Vitaly Herasevich, MD, PhD

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Vitaly Herasevich, MD, PhD, MSc is an internationally recognized expert in applied clinical informatics and critical care medicine. He is Professor of Anesthesiology and Professor of Medicine in the Department of Anesthesiology and Perioperative Medicine, Division of Critical Care, at Mayo Clinic, Rochester, Minnesota. Over the past 25+ years, Dr. Herasevich has been at the forefront of transforming how information technology is integrated into clinical practice, with particular focus on the intensive care environment.

Dr. Herasevich began his medical training in Belarus, where he earned his MD and PhD degrees, and subsequently pursued specialized training in medical informatics and clinical research. He joined Mayo Clinic in 2006, where he earned an MSc in Clinical Research and Informatics and became co-director of the Clinical Informatics in Intensive Care Laboratory. The laboratory's mission is to improve outcomes in critical care through the development and evaluation of health IT tools that enhance decision-making, safety, and quality of care.

Among his most impactful innovations are clinical decision support systems (CDSS) tailored to critical care. He is one of the key developers of syndromic surveillance tools, commonly referred to as "sniffers," which provide early electronic alerts for life-threatening conditions like sepsis, acute respiratory distress syndrome (ARDS), and shock. These tools are designed to promote earlier recognition and intervention, ultimately saving lives. He also co-developed the Ambient Warning and Response Evaluation (AWARE) system—a novel, context-aware, informatics-driven visualization and alerting platform aimed at reducing information overload and improving care coordination in the intensive care unit (ICU). This work has been widely recognized for its real-world impact on patient safety and workflow efficiency.

Dr. Herasevich has also played a leading role in designing and implementing clinical data warehouses that support quality improvement, population health analytics, and outcomes-based research. He has served as principal investigator (PI), co-investigator, or informatics lead on numerous federal (NIH, AHRQ, DoD) and industry-funded grants, cumulatively exceeding $115 million in research support. His scholarship includes over 150 peer-

reviewed publications, and he is the lead author of the widely used reference textbook, “Health Information Technology Evaluation Handbook,” now in its second edition.

A passionate advocate for interdisciplinary collaboration, Dr. Herasevich is active in numerous professional and scientific societies. He is a Fellow of the American College of Critical Care Medicine (FCCM), a Fellow of the Healthcare Information and Management Systems Society (FHIMSS), and a Fellow of the American Medical Informatics Association (FAMIA). He currently serves as President of the Minnesota HIMSS Chapter, where he promotes regional and national initiatives in health IT adoption, innovation, and workforce development.

Dr. Herasevich is frequently invited to speak nationally and internationally on topics including clinical informatics, sepsis surveillance, information visualization, data governance, and the evaluation of health technologies. His more recent interests extend into the fields of information security, machine learning, and computer vision, where he continues to explore novel applications to enhance clinical decision-making and patient care in complex healthcare environments.

Through his pioneering work, Dr. Herasevich has helped shape the evolving landscape of digital health in the ICU and remains a leading voice in the field of clinical informatics, bridging medicine, data science, and systems engineering to improve patient outcomes.

Selected publications:

Validation of an Electronic Surveillance System for Acute Lung Injury. *Herasevich V, Yilmaz M, Khan H, Hubmayr RD, Gajic O.*, *Intensive Care Med.* 2009 Jun;35(6):1018-23. This study validates one of the first electronic syndromic surveillance systems for acute lung injury (ALI), confirming its accuracy in identifying ALI using routinely collected electronic health record (EHR) data, paving the way for proactive management

Informatics Infrastructure for Syndrome Surveillance, Decision Support, Reporting, and Modeling of Critical Illness. *Herasevich V, Pickering BW, Dong Y, Peters SG, Gajic O.*, *Mayo Clin Proc.* 2010 Mar;85(3):247-54. This foundational paper describes the design and implementation of an integrated informatics infrastructure supporting syndrome surveillance, real-time decision support, and modeling of critical illness. The infrastructure became the basis for several early-warning and surveillance tools implemented at Mayo Clinic.

Development and Pilot Evaluation of Centralized Patient Surveillance Dashboard to Support ICU Population Management. *Herasevich V, Pickering BW, Dong Y, Peters SG, Gajic O.*, *Crit Care Med.* 2013 Aug;41(8):1965-71. This original manuscript presents the development and pilot testing of a centralized, ICU-wide patient monitoring dashboard (precursor to modern population management tools). The dashboard helped clinicians identify at-risk patients across the unit, enhancing situational awareness and prioritization.

Tele-ICU Technologies. *Herasevich V, Subramanian S.*, *Critical Care Clinics.* 2019 Jul;35(3):427-438. This review discusses the fundamental principles of Tele-ICU delivery models, technological requirements, cybersecurity considerations, health IT standards, and the interoperability necessary for implementing effective Tele-ICU systems. The authors provide insights into building robust Tele-ICU platforms to enhance critical care delivery.

Automatic ARDS Surveillance with Chest X-Ray Recognition Using Convolutional Neural Networks. *Ye RZ, Lipatov K, Diedrich D, Bhattacharyya A, Erickson BJ, Pickering BW, Herasevich V.*, *Journal of Critical Care, 2024;82:154794.* This study explores the application of convolutional neural networks (CNNs) for the automatic detection of Acute Respiratory Distress Syndrome (ARDS) using chest X-ray images. The authors demonstrate that CNN-based models can effectively recognize ARDS, potentially facilitating timely diagnosis and intervention in critical care settings.