Diagnostic Accuracy of the COVID-19 Rapid Detection Assay and Identification of COVID-19 in Patients Requiring Admission at Scarborough Health Network

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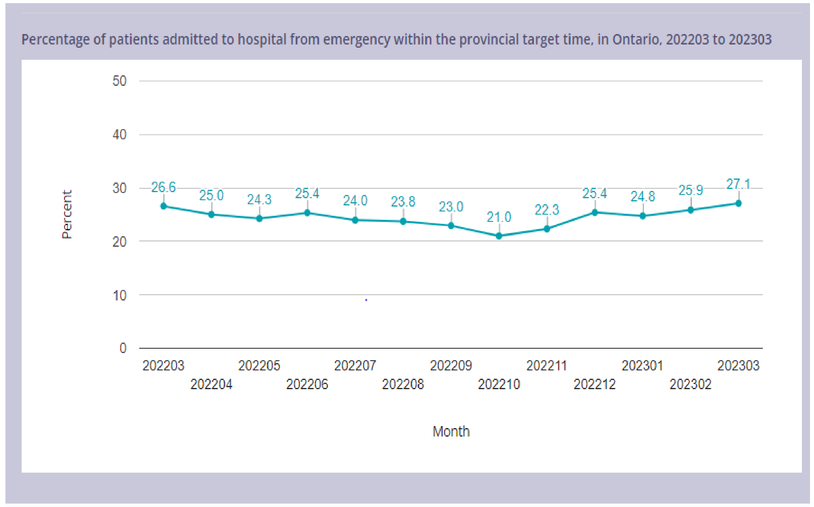
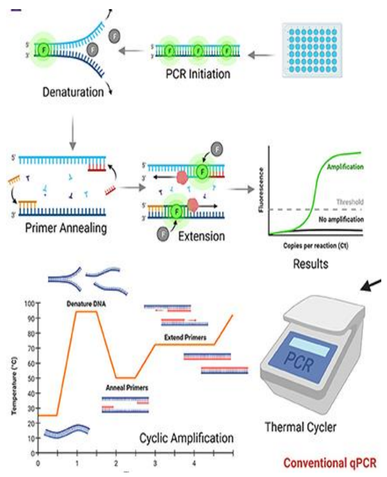
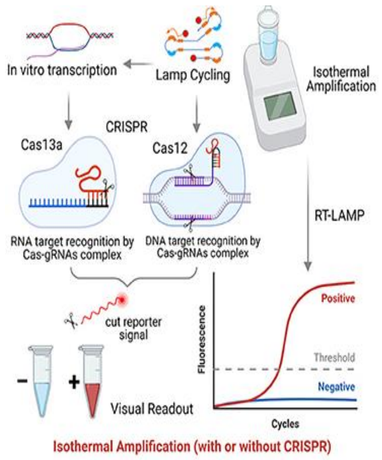
Background

At Scarborough Health Network (SHN), we are challenged by a limited number of single patient rooms, with the majority of rooms being semi-private or wardrooms. The COVID-19 pandemic presented major challenges with COVID-19 patient management and patient flow. Rapid decisions based on accurate laboratory test results were needed in order to isolate patients with possible COVID-19 infection both in the emergency department (ED) and when admitted to acute care to minimize nosocomial spread, maintain patient flow and ensure appropriate treatment. Reverse transcription polymerase chain reaction (RT-PCR) assays are considered gold standard in diagnosis of COVID-19 but have a long turn around time (TAT) and are therefore too slow to make isolation decisions for patients requiring admission to acute care hospitals with limited isolation capacity. The COVID-19 rapid detection assay is a simple, user-friendly test utilizing an isothermal nucleic acid amplification technology (NAAT). This test provides the qualitative detection of nucleic acid from SARS-CoV-2 viral RNA, with a shorter TAT allowing point-of-care testing, thus helping in timely decision-making for patient isolation







Discussion

Laboratory testing for detection of SARS-COV-2 is mainly based on amplification and detection of viral gene sequences in upper respiratory tract specimens. The PCR tests have a longer TAT, therefore, management of EDs with large flow of patients becomes challenging and leads to a risk of overcrowding in these units and delay in initiation of treatment to the patients. Rapid COVID-19 tests using isothermal nucleic acid amplification technology (NAAT) have been able to address this issue by reducing the TAT and producing results comparable to RT-PCR testing. The results of our study were comparable to a similar study by Jean-Claude NguyenVan et al

Objective

To assess the diagnostic performance of COVID-19 rapid detection assay in comparison to Multiplex RT-PCR assay for COVID-19 detection as a COVID-19 diagnostic tool for isolating patients requiring admission from the ED of an acute care hospital

Method

Nasopharyngeal samples of patients from all age groups requiring admission to SHN, both with and without COVID-19 symptoms were collected in ED and sent to the Laboratory in viral transport medium (VTM) to test with both the COVID-19 rapid detection assay and Multiplex RT-PCR assay for COVID-19 detection

Results

From the total of 6209 samples collected from ED admissions, we observed a high concordance among the COVID-19 rapid detection assay and Multiplex RT-PCR assay for COVID-19 detection, with 6008 (96.76%) tests concordant and 201 (3.24%) tests discordant

	No. of samples	Percentage
Concordant	**6008**	**96.76%**
Discordant	**201**	**3.24%**
Total samples	**6209**	**100%**

Conclusion

Given the high concordance between the COVID-19 rapid detection assay and the gold standard RT- PCR assay, it can be concluded that the COVID-19 rapid detection assay provides a rapid and reliable alternative for the faster identification of COVID-19 positive cases. With limited isolation capacity at SHN, this ensures appropriate COVID-19 patient management and provides earlier opportunities for cohorting of patients which improved patient flow.