MATERIAL AND STERILIZATION DATABASE FOR HOMEMADE MASKS

Please note that sterilization information and incomplete sections may be updated as time progresses. Thank you for understanding, and please stay safe and remain healthy during this time.

I. BASIC CLOTH MASK INFORMATION

A. PURPOSE

1. On April 3rd, 2020, the Center for Disease Control (CDC) recommended that all Americans wear cloth face masks when they are in public settings[1]. The purpose of these cloth masks is to make sure that the virus will not be transmitted from person to person via droplets that can be found in coughs and sneezes. In addition to this, some people are carriers of COVID-19 but do not show any symptoms. It is important to understand that these individuals could still transfer the disease to another person. Although the CDC has recommended that all Americans wear cloth masks when they are in public, the general public must not use surgical masks or N-95 respirators. The surgical masks and N-95 respirators should be saved and used only by healthcare workers who are treating a huge number of patients with COVID-19 every day and must be protected from the virus so that they can continue saving lives. The purpose of this database is to provide the general public with ways to make their own, effective, cloth masks and also to provide ways for the public to test and sterilize the masks that they use.

B. DESIGN CONSIDERATIONS

1. FIT OF MASKS

a) There are many different ways to make cloth masks but in order to maximize the efficiency of cloth masks, you must make sure they fit against your face properly and leave little to no gaps. One of the best ways to make sure the mask that you make fits against your face is by using ties (Cotton tape, Bias tape, etc.) instead of using elastic. This allows for the mask to be closer to your face and minimize gaps for droplets to go through.

2. MASK MAKING TECHNIQUES

a) The way you make your mask will depend heavily upon the material you use and the resources you have available.

[1] Center for Disease Control Recommendation for Cloth Masks

Therefore, in each material section, we will be providing ways for you to make masks and how to sterilize these masks so that you can use them over and over again.

3. COMFORT
    a) Many healthcare workers currently re-use their masks for several days (which we're trying to relieve) or don't have time to change out filters/masks in between patients. Our GW tester said that the mask wasn't comfortable enough which is something to consider.
    b) Also being able to breathe freely while having the mask on, which can be a challenge when also trying to create a seal esp. with materials like plastic or vacuum bags and since we don't have a lot of high-tech gear we can't easily create one of those one-way air valves (oxygen can flow in, but the virus can't) as of now..?

II. TESTING

A. ESSENTIAL OILS AND AROMATIC TESTS

1. The best way to test the functionality of your mask is to perform essential oils or aromatics tests. For the essential oils test, spray essential oils on your mask; if you are able to smell the oils with your mask, this means that droplets will be able to go through your cloth mask and therefore your mask is not effective. For the aromatic test, wear your mask while cooking something with a strong smell. If you are able to smell what you are cooking, the mask is not effective.

III. COTTON

A. MATERIAL INFORMATION

1. Effective cotton fabrics
    a) "Quilter's Cotton" (100% Woven Cotton)
    b) Two Layers of Batik Fabric
    c) Double layer mask with outside as cotton and inside as flannel
2. An effective way to test if the material will be able to filter out droplets is to hold the material up to the light and see if you can see light coming through. If you can, the material will not be effective.
    a) A great way to ensure that your material will hold against droplets is by using two or more layers of fabric instead of

one. This will also be great if you are using a fabric that tends to have bigger holes and also flimsier fabrics.

(1) Keep in mind that the more layers you add, the less breathability you will have when wearing the mask. (It will be harder to breathe when you are wearing the mask)

B. COTTON STERILIZATION

1. Washing the mask regularly in a washing machine should sterilize it.
    a) Virus particles stuck inside the mask are removed from washing.
2. Using soap and water/can dry on low heat
    a) Bleach and any other harsh chemicals could degrade fibers and be damaging to mask https://www.nytimes.com/2020/04/10/well/live/coronavirus-face-masks-guides-protection-personal-protective-equipment.html lindsey marr from vtech
3. How to take off mask so that germs don't spread masks4all.co
4. What happens when mask is wet when you wear it

IV. VACUUM BAGS

A. MATERIAL INFORMATION

1. While certain vacuum bags (which are designed specifically to trap particulate matter) have a filtration efficiency near that of surgical masks, many companies have begun posting warnings that their vacuum bags should not be used for this purpose. Additionally, vacuum bags may be difficult to breathe through.

B. VACUUM BAG STERILIZATION

V. LINEN

A. MATERIAL INFORMATION

1. Linen, like cotton, can be tested by holding the fabric up to a light to see if it will be an effective material.

B. LINEN STERILIZATION

VI. PLASTIC

A. MATERIAL INFORMATION

1. PLASTIC 2: Plastic found in grocery plastic bags; HDPE (High Density Polyethylene)
    a) NOTE: HDPE Plastic (Plastic 2) is a plastic that is safe to melt, could potentially be melted into more diverse forms which could help in a more comfortable mask design.

2. PLASTIC 4: Plastic found in the thick, glossy, shopping bags; LLDP (Linear Low Density Polyethylene)
    a) NOTE: also safe to melt if anyone's feeling up to trying it
3. PLASTIC 5: Plastic found in dry cleaner garment bags; LDP (Low Density Polyethylene)
    a) NOTE: safe

B. PLASTIC STERILIZATION
1. HDPE: Wiped down both sides of the mask with a 70% Isopropyl Alcohol swab. Effective in killing

C. PROCEDURE
1. HDPE: Sprayed strong perfume on the exterior side of the mask, and couldn't smell anything from the other side.
    a) TIME: Production of just the filter, not the mask itself, took less than 5 minutes, and used plastic bags which are a very commonly found resource, could easily be mass produced.
    b) NOTE: Having an elastic of some sort on the top of the mask is necessary to create a strong enough seal and effective enough mask.

VII. GENERAL INFORMATION

A. For most fabrics, washing with soap and water in a sink or washing machine is an effective mechanism for sterilization. Many proposed methods of mask cleaning, including pressure cookers and microwaves to simulate laboratory grade autoclaves, may be excessive, dangerous, and ineffective. All practices listed in this document are well researched and have been validated by official guidelines, in consideration of ease of application, material integrity, and safety. Please maintain the safety practices required by your local, state, and federal government regulations. Thank you for your understanding, and please stay happy and healthy.