



# **King County Fire Departments**

## **Ultraviolet Germicidal Irradiation (UVGI) – N95 Decontamination Guideline**

### **General Guidance**

1. Review CDC guidance on extended use and limited reuse of N95s or JIT retraining by UNMC. Follow CDC Guidance on reuse and extended use.
  - a. <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>
  - b. <https://www.youtube.com/watch?v=Cfw2tvjiCxM>

### **Definitions**

**Brown Paper Bag:** Bag to store contaminated N95 masks that have been used in the field and are eligible to be decontaminated in the UVGI Machine and intended to be used again. O/S brown paper bags shall only be used once. (If colored bags are unavailable, label bag “Contaminated”)

**Decontaminated:** For the purpose of this document, “decontaminated” means the object has undergone Ultraviolet Germicidal Irradiation as per protocols.

**In-Service Mask:** an N95 mask with no patient exposure or that has been through the UVGI Machine, decontaminated, and ready to be utilized again.

**New Mask:** an N95 mask that has come straight out of the manufacturer’s container.

**Used Mask:** an N95 mask that has been used in the field that has not been in potential virus transmission environment(s), has not been treated with the UVGI Machine and is available to be used again. These masks will be stored in a white, paper bag.

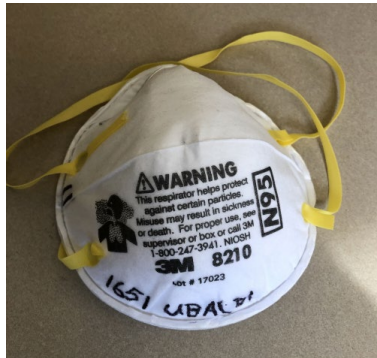
**UVGI Machine:** UVGI (Ultraviolet Germicidal Irradiation) decontamination box designed and produced for the fire service by the University of Washington Dept. of Mechanical Engineering, Chemical Engineering and Family Medicine as led by Dr. Jonathan D. Posner.

**White Paper Bag:** Bag to store new or decontaminated N95 masks ready to be used in the field. Member’s Last Name and ID number must be marked on exterior of the white paper bag in Sharpie. (If colored bags are unavailable, label bag “Decontaminated”)

## **PROCEDURES**

### **Start of Shift**

1. Member(s) obtain up to two (2) New or In-Service N95 masks.
  - a. Utilize their undeployed N95 mask(s) from previous shift.
2. If new, write last name and ID # on outside of the mask with a felt Sharpie.
  - a. Do NOT use a ballpoint pen or anything sharp that could damage the N95.
3. If re-using, inspect N95 for defects and dispose damaged or soiled N95s.
  - a. Ensure fit or mask seal not compromised.
4. Ensure supply of brown paper bags on apparatus.
  - a. Procure one brown bag per position for “used” mask(s)
  - b. Write identifying name and ID number on brown bag
    - i. Place on assigned apparatus.
5. Ensure adequate supply of new N95 masks on apparatus.



**Figure 1 – Mask Markings**

### **On Emergency Response Scene**

1. Using the Recon/Scout Model – member uses N95 mask per protocol.
2. At conclusion of use, safely doff per protocol.
  - a. “Handwash sandwich” (see fig 2)



**Figure 2: Handwash Sandwich**

3. Members will use the attached PPE Reuse flow chart to determine if N95 mask can be decontaminated. (See Figure 3)
  - a. N95 masks still ready to use placed in white paper bag.
  - b. N95 masks to be decontaminated shall be placed in brown paper bag.

- c. N95 masks to be disposed of per department policy.
- 4. N95 masks to be decontaminated in brown, paper bags shall be stored in ventilated, plastic bin.
- 5. Additional New N95 mask(s) put into service for members as needed.
- 6. If N95 mask is not utilized or no potential patient contact for duration of shift, safely/properly store in preparation for next shift/use.
  - a. Follow Doffing procedures
    - i. Hand hygiene
    - ii. Do not compress mask
    - iii. Do not touch inside of mask
    - iv. Hand hygiene (See figure 2)
  - b. Place N95 into "In-Service" paper bag and stow in designated area in station.

### **UVGI Machine Procedures (Back at the Station)**

**Masks with an exhalation valve or Surgical/Procedure masks are NOT to be decontaminated in UVGI machine.**

Designated, trained member(s) perform UVGI decon on used N95 masks.

1. Don Level 2 PPE (Level 2 = N95 mask, gloves, eye protection. Long Sleeves recommended)
2. Dispose of N95 Masks in a red biohazard bag or trash if:
  - a. Masks with visible soiling (fluids, stains etc.) shall be disposed of, -OR-
  - b. Masks with any damage (including strap stretching) shall be disposed of, -OR-
  - c. Masks used in the presence of an aerosol-generating procedure. (Intubation, CPAP, etc.)
  - d. Masks that have had five (5) uses (four hashmarks visible).
3. Follow manufacturer's instructions on operation of UVGI Machine (*See Appendix A*)
  1. Open UVGI Machine, pull out shelf.
  2. Set used N95 masks on shelf with minimum of one inch between masks.
    - a. Separate straps from mask as much as possible.
  3. Slide shelf in and secure door.
  4. Ensure UVGI Machine is clear of debris and not in direct contact with anything.
  5. Set and start timer on top of machine.
  6. Ensure Machine light can be seen from all inspection holes.
  7. UVGI Machine on for 30 minutes, until automated timer completes.
  8. Open UVGI Machine and retrieve decontaminated N95 masks.
    - a. Place a hash mark on exterior portion of the mask, between the straps, indicating it has been through the UVGI Machine.
    - b. Mark name and/or ID number from mask onto white paper bag.
    - c. Place decontaminated N95 in corresponding white, paper bag.
  9. Place completed bags in designated area of station.

10. **DO NOT CONTACT THE BULBS—THEY ARE FRAGILE.** (See Appendix B)
  - a. As per manufacturer's instruction, bulbs need to be carefully cleaned periodically to minimize dust attracted by electrostatic charge.
11. Decontaminate exterior of the UVGI Machine with department/manufacturer's approved disinfectant.
12. UVGI Machine Operator doff PPE and wash hands.

### **End of Shift**

1. Member stores in-service and new mask(s) in white paper bag(s) with other PPE for storage until next shift.



*Figure 4 – UVGI Machine in use*

### **Summary**

- UVGI cleaning can be completed up to 4 times per mask. (Masks up to 5 uses)
- Damaged, heavily soiled or seal compromised masks shall be disposed of.
- Masks worn at high risk aerosol-generating calls shall be disposed of.
- Do not wear a mask worn by another member.
- Follow step-by-step process shown in Flowchart (**see figure 3**)

***Appendix A: UW/EIH UVC N95 Decontamination Box User Manual V0.2***

***Appendix B: Manual on maintenance of UVGI Machine, including cleaning and replacement of bulbs.***



## UVGI Machine Decontamination of N95 Masks

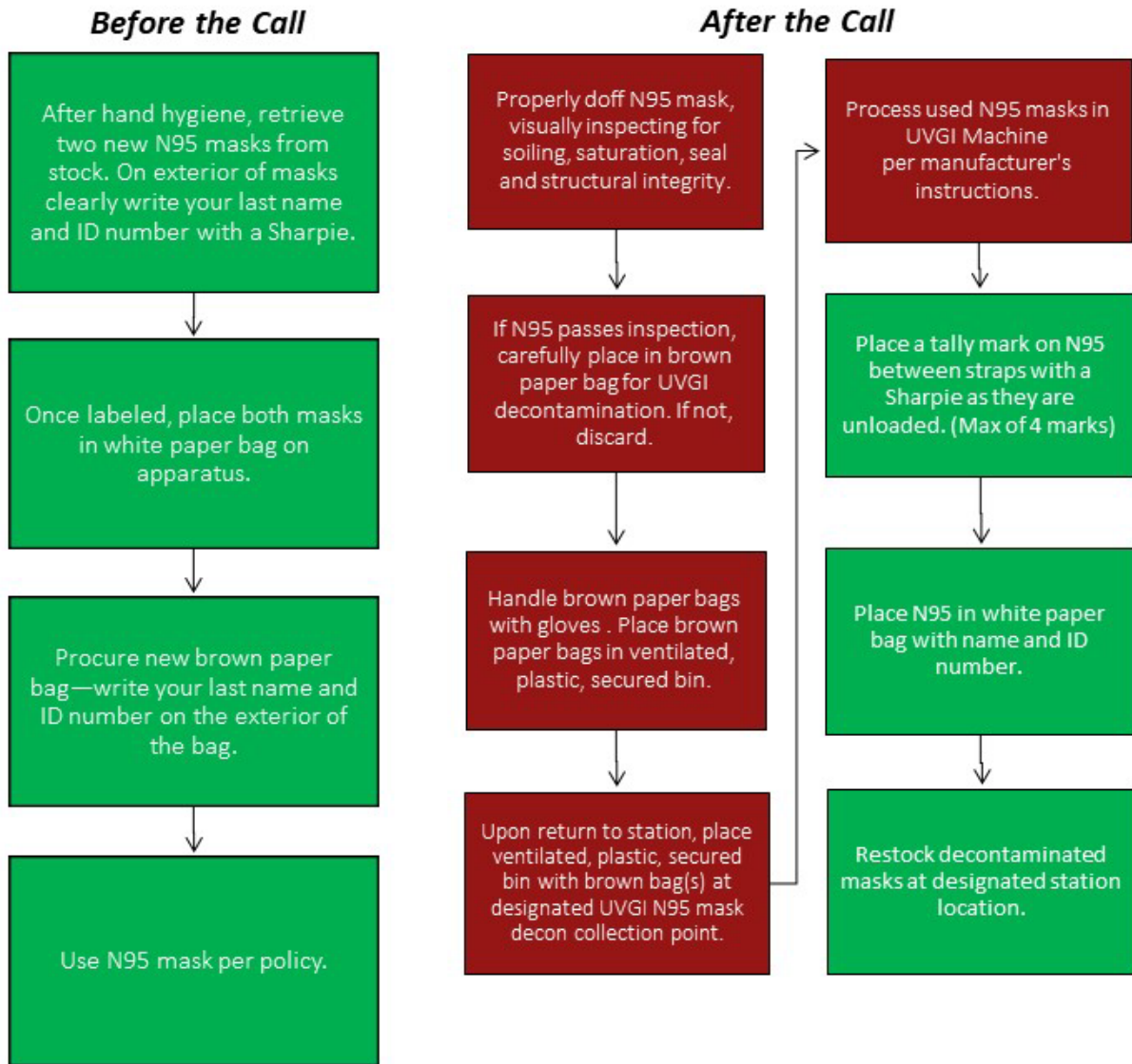


Figure 3: Flow Chart