Quantitative respirator fit tests for P2/N95 in Australian general practice

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OVER THE PAST TWO YEARS, the COVID-19 pandemic has forced general practice to rapidly modify practice. A key change in service delivery is the requirement to wear P2/N95 masks in potential high-risk settings.[1] In many hospitals, condensation nuclei counter (CNC)-based quantitative fit testing has been recommended as the gold standard by US National Institutes of Labor and UK legislation.[2] Quantitative fit testing of healthcare workers is also emerging as the standard of practice in the Australian public hospital system.[3] To date, there is limited information on the feasibility of establishing a quantitative fit testing program in primary care settings. Here, the authors report the results of a pilot trial of quantitative fit testing in metropolitan general practice and how fit test failures were managed.

Methods

At three separate half-day sessions over a one-week period between 11 and 18 November 2021, two South Australian general practice clinics underwent quantitative N95 respirator mask fit testing using CNC methods (TSI PortaCount, N95-Companion). A total of 33 healthcare workers (administration, allied and clinical) were tested. Three different sizes (Small, Regular and X-Large) of a locally manufactured N95 respirator mask were purchased by the practice management prior to testing and made available to fit testers on the day of the tests. X-Large masks were purchased by the practices for the purpose of fit testing from the manufacturer's online store as no 'Large' sizes were available. Fit tests were conducted on site (tea room, consultation room or administration office) with a qualified and experienced (>12 months using a condensing nuclei device) fit testing technician and/or fit testing nurse at an estimated cost of $43/hr. This cost is significantly lower than what would be expected from a privately contracted technician. Mask donning and doffing training was provided one on one for all participants prior to a fit test, and fit coaching was provided during tests and after a failed test. Fit coaching was performed in accordance with the manufacturer's Instructions of Use documentation and online training material as provided with the respirators.[4] Fit tests were repeated up to five times per participant in an attempt to achieve a passing score (fit factor >100), with either repeat tests on a mask following additional donning instruction or swapping the failing mask for a different size. In the event of a failed fit test, the practice manager was notified, and a recommendation was made for clinical review by the practice prior to deployment.[5] Ethical approval for this research project was obtained from the Human Research Ethics Committee of Flinders University and Southern Adelaide Local Health Network (Protocol number: 194.20).

Results

There were 21 of 33 (63.6%) participants who achieved a 'pass' score with a fit factor >100 with one of the three available sizes of masks available. There were 19 participants who passed with a Regular mask, and two with Small mask. No participants passed with a X-Large mask. The mean number of tests before a 'pass' was achieved was 2.25 ± 1.13 tests, and the mean number of tests before a 'fail' was recorded was 2.91 ± 0.89 fit tests. There were five (15.2%) participants who achieved a 'pass' after only one test, with remaining passers requiring additional training/coaching prior to achieving a passing score. The mean fit factor for participants who passed was 162.4 ± 31.8, and the mean fit factor for failing tests was 65.4 ± 60.8. For non-passers, fit coaching was provided by working through the Instructions for Use provided by the mask manufacturer and confirming each step with the instructor prior to moving to the next.

Conclusion

This case study demonstrated that quantitative fit testing was feasible in two South Australian metropolitan general practices during the COVID-19 pandemic. There remains a modest proportion (36.4%) of workers in these practices who remained un-fitted to an N95 mask in the available supply chain at the time of testing. Additional one-on-one training and fit coaching was required to achieve a passing score in 84.8% of participants (ie the participant failed at least one fit test before a pass was achieved), highlighting the importance of high-quality education on appropriate methods of using these types of respirator masks safely and effectively. For those who 'failed' the fit test, additional fit coaching was provided to ensure the wearer was capable of achieving the best possible fit with the most appropriate available mask.

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