FACE COVERING GUIDANCE AND AN UPDATE ON SARS-COV-2 VARIANTS

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DOUBLE MASKING
RECENT NEWS

• Dr. Anthony Fauci
  – “If you have a physical covering with one layer, you put another layer on, it just makes common sense that it likely would be more effective”

• Presidential inauguration coverage
• General news excitement following
SARS-COV-2 TRANSMISSION MODE

- Centers for Disease Control and Prevention (CDC)
  - Transmission Modes = Contact, droplet, airborne
  - **Principal mode of infection** = exposure to respiratory droplets through close contact
  - Most infections spread through close contact, not airborne transmission

- Airborne transmission risks include:
  - Enclosed spaces with others
  - Prolonged exposure to respiratory particles
  - Inadequate ventilation or air handling
CLOTH FACE COVERING PURPOSE

• SOURCE CONTROL
  – Barrier to capture the wearers respiratory droplets
  – Protect others from your droplets
  – May also filter external droplets, per CDC
    • Efficiency varies
    • Some filter nearly 50% of fine particles (<1 µm)
• Upwards of 80% blockage of personal droplets (CDC)
CLOTH FACE COVERINGS

Are not tested and not regulated to meet a certain minimum standard

- Freedom to fabricate/select
- Any number of layers, fabric type and density
- Various styles
- Could be supplied to the person by company or donation
- VALVES! – People may not be aware of the lack of source control
- Fit may not be ideal
- All loose-fitting face coverings leak

Googled “horrible face coverings”

ENVIRONMENTAL HEALTH & SAFETY
UNIVERSITY of WASHINGTON
EXHALATION VALVES

airflow visualization 30 fps

Unfiltered breath

Filtered breath
CLOTH FACE COVERINGS

CDC Guidance

– Multiple layers of tightly woven, washable and breathable fabric
– Nose wire
– Block light when held up to bright light source
– Snug fit to face
– Covers mouth and nose
– Secured with ties or loops
– Allows for breathing without restriction
CLOTH FACE COVERING RESEARCH

Chest Clinic (July 2020)

- Face Coverings and Mask to Minimize Droplet Dispersion and Aerosolization: A Video Case Study
CLOTH FACE COVERING RESEARCH

NIOSH – Health Effects Laboratory Division

- Efficacy of Face Masks, Neck Gaiters and Face Shields for Reducing the Expulsion of Simulated Cough-Generated Aerosols (October 2020)

Hanes cloth mask on head form

3M 1860
KC ASTM Level 3
Hanes Defender-cotton 3 layer
CLOTH FACE COVERING RESEARCH

JAMA Internal

– Evaluation of Cloth Masks and Modified Procedure Masks as PPE for the Public During the COVID-19 Pandemic

<table>
<thead>
<tr>
<th>Table. Face Mask FFE Against Submicron Particle Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer-grade face masks</td>
</tr>
<tr>
<td>2-Layer woven nylon mask with ear loops</td>
</tr>
<tr>
<td>Without aluminum nose bridge</td>
</tr>
<tr>
<td>With aluminum nose bridge</td>
</tr>
<tr>
<td>With aluminum nose bridge and 1 nonwoven insert</td>
</tr>
<tr>
<td>With aluminum nose bridge, washed (no insert)</td>
</tr>
<tr>
<td>Cotton bandana</td>
</tr>
<tr>
<td>Folded surgeon general style</td>
</tr>
<tr>
<td>Folded “bandit” style</td>
</tr>
<tr>
<td>Single-layer woven polyester gaiter/neck cover (balaclava bandana)</td>
</tr>
<tr>
<td>Single-layer woven polyester/nylon mask with ties</td>
</tr>
<tr>
<td>Nonwoven polypropylene mask with fixed ear loops</td>
</tr>
</tbody>
</table>

| 3-Layer woven cotton mask with ear loops | New | 26.5 (10.5) |
| Medical face masks and modifications | | |
| 3M 9210 NIOSH-approved N95 respirator | New | 98.4 (0.5) |
| Surgical mask with ties | New | 71.5 (5.5) |
| Procedure mask with ear loops | New | 38.5 (11.2) |

Abbreviations: FFE, fitted filtration efficiency. NIOSH, National Institute for Occupational Safety and Health.

* The percentage of FFE corresponds to 100 x (1 - behind the mask particle concentration / ambient particle concentration). Overall FFE percentage and SD were calculated across the length of the test.
## CLOTH FACE COVERING RESEARCH

**ACS Nano**

- **Aerosol Filtration Efficiency of Common Fabrics Used in Respiratory Cloth Masks (4/20/20)**

<table>
<thead>
<tr>
<th>sample/fabric</th>
<th>filter efficiency (%)</th>
<th>pressure differential (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;300 nm average ± error</td>
<td>&gt;300 nm average ± error</td>
</tr>
<tr>
<td>N95 (no gap)</td>
<td>85 ± 15</td>
<td>999 ± 0.1</td>
</tr>
<tr>
<td>N95 (with gap)</td>
<td>34 ± 15</td>
<td>12 ± 3</td>
</tr>
<tr>
<td>surgical mask (no gap)</td>
<td>76 ± 22</td>
<td>996 ± 0.1</td>
</tr>
<tr>
<td>surgical mask (with gap)</td>
<td>50 ± 7</td>
<td>44 ± 3</td>
</tr>
<tr>
<td>cotton quilt</td>
<td>96 ± 2</td>
<td>961 ± 0.3</td>
</tr>
<tr>
<td>quilter's cotton (80 TPI), 1 layer</td>
<td>9 ± 13</td>
<td>14 ± 1</td>
</tr>
<tr>
<td>quilter's cotton (80 TPI), 2 layers</td>
<td>38 ± 11</td>
<td>49 ± 3</td>
</tr>
<tr>
<td>flannel</td>
<td>57 ± 8</td>
<td>44 ± 2</td>
</tr>
<tr>
<td>cotton (600 TPI), 1 layer</td>
<td>79 ± 23</td>
<td>984 ± 0.2</td>
</tr>
<tr>
<td>cotton (600 TPI), 2 layers</td>
<td>82 ± 19</td>
<td>995 ± 0.1</td>
</tr>
<tr>
<td>chiffon, 1 layer</td>
<td>67 ± 16</td>
<td>73 ± 2</td>
</tr>
<tr>
<td>chiffon, 2 layers</td>
<td>83 ± 9</td>
<td>90 ± 1</td>
</tr>
<tr>
<td>natural silk, 1 layer</td>
<td>54 ± 8</td>
<td>56 ± 2</td>
</tr>
<tr>
<td>natural silk, 2 layers</td>
<td>65 ± 10</td>
<td>65 ± 2</td>
</tr>
<tr>
<td>natural silk, 4 layers</td>
<td>86 ± 5</td>
<td>88 ± 1</td>
</tr>
<tr>
<td>hybrid 1: cotton/chiffon</td>
<td>97 ± 2</td>
<td>992 ± 0.2</td>
</tr>
<tr>
<td>hybrid 2: cotton/silk (no gap)</td>
<td>94 ± 2</td>
<td>985 ± 0.2</td>
</tr>
<tr>
<td>hybrid 2: cotton/silk (gap)</td>
<td>37 ± 7</td>
<td>32 ± 3</td>
</tr>
<tr>
<td>hybrid 3: cotton/flannel</td>
<td>95 ± 2</td>
<td>98 ± 1</td>
</tr>
</tbody>
</table>

*The filtration efficiencies are the weighted averages for each size range—less than 300 nm and more than 300 nm.*
CLOTH FACE COVERINGS

Effective!

- If constructed per minimum guidance
- Worn, and worn properly

“Real-world” effectiveness examples (CDC)

- 2 symptomatically ill hairstylists – 139 clients – 15 minutes each – 67 clients consenting to interviews not infected
- Retrospective Thailand study – 1,000 persons contact traced – 70% reduced risk for mask wearers versus individuals not wearing masks
- USS Theodore Roosevelt – Close working environments – use of face coverings resulted in 70% reduced risk
DOUBLE MASKING SUMMARY

• Not necessary if you have a proper mask, but double masking optional as long as following CDC guidelines (Types of Masks)
• Wear a proper, good fitting mask with at least two layers
  – Fitter or brace may be used for a snug fit
• Reserve N95s for healthcare and required tasks based on risk/regulation
• Soon, maybe February – ASTM Standard for barrier face coverings
DOUBLE MASKING SUMMARY

Remember that we have many other prevention controls
- COVID-19 Prevention Plans
- Hand hygiene
- Physical/social distancing
- Ventilation
- Self-attestation
- Working remotely / virtual meetings
- Scheduling
- Occupant density
- Work area layout and pedestrian routing
- Risk ranking with controls and PPE
- Other alternative strategies (barriers)
Does Wearing a second mask make a difference? – Dr. Seth Cohen
NEW SARS-COV-2 VARIANTS

CDC – [New Variants of the Virus that Causes COVID-19]

Detected in United States in December-January

• UK – B.1.1.7
  – Spreads more easily and quickly (30-50% more contagious)
  – Mutation in the receptor binding domain

• South Africa – B.1.351
  – Shares some mutations with B.1.1.7

• Brazil – P.1
  – Contains additional mutations that may affect its ability to be recognized by antibodies

• Emerging Nigeria strain – CDC monitoring, but no concerning characteristics so far
NEW SARS-COV-2 VARIANTS

What is unknown

– How widely they have spread
– Differences from the original detected disease
– How they affect existing therapies, vaccines, and tests

Public health officials are studying the new variants

– Spread easier from person to person?
– Milder or more severe disease in people?
– Detected by current available viral tests?
– Respond to medicines?
– Change effectiveness of COVID-19 vaccines?
NEW SARS-COV-2 VARIANTS

More research needed about new variants

• Transmission mode outside the body versus coronavirus spike binding to cell receptor and outcomes
• New mutations do not necessarily mean spreads easier outside the body through the air, droplets or via surfaces
• No evidence to suggest a major change in prevention strategy
  – (Wash hands, Wear mask, Watch distance)
NEW SARS-COV-2 VARIANTS

Additional information:

• UW Medicine Vaccines FAQ (https://www.uwmedicine.org/coronavirus/vaccine)


• Seattle King County Public Health (Public Health Insider)
QUESTIONS / DISCUSSION

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