

On RATs and POCT RT-PCRs for COVID and 'flu'

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Submitted: 17 August 2022; Revision requested: 11 September 2022; Accepted: 13 November 2022

As a part of our response to the COVID pandemic we have become used to rapid antigen (RAT) and polymerase chain reaction (PCR) tests for COVID. Rapid tests exist for other diseases too, capable of identifying live viral antigens (RATs) and viral molecular fragments (RT-PCRs). Using rapid tests at the point of care accelerates diagnosis and, importantly, the ability to institute early targeted effective treatment.

In this December 2022 edition of ANZJPH we published evidence for the use of Point of Care Testing (POCT) RT-PCR tests for influenza in a group of aged care facilities across Sydney.¹ The results of this study demonstrate that real time POCT testing resulted in an 83% rate of prescription of antivirals within 24 hrs compared with only 48% within 72 hours at non-POCT sites with reduced hospitalisations (13.3% with POCT RT-PCR vs 21.3% at non-POCT sites) and reduced mortality (3.9% with POCT RT-PCR vs 7.3% for non-POCT sites, with high sensitivity and specificity (>95%).¹

The Southern hemisphere is now heading into another winter, and along with COVID, the incidence of influenza and other unpleasant respiratory viruses will rise again. These important respiratory infections have similar symptoms (general malaise and fatigue, sore throat, productive cough, fever, and so on), and are difficult to distinguish from each other. Prevention, prompt diagnosis, and appropriate early treatment of these viruses is more important than ever, especially for our most vulnerable people.

RATs identify fragments of active virus protein, usually indicate that the person is infectious at the time of testing - which is useful to know for example prior to going to work, or attending an event where other people are going to be present. In Australia, publicly available RATs are currently only available for COVID, especially at the start of the disease process, and it is difficult to clinically distinguish between Covid and other respiratory viruses. Also, a negative RAT might be truly negative, or it might simply be a false negative depending on the stage of the infection. Because management is different for different illnesses this is important, especially in settings such as aged care. In the USA, Rapid Antigen tests for Influenza with 50-70% sensitivity are also available, capable of providing a diagnosis within 15 minutes. (50-70% sensitivity for Rapid EIA Flu tests).²

PCR tests identify genetic fragments (such as mRNA fragments) of specific viral, bacterial, and some other pathogens. Sometimes specimens are PCR-tested against a panel of organisms to identify the cause of an illness – for example against COVID, Influenza A, Influenza B, parainfluenza, and respiratory syncytial virus (RSV). Gold-standard PCR processing is usually carried out in a laboratory. However, real-Time (RT)-PCRs, can also tell us if fragments of viral mRNA are present, and can act as early warning indicators (1-1.5 days prior to a positive RAT result), as well as confirming current or recent infection.

POCT RT-PCR tests are more sensitive than RATs and provide faster diagnosis, but influenza RT-PCRs are not yet widely available. These easily administered tests can change the speed at which a diagnosis is made and effective treatment started, importantly in critical settings. As Jones et al.'s article¹ indicates, rapid diagnosis and early treatment for influenza within the effective window for Tamiflu can result in greatly reduced morbidity and mortality.

If begun within five days of onset of symptoms COVID treatments are effective at preventing serious disease, and are now available for eligible people.³ However, whilst a positive result is necessary for COVID antiviral treatment, there is no such requirement for influenza, and treatment can be started in the event of diagnosis in a personal contact. All these antivirals have to be prescribed - COVID medicines by a doctor and only available to specific people,⁴ however Tamiflu (which may be preventive if provided promptly following exposure) can also be prescribed by a nurse practitioner or physician assistant.

In May 2022 the Australian Federal Government undertook an initiative to install limited stocks of Tamiflu in aged care facilities across Australia.⁵ Perhaps, with the new guidelines, COVID-specific antivirals might be added to this stockpile and coincidentally reduce the strain on our frontline health workforce.

Public health measures are geared to preventing disease in as many people as possible using easily accessible and sensible interventions, underpinned by laws and regulations. During the past few months most COVID prevention measures have been removed. This marked change of attitude to COVID prevention – which served well to prevent both COVID (and other respiratory infections) during 2020-2022 - has

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Aust NZ J Public Health. 2023; Online; <https://doi.org/10.1016/j.anzjph.2023.100028>

resulted in a disregard for these sensible and simple public health initiatives. Both flu and COVID are particularly disastrous for people in sheltered residential settings, and a thirty-minute POCT -RT-PCR that can identify Influenza, RSV and Covid 19 with earlier detection time frame and high sensitivity and specificity will result in faster diagnosis, earlier prescription of antivirals and, hopefully reduced mortality and morbidity in an area where we can still affect the outcomes for influenza and COVID infections. We can at least use this sensible diagnostic measure to help protect our vulnerable people who do not have an independent capacity to protect themselves.

Funding

None.

Conflicts of interest

The authors have no competing interests to declare.

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