

COMPARISON BETWEEN QUALITATIVE AND QUANTITATIVE FIT TESTING – AS COMPLETED BY STAFF AT CITY HOSPITAL BIRMINGHAM

Introduction

Sandwell and West Birmingham Hospitals NHS Trust is an integrated care organisation dedicated to improving the lives of local people, maintaining an outstanding reputation for teaching and education, and facilitating innovation and research.

The Trust employs over 7,000 people and spends around £430m of public money, largely drawn from their local Clinical Commissioning Group. That Group and the Sandwell and West Birmingham Hospitals NHS Trust are responsible for the care of 530,000 local people across North-West Birmingham and Sandwell.

Situation

Respirator fit testing is a key component to any respiratory protection programme, protecting staff from airborne hazards. Anyone wearing a tight fitting respirator is required by HSE INDG 479 to perform respirator fit testing. The Infection Prevention and Control Team at the Trust are responsible for providing over 4,000 frontline staff members with a respirator fit test to ensure the FFP3 masks they use are protecting them.



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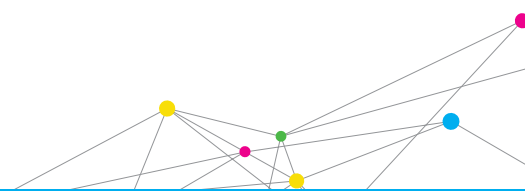
There are two basic types of fit tests: Quantitative Fit Testing (QNFT) and Qualitative Fit Testing (QLFT).

QLFT is a low cost, subjective pass/fail test that exposes the respirator wearer to a chemical stimulant (while donning a test hood) such as Isoamyl Acetate, Sodium Saccharin, Bitrex or Irritant Smoke that can only be detected if the respirator leaks. The respirator wearer must breathe through their mouth, with tongue extended during the fit test to enable detection (tasting) of leakage into the respirator. QLFT methods are often compromised by well-meaning test operators who skip important steps, unknowingly invalidating the fit test. To properly follow the protocol, a fit test operator must squeeze the nebulizer bulb between 75 and 225 times for each fit test performed. The temptation to get through the test faster is strong, especially when the same test operator fit tests dozens of people per day.



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QNFT is an objective test that involves the use of an instrument to measure how well the respirator fits. The measurement is not dependent on the person's voluntary response. The instrument measures the fit while the person performs a series of special exercises and automatically records the results. An aerosol challenge agent concentration (C_{out}) is measured outside the respirator and then again inside the respirator (C_{in}). The ratio of the two measurements (C_{out}/C_{in}) is called a fit factor. The minimum fit factor required by HSE, which should be achieved in each of the test exercises when carrying out a quantitative fit test, is 2,000 for a full-face mask, 100 for a half-mask and 100 for FFP3, FFP2 and FFP1 filtering facepieces.

Prior to 2018 at the Sandwell and West Birmingham Hospitals, NHS Trust fit testing was carried out using the Qualitative Hood method. "Very few staff had been fit tested due to lack of available training for fit testers, staff were losing confidence in how to perform the fit test and a high percentage of those tested were unclear as to whether they could taste the Bitrex® solution once a mask was fitted", says Kasmiro Aheer, Infection, Prevention & Control Nurse Advisor. Consequently, some staff lost confidence in the accuracy of the system.

Solution

To resolve this issue, the Trust made the decision to invest in a Quantitative Fit Testing solution to eliminate the guesswork associated with QLFT methods such as Saccharin and Bitrex® and better measure respirator fit. They chose to invest in the PortaCount® Respirator Fit Tester. The PortaCount includes fit test animations that free administrators from the need to coach staff through the test, allowing time to multitask and further increase productivity. "Staff are much more confident using this test than the qualitative method, as you

are not relying on a person tasting a chemical, it is a non-subjective test. Due to this, staff are now regularly booking out the machines and fit testing members of their individual teams", says Kasmiro Aheer.

The PortaCount has helped the Trust get up to speed with their fit testing programme. Users feel more confident in the fit test the PortaCount provides as it is objective and the software helps guide them through the test with animations demonstrating how to perform the exercises. Users are particularly impressed with the FitCheck™ Mode function, which allows them to see in real time if the mask is a good or poor fit via a gauge indicator. FitCheck™ Mode saves time, as users can instantly see if the mask fits the person and if any adjustments are necessary. Hospital staff also like that all documentation is stored in a database and that fit test reports can be printed easily, as previously these reports had to be handwritten.

Thanks to the PortaCount, the Trust has quickly disqualify their poor fitting masks, narrowing down to the three mask types the Trust now uses. Fit tested staff now achieve high pass rates for the three mask types selected. For staff that continue to have trouble passing fit tests, FitPro Ultra has troubleshooting guides included in the software to help identify and solve problems with a few clicks on the screen.

Conclusion

The PortaCount Respirator Fit Tester has been a successful solution for the issues the Birmingham and Sandwell Trust have faced. Ultimately, users of the PortaCount Fit Tester feel it is a much more accurate test than qualitative methods of fit testing. Quantitative fit tests are quicker to complete and staff are happy that no chemicals are used. They are able to test all staff, even those who are pregnant and have asthma. Using quantitative versus qualitative fit testing ensures better fit and better compliance for a better protected staff.

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