






Cost-effectiveness and Clinical Impact of Point-of-Care PCR Testing



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Cost-effectiveness and Clinical Impact of Point-of-Care PCR Testing



1 Hernandez DR et al. [Near point-of-care adoption of Cepheid Xpert® Flu/RSV XC testing within an integrated healthcare delivery network](#). *Diagn Microbiol Infect Dis*. 2019.

-  Adoption of PCR testing for influenza and RSV in outpatient clinic-based physician office laboratories reduced collect-to-result time by 70% compared to testing in a centralized core laboratory.
-  Onsite PCR testing reduced over- and under-treatment for influenza A and B by 15%.
-  For every \$1 invested in reagents and technologist time to establish a POC PCR testing program, \$6.3 was returned via recovered costs from avoiding unnecessary antiviral therapy prescription.

2 Davies S et al. [A cost-consequence analysis of the Xpert® Xpress CoV 2/Flu/RSV plus test strategy for the diagnosis of influenza-like illness](#). Association for Molecular Pathology 2023 Annual Meeting Abstracts. *J Mol Diagn* 2023, p 64 Abstract 039.

-  Across 203,548 simulated patients tested for ILI, testing with Cepheid's Xpert Xpress PCR tests resulted in cost-savings of \$31.2M vs antigen strategies and \$19.7M savings vs send-out PCR strategies.
-  Decreased rates of hospitalizations, ICU admissions, mechanical ventilation, and mortality.

3 Hinson JS et al. [Targeted rapid testing for SARS-CoV-2 in the emergency department is associated with large reductions in uninfected patient exposure time](#). *J Hosp Infect*. 2021 Jan;107:35-39. doi: 10.1016/j.jhin.2020.09.035. Epub 2020 Oct 7. PMID: 33038435; PMCID: PMC7538869.

-  Targeted rapid PCR testing for SARS-CoV-2 using Cepheid's Xpert Xpress SARS-CoV-2 test reduced the time uninfected patients spent under investigation for COVID-19, conserved limited infection-control capacity, and increased COVID-19 treatment capacity.
-  Significant decrease in infection-control resource consumption with savings calculated to be over \$650,000 in non-reusable PPE alone.

CITATION SYMBOL KEY



Reduced cost



Improved patient flow



Appropriate treatment






Reduced time to result





Improved clinical outcomes




4 Stockl et al. [Use of Antigen and Molecular Testing for the Diagnosis of Coronavirus Disease 2019 \(COVID-19\) among Patients with Influenza-like Illness \(ILI\) in the Non-inpatient Setting](#). Association for Molecular Pathology 2023 Annual Meeting Abstracts. J Mol Diagn 2023, p 53 Abstract 006.

-  Among 263,572 patients who received an antigen test for SARS-CoV-2 and influenza, 70% required more than one test. In 35% of those cases, a molecular test for respiratory disease was done on the same day.
-  Patients first tested with antigen tests for SARS-CoV-2 and influenza were more than four times more likely (70%) to have more than one test performed on the same day vs patients who first received testing with Cepheid Xpert Xpress PCR tests (16%).
-  The higher incidence of repeat testing with antigen tests may indicate a higher resource burden.

5 Benirschke RC et al. [Clinical Impact of Rapid Point-of-Care PCR Influenza Testing in an Urgent Care Setting: a Single-Center Study](#). J Clin Microbiol. 2019 Feb 27;57(3):e01281-18. doi: 10.1128/JCM.01281-18. PMID: 30602445; PMCID: PMC6425177.

-  For influenza testing in an urgent care setting, antiviral prescribing was lower in patients with a negative PCR result (2.3%) than in patients with a negative RIDT (antigen test) result (25.3%).
-  Antivirals were appropriately prescribed more often for patients who tested positive by PCR than by RIDT or by reflex PCR.

6 Turner KME et al. [An early evaluation of clinical and economic costs and benefits of implementing point of care NAAT tests for Chlamydia trachomatis and Neisseria gonorrhoea in genitourinary medicine clinics in England](#). Sex Transm Infect. 2014;90:104–11.

-  Using a POC PCR test (Cepheid Xpert CT/NG) for detection of chlamydia and gonorrhea reduced baseline costs to £103.9 million vs £115.6 million for standard care.
-  Estimated avoidance of 95,000 inappropriate treatments.
-  Patients received diagnosis and treatment on the same day as testing, potentially preventing 189 cases of pelvic inflammatory disease and 17,561 onward transmissions annually.

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7 Melhuish A, Vargas-Palacios A, Yaziji N, Selfridge J, Pisavadia M, Sagoo GS, Minton J. [Cost evaluation of point-of-care testing for community-acquired influenza in adults presenting to the emergency department](#). J Clin Virol. 2020 Aug;129:104533. doi: 10.1016/j.jcv.2020.104533. Epub 2020 Jul 3. PMID: 32659711.

 Patients evaluated for influenza who had a POC PCR on average cost 67% less than those who did not.


 Savings from POC testing could be attributed to more targeted treatments, reduced admissions, and shorter lengths of stay.


8 Rahamat-Langendoen J, Melchers WJG, Van Der WGJ. [Impact of molecular point-of-care testing on clinical management and in-hospital costs of patients suspected of influenza or RSV infection: a modeling study](#). J Med Virol. 2019;91(January):1408–14.


 Introducing POC PCR testing for influenza and RSV can reduce time-to-diagnosis, length of stay, and mean cost per patient.

 Estimated total cost reduction of between €95,937 to €293,471 in a single influenza season at the hospital level.

9 Hale B et al. [Clinical impact of rapid molecular tests in patients with viral respiratory symptoms: a systematic literature review](#). Presented at ISPOR Europe, November 2023, Copenhagen, Denmark. Poster MT10.

 Rapid molecular tests reduced unnecessary patient isolation, bay closures, and length of stay at EDs and hospitals compared to standard molecular tests and rapid antigen detection tests (RADTs).

 Rapid molecular tests reduced use of antibiotics and oseltamivir in those with negative test results for influenza and/or RSV.

 Rapid molecular tests led to faster test results and lower hospitalization rates in patients testing for SARS-CoV-2 and influenza compared to standard molecular tests and RADTs.

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10 Fenstermacher K et al. [Pre- and Post-implementation Comparison of the Impact of Emergency Department \(ED\)-Based COVID-19 Point-of-Care Testing on ED Patient Metrics](#). *Annals of Emergency Medicine*. Vol 82, Issue 4, S172, October 2023. doi: 10.1016/j.annemergmed.2023.08.422.



POC PCR testing for flu, COVID-19, and RSV reduced time to test results and total costs compared to central lab PCR.



Time from ED arrival to SARS-CoV-2 test result decreased by an average of 133.8 minutes; time from COVID-positive patient arrival to test result decreased by an average of 177.4 minutes.



Isolation time for COVID-negative patients decreased by an average of 139.5 minutes, decreasing the unnecessary use and cost of SARS-CoV2 PPE and negative pressure beds, and decreasing the risk of COVID-19 exposure to negative patients.

Abbreviations:

POC: point of care

PCR: polymerase chain reaction

ILI: influenza-like illness

ICU: intensive care unit

PPE: personal protective equipment

RIDT: rapid influenza diagnostic test

RSV: respiratory syncytial virus

ED: emergency department

RADT: rapid antigen detection tests

IVD. In Vitro Diagnostic Medical Device. May not be available in all countries.

Xpert Xpress CoV2 *plus* and Xpert Xpress CoV2/Flu/RSV *plus* (CLIA Waived) are for use under an Emergency Use Authorization in the United States.

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