



COVID-19 Science and Medicine Updates

Compiled by University of Maine faculty and students

Maine Updates – April 8, 2020:

April 7, 2020 data in Maine (latest CDC posted data this morning):

519 confirmed cases, 176 recovered, 99 hospitalized, 12 deaths

Maine CDC is no longer reporting number of COVID-19 tests that have been processed, and number of negative cases. They state this is because of the number of outside labs that are testing samples from Maine, it is no longer possible to post an accurate count of negative tests.

<https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus.shtml>

Governor Mills Announces Plan to Open Alternative Care Sites in Coordination With Maine Hospitals & Cities of Portland and Bangor

Since epidemiological modeling leads to a broad set of potential outcomes, some of which likely will overwhelm Maine hospital and healthcare systems, Maine plans to be prepared by opening alternate care sites in Portland and Bangor, in case the worse scenarios become a reality.

<https://www.maine.gov/governor/mills/news/governor-mills-announces-plan-open-alternative-care-sites-coordination-maine-hospitals-cities>

Why hand washing is better than hand sanitizer; risks of homemade hand sanitizer:

- To kill COVID-19, hand sanitizer should have 60-70% alcohol.
- Hand washing is more effective than hand sanitizer use, but sanitizer is useful when not near a sink with soap.
- There are some germs that hand sanitizer cannot remove (Cryptosporidium, norovirus, and Clostridium difficile).

<https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html>

- Hand sanitizer may not be as effective as hand washing, especially when grease and/or dirt are on the hands.

<https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html>

- If it is used, hands sanitizer should be spread over the entire hand and should be allowed to dry (alcohol evaporation).

<https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html>

- Commercial hand sanitizers typically have moisturizers that make alcohol less harmful to the skin. If the correct ratio of moisturizer to alcohol is not added to homemade hand sanitizer, these sanitizers could harm the skin.
- The Skin is an important barrier against germs.

<https://www.cnn.com/2020/03/03/health/coronavirus-diy-hand-sanitizer-trnd/index.html>

- Evidence suggests that some germs are evolving to be resistant to hand sanitizers, so long-term use is not advised.

<https://www.npr.org/sections/goatsandsoda/2018/08/02/635017716/some-bacteria-are-becoming-more-tolerant-of-hand-sanitizers-study-finds>

Handwashing and COVID-19:

- Keeping your hands clean is one of the most important actions that you perform to avoid spreading germs and getting sick. Handwashing is the best way to keep your hands clean because the soap removes the microbes; the surfactants in the soap and the friction you use during the handwashing process helps remove microbes. The process should take 20 seconds.
- After washing, drying hands is important because microbes are more easily transferred to and from wet hands
- If hand washing is not possible, alcohol sanitizer with 60% alcohol or more can be used. Do not rinse or wipe off the sanitizer before it is dried.

<https://blogs.cdc.gov/publichealthmatters/2016/10/global-handwashing-day-2016/>

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>

What is a ventilator?

- A machine that supports breathing
- Oxygen is delivered and carbon dioxide is removed through an endotracheal tube (breathing tube) that is placed through the mouth and is passed through your vocal cords into the trachea.
- The end of the tube is a few centimeters above the carina (bifurcation of the right and left main bronchus).
- The ventilator is programmed to deliver number of breaths/minute and volume of breaths.
- Other programmed settings on the ventilator can include continuous pressure at the end of expiration (positive end expiratory pressure or PEEP) to keep alveoli open. When a patient is breathing with ventilatory support, he/she will not be able to eat. Food will likely be administered via a tube that is inserted through the nose or mouth and goes to the stomach; or an intravenous line will provide nutritional supplements.
- When placed on the ventilator, it is likely that the patient will be provided some sedation to reduce anxiety and discomfort.

<https://www.nhlbi.nih.gov/health-topics/ventilatorventilator-support>
 Hoffman, J. & Sullivan, N. (2017). Medical surgical nursing: Making connections to practice. Philadelphia, PA: F. A. Davis Company.
 ISBN: 978-0-8036-4417-5

Why do lungs get highly inflamed and require ventilatory support with COVID-19?

- Some COVID-19 patients develop acute respiratory distress syndrome (ARDS). This is an acute inflammatory condition that occurs in all lung field (alveoli). There are many causes of ARDS (including COVID-19); the insult causes a reaction that damages the alveolar and capillary walls.
- The walls become more permeable, allowing plasma, proteins and erythrocytes to enter the interstitial space. The osmotic pressure is also disrupted, and more fluid enters the alveoli. The protein enriched fluid that accumulates in the alveoli along with cellular debris and other cells and substances disrupts gas exchange from the alveoli to the blood (carbon dioxide cannot be expelled, and oxygen cannot be absorbed). Hypoxemia develops (the amount of oxygen in the blood). Ventilatory support may be required depending on the extent of hypoxemia.
- As the pathology progresses, there is damage to the type II alveolar cells that produce surfactant that is needed to maintain lung or alveolar compliance (ability to distend or stretch), and the lungs increasingly lose compliance or become “stiff”. Decreased alveolar compliance and alveolar collapse lead to increased breathing effort with increased hypoxemia. Ventilatory support is a critical need at this point in the pathology.

Sorenson, M., Quinn, L., & Klein, D. (2019). Pathophysiology: Concepts of human disease. New York: Pearson.

Update on NSAIDs with COVID-19:

- At this time (4/7/20), there is no reliable evidence showing that NSAIDs worsen the symptoms COVID-19.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7105332/>
- From Knowable Magazine (a publication of the Annual Reviews):
 - “The idea got attention after [a letter in the *Lancet*](#) proposed that drugs like ibuprofen could increase the number of cell receptors that the virus binds to during infection. The health minister of France then [issued a warning to doctors](#) about using the drugs when treating Covid-19, urging the use of acetaminophen (not an NSAID) instead. However, medical agencies such as the World Health Organization have said they are [not recommending that people avoid ibuprofen](#) or drugs like it when treating Covid-19.”
 - This retraction was due to problems with the original data set.

Homemade Facemasks – evidence on COVID-19 transmission:

<https://www.nytimes.com/article/coronavirus-homemade-mask-material-DIY-face-mask-ppe.html>

- Around the country, volunteers are sewing homemade facemasks using a variety of materials and patterns. These masks are filling a shortage in respirator N95 masks and surgical masks, and are mostly being used by the public in order to conserve medical masks for healthcare personnel.
- Recent recommendations indicate people should be wearing homemade masks when necessary to go out in public (such as the pharmacy, grocery store). Social media has posted tutorials to make a homemade mask without the need to sew – using a bandana and two elastics.
- The new recommendations for the public to wear masks comes from recent evidence that COVID-19 may be transmitted through breathing or talking.

<https://www.cnn.com/2020/04/02/health/aerosol-coronavirus-spread-white-house-letter/index.html>

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>

- Testing materials for homemade masks requires removing air gaps around the edges and determining movement of small particles and aerosols through the pores in the fabric.
- For example, from the NYTimes link above: A 600 thread count pillow case captured just 22 percent of particles when doubled, but four layers captured nearly 60 percent. A thick woolen yarn scarf filtered 21 percent of particles in two layers, and 48.8 percent in four layers. A 100 percent cotton bandanna did the worst, capturing only 18.2 percent when doubled, and just 19.5 percent in four layers.
- The best-performing designs were a mask constructed of two layers of high-quality, heavyweight “quilter’s cotton,” a two-layer mask made with thick batik fabric, and a double-layer mask with an inner layer of flannel and outer layer of cotton.
- Most advice indicates that mask wearing is best at helping an infected person transmit viral particles by coughing and sneezing. While wearing a mask, someone could still become infected by COVID-19 through the eyes, or through the gaps in the side of a mask.
- According to the WHO, masks should be put on with clean hands, and masks should fit snugly with no gaps around the edges that could let in contaminated air.
- Do NOT re-use single-use masks. Do NOT use a mask that is damp or wet. Wash your hands after removing and discarding a mask.
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>
- Cloth face masks can be washed in a washing machine before re-use.

How COVID-19 affects rural areas:

- Cases are likely to peak in rural areas later than in urban areas (~3-6 weeks later by some estimates).

<https://www.healthline.com/health-news/rural-america-hardest-hit-by-covid-19-outbreak#Older-and-less-healthy>

<https://www.vox.com/2020/3/28/21197421/usa-coronavirus-covid-19-rural-america>

- In rural areas, there are higher percentages of people with characteristics making them especially susceptible to serious COVID-19 symptoms. Such areas feature more elderly, cigarette smoking, and obesity.

<https://www.washingtonpost.com/opinions/2020/04/06/covid-19-crisis-is-going-get-much-worse-when-it-hits-rural-areas/>

<https://www.healthline.com/health-news/rural-america-hardest-hit-by-covid-19-outbreak#Older-and-less-healthy>

<https://www.census.gov/content/dam/Census/newsroom/press-kits/2019/paa/paa-poster-older-population.pdf>

- Many counties that make up rural America may have insufficient numbers of ICU beds. Half of the counties in America lack ICU beds entirely. If the COVID-19 transmission rate is not slowed, this will lead to a shortage of ICU beds available to patients in rural counties.

<https://www.vox.com/2020/3/28/21197421/usa-coronavirus-covid-19-rural-america>

<https://www.healthline.com/health-news/rural-america-hardest-hit-by-covid-19-outbreak#Older-and-less-healthy>

<https://www.washingtonpost.com/opinions/2020/04/06/covid-19-crisis-is-going-get-much-worse-when-it-hits-rural-areas/>

- Many hospitals in rural areas have been forced to stop offering elective procedures, such as physical therapy and lab testing. These procedures make up a significant portion of the profit of many hospitals.

<https://www.washingtonpost.com/opinions/2020/04/06/covid-19-crisis-is-going-get-much-worse-when-it-hits-rural-areas/>

- The recently passed stimulus package allocated \$100 billion to health care providers, which will likely lift some of the financial burden rural hospitals are currently experiencing. However, it is yet unclear if this stimulus package will solve the issue entirely.

<https://www.washingtonpost.com/opinions/2020/04/06/covid-19-crisis-is-going-get-much-worse-when-it-hits-rural-areas/>

Recommended Science-Based Journalism on COVID-19:

From Bats to Human Lungs, the Evolution of a Coronavirus (New Yorker)

<https://www.newyorker.com/science/elements/from-bats-to-human-lungs-the-evolution-of-a-coronavirus>

How Does the Coronavirus Behave Inside a Patient? (New Yorker)

<https://www.newyorker.com/magazine/2020/04/06/how-does-the-coronavirus-behave-inside-a-patient>

How Immune Responses Weaken with Age (Knowable)

<https://www.knowablemagazine.org/article/health-disease/2020/aging-immune-system-and-vaccines>

Reputable Online Resources with COVID-19 Data:

IHME Health Data and Projections:

<https://covid19.healthdata.org/united-states-of-america>

<https://covid19.healthdata.org/united-states-of-america/maine>

Johns Hopkins

<https://coronavirus.jhu.edu/map.html>

Questions about the production of these bulletins?

Contact kristy.townsend@maine.edu

The University of Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities. The following person has been designated to handle inquiries regarding nondiscrimination policies: Equal Opportunity, 101 North Stevens Hall, University of Maine, Orono, ME 04469-5754, 207.581.1226, TTY 711 (Maine Relay System).