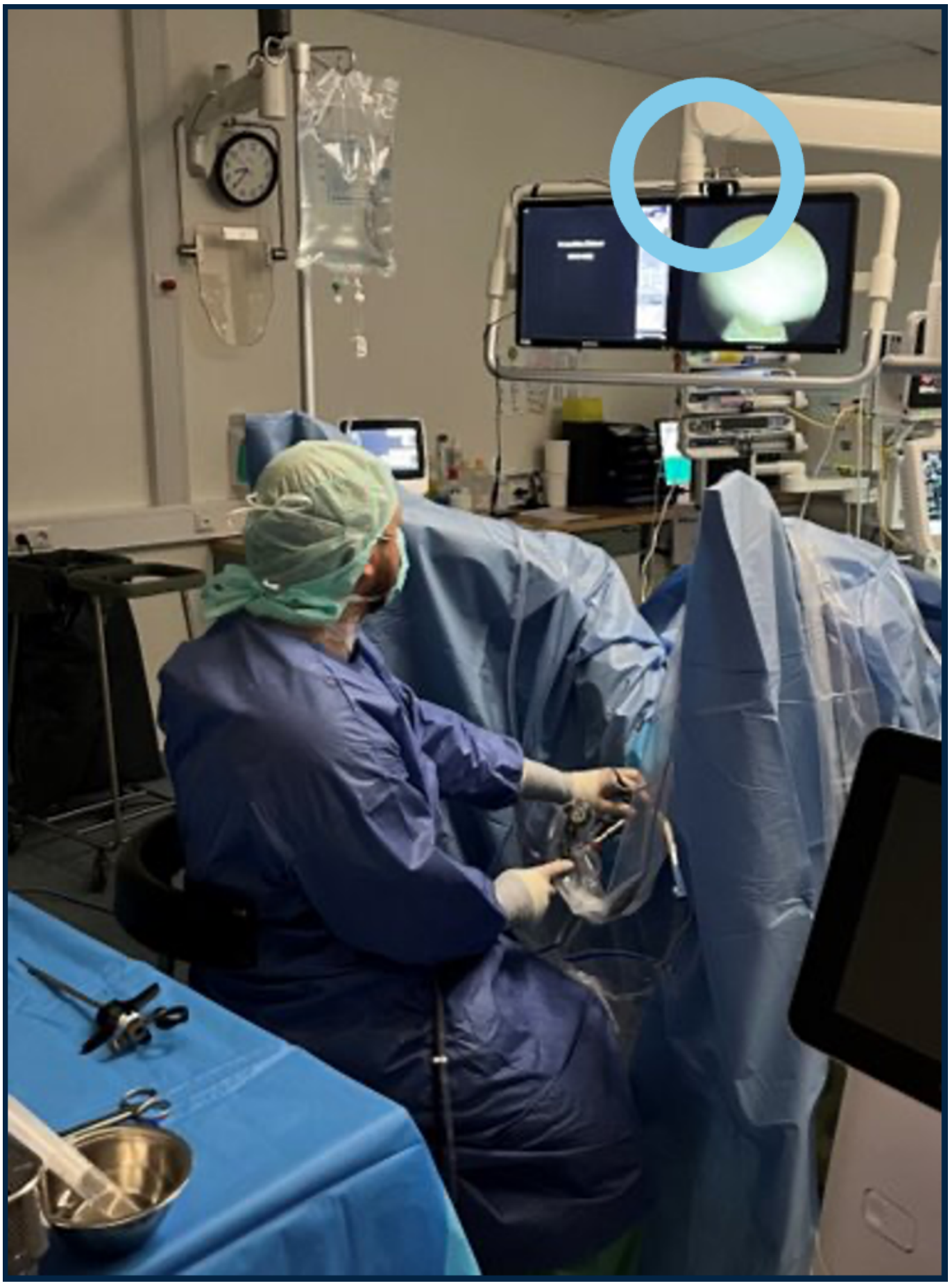
HoloLase MD has been specifically designed to support various urological surgical procedures, where precision and control are critical. This includes procedures such as:

- **Prostate Laser Enucleation** (HoLEP, ThuLEP): With HoloLase MD, surgeons experience heightened precision and significantly reduced enucleation time, leading to improved outcomes.
- **Kidney Stone Therapy**: The AR capabilities of the headset enable more accurate targeting and efficient removal of stones, enhancing the effectiveness of the treatment.

- **Tumor Enucleation** (e.g., Urothelial Carcinoma): For delicate excisions of cancerous tissues, HoloLase MD offers a high level of control, which is particularly important in minimizing risks associated with tumor removal.

Setting

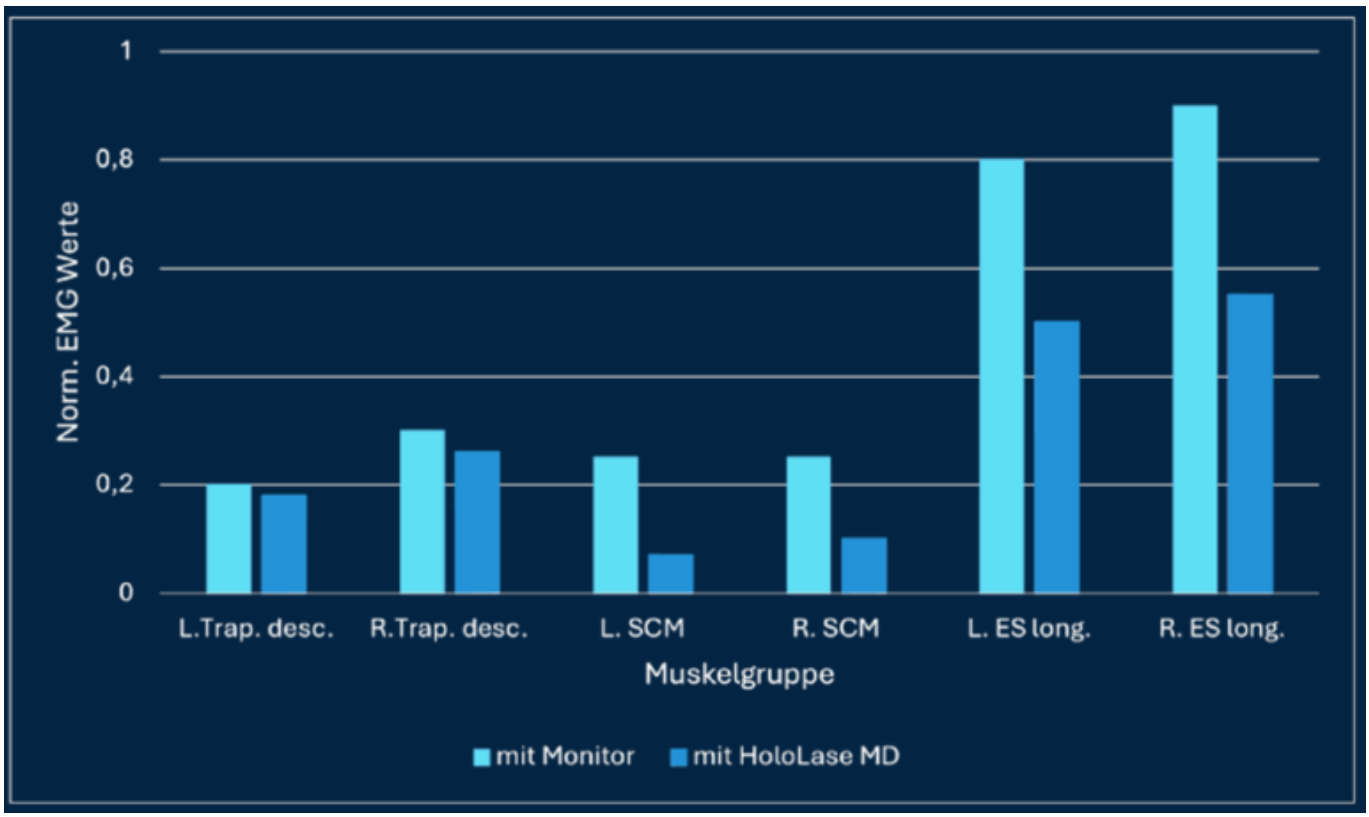




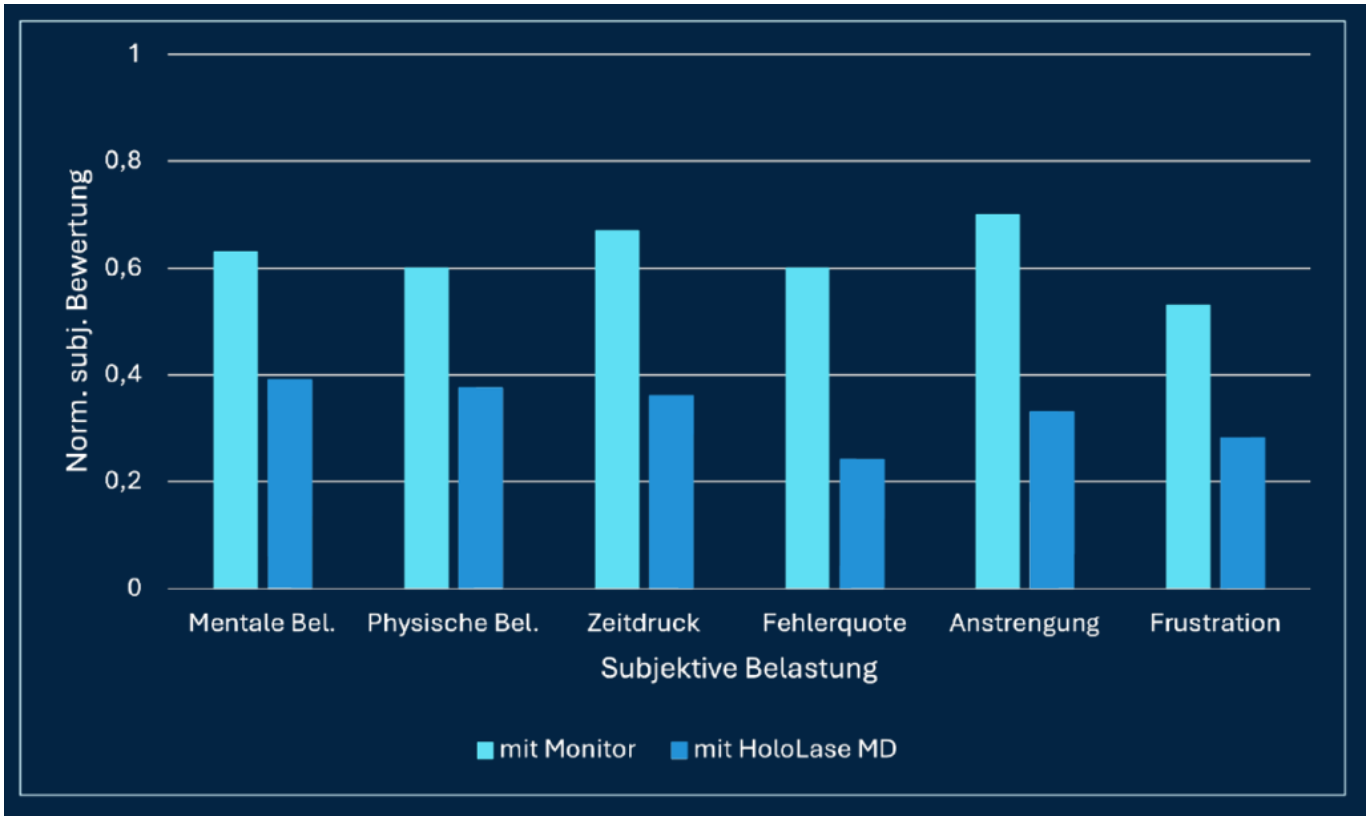
Clinical Evaluation and Ergonomic Impact

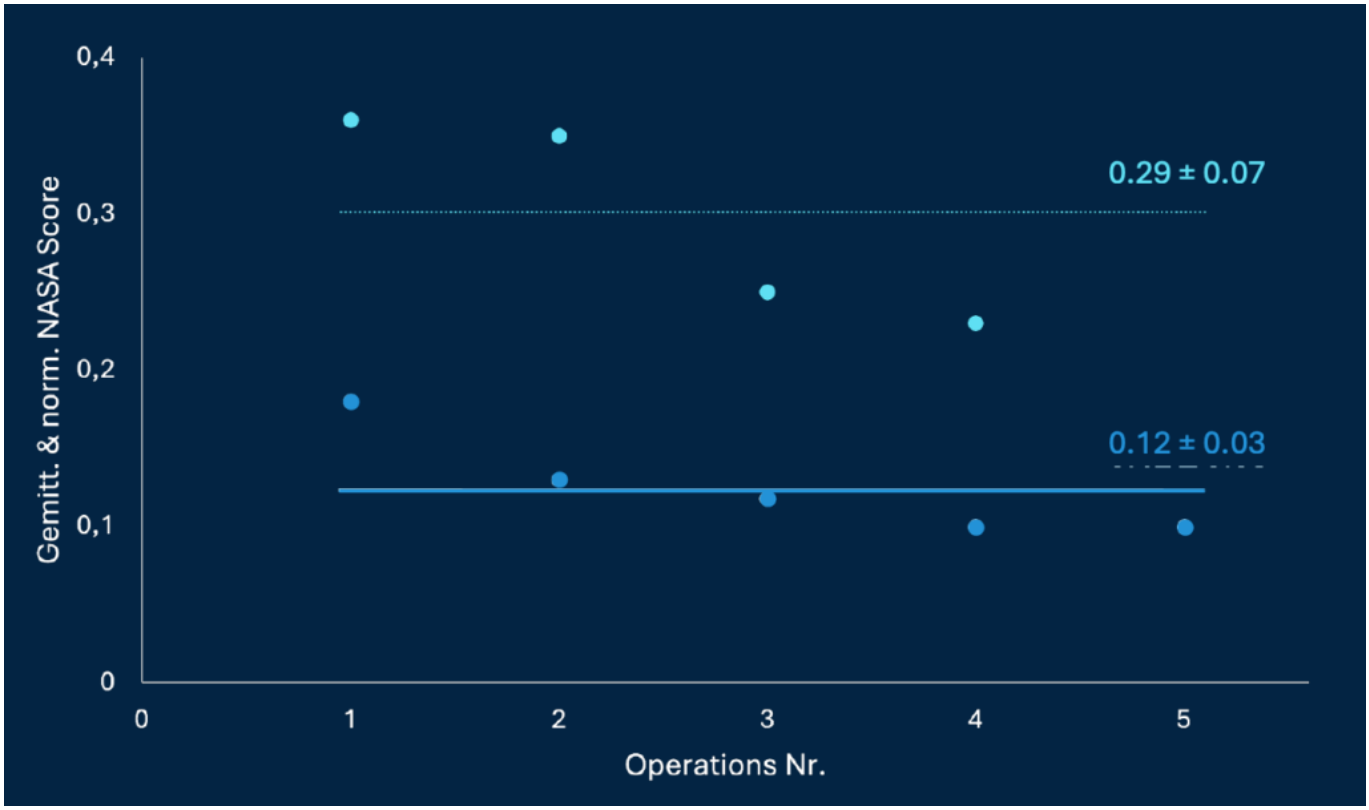
Enhanced Physical Comfort for Surgeons

The ergonomic advantages of HoloLase MD were rigorously evaluated through a clinical study at Asklepios Westklinikum Hamburg. Using electromyography (EMG) measurements, researchers assessed the headset's impact on muscle strain experienced by surgeons. The results were remarkable, revealing that the HoloLase MD reduced muscle load by up to 70% in comparison to traditional surgical setups. This substantial reduction in physical strain is a game-changer, as it minimizes the risks of musculoskeletal issues that often affect surgeons over time.



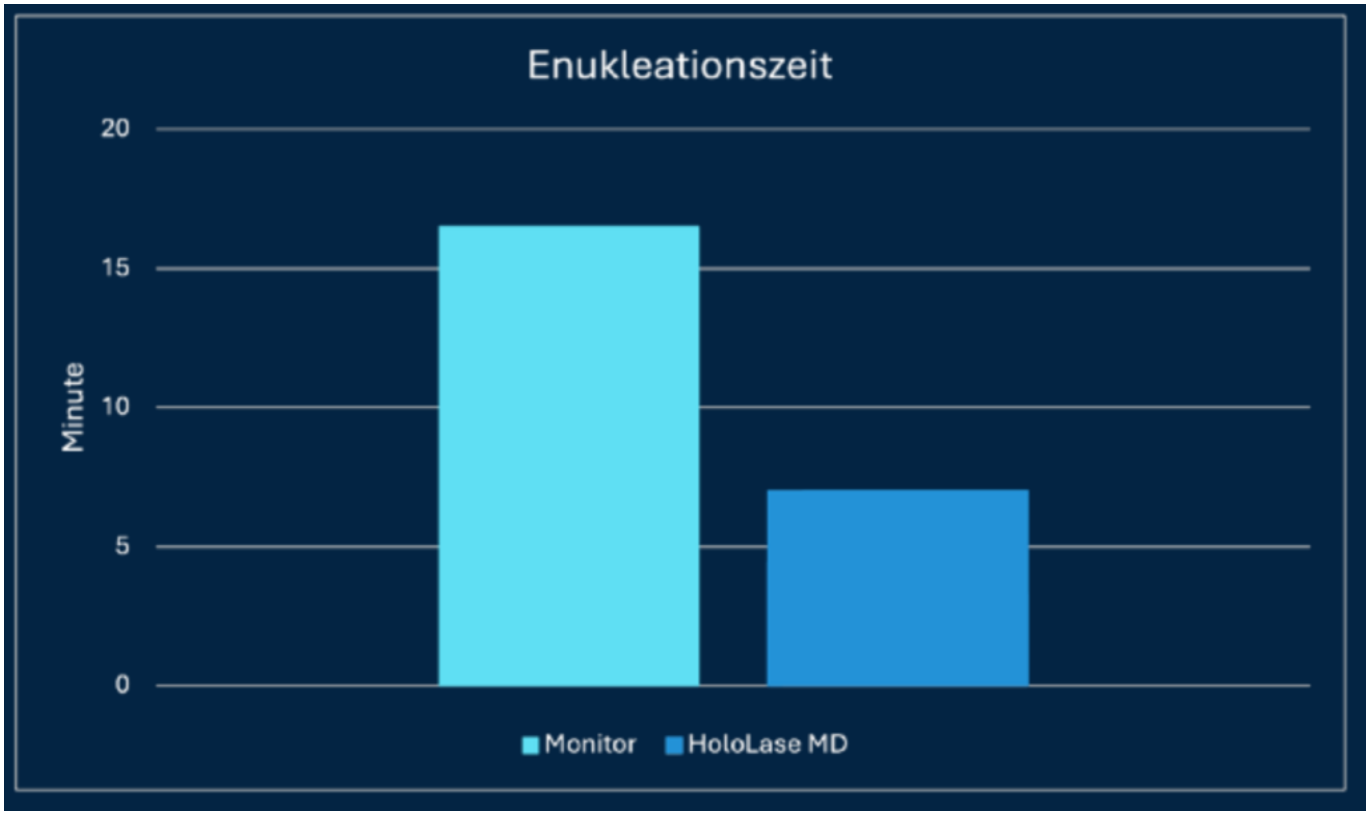
Further supporting these findings, the study used the NASA Task Load Index (TLX) to measure perceived workload. Surgeons reported a 60% reduction in their perceived physical and mental workload when using HoloLase MD, underscoring the headset's effectiveness in providing ergonomic support. This reduction in workload not only makes procedures more comfortable but also helps surgeons maintain focus and precision over extended periods.





Increased Efficiency in Surgical Procedures

Beyond its ergonomic benefits, HoloLase MD has also demonstrated an impressive impact on surgical efficiency. In prostate laser enucleation procedures (e.g., HoLEP), the headset effectively reduces enucleation time, allowing surgeons to complete procedures in half the time typically required. This enhancement in efficiency is crucial in high-demand environments, where streamlined procedures contribute to increased patient throughput and reduced wait times.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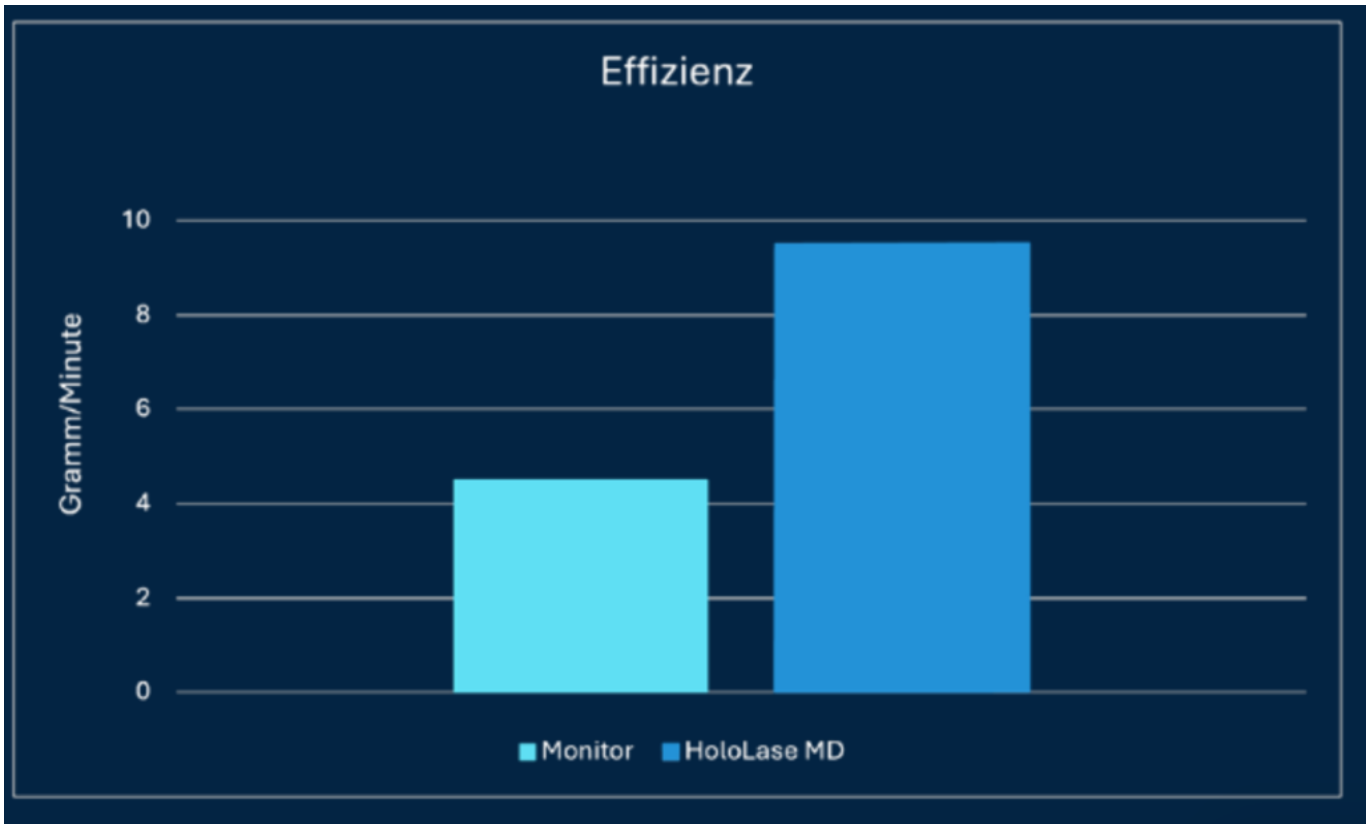
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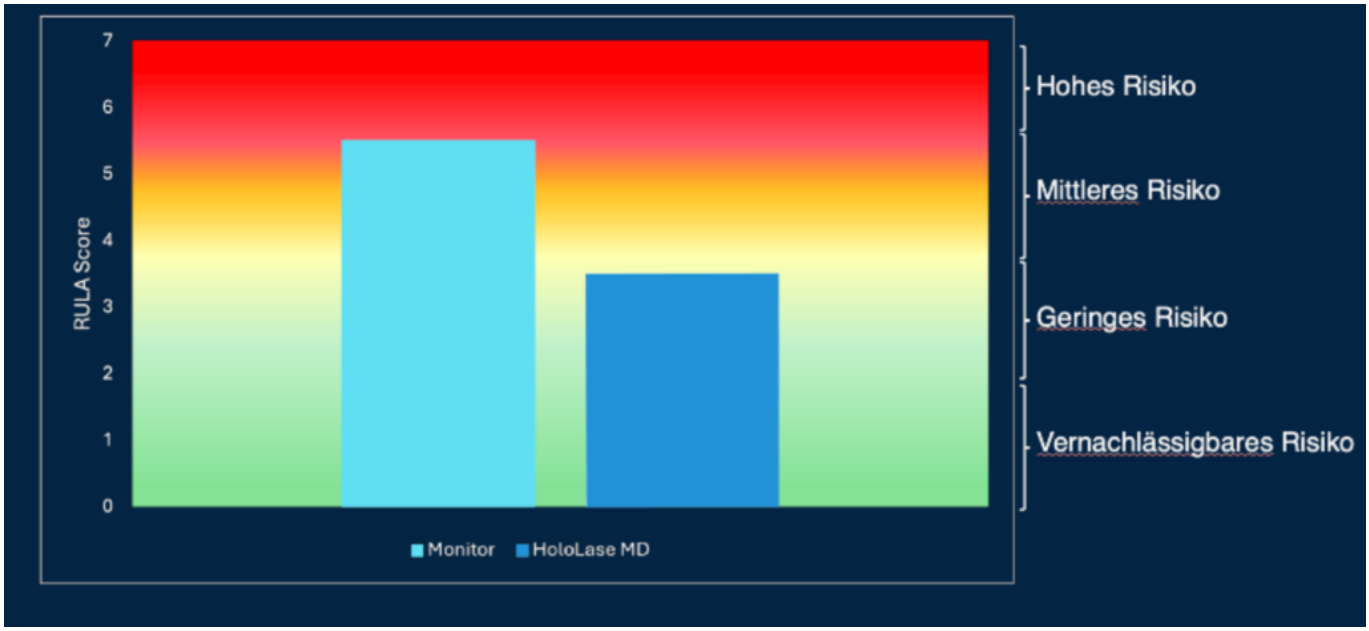

Positive Feedback from Surgical Professionals

Dr. Giuseppe Magistro, Chief of Urology at Asklepios Westklinikum Hamburg, provided positive feedback on the integration of HoloLase MD into his surgical practice. He noted that the ability to view critical information directly within his line of sight—without needing to look away from the patient—has greatly improved the safety and precision of his procedures. Dr. Magistro highlighted that the ergonomic support and lightweight design of the headset have made it easier to maintain concentration over long periods, ultimately benefiting both the surgeon and the patient.

“Integrating HoloLase MD into our procedures has substantially improved our workflow. Having critical information right within my field of vision without looking away from the patient improves both safety and precision.”

Conclusion

The HoloLase MD represents a significant advancement in laser-based urological surgery, delivering unparalleled support for precision, efficiency, and ergonomics. With its innovative features, the headset has demonstrated a tangible impact on the physical and cognitive demands of surgical practice, as well as on the overall efficiency of complex procedures. The initial response from the medical community has been overwhelmingly positive, and with further development, the HoloLase MD is set to become an

invaluable asset in urological surgery and beyond.

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