Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Opinion

A review of respiratory protection measures recommended in Europe for dental procedures during the COVID-19 pandemic

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The main mode of transmission of the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) virus is via respiratory droplets and aerosols [1]. During the coronavirus disease 2019 (COVID-19) pandemic period, the World Health Organization (WHO) recommends wearing respiratory protection when undertaking aerosol-generating procedures (AGPs) to reduce the risk of cross-infection between patients and healthcare workers (HCWs) and vice versa [2]. Patients who test positive for this virus are known to carry high numbers of virus particles in their saliva and on their tongue [3]. Dentistry poses a particular challenge due to the large number of AGPs and droplet-generating procedures undertaken in the oral cavity, and the very close proximity (<0.5 m) of dental HCWs to the plume of aerosolized respiratory secretions. The availability of personal protective equipment (PPE) to HCWs has been put under considerable strain due to the COVID-19 pandemic [4]. In some countries, shortages of PPE have necessitated sessional use of equipment that was previously deemed single patient use [2]. Therefore, facemask recommendations may not be based solely on maximum protection, but also on pragmatism including availability and areas of priority within a region's healthcare system.

A review of protocols for dentistry during the peak of the COVID-19 epidemic was undertaken, focusing on respiratory protection measures during dental procedures for the European continent. European dental association websites were screened for information on guidance or protocols regarding SARS-CoV-2 and PPE. Documents in languages other than English or Dutch were translated into English using Google Translate. After obtaining the data, the results were presented to experts involved in dentistry and oral microbiology within Europe for verification. Three categories of respiratory protection measures were identified within the protocols: medical (surgical) facemasks, and filtering facepiece particle (FFP)2 and FFP3 respirators.

Of the 24 included European countries, 75% recommend FFP2/FFP3 respirators when performing AGPs in patients with symptoms of COVID-19, and 25% recommend referral or postponing treatment (results per country are available upon request). These practices are in accordance with the WHO guidance [2]. The potential for transmission from asymptomatic or pre-symptomatic carriers was identified as a concern in many of the countries, especially if an AGP was necessary [5–7]. When patients do not show symptoms of COVID-19, 54% of countries recommend FFP2/FFP3 respirators when performing AGPs. A considerable number of countries also recommend FFP2/FFP3 respirators when performing non-AGPs, both in patients with (63%) and without (33%) symptoms of

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COVID-19. These masks filter significantly more effectively and have a better fit compared with medical facemasks; studies showed 9% total leakage of fine particles when using FFP2-equivalent respirators, whereas the leakage for medical facemasks was 22—35% [8]. However, the effectiveness of these respirators to prevent transmission of pathogens is highly dependent on proper fit and use of the equipment [9]. The clinical effectiveness of the protection of HCWs using respirators compared with medical facemasks against transmission of respiratory infections during AGPs is controversial [10].

Infection prevention can be a challenge to assess risk across competing interests of patient safety, medico-legal implications, occupational health, resource availability, practicality and cost. When attempting to reduce the risk of infection whilst continuing to provide health care, there is a level of uncertainty about safety for both clinicians and patients. Risk of infection has always been present within dental health care, although the risk of infection is currently elevated and the consequences of infection are severe. It remains unclear what levels of respiratory PPE are required for providing dental health care during the pandemic. The differences in respiratory PPE recommendations in Europe reflect different approaches to risk assessment. The wide variation in recommendations raises concerns about the hazards to both patients and dental HCWs when providing dental health care. The variation in the application of respiratory protection among dental HCWs may adversely influence the spread of COVID-19 between countries.

In conclusion, the recommendations on respiratory protection when undertaking dental health care in European countries vary considerably. This highlights the need for a task force to re-examine the evidence base for respiratory viral transmission during dental procedures, and support closer alignment of guidelines throughout the dental healthcare sectors.

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