# Improving emergency department flow and decreasing risk through development and implementation of molecular diagnostics guided triage

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In the Emergency Department (ED), prompt and accurate diagnoses are crucial for saving lives and minimizing morbidity in highly critical patients. Infectious diseases are an especially important cause of morbidity and mortality, thus underscoring the importance of linking the causative microbe with the appropriate antimicrobial therapy.

Due to the lack of supplies and the expense of testing during the COVID-19 epidemic, accessibility to emergency services was frequently restricted. Concurrently, hospitals were under pressure to rapidly and properly identify infected patients and employees in order to minimize nosocomial disease transmission. This was of particular importance for protecting patients at high-risk of adverse outcomes, but also for protecting accessibility and high standards of healthcare, as COVID-19 infection rates were on the rise.

Due to excellent sensitivity, specificity, and applicability for various sample types, quantitative PCR (qPCR)-based diagnostic techniques are the gold standard for SARS-CoV-2 [1-3]. Hospitals, especially EDs overseeing care for new patients and performing emergency procedures, experience a significant burden when waiting periods exist between sample collection and results from specialized laboratories. This was particularly true during the pandemic with a high incidence of SARS-CoV-2 infection.

With this in mind, an integrated care team from Clinical Hospital Center Rijeka, Croatia sought to utilize already existing commercial qPCR reagents to optimize a typical qPCR process for use in everyday practice. The method had advantages over existing qPCR methods having already demonstrated feasibility of direct qPCR (dqPCR) detection without an RNA isolation phase, thus making it a faster method. Thus, a commercially available SARS-CoV-2 diagnostic test was modified into a point of care (POC)-dqPCR with premixed aliquots and was implemented as the accepted standard for rapid molecular diagnostic for respiratory infectious diseases in the Laboratory for Rapid Molecular Diagnostics in the ED at Clinical Hospital Center Rijeka. When the POC dqPCR method was introduced, waiting period for the results decreased by up to 38 hours [from a maximum of 44 hours to 6 hours]. This approach saved 33% of the budget for molecular diagnostics for a monthly savings €40,000, [annually €480,000] on isolation reagents alone. Finally, this new process positively and substantially affected clinical decision-making, while mitigating risk of downstream COVID-19 transmission.

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