

The price of time: a cost comparison between fast and slow point-of-care diagnostics in primary care



It is well known that point of care (“PoC”) testing offers significant clinical advantages over central laboratory testing when the time to answer is short enough to provide clinicians with an answer during a consultation rather than having to loop back with a patient hours or days later when the result is available. Fast turnaround times also enable significant cost reductions by reducing the number of patient-clinician meetings required for a diagnosis & treatment decision and the number of times a patient needs to travel to the healthcare site for a given illness episode. There have been many studies attempting to quantify the cost saving between PoC and laboratory testing but few have tried to quantify the cost of existing PoC molecular diagnostic tests, which typically return a

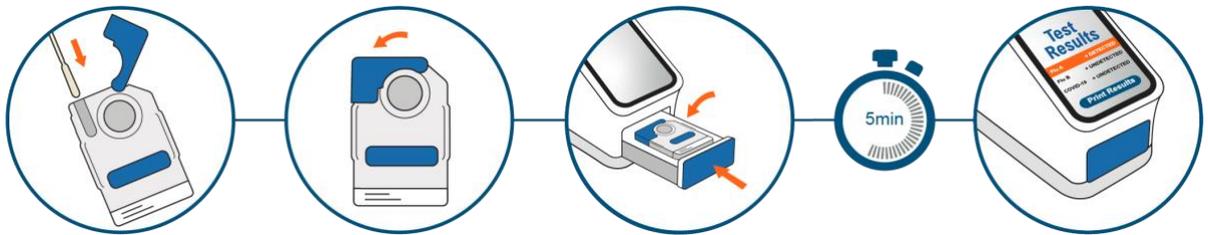


result in an hour or so, against a similar device that can return a result in a much shorter time, just 5 minutes.

The real cost saving will vary between different healthcare settings because the key difference is the cost of the physical location where the slower PoC test is performed (typically the nurses room) and whether the nurse can do something useful while waiting for the slower test to report; but a general picture emerges from the typical cost figures set out below.

The LEX workflow

The LEX Diagnostics PoC flu / Covid differential diagnostic is a true PCR diagnostic designed to provide a definitive indication of the presence or absence of both influenza and SARS-CoV2 in a single test using a nasal swab which is automatically eluted, processed, and measured inside a sealed low cost cartridge; all within 5 minutes.



Importantly, once the nasal swab has been placed into the cartridge and sealed there is no further work required of the clinician, leaving them free to work on other tasks or talk further with the patient. Competing systems require the clinician perform additional steps which increases hands-on time and reduces productivity.

The cost of two workflows

The table below compares two workflows for a SARS-CoV2/influenza diagnostic carried out by a nurse in a primary care setting and their respective cost/time profiles to give a rough estimate of potential savings available from simply running a test faster.

Process		5 min PoC test	Existing 20min PoC test
1	Unpack consumable and swab	1min	1min
2	Collect nasal swab	2min	2min
3	Manually elute swab in UTM	-	2min
4	Place swab in cartridge & break off tip	5sec	-
5	Pipette UTM into cartridge/consumable	-	2 min
6	Set up instrument and leave to run	5min	20 min
7	Inform waiting patient and decide next step	3min	-
8	Find patient in waiting room & return to private area	-	5min
9	Inform patient and decide next step	-	3min
Total		11min	35min



The table provides estimates of time only but a rough translation to cost can be made by using typical costs, including overheads to allow for associated facility costs, for a nurse in primary care settings.

Using data from <https://www.salaryexpert.com/salary/job/primary-care-nurse/united-states> and a 30% overhead loading the average nurse in US primary care costs about \$52/hr

	5 min PoC test	Existing 20min PoC test
Workflow cost	\$9.50	\$30.30

This is a cost difference of over \$20, even before the cost advantages of the lower cost LEX device & consumable are taken into account. This difference is magnified again in high cost parts of a country or where higher cost staff are used to conduct tests due to their complexity.



Is the difference really that large?

An experienced nurse in a busy practice can often find other tasks to perform while waiting for the PCR test to run its course but the distraction factor should not be underestimated and the time required to manage the, potentially infectious, patient through the waiting period can take up much of the 20min of hands-off time.



Additionally, this analysis has allowed no time for a more qualified, and expensive, clinician to assess the patient, decide a test is necessary, find the nurse, and ask for the test to be performed. In the pandemic phase of SARS-CoV2 every patient was frequently tested on entry to the building and this step was eliminated but as the pandemic moves to its chronic phase this cost becomes relevant as the cost of automatic testing becomes too high.

Conclusion

Waiting more than a few minutes for a test result in primary care creates significant costs in additional tasks, disrupted work flows and difficulties dealing with sudden rises in test demand during a day. All these things are greatly reduced as the time to result drops below 10 min.

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