PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	The timing of respiratory virus molecular testing in emergency departments and its association with patient care outcomes: A retrospective observational study across six Australian hospitals
AUTHORS	Wabe, Nasir; Li, Ling; Dahm, Maria; Lindeman, Robert; Yimsung, Ruth; Clezy, Kate; Thomas, Judith; Varndell, Wayne; Westbrook, Johanna; Georgiou, A

VERSION 1 - REVIEW

REVIEWER	Jesse Papenburg McGill University Health Centre, Canada
REVIEW RETURNED	13-May-2019

GENERAL COMMENTS	This is a retrospective cohort study conducted in adults presenting in six EDs in New South Wales, Australia during the 2017 flu season. The aim of the study was to determine if the timing of respiratory virus testing using rapid molecular tests in EDs is associated with indicators related to timeliness of patient care including ED LOS. The major finding is that for every 30-minute increase in the time from ED arrival until respiratory virus testing there was a 24.0-minute increase in the median ED LOS. The authors suggest that earlier initiative of RMDT may result in reduced ED LOS. Major comments -This is a succinct and clearly written paper. -The appropriateness of testing was not considered. It could be argued, if one extrapolates from the cited literature on blood tests (the ordering of a blood test results in an adjusted marginal effect of a 72-minute increase in ED LOS), that reducing inappropriate resp. virus testing could have a considerable impact on reducing ED LOS. Minor comments -Ref # 4 is incomplete -How is this paper different from the one by the same authors cited as Medical Journal of Australia 2018;In press (accepted 12 November 2018)

REVIEWER	Daniel Rogan, MD, MS Resident Physician Department of Emergency Medicine Stanford Hospital and Clinics 900 Welch Road, Suite 350 Palo Alto, CA 94304 USA
REVIEW RETURNED	23-May-2019

GENERAL COMMENTS	A nice study confirming something that many providers feel is likely true - a delay in starting a test results in a delay in disposition. It will be interesting to see if the same phenomenon holds true under either a prospective study evaluating a protocol to start this testing from triage, or more interestingly, as more rapid PCR style tests with 20-30 minute TAT (e.g. Cobas Liat from Roche) become available rather than the 2-3 hr TAT available at the time of study at these sites (not referring to antigen-based tests which are much less accurate, though they are fast). Small note: Page 5, line 46 - typo, repeated use of "and RSV"

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Jesse Papenburg

Institution and Country: McGill University Health Centre, Canada

Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below

This is a retrospective cohort study conducted in adults presenting in six EDs in New South Wales, Australia during the 2017 flu season. The aim of the study was to determine if the timing of respiratory virus testing using rapid molecular tests in EDs is associated with indicators related to timeliness of patient care including ED LOS. The major finding is that for every 30-minute increase in the time from ED arrival until respiratory virus testing there was a 24.0-minute increase in the median ED LOS. The authors suggest that earlier initiative of RMDT may result in reduced ED LOS.

Major comments

This is a succinct and clearly written paper.

The appropriateness of testing was not considered. It could be argued, if one extrapolates from the cited literature on blood tests (the ordering of a blood test results in an adjusted marginal effect of a 72-minute increase in ED LOS), that reducing inappropriate resp. virus testing could have a considerable impact on reducing ED LOS.

Reply: Thank you for your very positive comments. Regarding the appropriateness of RMDT testing, we did not evaluate this as the aim of the current study was just to determine whether the timing of the testing was associated with patient care outcomes (not about the impact of ‘appropriateness of testing’). In our study EDs, respiratory viral testing is generally performed based on a local testing algorithm to promote evidence-based test ordering, but there could be a potential for inappropriate testing (over-ordering). We agree that inappropriate testing could potentially increase ED LOS, and this should be investigated in a separate study in the future.

Minor comments

Ref # 4 is incomplete

Reply: Thank you for this. Ref #4 is not a journal article. We have updated this reference as below:

Lewandrowski K. POC testing in the emergency department: Strategies to improve clinical and operational outcomes. Radiometer Medical ApS, 2700 Brønshøj, Denmark.: acutecaretesting.org.; 2011 [Available from: https://acutecaretesting.org/-/media/acutecaretesting/files/pdf/poc-testing-in-the-emergency-department-strategies-to-improve-clinical-and-operational-outcomes.pdf accessed 30 January 2019.

How is this paper different from the one by the same authors cited as Medical Journal of Australia 2018;In press (accepted 12 November 2018)

Reply: There is a clear difference between the two papers. The Medical Journal of Australia paper was a before-after study which compared outcomes (hospital admissions, ED LOS, supplementary lab testing etc) of two PCR-based diagnostic tests. In that study, we compared patients tested for influenza A/B and RSV using a rapid PCR (i.e. Cepheid Xpert® Flu/RSV XC assay) during the first six months following the introduction of rapid PCR (July-December 2017, an 'after' group) with patients tested with a central laboratory-based multiplex PCR (Seegene AllplexTM RP) during the same period before the introduction (July-December 2016, a 'before' group). This paper is now published and can be accessed here: https://www.ncbi.nlm.nih.gov/pubmed/30838671.

On the other hand, all patients in the current study were tested using rapid PCR (RMDT) and we aimed at investigating whether the timing of the test was associated with ED outcomes.

Reviewer: 2

Reviewer Name: Daniel Rogan, MD, MS

Institution and Country: Resident Physician, Department of Emergency Medicine, Stanford Hospital and Clinics, Palo Alto, CA USA

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

A nice study confirming something that many providers feel is likely true - a delay in starting a test results in a delay in disposition. It will be interesting to see if the same phenomenon holds true under either a prospective study evaluating a protocol to start this testing from triage, or more interestingly, as more rapid PCR style tests with 20-30 minute TAT (e.g. Cobas Liat from Roche) become available rather than the 2-3 hr TAT available at the time of study at these sites (not referring to antigen-based tests which are much less accurate, though they are fast).

Reply: Thank you for your positive feedback. I completely agree with what you said. In fact, we are planning to conduct a prospective controlled study to evaluate the benefits of triage-initiated testing in EDs. As noted in the current paper, in our EDs, rapid PCR testing currently occurs about 3 hours after patients' ED arrival. We believe that if testing is done at triage, ED LOS can be reduced.

Small note: Page 5, line 46 - typo, repeated use of "and RSV"

Reply: Apology for the error. We have corrected this as suggested.

VERSION 2 – REVIEW

REVIEWER	Jesse Papenburg MD MSc McGill University Health Centre CANADA
REVIEW RETURNED	05-Jun-2019

GENERAL COMMENTS	The revision appears acceptable to me. However, I would still suggest that the authors mention that the appropriateness of testing was not considered (as a limitation of the study). Reducing inappropriate/unnecessary respiratory virus testing could also have a considerable impact on reducing ED LOS

VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Jesse Papenburg MD MSc

Institution and Country: McGill University Health Centre

CANADA

Please state any competing interests or state ‘None declared’: None

Please leave your comments for the authors below

The revision appears acceptable to me.

However, I would still suggest that the authors mention that the appropriateness of testing was not considered (as a limitation of the study). Reducing inappropriate/unnecessary respiratory virus testing could also have a considerable impact on reducing ED LOS.

Reply: Thank you for your suggestion. We have added the following statement to the limitation section as suggested by the reviewer.

Finally, the current study did not consider the appropriateness of RMDT ordering practices. Reducing inappropriate or unnecessary respiratory virus testing could also have a considerable impact on reducing ED LOS.