

**MEDTECH  
INNOVATION  
AND EDUCATION  
CENTER**

The MedTech Innovation and Training Center at Óbuda University is a unique Hungarian facility that provides a realistic clinical environment for the development of healthcare technologies. The center assists in the testing, validation, and market launch preparation of medical devices with its modern operating room, intensive care, and IT infrastructure. The institution offers close cooperation between the university's knowledge base, industry players, and the healthcare sector to refine prototypes. The laboratory not only supports research and development, but also plays a key role in training future professionals and ensuring compliance with international quality standards. Its goal is to operate an internationally competitive innovation ecosystem that effectively links scientific results with practical medicine. The lab is not just infrastructure, but a professional meeting point where the university, industry, and healthcare players can shape the MedTech solutions of the future together.

#### WHAT MAKES THE CENTER UNIQUE?

The laboratory infrastructure fully models a modern hospital environment in which real clinical modeling can be performed in the following units

- Operating room (OR),
- Intensive Care Unit (ICU),
- Pediatric Intensive Care Unit (PICU),
- Integrated healthcare information system (HIS) with real interfaces.

Enabling:

- Clinical workflow-based testing of prototypes,
- Device validation in a real simulation environment,
- Interoperability testing,
- Implementation of education and training programs.

#### COMPREHENSIVE INSTITUTIONAL HEALTH INFORMATION SYSTEM (HIS)

One of the center's most significant professional strengths is its integrated, real-time institutional health information system (HIS), which is based on a functioning system used in several domestic healthcare institutions. The HIS operating in the laboratory environment models complete institutional data management, patient pathway management, and clinical administration. The laboratory is ready to handle foreign HIS systems and support developments based on them.

Interfaces and connection points:

- NEAK interface – modeling of financing and reporting processes,
- EESZT connection – integration of national digital health infrastructure,
- HL7-based data connections,
- DICOM image processing interfaces,
- Clinical data and patient pathway modeling environment.

This enables integration testing of medical software, data security and interoperability validation, and testing of digital health developments for system integration.

The MedTech lab also features a BI component for visualizing and analyzing data generated in the lab, which can be used to demonstrate data-driven decision-making and hospital operations monitoring.



## AI CAPABILITIES

Due to the University's profile, it has exceptional access to AI systems. With the help of the Med-Tech lab, depersonalized datasets can be created that can be used to develop various target models for both the functional expansion of different devices and to support clinical decision-making.

## OR – OPERATING ROOM

The surgical unit models a full-scale surgical environment suitable for validating surgical instruments, imaging systems, medical robotics solutions, and surgical workflows.

Main tools:

- Surgical bed,
- Ceiling-mounted operating light system,
- Integrated camera system,
- Extraction system,
- Electrosurgical unit (cautery),
- Patient monitoring system,
- Anesthesia machine and ventilator support,
- Surgical instrument carts,
- Sterile work surface modeling.

## ICU – INTENSIVE CARE UNIT

The intensive care unit is designed to simulate the care of critically ill patients, enabling the validation of life support devices, monitoring systems, and intensive care technologies.

Main tools:

- Field hospital bed system,
- Multi-parameter patient monitoring systems, data concentrator,
- Ventilation equipment,
- Infusion pumps,
- Simulator doll (for critical care training).

## PIC – PAEDIATRIC INTENSIVE CARE

The pediatric intensive care unit focuses specifically on developments in neonatology and infant care, ensuring prototype evaluation and validation in a specialized clinical environment.

Main tools:

- Incubator station,
- Blue light (phototherapy) system,
- Infant monitoring system,
- Newborn simulation devices,
- Respiratory support units,
- Precision temperature control systems.



## INTEGRATED TOOL LIST – FOR VALIDATION AND DEVELOPMENT PURPOSES

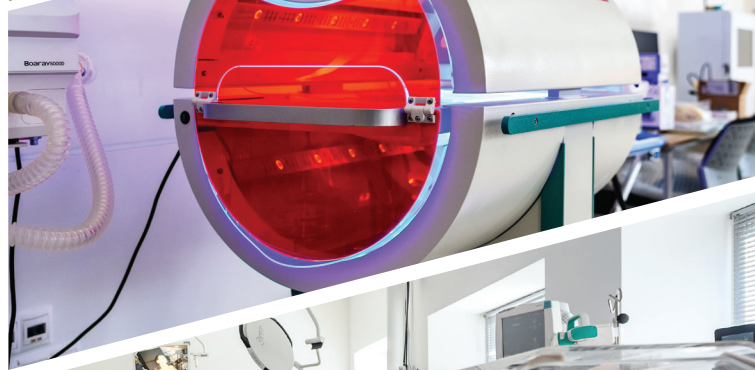
The following integrated tools are available to support development and validation activities:

- Patient monitoring systems,
- Ventilators,
- Electrosurgical equipment,
- Infusion pumps,
- Medical camera systems,
- Interoperable IT interfaces,
- Healthcare data management systems.

## OTHER TOOLS, EQUIPMENT

Additional measurement and prototyping tools are also available to support development and research tasks:

- Mobile ECG, single-channel ECG,
- Drug pumps,
- Ventilators,
- Diabetes-related devices,
- Wearable physiological parameter measuring devices (HR, GSR, etc.),
- EEG system (g.tec),
- Fablab station – for rapid prototyping,
- Data concentrator system,
- Additional equipment will be purchased and integrated as required by the project.





## QUALITY ASSURANCE AND CERTIFICATION GUIDELINES

The MedTech Center operates in accordance with the following quality assurance and certification frameworks, which are currently being implemented:

- ISO 9001 quality management system,
- MSZ EN ISO 13485:2016 medical device quality management support,
- MDR/IVDR compliance validation background,
- Interoperability and IT security validation protocols,
- ISO/IEC 42001:2023 Artificial Intelligence Management System standard.

The goal is to create an accredited validation environment that prepares for certification and represents significant added value for our industrial partners.

## EDUCATION – TRAINING FUTURE PROFESSIONALS

In addition to university education, the Center:

- Specialized continuing education courses,
- Industrial training,
- Tool use and validation workshops,
- Multidisciplinary project work.

Students and professionals can work with real technologies and real systems.

## RESEARCH & DEVELOPMENT & INDUSTRIAL COOPERATION

The Center operates within the framework of EKIK – University Research and Innovation Center, and actively supports:

- Accelerating industrial prototype and product development,
- Providing the technical validation environment required for CE compliance,
- Clinical engineering testing,
- Usability testing solutions,
- Professional background for tender consortia,
- Startup and spin-off collaborations.

