

Risk Management Approach for a Secure and Performant Integration of Automated Drug Dispensing Systems in Hospitals

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Abstract : Medication dispensing system is a life-critical system whose failure may result in preventable adverse events leading to longer patient stays in hospitals or patient death. Automation has led to great improvements in life-critical systems as it increased safety, efficiency, and comfort. However, critical risks related to medical organization complexity and automated solutions integration can threaten drug dispensing security and performance. Knowledge about the system's complexity aspects and human machine parameters to control for automated equipment's security and performance will help operators to secure their automation process and to optimize their system's reliability. In this context, this study aims to document the operator's situation awareness about automation risks and parameters involved in automation security and performance. Our risk management approach has been deployed in the North Luxembourg hospital center's pharmacy, which is equipped with automated drug dispensing systems since 2009. With more than 4 million euros of gains generated, North Luxembourg hospital center's success story was enabled by the management commitment, pharmacy's involvement in the implementation and improvement of the automation project, and the close collaboration between the pharmacy and Sinteco's firm to implement the necessary innovation and organizational actions for automated solutions integration security and performance. An analysis of the actions implemented by the hospital and the parameters involved in automated equipment's integration security and performance has been made. The parameters to control for automated equipment's integration security and performance are human aspects (6.25%), technical aspects (50%), and human-machine interaction (43.75%). The implementation of an anthropocentric analysis system before automation would have prevented and optimized the control of risks related to automation.

Keywords : Automated drug delivery systems, Hospitals, Human-centered automated system, Risk management

Conference Title : ICHRCO 2020 : International Conference on Healthcare Robotics, Challenges and Opportunities

Conference Location : San Francisco, United States

Conference Dates : September 24-25, 2020