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Improving emergency department flow to enhance resource utilization and improve patient outcomes through laboratory-led integrated initiatives

2-hours.... 3.5-hours... 6-hours or more to wait to be seen in the emergency department (ED). We have all been affected by long wait-times and overcrowding in the ED. Unfortunately, ED overcrowding does not appear to be going anywhere anytime soon, affecting the developed and developing world alike, leading to delayed care, increased costs, and increased risks of adverse outcomes. Encouragingly, efforts to streamline triage have the ability to not only quickly identify the etiology of symptoms, but to also alleviate burdens within the healthcare system. Laboratory medicine has long since been an integral part of triage and diagnosis, with insights enabling enhanced decision-making and outcomes. By contrast, inappropriate testing, lack of availability of novel testing strategies and/ or unnecessary testing can further impact already constrained resources. Consequently, efforts within and outside laboratory medicine to improve triage for improved patient flow can markedly improve outcomes. Two initiative receiving recognition of Achievement through the UNIVANTS of Healthcare Excellence award program do just that.

At Ain-Shams University, Emergency Hospital in Egypt, resources are scarce and needs are high in the ED. As such, the importance of early and accurate triage have monumental impact on patients. With the goal of optimizing testing and outcomes in ED, an integrated clinical care team designed and implemented a novel testing approach. This team customized their test panel to their institution and patients based on a cross functional consensus between internal medicine, surgical physicians and laboratory professionals. Changes were made based on the most informative tests across the most common emergency conditions, with feasibility capacity to be performed within one hour.

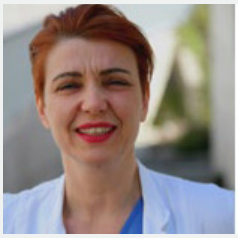
ED physicians now have the choice to order from a panel of 10 tests, with individual recommendations related to evidence-based ordering. Subsequently, the decision to admit patients and/or request additional testing is made, with the admission order set as a guided 20 test panel, with similar test specific recommendations related to evidence-based ordering.

From left to right: Gemma Alvarez Corral, Maria Isabel Romero Manjon, Francisco Ruiz-Cabello Osuna, Eva Gutierrez Pérez

In this resource constrained environment, this new streamlined process has made substantial improvements to patient care and flow with 15.2% more patients who were low-risk (from 49.0% to 64.2% of all ED patients) confidently sent home without the need for unnecessary serial lab testing. This resulted in a 12% increased workflow capacity in the ED, enabling over 10,000 more patients to be seen each year since implementation (14,978 and 12,515 for year 2020/2021 and year 2021/2022; respectively). Impressively, EGP 270/patient (on average) is saved in testing alone. Congratulations to Wessam EL Sayed Saad, *Professor of Clinical Pathology, Emergency Laboratory Director*, Essam Fakhery Ebied, *Professor of Colorectal Surgery, Manager of Emergency Hospital*, Rawan Mahmoud Mohamed, *Emergency Laboratory Director*, Ashraf Hassan Abdelmobdy, *Vice Deputy of Emergency Hospital*, Nouran Mahmoud Bahig, *Emergency Laboratory Director, Deputy*.

In Rijeka, Croatia, the ED at the Clinical Hospital Center Rijeka In Rijeka, Croatia, the ED at the Clinical Hospital Center Rijeka is no stranger to similar ED needs, which were magnified during the COVID-19 pandemic. Particularly during early stages when lack of supplies and expensive testing for CVOID-19 limited accessibility to emergency services. Simultaneously, the need to quickly and accurately identify patients and employees with COVID-19 was crucial to mitigate inhospital transmission.

Understanding that rapid identification of SARS-CoV-2 positive patients was a integral need, an integrated care team at this site used already existing commercial quantitative PCR (qPCR) reagents to optimize a typical qPCR process. This methodology had advantages over existing qPCR methods having already demonstrated feasibility of direct qPCR (dqPCR) detection without an RNA isolation phase - 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.



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Vanda Juranic Lisnic

Mate Lerga

Mario Franic

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During this critical time in the pandemic where emergency services and patient flow were especially critical, this process decrease wait-time for results by up to 38 hours [from a maximum of 44 hours to 6 hours], while positively and substantially affecting clinical decision-making, while mitigating risk of downstream. Impressively, €40,000/ month [annually €480,000] in mitigated costs were realized based on isolation reagents alone. Well-done to Martina Pavletic, *Head, ICU Specialist*, Vanda Juranic Lisnic, *Laboratory Manager*, Mate Lerga, *Emergency medicine specialist*, Mario Franic, *Laboratory Educator*, Jennifer Babic, *Nursing Educator*.

For more information on these best practices and others, please visit www.UnivantsHCE.com.