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LETTER TO THE EDITOR

Respiratory protective equipment at work: good practices for filtering facepiece (FFP) mask

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The selection of a respiratory filtering facepiece (FFP) mask is often questioned in hospital infection control. These FFP-masks are systematically indicated as part of the respiratory precautions as additional isolation measures with airborne risk [1–3]. In some situations, healthcare workers (HCWs) can be exposed with a risk of nosocomial ultra-resistant tuberculosis despite FFP-mask [4]. This present opinion provides guidance on the selection and use of adequate and suitable respiratory protective equipment in the workplace.

Indications and types of respiratory masks

Wearing a FFP-mask includes both the type of mask and its performance. When HCWs are exposed to airborne risk during care with aerosol in patients with a suspect or confirmed diagnosis of tuberculosis or measles for example, their protection relies on FFP2-mask appropriate utilization. In France, this recommendation [5] is related to a specific European norm EN 149 [6]. FFP2-masks filter the inspired air. The effectiveness of the protection relies on the qualities of the filter media and the tightness of the facepiece. Indeed, in case of an imperfect sealing, part of the inspired air is not filtered. The minimum performance required, however, tolerates a total inward leakage that must not exceed 2% for FFP3-mask and 8% for FFP2-mask [6].

How to select a FFP-mask?

There are different forms of FFP-masks: hard or soft shell, duckbill or folds. Hard-shell masks are less adaptable to the morphology of people face [7]. In several national and international guidelines (France, Belgium, Canada, the USA, the UK), it is recommended to choose a FFP-mask adapted to each user based on a fit-test. This implies proposing models and sizes adapted to different face morphologies [5, 8–12]. Fit-tests are described international guidelines. Currently, in most French healthcare facilities, only one type or one size is proposed for both FFP2- and FFP3-masks.

What are the conditions of FFP-mask use?

Good practices when wearing a FFP-mask (placement and removal outside the premises where the patient is, maximum wearing time according to the recommendations of the manufacturer, no manipulation, disposal in the sector of waste treated as household waste) have been previously described [3]. A fit-check must be performed by the user before each use. This procedure allows checking the correct position of the FFP-mask, also to identify a major failing of adaptation to the wearer's face. Wearing it with

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a beard, even a short one, makes it difficult to seal the FFP-mask correctly. The knowledge of the different tests to ensure the choice of a good FFP-mask application and positioning is necessary.

What is fit-test?

For FFP2- or FFP3-masks, it is possible to use a qualitative test consisting in exposing the HCWs wearing a mask to an atmosphere containing a test substance with a particular taste or odor (mostly the sweet taste of saccharine or bitter Bitrex®). If the HCW detects the substance, the FFP-mask is not waterproof and must be readjusted. After two or three unsuccessful attempts, the FFP-mask is deemed unsuitable for the wearer's face. This qualitative adjustment test requires little material (bell hood, test substance), but a strict adherence to an experimental protocol performed by a trained person is mandatory.

What is the tightness check (fit-check)?

This test (called negative pressure) consists of the following: The HCW correctly places the FFP-mask on his(her) face, closes the filtering surface with his(her) hands, inhales and holds his(her) breath for a few seconds; if the seal is good, the FFP-mask must remain slightly plated in the face. In case of failure, the FFP-mask has to be readjusted and the control reiterated.

In conclusion, this opinion reminds of the risks using a simple step-by-step approach. It helps you to decide the adequate level of protection for a given hazardous substance and how to select a FFP-mask that is suitable for the particular wearer, task, and work environment (Table 1). It also contains an advice on how to make sure that the selected FFP-mask keeps working effectively. This approach and propositions can be useful for preventing respiratory infections such as tuberculosis or measles through the world.

Table 1 Recommendations for FFP-mask use and choice

Conditions for FFP-mask use
To improve awareness of professionals to wear correctly a FFP-mask (i.e., face and elastic positioning)
To train HCWs to carry out the tightness check (fit-check)
To systematically perform the tightness check or fit-check before each FFP-mask use
FFP-mask choice
To provide several models and sizes of FFP-mask for HCWs in all healthcare at-risk wards
The possibility of health facilities to allow the choice of a FFP-mask adapted to each HCW and other peoples or visitors if needed
To evaluate different FFP-mask models adapted to each one by a fit-test in priority for HCWs working in high-risk units (pneumology, infectious diseases, emergency)

HCWs, healthcare workers

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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