MH-TMC CAMPUS
COVID-19
RESOURCES

Personal Protective Equipment (PPE) Toolkit

April 6, 2020
Below is an easy reference for use of masking and face protection on inpatient units during the COVID-19 Pandemic. Adherence to these guidelines will help us maintain an adequate supply of PPE. We ask that you please help us to conserve where appropriate. If you have any questions, please escalate to unit manager.

| Surgical Face Mask | All clinical employees are required to wear a surgical face mask when providing direct patient care.  
Wear entire shift, unless worn into isolation room, wet or soiled  

All non-clinical employees are required to wear a surgical face mask when outside of their office.  
Place mask on at screening site and wear entire day unless damaged, wet or soiled |
|---|---|
| Surgical Face Mask with Eye Protection | • Pre-PUI Patients  
• PUI Patients  
• Confirmed/Positive COVID-19 Patients  
*droplet PLUS precautions  
*shoe covers are not needed |
| N95 Mask with Eye Protection and Bouffant | • Intubations on all patients regardless of COVID status  
• Pre-PUI, PUI and Confirmed Positive COVID-19 Patients with uncontrolled coughing or undergoing aerosoled/invasive airway procedures:  
  • Extubations and terminal extubations  
  • BiPAP, CPAP, Vapotherm  
  • Sputum induction  
  • Open airway suctioning  
  • Tracheal intubation  
  • Bronchoscopy  
  • Nebulizer treatments IN PROGRESS  
  • Patients with uncontrolled cough  
*droplet PLUS and airborne isolation precautions  
*Place N95 mask and Face Shield/goggles in recycle collection bin |

**Pre-PUI** - Patient with undifferentiated respiratory symptoms, not tested for COVID-19.  
**PUI** – Patient with undifferentiated respiratory symptoms being tested for COVID-19.  
**Confirmed/Positive COVID-19** – Patient who tests positive for COVID-19.
<table>
<thead>
<tr>
<th><strong>Guidelines for Disposal and Reuse of Masks and Face Protection</strong></th>
</tr>
</thead>
</table>
| **Surgical Face Mask** | **Trash** | Surgical mask should be discarded when:  
- Exiting room of PUI  
- Exiting room of Confirmed COVID-19  
- Damaged, wet, or visibly soiled |
| **N95 Mask** | **Labeled Storage Container** | - One mask per provider/per patient/per day  
- Should be stored in the provided clear plastic food storage containers in between use ([refer to PPE donning and doffing video for storage and labeling requirements](#))  
- N95 mask should immediately be placed in collection bin *(not stored in container)* if:  
  - Exiting room of confirmed COVID-19 patient  
  - Wet or visibly soiled |
| **N95 Mask** | **N95 Mask Collection Station** | - At shift end or after exiting Confirmed patient room, open labeled storage container and dump N95 respirator mask inside bin *(Mask only - do not throw personal labeled storage container into bin)*  
- Close bin lid and clean hands |
| **Safety Glasses and Face Shields** | **Shield and Goggle Collection Station** | - Between uses, clean with a disinfectant wipe and place exterior side down on a clean paper towel labeled with your name  
- At shift end or when contaminated by direct splash or spray, remove, and wipe shield/goggles with any available cleaning wipe and place wipe in trash  
- Open bin lid and deposit shield/goggles inside.  
- Close bin lid and clean hands |

If collection stations are full, call 4.7905 during normal business hours or 4.2148 after hours  
If your unit is using N95 masks, Face shields or goggles and you do not have a collection bin, call 4.7905 during normal business hours or 4.2148 after hours or email Steve.Jones@memorialhermann.org.
Sterilization and Re-use of N95 Respirators

Tuesday, March 31, 2020

As Memorial Hermann continues to take proactive steps to conserve its steady supply of PPE, our Campus is in a unique position to learn from Academic Medical Centers across the country on proven methods that support these efforts.

Numerous research studies, internal validation of fit testing and recently released FDA guidance have shown that N95 respirator masks can be sterilized and safely re-used in the healthcare setting using Bioquell Hydrogen Peroxide Vapor technology. This specialized technology is available onsite and allows Memorial Hermann-TMC to begin sterilizing and reusing its N95 respirator masks. Our campus will follow the Duke Health protocol which includes inspecting each mask before re-issuing.

Effective immediately, Memorial Hermann-TMC will be conserving all N95 respirators by asking employees and affiliated physicians to place used N95 respirator masks in the bins on their unit at the end of their shift for sterilization. This is for all N95 respirator masks, including those worn during aerosolizing and invasive airway procedures, and while treating patients with COVID-19.

Memorial Hermann-TMC remains committed to protecting our patients, employees and physicians, and we pride ourselves in having the ability to innovate and pivot when the environment around us changes. This proactive conservation initiative will help ensure availability of PPE if and when we experience a surge in the number of COVID-19 patients while keeping the health and safety of our employees and physicians top of mind.

Frequently Asked Questions about this initiative are below as well as links to the relevant research. If you have additional questions about this process or anything related to PPE, please email TMC.COVID19@memorialhermann.org.

FAQs – Sterilization and Re-use of N95 Respirators

What is the disinfecting process being used?

Specialized equipment (Bioquell Vaporiser) allows us to aerosolize hydrogen peroxide, which permeates the layers of the mask to chemically disinfect and eliminate any microbial contaminants, including viruses, without degrading the filtration efficiency of the mask. Memorial Hermann-TMC has used the Bioquell technology for 12 years to disinfect rooms, equipment and supplies. While this is the first time our campus has used the technology on N95 respirator masks, our internal validation, external research and real world adoption of this practice in various parts of the country has proven effective.

Where is the research that says this is safe and effective?

In addition to internal validation studies, the following links provide external research and evidence of efficacy of Hydrogen Peroxide Vapor sterilization on N95 respirator masks.

- Final Report for Bioquell HPV Decontamination for Reuse of N95 Respirators - https://www.fda.gov/media/136386/download
- Urgent Research Shows Face Masks Can Be Safely Reused by Pandemic Medical Workers - https://www.umass.edu/newsoffice/article/urgent-research-shows-face-masks-can-be
I've read that UV and other types of disinfecting will break down or degrade the mask. How is this process different?

Research and FDA guidance have shown that vaporized hydrogen peroxide disinfection is effective for disinfecting N95 respirator masks for multiple cycles. Our research and internal validations to date have shown that masks are safe and effective up to 15 cycles and we are actively testing efficacy for additional cycles. While differences were found between control respirators and those that have undergone decontamination for both filter aerosol penetration and filter airflow resistance, the practical significance is minimal. Most degradation appears to happen when the elastic band that secures the mask stretches as well as discoloration of the metal piece. Our reprocessing team has a strong inspection process in place to take out of circulation any mask that appears to be soiled or damaged; however, it is important to always assure a good fit and a properly functioning mask before use.

I've read that if you get the mask wet, it is outside of manufacturers’ recommendations. Is this true in this case?

While masks are coated in a hydrogen peroxide vapor, which then reduces to water, our process includes drying time. The filtration efficiency of the mask has been validated internally and externally after undergoing this process.

The CDC says I can wear a homemade mask or bandana. Is that safe?

CDC only recommends cloth masks as a last resort, when other masks are not available and that is not the case at Memorial Hermann. Cloth masks do not protect against aerosols and tend to saturate with moisture, which promotes the growth of bacteria. Cloth masks should also not be worn on the outside of N95 respirators. In order to protect yourself and the N95 mask from respiratory secretions while performing aerosolizing or invasive airway procedures, you should don a faceshield over the mask.

Is Memorial Hermann-TMC the only campus sterilizing and reusing N95 masks?

Currently, Memorial Hermann-TMC is the only system campus with the Bioquell technology to sterilize N95 respirators. We are exploring how to extend access to additional Memorial Hermann care delivery sites.

Should I label or write on my mask?

No, do not write anything on your mask. You may notice markings made during the sterilization and reprocessing. These markings indicate how many cycles the masks have undergone. This should be the only markings made on the masks.

Who can I contact if I have questions about this initiative? TMC.COVID19@memorialhermann.org

N95 Respirator Mask Etiquette

- Do not write on the N95 mask
- Do not wear makeup or perfume/cologne
- Tie long hair back, do not wear jewelry, and avoid touching/readjusting the N95 mask as much as possible
- Wear, store and recycle N95 mask as directed, taking care not to over-stretch elastic
- Always ensure proper fit and seal of N95 mask to your face
N95 Collection Need-to-Knows

Research and FDA guidance have shown that vaporized hydrogen peroxide disinfection is effective for disinfecting N95 respirator masks for multiple cycles.

Help support N95 Mask supply initiatives with these protocols:
• Do not write anything on your mask.
• Do not wear make-up or perfume/cologne.
• Avoid touching/readjusting the mask whenever possible.
• Tie back long hair and avoid wearing jewelry.
• Wear and store the mask as directed. Avoid over-stretching elastic.
• If you have not been fit-tested, do not wear a N95 mask.
• At the end of your shift, place your mask in the Collection Bin with the yellow “recycle” icon shown above.

Do not throw away your N95 mask!
EFFECTIVE IMMEDIATELY: NEW ORDER FORM AND PICK-UP LOCATION FOR N95 MASKS

Effective immediately, the attached order form should be used when ordering N95 respirator masks for your unit. The completed order form should be sent to pneumatic tube station 36. The new pick-up location for N95 masks is Robertson Pavilion first floor, suite 300 (old Blood Bank). The bag containing the used N95 masks can be brought down at the time of mask pick-up.

If you have any questions about this process, please contact 713-704-5497.

The Memorial Hermann-TMC Campus includes Children’s Memorial Hermann Hospital and Memorial Hermann Orthopedic & Spine Hospital. If you have questions, suggestions or news to share with the Campus, please email Medical Center Communications or call 713.704.5407.

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# N95 Order Form

To be completed and sent to the N95 Distribution team *(tube station 36)*

Additional orders can be placed in Care4

N95 Distribution Spectra Link: x45497

Pick-up in the Distribution Depot
R1.300 (old blood bank) on 1 Robertson behind café Hermann

Please notify if urgent need.

Add counts below only for patients that require N95 utilization per MH Guidelines.

<table>
<thead>
<tr>
<th>Patient Room Number</th>
<th>Mask Size</th>
<th>Reason Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>RT</td>
</tr>
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</table>

PUI and Confirmed Positive Co-VID Patients can use surgical mask with eye protection.

N95 required for PUI/Positive patients during aerosoled/invasive airway procedures, intubations, BiPAP, CPAP, Vapotherm, sputum induction, open airway suctioning, tracheal intubation, bronchoscopy, nebulizer treatments in progress, and patients with uncontrolled cough.

*For all other isolation patients, refer to PPE guidelines*
PPE Allocation Order and Receipt Form

1. Please review your current PPE inventory before placing your orders and only order what you need.
2. Daily PPE orders can be placed to receive allotment for isolation patients, use the form below.
3. To be completed and sent to CS (tube station 12) no later than 10:00 AM daily.

Pick-up is between 1600-1800 daily in the CS (HP basement). Please bring a cart with you to pick-up your order!

<table>
<thead>
<tr>
<th># Patients on</th>
<th>ICU</th>
<th>IMU</th>
<th>FLOOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact/Contact +:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droplet:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airborne:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUI:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If >3 isolation pts, check if buffer is needed
- Masks
- Gowns

Manager/Designee Signature: ________________________________

Tube completed form, with signature, to Central Supply (Tube 12) NO LATER THAN 10:00 AM DAILY

Bottom portion to be completed upon pickup (1600-1800)

<table>
<thead>
<tr>
<th># Kits picked up</th>
<th>ICU</th>
<th>IMU</th>
<th>FLOOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact/Contact +:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droplet:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Airborne:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>PUI:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buffer:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 2 kits/patient will be made to provide supplies for 24 hours

Name of person picking up kits: ________________________________

Signature of person picking up: ________________________________
To: Memorial Hermann-TMC Campus and Children’s Memorial Hermann Hospital Employees

From: Gregory Haralson  
Chief Executive Officer  
Memorial Hermann-TMC

Susie Distefano  
Chief Executive Officer  
Children’s Memorial Hermann Hospital

Date: March 25, 2020

Re: PPE Preservation – Emergent PPE Kit for Inpatient Units with PUIs

As you have undoubtedly heard in the news, there is a shortage of Personal Protective Equipment (PPE) nationwide; however, Memorial Hermann is working to ensure that we maintain our stable supply of PPE for our clinical workforce with conservation strategies that ensure availability when needed.

Effective immediately, inpatient units with any PUIs (Patients Under Investigation) will be given an Emergent PPE Kit to keep on hand for rapid access in acutely ill patients who require intubation (or any aerosolizing procedures). We are asking that the unit charge nurse identify a designated area for the Emergent PPE kit and share location with the Operations Administrator (OA). This should be somewhere accessible in an emergency but remain concealed. Kits should not be stored in patient rooms. Each kit is fastened with a crash cart lock that must be broken before use.

Units with at least one PUI are eligible for the kit and there is a limit to one kit per unit. The Emergent PPE kits are available from the OA. The unit charge nurse should contact the OA to coordinate delivery of kit, return kits after use or return after all PUIs have cleared from unit.

It is important to note that this does not change your daily allocation of PPE supplies. If you have any questions, please contact the Operations Administrator at 713-704-7995.
## Comparison between 3M 1860 N95 Respirators and Other Brands

<table>
<thead>
<tr>
<th>Current N-95</th>
<th>Facial Size</th>
<th>3M 1860S N95 (Small)</th>
<th>3M 1860 N95 (Regular)</th>
<th>3M Aura 1870 (*)</th>
<th>3M 8670 (*)</th>
<th>San Huei SH2950</th>
<th>Moldex 22115N95</th>
<th>San Huei SH2950</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M 1860S N95</td>
<td>X-Small</td>
<td>Moldex 1510</td>
<td>3M 8210 (*)</td>
<td>3M 8210 (*)</td>
<td>3M 8670 (*)</td>
<td>San Huei SH2950</td>
<td>Moldex 22115N95</td>
<td>San Huei SH2950</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>3M 8210 (*)</td>
<td>3M Aura 1870 (*)</td>
<td>3M 8670 (*)</td>
<td>3M 8210 (*)</td>
<td>3M 8511 (*)</td>
<td>Milwaukee TC84A-8143 (*)</td>
<td>Moldex 2217GN95</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>3M 8210 (*)</td>
<td>3M Aura 1870 (*)</td>
<td>3M 8670 (*)</td>
<td>3M 8233 (*)</td>
<td>3M 8511 (*)</td>
<td>Milwaukee TC84A-8143 (*)</td>
<td>Moldex 2217GN95</td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>3M 8233 (*)</td>
<td>3M 8511 (*)</td>
<td>3M 8670 (*)</td>
<td>3M 8233 (*)</td>
<td>3M 8511 (*)</td>
<td>Milwaukee TC84A-8143 (*)</td>
<td>Moldex 2217GN95</td>
</tr>
<tr>
<td></td>
<td>X-Large</td>
<td>Moldex 22126GN95</td>
<td></td>
<td></td>
<td></td>
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</table>

(* NOT FOR USE IN A STERILE ENVIRONMENT (OR):
3M 8233
3M 8511
Milwaukee TC84A-8143
(* COMPATIBLE WITH 3M 1860 (SMALL/REGULAR). NO FIT TEST REQUIRED

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Last Updated 3.27.2020
For Questions About Masks, email: EmployeeSafety@memorialhermann.org
Droplet **PLUS** Precautions

**EVERYONE MUST:**

- Keep door closed
- Hand hygiene
- Gown
- Gloves
- Eye Protection (face shield or goggles)
- Surgical mask

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**CAUTION!**

**AIRBORNE ISOLATION & N95 IS RECOMMENDED FOR:**

- Intubations
- BiPAP, CPAP, Vapotherm
- Sputum induction
- Open airway suctioning
- Tracheal intubation
- Bronchoscopy
- Nebulizer treatments IN PROGRESS
- Patients with uncontrolled cough

If patient condition requires any respiratory interventions or treatments move to **Airborne Isolation.**
SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. **GOWN**
   - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
   - Fasten in back of neck and waist

2. **MASK OR RESPIRATOR**
   - Secure ties or elastic bands at middle of head and neck
   - Fit flexible band to nose bridge
   - Fit snug to face and below chin
   - Fit-check respirator

3. **GOGGLES OR FACE SHIELD**
   - Place over face and eyes and adjust to fit

4. **GLOVES**
   - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene
HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)
EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES
   • Gown front and sleeves and the outside of gloves are contaminated!
   • If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
   • Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
   • While removing the gown, fold or roll the gown inside-out into a bundle
   • As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container

   PERFORM HAND HYGIENE

2. GOGGLES OR FACE SHIELD
   • Outside of goggles or face shield are contaminated!
   • If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
   • Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
   • If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

3. MASK OR RESPIRATOR
   • Front of mask/respirator is contaminated — DO NOT TOUCH!
   • If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
   • Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
   • N-95 masks can be reused during shortage or epidemic situations. Store according to hospital policy.

4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE

   OR

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE