

WRAP UP

Wearing a face mask is the single most effective behavior we can practice in order to mitigate the transmission of Covid-19. In the past several days I have been able to find more information concerning studies done on the effectiveness of different types of face masks. The information comes from the physics department at Duke University, NEJM (New England Journal of Medicine), and a 2019 Scientific Reports published by Nature.

The physics department at Duke tested 14 commonly available masks. Each type of mask was tested ten (10) times during regular speech versus speech with no mask. The results are as follows:

The least effective mask was the neck fleece, or gaiter. The study showed that use of the neck gaiter actually produced more aerosolization during speech than that which occurs when no mask is used. It is the opinion of the researchers that the mask material breaks down the exhaled droplets into much smaller aerosolized particles that remain in the air longer and travel further.

Folded bandanas (ala Jesse James robbing a bank) and knitted masks also fared poorly.

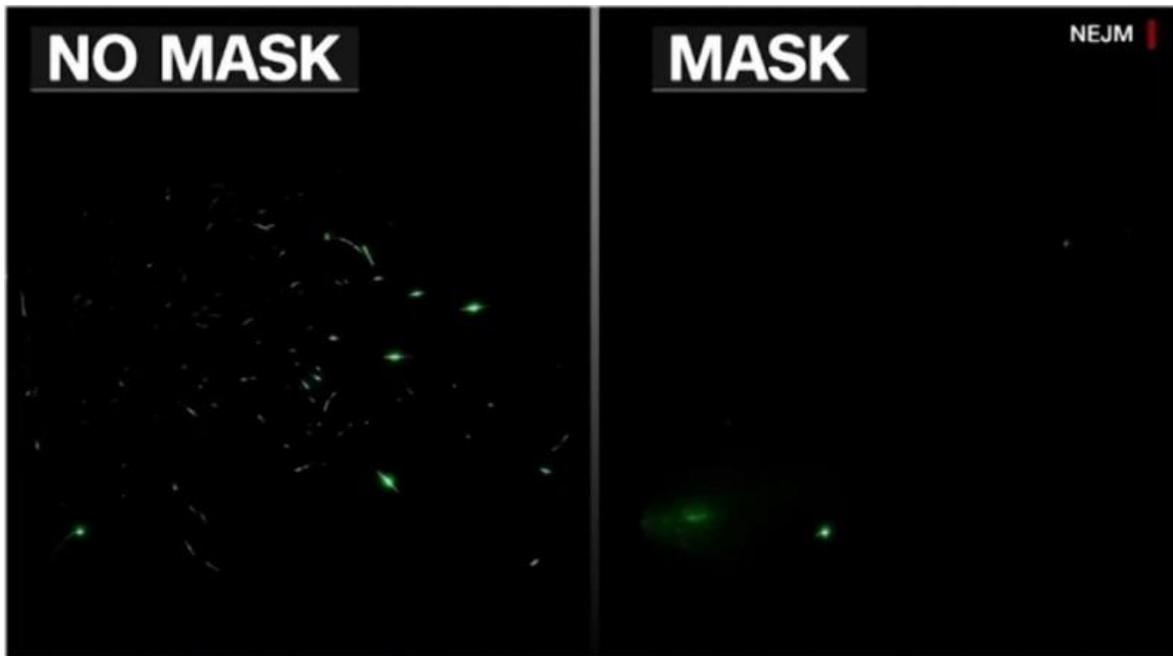
3-layer surgical style masks, as well as 3-layer cotton masks, performed quite well. N-95 masks were the most effective in minimizing the transmission of aerosolized, exhaled air.

Face masks with valves, while seemingly providing easier breathability, do not provide protection for either the wearer or anyone else. The valve results in a stream of exhaled air that has the potential to be a concentrated stream of contamination should the wearer have Covid-19. The valve also provides a path to inhale potentially contaminated air expelled by others.

Similarly, a face shield also does not provide adequate protection. The open sides and bottom of a face shield allow for exhaled to escape or inhaled air to gain access to the wearer. A face shield certainly provides protection to the wearer's eyes in the event of a close face-to-face encounter, such as in an emergency room setting or by EMT's in the field. However, if you notice in those photos, those 1st responders also wear a face mask under the shield.

In the February 2019 Scientific Report by Nature, the results of a study were shared that showed aerosolization during speech. When speaking quietly an average of 6 particles/second is emitted by a speaker. When speaking loudly, but not so loud as to be yelling, 53 particles/second is emitted by a speaker. Now picture a packed room full of people, all taking simultaneously, and wanting to be heard by the person or group of friends they are with: such as in a bar. Few people are wearing a mask. Now multiply the 53 particles/second for each person speaking. Get the picture?

Below is a photo I was able to find in the NEJM (New England Journal of Medicine) of aerosolization during speech both with and without a mask:



Who would you prefer to be standing near?

Again I will remind us all that Covid-19 is, indeed, a novel (new) virus. We are all learning as we go. Every day brings new information that has the potential to change our behaviors as we work through this pandemic. As a speaker on the last APHA (American Public Health Association) conference (Managing Ongoing Surges: Lessons from the Front Lines) I listened to said, “We are building the airplane as we fly.” Think about that statement. I’d prefer to know that the plane I enter is intact and ready to fly without the chance for any issues.

By the same token I’d prefer to think that my physician knows everything about every disease and every body he/she cares for. Yet what I can say, with certainty, after 49 years in health care, is this: knowing everything about every disease and every person is impossible; while we may all be built alike we are not at all built alike; with the average human body containing 30,000,000,000,000 (that’s 30 Trillion) cells, there is no way we are all the same. And so we continue to learn as we go...about everything...and especially about Covid-19.

Many Thanks!

As I write what is the last of the information that is currently available, I realize I need to thank many people who have helped me along the way. Without the research of hundreds, if not thousands of scientists, physicians, physician researchers, engineers, and a plethora of others, I would not have been able to assemble the puzzle pieces that are Covid-19. Those thanks go out to:

- NIH (National Institute of Health)
- NAM (National Academy of Medicine)
- CDC (Centers for Disease Control)
- WHO (World Health Organization)
- APHA (American Public Health Association)
- NAE (National Academy of Engineering)

- The UPG's very own Tom Sarver – Tom provided much needed information on the mental health aspects of dealing with the stresses involved in living through isolation caused by the pandemic
- Dr. Jeffrey Jahre, Vice President of Medicine and Academic Affairs, St. Luke's University Health Network, Infectious Disease Specialist – Dr. Jahre was gracious in taking and returning my phone calls in order to help me understand some of the information I was confused about; he was a valuable soundboard for my thoughts and helped to keep me on the right information pathway
- Diane Botbyl, Administrative Assistant to Dr. William Burfiend, Chief, Department of Surgery at St. Luke's University Health Network, and good friend – Diane was the person I would contact to reach Dr. Jahre. And although it was not her department, the 2 offices are down the hall from each other and she graciously took on the task of being the go-between for Dr. Jahre and me.
- Kelly Cascario, Administrative Assistant to Pastor Jerry, who was responsible to get these articles out to the parish via broadcast email and print
- Pastor Tom Keener, who made it possible for these articles to appear on the UPG web site
- Dr. Victor Dzau, President, National Academy of Medicine, who, upon receiving a forwarded email of one of the articles, took the time to respond
- Dr. Alton Romig, Jr, Executive Officer of the National Academy of Engineering, my brother, who provided the initial information about the APHA on-line seminars (www.covid19conversations.org) that got this ball rolling; who continues to send me information from the multiple National Academies that pertain to the pandemic; who has acted as a soundboard; who has read all the articles and continues to encourage me through his feedback on them; and who took it upon himself to forward one of the early articles to Dr. Dzau
- To all of you, who have had to abide all this writing.

In closing I'd like to leave you with a few tips:

- Wear a face mask!
- Avoid crowded indoor spaces
- Avoid crowded outdoor spaces where physical distancing isn't possible
- Stay hydrated
- Maintain at least 6 feet of distance when in the presence of people not from your place of residence
- Get a flu shot!
- Oh, did I say, Wash your hands, wash your hands, wash your hands!

May God's peace be with us all as we journey through these rough waters of the pandemic. And when it is time, and we are encouraged to step out of the boat, may we all find the courage and trust to do so. (Thank you Vicar Jamie for the idea!)

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