

# Respiratory Protection in Dentistry During the COVID-19 Outbreak

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• Conflicts of interest: none declared.

## Dear Editor,

On January 8, 2020, the Chinese Center for Disease Control and Prevention officially announced a new coronavirus as the etiological agent of a new respiratory disease in humans.<sup>1</sup> The disease rapidly spread around the world and on March 11, 2020, it was officially declared a SARS-CoV-2 pandemic by the World Health Organization.

The potential transmission of the virus via aerosols, droplets, and contact is crucially important for dental surgeons, since many of the procedures they perform generate aerosols.<sup>2,3</sup> There is a consensus in the literature that N95/FFP2/FFP3 (FFP - Filtering Facepiece) and similar respirators offer better protection than disposable surgical masks because they filter more effectively and seal to the face (Chart 1). As such, they should be the option of choice for aerosol-generating procedures.<sup>4</sup>

However, there is a lack of consensus in the recommendations when it comes to respiratory protection against COVID-19 during non-aerosol-generating procedures. An analysis of the public health recommendations issued in Brazil, the USA, the UK, Canada, and Australia, as well as the recommendations of the American Dental Association, revealed that some recommend N95/FFP2/FFP3 respirators for all dental procedures,<sup>4,5,6</sup> while others recommend disposable surgical masks for non-aerosol-generating procedures.<sup>7,8,9,10,11</sup>

The respiratory protection recommendations found in the documents analyzed with the respective countries and dates of publication (latest update) are given in Table 1.

Recent evidence indicates that SARS-CoV-2 may be transmitted via infectious aerosols produced naturally in speech and breathing (bioaerosols).<sup>12,13</sup> While there is no scientific evidence that the viral load present in such bioaerosols is enough to cause infection, airborne transmission would explain the high contagion rates found in SARS-CoV-2.<sup>12</sup> In view of the proximity of dental surgeons to the patient's face during dental treatments and their duration of exposure in an indoor environment, I question whether surgical masks provide effective enough filtering of potentially infectious particles in bioaerosols during dental treatments.

Dental surgeons are at high risk of infection from SARS-CoV-2 because of the high viral load present in the upper airways and their potential exposure to biological material during aerosol-generating procedures. The potential for transmission during the incubation period and by asymptomatic patients makes it important to adjust biosecurity protocols for all patients, irrespective of whether they have a confirmed or suspected infection. I believe respiratory protection recommendations should be reviewed to include the use of N95 respirators in all dental procedures, whether or not they are aerosol-generating.

Chart 1. General characteristics of FFP (Filtering Facepiece) masks\*

Class	Filter penetration limit (at 95 L/min air flow)	Inward leakage	Typical Elastic Band	Indications
FFP1	Filters at least 80% of airborne particles	<22%	Yellow	Dust and/or Mists (mechanically generated aerosols)
FFP2	Filters at least 94% of airborne particles	<8%	Blue or White	Fumes (thermally generated aerosols) and/or Biological Agents
FFP3	Filters at least 99% of airborne particles	<2%	Red	Particles highly toxic (TL <0.05 mg / m <sup>3</sup> ) and/or of unknown toxicity

\*European Committee for Standardization ([www.cen.eu](http://www.cen.eu)). Abbreviations: FFP (Filtering Facepiece); TL (Tolerance Limit)

**Table 1.** Official documents, country, date of latest update, and recommended respiratory protection.

Agency - Date of Document	Respiratory Protection: Non-aerosol-generating Procedures	Respiratory Protection: Aerosol-generating Procedures
Agência Nacional de Vigilância Sanitária <sup>4</sup> (Brazil) May 8, 2020	N95 respirator	N95 respirator
American Dental Association <sup>7</sup> (USA) April 1, 2020	Surgical mask	N95 respirator
Centers for Disease Control and Prevention <sup>5</sup> (USA) April 27, 2020	N95 respirator	N95 respirator
Communicable Diseases Network Australia <sup>8</sup> (Australia) May 5, 2020	Surgical mask	N95 respirator
European Centers for Disease Control and Prevention <sup>6</sup> (Europe) February 28, 2020	FFP2/FFP3 respirator	FFP2/FFP3 respirator
National Health Service <sup>9</sup> (UK) April 15, 2020	Surgical mask	N95 respirator
World Health Organization <sup>10</sup> (Switzerland) April 6, 2020	Surgical mask	N95 respirator
Public Health Agency of Canada <sup>11</sup> (Canada) April 30, 2020	Surgical mask	N95 respirator

Abbreviation: FFP (Filtering Facepiece)

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### Mini Curriculum and Author's Contribution

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