



# COVID-19: What's New?

Bernice D. Mowery, PhD, RN

## Face Masks

Bernice D. Mowery

**Editor's Note:** Evidence-based practice is a challenge during the COVID-19 pandemic as science struggles to learn about the SARS-CoV-2 virus. To assist readers in identifying the latest findings, the *COVID-19: What's New?* column reviews and critiques two articles to share pertinent findings with practice implications.

Mowery, B.D. (2020). Face masks. *Pediatric Nursing*, 46(5), 255, 259.

**Key Words:** COVID-19, face masks, pandemic, N95, personal protective equipment (PPE).

In this issue, we explore the topic of face masks. Face masks have been worn by health professionals to protect themselves since the plague in the Middle Ages. Due to shortages of N95 masks during the COVID-19 pandemic, many institutions are asking staff to wear surgical/medical masks for routine care of COVID-19 patients, reserving N95 respirators for aerosol-producing procedures. However, recent systematic reviews/meta-analyses were unable to support or refute this practice (Bartoszek et al., 2020; Ippolito et al., 2020). Wearing face masks in public is now recommended world-wide, but empirical evidence about the most effective masks to prevent the spread of SARS-CoV-2 is not available. Many questions remain about how to best protect ourselves and our patients from SARS-CoV-2. Two recent articles provide detailed reports of how to test respirators/masks and include mask evaluations on a small number of participants.

**Findings:** The most effective mask was an N95 with a face shield, which had an FFE of 99.6%. Other commonly used N95 respirators, even those that expired in 2009, and used respirators sterilized with ethylene oxide (EtO) or hydrogen peroxide, had acceptable FFEs greater than 95%. N95 respirators not properly 'fitted' achieved FFEs between 90% and 95%. Two Centers for Disease Control and Prevention (CDC)-approved imported respirators not certified by the National Institute for Occupational Safety and Health (NIOSH), and those not approved ( $n = 6$ ) failed to achieve 95% FFE. Surgical masks with ties achieved an FFE of 71.5%, while those with ear loops had only 38.1%.

**Key Messages:** Nurses need to know the effectiveness of the N95 respirators and surgical/medical masks supplied by their employers. The method used to determine FFEs in this study may be replicated in other institutions. Expired N95 respirators, sterilized used N95 respirators, and some less commonly used respirators may be acceptable substitutes for unavailable standard N95 respirators. Measures to assure surgical/medical masks fit snugly to the face should also be taken. Further research is needed to evaluate mask effectiveness for COVID-19 with extended use, with multiple uses, with face shields, and on different facial configurations.

### Filtration Efficiency of Hospital Face Mask Alternatives Available for Use During the COVID-19 Pandemic

(Sickbert-Bennett et al., 2020)

**Overview:** This quality improvement study used the Occupational Safety and Health Administration's Quantitative Fit Testing Protocol for Filtering Facepiece Respirators in a laboratory to assess the fitted filtration efficiencies (FFE) of 29 mask alternatives worn by one male with no beard and one female volunteer. Probes were fitted into the face masks to sample aerosol inside the mask.

### Low-Cost Measurement of Face Mask Efficacy for Filtering Expelled Droplets During Speech

(Fischer et al., 2020)

**Overview:** Most members of the public use face masks that have not been tested for SARS-CoV-2. Fischer and colleagues (2020) designed a method to evaluate face mask efficacy for reducing droplets during speech. To test their

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The **COVID-19: What's New** column focuses on issues, information, and strategies relevant to the current COVID-19 global pandemic and pediatric patients. To suggest topics, obtain author guidelines, or to submit queries or manuscripts, contact Bernice D. Mowery, PhD, RN, *Pediatric Nursing*; East Holly Avenue/Box 56; Pitman, NJ 08071-0056; (856) 256-2300 or FAX (856) 589-7463; pnjrnl@ajj.com

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system, they evaluated 14 face masks/respirators worn by either one or four participants. One participant was male, but no other participant descriptions were given. A computer algorithm counted the number of particles videotaped for each test.

**Results:** The experimental device was described thoroughly, and recognized limitations included using a cell phone camera and measuring only a small part of the enclosure. The device effectively measured droplets emitted during speech that were larger than 0.5  $\mu$ m. Although not the primary purpose, evaluations of face masks/respirators were included. The droplet transmission fractions ranged from 0.1% for the N95 without a valve to 110% for the neck gaiter. The single layer neck gaiter was less effective than no mask. The authors explained the neck gaiter seemed to convert larger droplets into smaller droplets that remain airborne longer.

**Key Messages:** We are desperate for information to protect ourselves and our patients during the COVID-19 pandemic. Even though the primary purpose of this research was to evaluate a measurement tool, ABC, NBC, *The Washington Post*, and *USA Today*, among others, reported broad generalizations about face masks not empirically supported, illustrating the need to be skeptical about COVID-19 reports until scientifically verified. ■■■

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