Enhancing Patient Safety in Healthcare Settings: Systematic Investigation of Retained Foreign Objects as a Showcase

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Abstract

Medical errors have been the fourth leading cause of death in the United States, with an average of 250,000 deaths per year, after heart disease, cancer, and COVID-19. Knowing that more than 35 million patients get hospitalized every year in the U.S., developing more robust systematic incident investigation frameworks to reduce instances of medical errors and enhance patient safety is of paramount importance. This study specifically analyzes retained foreign objects (RFOs), as one of the most common sentinel events (any unanticipated event in a healthcare setting resulting in death or serious physical or psychological injury to a patient, not related to the natural course of the patient's illness), according to The Joint Commission. It uses the AcciMap framework, originally developed by Jens Rasmussen in 1997 as an incident analysis framework, for systematic investigation of RFOs and development of context-specific recommendations to reduce the instances of those errors in operating rooms. It uses two sources of data collection, i.e. a comprehensive literature review of previous studies that investigated RFO incidents as well as a provided dataset of reported RFOs to The Joint Commission, to capture contributing causes of the incidents and develops two separate AcciMap frameworks based on these two sources to analyze different socio-technical factors that led to those RFOs and identify the most influential causes through some data analysis. It then compares findings from the two analyses to identify similarities and differences between the captured influential causes and provides recommendations for improvement.

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Dr. Maryam Tabibzadeh is currently a visiting professor at the John Garrick Institute for Risk Sciences. She is an Associate Professor in the Department of Manufacturing Systems Engineering and Management at the California State University, Northridge (CSUN). Her research has been focused on risk analysis in complex safety-critical and technology-intensive industries, such as healthcare and offshore drilling sectors. Investigating the critical role of human and organizational factors, along with technological elements, in those industries has been a major focus of her research projects. Her main areas of research are risk assessment and safety management, systematic accident investigation and prevention, patient safety, and offshore energy safety. Dr. Tabibzadeh has presented and published papers in different peer-reviewed conferences and journals. As part of her accomplishments, she received the Outstanding Engineering Achievement Merit Award in 2018 and 2024 and the Distinguished Engineering Educator Award in 2022 from The Engineers' Council. She was recently selected as an Early-Career Research Fellow (2024 – 2025) at the Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine. She was also the College of Engineering and Computer Science's Research Fellow at CSUN in 2021 – 2022 and the Easton Foundation Faculty Fellow in 2019 – 2020. Dr. Tabibzadeh received her Ph.D. in Industrial and Systems Engineering from the University of Southern California.