HOW YOU CAN TAKE A DISPOSABLE SURGICAL MASK AND ENHANCE IT TO KILL OFF AIRBORNE VIRUSES THAT LAND ON IT OR EMBED IN IT

Centers for Disease Control (CDC) webpage on the 2019-nCoV now officially known as COVID-19 (Novel coronavirus): https://www.cdc.gov/coronavirus/2019-ncov/index.html

Centers for Disease Control (CDC) FAQs on the 2019-nCoV now officially known as COVID-19 (Novel coronavirus): https://www.cdc.gov/coronavirus/2019-ncov/faq.html

Coronavirus spreads in 3 main ways: This one worries the CDC most https://www.slashgear.com/coronavirus-spreads-in-3-main-ways-this-one-worries-the-cdc-most-14609903/

Harvard Professor Sounds Alarm on 'Likely' Coronavirus Pandemic: 40% to 70% of World Could Be Infected This Year (Feb. 14, 2020): https://www.mediaite.com/news/harvard-professor-sounds-alarm-on-likely-coronavirus-pandemic-40-to-70-of-world-could-be-infected-this-year/

A spot on look at how some in the world of alternative medicine/complementary-alternative medicine/integrative medicine are exploiting coronavirus fears to make money (by Harriet Hall, MD): https://sciencebasedmedicine.org/alternative-medicine-exploits-coronavirus-fears/

Preventing a pandemic: Wash your hands by Steven Novella, MD https://sciencebasedmedicine.org/handwashing-to-prevent-pandemic/

Nova Cells Institute of Mexico (NCIM) knows of **NO** scientifically credible (much less validated) non-mainstream treatment or vaccine for the COVID-19 strain of. There may however be a way to reduce your chances of becoming infected. This is not something NCIM offers or in any way makes money off of.

There is a line of research that goes back many years in which a coating of salt (sodium chloride – NaCl) applied to surgical masks was shown to kill many viruses including strains of influenza (flu), at least in bench top experiments (Not human studies, but in animal models).

Here is a link to a paper on this which appeared in the peer reviewed journal (Nature) *Scientific Reports*: https://www.nature.com/articles/srep39956.pdf

In this paper the authors used sodium chloride (table salt) at a specific concentration along with a surfactant to help it penetrate and better adhere to cotton fibers in surgical masks of the sort routinely used by healthcare professionals such as MDs, DOs, RNs, dentists and such.

This work was done in 2016 and published in early 2017. There were five scientists listed as authors and equal contributors to this research: Fu-Shi Quan (Department of Medical Zoology, Kyung Hee University School of Medicine, Seoul, Korea), Ilaria Rubino (Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada), Shu-Hwa Lee (Department of Biomedical Science, Graduate School, Kyung Hee University, Seoul, Korea), Brendan Koch (Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada) and Hyo-Jick Choi (Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada).

In February of this year (2020), two of the individuals cited above, Ilario Rubino and Prof. Hyo-Jick Choi (University of Alberta), were the focus of articles with titles such as "Alberta Scientists Pioneer Mask That Kills Viruses In Mere Minutes" (Subtitled "And they're confident the face mask will work on the Coronavirus") and "A biomedical engineer created a mask coated in salt that he says could neutralize viruses like the coronavirus in 5 minutes"

Dr. Choi discusses the salt mask in this 1m25s video posted to YouTube (Edmonton Journal) back on 2-13-2018: https://youtu.be/g8EgAOoY4Gg

And in this 2-3-2020 article titled Scientist Claim Salty Mask Could Fight Coronavirus it is noted that "According to Choi, the coating consists of two salts: **potassium chloride** and **sodium chloride** mainly."

It should be pointed out that researchers at 2 separate Korean universities have done fairly extensive research on how specifically processed natural sea salt preparations deposited on air filters exerted a bactericidal effect (Killed bacteria). However, their system did not look at any virucidal (virus killing) effects. Their work is mentioned only because it will undoubtedly occur to some people reading this to try substituting sea salt for pure sodium chloride (Table salt) in coating surgical masks for personal use. There are again problems connected with this such as lack of testing against viruses as well as technical challenges surrounding the use of sea salt which has not been processed to weed out large salt crystals (The Korean scientists reported that "We produced submicron-sized salt particles to increase the exposure area to surrounding antigens and observed the physical properties of the NSS particles, such as particle size distribution and morphology." Their methods are laid out in a 2020 paper they coauthored which is available in its entirety at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6981996/pdf/ijerph-17-00190.pdf

Long story short: Those preparing their own salt-based solutions to use in coating disposable surgical masks should stick to pure NaCl (Table salt). Preferably a very finely ground salt.

IS MAKING & APPLYING A SALT RICH COATING TO DISPOSABLE SURGICAL MASKS A PRUDENT THING TO DO?

Dr. Choi's lab has received financial support from Mitacs, a Canadian nonprofit organization, to help him and his University of Alberta collaborators develop and test their virucidal mask coating. In a 2-

5-2020 Newsroom post Mitacs states that “Choi's lab is being funded by Mitacs, a Canadian nonprofit that works with hundreds of organizations and universities to "foster growth and innovation in Canada."

However, **it appears Dr. Choi’s mask coating will not likely reach the marketplace until 2021**. With the flu season well underway and the 2019-nCoV (COVID-19) strain of coronavirus spreading in countries throughout the world, many people are asking what measures they can take now to reduce their risk of infection with either influenza or 2019-nCoV (COVID-19).

Many people who have followed the flurry of news articles on Dr. Choi’s work are asking if there is some way they can create and apply a sufficiently concentrated salt solution to disposable protective face masks at home. What they are asking for is an effective stop gap or make do measure they can do on their own, at least until such time as Dr. Choi’s coating or masks made using it reach the marketplace.

With this in mind NCIM asked one of its seasoned biomedical innovators to see if he could come up with such a “do-it-yourself at home” approach to creating salt layer coated disposable surgical masks. Armed with insights gleamed from various published scientific papers as well as his own experience working with a variety of anti-viral substances and compounds starting in the late 1980s, he concluded that specific forms of salt and iodide, lithium chloride and some plant compounds, were “especially promising as virucidal agents”. But as a “home approach” is the focus, he decided the safest and easiest to acquire compounds for home experimentalists to work with are those Dr. Choi had apparently settled on: sodium chloride and potassium chloride. After giving this some thought and doing various calculations he came up with the items and procedure which follows below.

YOUR PROTECTIVE MASK ENHANCING SHOPPING LIST

Table salt (Sodium Chloride) – straight salt, not iodized or other forms. A finely ground or powdery form would be ideal.

Potassium Chloride – is sold online and is also marketed as a salt substitute in some supermarkets

Distilled water – A small bottle is OK although most supermarkets sell only 1 gallon (3.79L) jugs or bottles of it. (Dr. Choi used deionized water in his work which is sold online through many sources including Amazon https://www.amazon.com/slp/deionized-water/atcwhc26wcj28bu. However, distilled water is very pure in most instances and is thus suitable for creating an at-home salt-surfactant solution. See https://www.uswatersystems.com/deionized-water-vs-distilled-water)

A suitable 1 or 2 ounce (30 or 60 mL) spray bottle (Glass is probably best as plastics contain chemicals that could leach into the salt-surfactant solution). **Look for no-clog pumps.**

Polysorbate 20 (Tween20) – small bottles of 4-6 ounces can be bought on Amazon, Walmart, eBay & other websites. One low priced 2 oz bottle can be found on Amazon is at https://www.amazon.com/dp/B07DL55NFH/ref=twister_B07DL2WG4Z?_encoding=UTF8&psc=1

If you do not yet bought a box of 25, 50, 75 or 100 disposable surgical masks, you will probably find this item at a local pharmacy like CVS, Walgreens, or Rite Aid or in the pharmacy section of a Walmart, Kmart or Target store. You can also find these for sale online by vendors affiliated with Google, eBay, and such as well as independent medical supply outlets.

MIXING UP AND APPLYING THE SALT & SURFACANT MIXTURE TO DISPOSABLE SURGICAL MASKS

Pour 6 ounces (~177mL) of distilled water to a small clean glass bowl or coffee cup or such. Add 6 level tablespoons (~90 grams) of find ground sodium chloride (NaCl ▸ table salt) and 6 level tablespoons (~90 grams) of potassium chloride (KCl) to the distilled water and stir until dissolved. NOTE: Because of the large quantities of NaCl & KCl being used there will be some undissolved crystals in the bottom of your container. One way to get these crystals better dissolved is to place the 6 oz (~177 mL) salty solution in a small pan and heat to boiling. Let the liquid boil for 3-5 minutes, then cut the heat and let the pan and liquid cool down naturally to room temperature.

As a result of the heating process, some liquid will boil off. To compensate add less than 1 ounce (25 mL) of distilled water to the salty liquid. Then add 6 drops of Polysorbate 20 to it and gently stir.

You will wind up with a very milky looking solution with some precipitate (salt crystals) at the bottom of your cooking vessel.

Stir the salty liquid well to achieve maximum blending, then pour this into a 6 ounce (~177 mL) glass sprayer bottle [Or into two 3 ounce (~90 mL) or three 2 ounce (~60 mL) sprayer bottles].

Prior to spraying the salt & surfactant solution on a disposable cotton fiber surgical mask: If the mask you are going to spray has a water or liquid droplet repellant side – typically the green or blue colored side that faces out when worn – do not spray your salt solution on this side of the mask. Instead, shake the spray bottle VERY thoroughly and then lightly spray the non-repellant surface until visibly saturated with the solution (This is usually the white colored side of a green-white or blue-white disposable surgical mask).

https://www.chp.gov.hk/files/pdf/use_mask_properly.pdf

If your mask does not have a water or liquid droplet repellant side or is composed of a soft cotton fabric throughout, then simply spray it lightly or until visibly wet (saturated).

Once the spraying phase is complete, place the treated mask or masks on a clean tray or plate and let it or them air dry thoroughly. NOTE: Some people may have their chosen sprayer bottle nozzle clog up. If so and this cannot be resolved, pour the salty solution into a small glass jar with a screw

top lid, shake the solution VERY well, remove the screw top jar lid and dip a clean/new sufficiently thick paint or artist's brush into the milky solution and proceed to "paint" the mask until is wet/saturated and then let the mask dry. Once you have coated one or more masks and are done with this task, put the screw top lid back on the jar containing the salty liquid, label and date it and then place this on a pantry or kitchen cabinet shelf out of the reach of small children (Some people place the jar in a Ziploc type bag as a way to prevent spillage should the jar fall and shatter).

When carrying a mask on your person, place it in a suitable Ziploc plastic bag or other sealable plastic bag. Once it has been worn return it to its storage bag and then dispose of it in accordance with local laws. Wash your hands for 20 seconds with soap and water after this.

Note: Dr. Choi did experiments in which he applied his salt coating to the inner or filtration layer of 3 ply disposable surgical masks. As best as NCIM can determine lightly saturating all layers of a disposable mask or the 2 absorbent (innermost) layers in masks with an outward facing liquid repellant outer layer with a salt-surfactant solution will result in well coated cotton fibers.

A WORD ABOUT TRYING TO ENHANCE THE VIRUS-KILLING ACTIVITY OF THE SALT-SURFACANT SOLUTION WITH COLLOIDAL OR OTHER SILVER CONTAINING PRODUCTS

We at NCIM are well aware of the fact that colloidal and other forms of silver are being sold over-the-counter (mainly via the Internet and on some TV infomercial type shows) mainly for internal use to prevent or treat viral and bacterial infections. *Newsweek* in fact recently ran an article on the appearance of a naturopath on televangelist Jim Bakker's mainstay religious talk show program (The Jim Bakker Show) who bumper-thumped a silver particle containing product called "Silver Solution" (A 12 ppm 16 oz bottle of this runs $40 USD on Bakker's Internet store).

Televangelist Sells $125 'Silver Solution' as Cure for Coronavirus:
https://www.newsweek.com/televangelist-show-guest-promotes-silver-solution-cure-coronavirus-1487069

Naturally, some people may be tempted to not only take colloidal or other forms of silver orally but to add them to the salt-surfactant solution. NCIM doctors and laboratory specialists including its chief biochemist wanted to share this with readers concerning the use of silver particle liquid products orally as well as adding them to the salt-surfactant solution:

The US government's own *National Center for Complementary and Integrative Health* (NCCIH) website offers some very cogent warnings about orally ingested colloidal and other forms of OTC silver products at https://nccih.nih.gov/health/colloidalsilver

In various laboratory studies, nanoparticle silver (1 to 100 nanometer sized silver particles) did have an antibacterial and antiviral effect on specific species of bacteria and viruses exposed to them in petri dish, cell culture and animal model experiments. The difficulty with oral dosing in people includes addressing such questions as: how many ppm (parts per million) does it take to reach and either facilitate the destruction of disease causing microorganisms in the human body or prevent their entry into host cells or tissues? Is one particular nanometer sized silver particle or a narrow size range of nanoparticles more effective than another against a specific virus or family of viruses in the human body (There is some evidence that 1-10 nm sized silver articles that attach to glycoproteins on cells can prevent some viruses from entering them)? In addition, as orally ingested nanoparticle

silver gets dispersed in the body, it follows that the quantity of nanoparticles that reach various tissue or fluids may not be sufficient to significantly impact virus numbers or activity and/or attach to enough cells so as to prevent widespread entry of the virus into them).

The NIH's searchable PubMed database at https://www.ncbi.nlm.nih.gov/pubmed/ contains many papers on *in vitro* (lab dish, cell culture) and *in vivo* (in living creatures mainly mice and such) experiments involving nanoparticle silver on various disease-causing bacteria and viruses. Reviews abound too such as https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5037809/

At this point in time the oral use of nanoparticle silver products to prevent or treat a viral infection appears an iffy proposition. It may do no harm with short-term use but it seems doubtful it will prevent a viral infection or have much if any impact on an existing one.

As for adding nanoparticle silver powder or liquid to the salt-surfactant solution or substituting a nanoparticle solution for the distilled water called for in the preparation directions above: There are published papers which indicate that sufficient amounts of nanoparticle silver (often combined with other compounds) has an antimicrobial effect. Many of these studies revealed antibacterial effects after treated masks or such were incubated with disease causing bacterial for 24 hours or more, such as this study from 2006 did https://www.journalofhospitalinfection.com/article/S0195-6701(05)00206-9/pdf). Other studies such as this one showed that nanoparticle silver in the 1-2 nm range combined with specific compounds and applied topically exerts an antimicrobial effect

Given the fact that Dr. Choi's salt coated protective mask experiments involving specific influenza virus strains demonstrated a very high rate of die off during the first 5 minutes after the viruses were deposited on the masks, it would seem the salt coating in itself should be more than sufficient to prevent virus particles from reaching wearers of treated masks. However, for those determined to try and improve on the virucidal effects of the coating, they should at least experiment with a nanoparticle silver powder or liquid whose silver particle size and purity has been verified/certified by a suitably licensed laboratory that is independent of the maker or seller.

A WORD ABOUT COVID-19 SURVIVAL ON SURFACES

In a *Science Alert* article titled "New Study Indicates How Long Coronaviruses Can Survive on a Surface" that was posted at https://www.sciencealert.com/study-shows-just-how-long-coronaviruses-can-stick-around-on-a-surface on February 13, 2020, the author Carly Cassella shared these salient points:

> According to the United States Centers for Disease Control and Prevention (CDC) it's "currently unclear if a person can get 2019-nCoV by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes."
>
> In fact, not a lot is known about the COVID-19 virus at all, so researchers are turning to similar coronaviruses, like SARS and MERS, for answers.
>
> Reviewing the literature on all available human and veterinary viruses within this family, encompassing 22 studies, researchers have found that the human pathogens can persist on surfaces and remain infectious at room temperature for up to nine days. (To put that in perspective, the measles virus can live on contaminated surfaces for up to two hours.)

> Granted, that's the upper end of a coronavirus lifespan, but on average, researchers say this family of viruses can survive between four and five days on various materials like aluminium, wood, paper, plastic and glass.

Here is a link to the full paper in PDF formatted form:
https://www.journalofhospitalinfection.com/article/S0195-6701(20)30046-3/pdf

Under the conclusions section of this paper the authors state the following:

> Human coronaviruses can remain infectious on inanimate surfaces for up to 9 days. Surface disinfection with 0.1% sodium hypochlorite or 62-71% ethanol significantly reduces coronavirus infectivity on surfaces within 1 min exposure time. We expect a similar effect against the 2019-nCoV.

70% ethanol containing hand sanitizers, wipes and sprays are sold by most pharmacies and scores of online stores and vendors (**Some of these products contain aloe vera gel or other compounds that will help prevent the user's skin from drying out and becoming chapped from repeated use**). For those who want to make their own hand sanitizer, this article contains a procedure for how to do this created by an infectious disease doctor (MD).

Given the fact coronavirus infected individuals can conceivably be symptom-free for up to 14 days or more after contracting the virus – and might be shedding the virus during this time – it would behoove individuals who circulate or work in heavily trafficked offices or buildings or who otherwise come into contact with people on a regular basis to: (1) wash their hands with soap and water fairly often; (2) wipe down or spray their office or work station desktop(s), office door knob(s) and any other surfaces touched by visitors or clients or such with a 70% ethanol product several times daily (They should do the same to public or office toilet seats prior to using, then wash their hands thoroughly with soap & water for at least 20 seconds afterwards); and (3) use a 70% ethanol wipe on supermarket cart or basket handles prior to use and then use a pocket hand sanitizer after checkout (It is possible COVID-19 virus particles from an infected but asymptomatic customer could have been left on diary case door handles and other surfaces they came into contact with while shopping).

Preventing a pandemic: Wash your hands by Steven Novella, MD
https://sciencebasedmedicine.org/handwashing-to-prevent-pandemic/

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