



**John Hickner, MD, MSc**  
Editor-in-Chief

# How effective is that face mask?

**M**ore and more, the streets of America are looking like those of Eastern countries (such as China) during previous public health crises. Americans are wearing face masks.

In addition to social distancing and hand washing, face masks are a primary defense against COVID-19. N95 face masks protect against 95% of the particles that are likely to transmit respiratory infection microbes. Last month, the Centers for Disease Control and Prevention (CDC) recommended that we all use masks, in addition to social distancing, in public settings. Since there will not be a sufficient

supply of N95 masks for the general public (and they are difficult to fit and wear properly), we are left with surgical masks and so-called DIY (do-it-yourself) masks. But do DIY face masks protect against COVID-19?

■ **The National Academies of Sciences, Engineering, and Medicine** published a scientific review of fabric face masks last month.<sup>1</sup> They found 7 studies that evaluated either the ability of the mask to protect the wearer or to prevent the spread of infectious particles from a wearer. Performance ranged from very poor to 50% filtration depending on the material used.

Jayaraman<sup>2</sup> found a filtration rate of 50% for 4 layers of polyester knitted cut-pile fabric, the best material he tested. Davies<sup>3</sup> compared a 2-layer cotton DIY mask with a surgical face mask and found that the cotton mask was 3 times less effective. And in the only randomized trial of cotton masks, the cotton 2-layer masks performed much worse than medical masks in protecting from respiratory infection (relative risk [RR] = 13).<sup>4</sup> A study of COVID-19-infected patients found that neither surgical nor cotton masks were effective at blocking the virus from disseminating during coughing.<sup>5</sup>

The most recent lab testing of DIY masks was done at Wake Forest Institute for Regenerative Medicine, where they tested a variety of materials; the results were somewhat encouraging.<sup>6</sup> The best homemade masks were those with “2 layers of high-quality, heavyweight ‘quilter’s cotton’ with a thread count of 180 or more, and those with especially tight weave and thicker thread such as batiks.”<sup>6</sup> The best homemade masks achieved 79% filtration. But single-layer masks or double-layer designs of lower quality, lightweight cotton achieved as little as 1% filtration.

■ **The bottom line:** Mass production and use of N95-type masks would be most effective in preventing transmission in general public settings, but this seems un-

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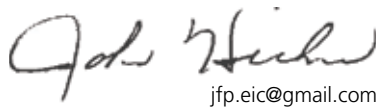
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likely. Surgical masks are next best. Well-constructed DIY masks are the last resort but can provide some protection against infection. **JFP**



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