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| <p><b>Document #:</b><br/><br/>CO-8</p> |  <p><b>Standard Operating Procedure (SOP)</b></p> | <p>Status: FINAL<br/>Revised: Nov 25, 2020<br/>Owner: Shared Health</p> |
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| <p><b>Reprocessing Half Respirators due to COVID-19 using Medical Device Reprocessing (MDR) and UV Disinfection System</b></p> | <p>Page 1 of 7</p> |
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| <p><b>Purpose</b></p>    | <p>To collect and decontaminate <b>half face respirators</b> with P95/P100 fabric filters.</p>   |
| <p><b>Background</b></p> | <p>A semi-critical device is a piece of medical equipment/device that contacts non-intact skin or mucous membranes but does not penetrate them. Generally, respiratory devices are considered semi-critical.</p> <p><math>A_0</math> is a theoretical measurement of microbiological lethality delivered by a moist heat disinfection process, expressed in terms of the equivalent time in seconds and temperature.</p> <p>Disinfection is the inactivation of disease-producing microorganism apart from bacterial spores. Hospital-grade disinfectants are used on inanimate objects and require a drug identification number (DIN) for sale in Canada. An <math>A_0</math> value of 600 is a sufficient level of disinfection for semi-critical devices according to CAN/CSA-Z314-18.</p> <p><i>Note: Filters may be reprocessed until they are no longer functional (e.g. clogged), as determined by the wearer (e.g., difficulty breathing).</i></p> <p>Devices emitting UV light are no-touch, automated disinfection systems that are used to kill pathogens associated with infectious disease and infections. These devices work primarily through the use of lamps that produce high-intensity ultraviolet C (UV-C) light, a form of electromagnetic radiation (UV-C wavelengths of 100-280 nm on the electromagnetic spectrum). UV-C is germicidal; it destroys the DNA of bacteria, viruses, and other microorganisms, preventing them from multiplying, repairing the damaged DNA, and causing infections and diseases. Several makes of UV-C disinfection towers exist.</p> |

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| <b>Supplies</b>                  | <ul style="list-style-type: none"> <li>– PPE (including level IV gown, nitrile/standard gloves, standard mask, eye protection)</li> <li>– UV lights meeting description above (See Background)</li> <li>– Dosimeters to measure UV light intensity</li> <li>– Washer/disinfector</li> <li>– Detergent</li> <li>– Clean and soiled bins</li> <li>– Dedicated space for UV disinfection</li> <li>– Nylon clothesline</li> <li>– Clips (as small as possible to avoid impeding UV light)</li> <li>– Extra respirator valves, gaskets, filters, and harnesses depending on respirator make and model</li> </ul> |
| <b>Types of Half Respirators</b> | <ul style="list-style-type: none"> <li>– Applies to all half face respirators with fabric filters</li> <li>– Does not apply to half respirators used in Pharmaceutical or cytotoxic preparations</li> <li>– Does not apply to made in Manitoba silicone respirators</li> </ul>  |

| Step | Collecting Half Respirators   |
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| 1    | Ensure collection bins are labeled as ‘SOILED Half Respirators’.  |
| 2    | Disinfect collection bin and lid and place in the designated location in each unit. The designated location <b>cannot</b> be in a patient’s room.   |
| 3    | Wearer to put used half respirator (with filters intact) into the designated bins. Do not mix half respirators with any other PPE being collected.  |
| 4    | Once collection bins are 2/3 full, immediately move to the designated ‘dirty’ area in your facility following site processes. Do not allow soiled items to come close to your body without wearing appropriate PPE. |
| 5    | Secure all used half respirators in a locked location.  |

| Step | Disassemble Respirators in Designated Area (Use Soiled One Way Workflow Where Possible)  |
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| 1    | Wear correct PPE as required for all item decontamination (level IV gown, nitrile gloves, standard mask, eye protection) when handling respirators for disinfection.   |
| 2    | In a designated dirty area, preferably MDR Decontamination, sort bins containing used half respirators.  |
| 3    | <p>Disassemble respirators; separating the respirator and filters into two streams. Do not disassemble any other straps, snaps or valves (if present).</p> <p>During disassembly, inspect each section for damage. Place damaged items into a separate bin for reprocessing. Damaged respirators may be used for spare parts.</p> <ul style="list-style-type: none"> <li>– Stream 1 Respirator – <b>respirator portion</b> to be reprocessed by MDR             <ul style="list-style-type: none"> <li>○ If respirators are not in MDR, place respirators into bin for transport to MDR</li> <li>○ Once the bin is full, place a lid on the bin</li> <li>○ Wipe down the outside of the bin with disinfecting wipes</li> </ul> </li> </ul> |

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- Transport bins to designated MDR processing area
- Stream 2 Filters – **filter portion** of respirator to be reprocessed by UV Light
  - Placed filters into bin for transport to UV light disinfection area
  - Once the bin is full, place a lid on the bin
  - Wipe down the outside of the bin with disinfecting wipes
  - Transport bins to designated UV processing area

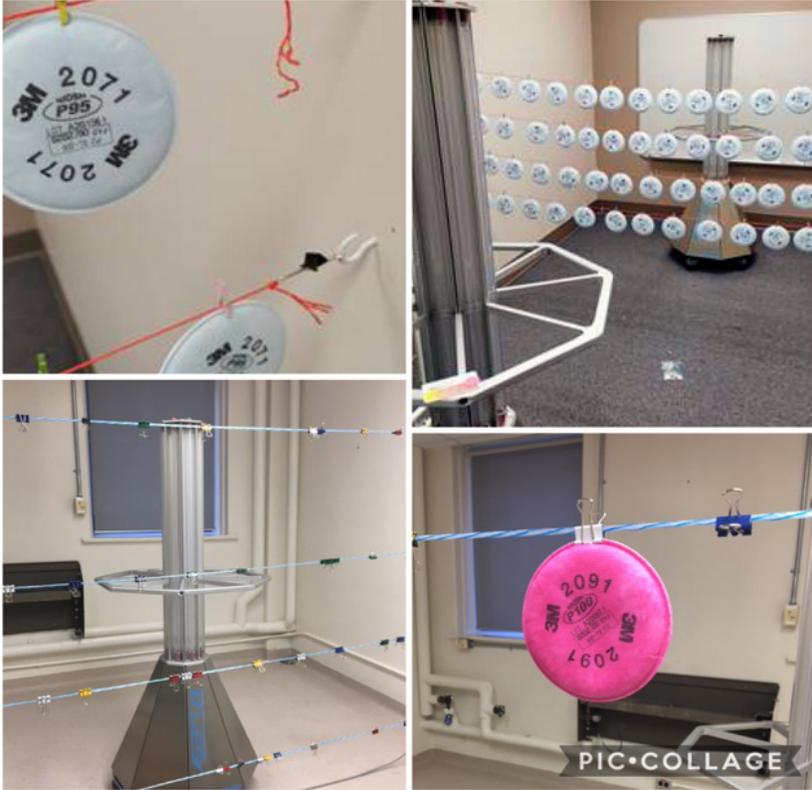
| Step | Stream 1 – Reprocessing of Respirator in MDR   |
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| 1    | Wear correct PPE when handling respirators for disinfection. See Step 1, Disassemble Respirators in Designated Area.   |
| 2    | Immerse entire respirator in a prepared cleaning solution. Detergents should have a neutral PH. Detergents that remove grease work well (e.g., Getinge Manual High Foam Detergent product #872).   |
| 3    | Using a low lint wipe or soft-bristled brush, remove all gross visible soil. Skin secretions, makeup, lotion and petroleum jelly are commonly found on the respirators. Pay attention to the lip of the respirator, including the underside.   |
| 4    | Rinse the respirator thoroughly using potable water  |
| 5    | <p>Place respirator in stainless steel baskets. Place <u>inside of respirator facing down</u> so most of the water drains. During this process, the lip or flange around the inside (cupped) will hold some water. Use a screen or a second pan to hold respirators in place and prevent the harness from becoming tangled in the spray arm.</p> <div style="display: flex; justify-content: space-around;">   </div> |
| 6    | Place loaded stainless steel baskets into the washer/disinfector. Wash respirators using a parameter set that achieves A <sub>600</sub> disinfection (i.e., Respiratory or Anaesthesia cycle – some respirators may tolerate a 90°C disinfection phase).   |

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| <p>7</p> | <p>Perform hand hygiene. Wearing clean PPE (mask, gloves) upon completion of washing, empty any residual pooled water from the masks.<br/>Move the baskets to the clean drying area. Use a pass-through dryer if available. Using forced air if available and required for additional drying.<br/>Flip respirators around so <u>inside is facing up</u> allowing water that may have previously pooled around the lip on the inside to go to the nose area of the respirator. Allow respirator to dry completely.<br/>If using a dryer, operate according to the dryer manufacturer’s instructions.</p> |  |
| <p>8</p> | <p>Take care to ensure the mask is thoroughly dry before proceeding to step 9.</p>  |   |
| <p>9</p> | <p>Wearing clean PPE disinfected masks are placed in the reassembly area utilizing aseptic process. This area should ideally be located in the MDR department in a dedicated clean reprocessing space.</p>  |   |

| Step     | Stream 2 – Filter Disinfection in UV Processing   |
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| <p>1</p> | <p>Move bins with used filters to designated area in UV light room.</p>   |
| <p>2</p> | <p>Wear correct PPE (see Step 1, Disassemble Respirators in Designated Area) when handling filters for disinfection.</p>  |
| <p>3</p> | <p>Remove filters from bins and hang on clothesline with clips inside the UV light room. Ensure filters do not overlap (there should be a space of at least 1 cm on either side of the filter).</p> |

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| <p>4</p> | <p>Attach one UVC dosimeter to the top line facing the primary UV light and one to the bottom line facing the secondary UV light</p>   |
| <p>5</p> | <p>Before starting the disinfection process, be sure the room is vacant of people</p> <ul style="list-style-type: none"> <li>– Nobody can be in the room during the UV disinfection process.</li> <li>– UV disinfection systems are often equipped with infrared motion detectors. If someone enters the room during a disinfection cycle, the system will automatically turn OFF. This interrupted cycle may be displayed as an error code.</li> </ul> |
| <p>7</p> | <p>Start disinfection cycle on the equipment</p> <ul style="list-style-type: none"> <li>– Total irradiation must be over 100mJ/cm<sup>2</sup>. This is established using UVC dosimeters</li> <li>– Refer to equipment user manuals for complete operating instructions</li> <li>– Some systems may operate in a room with windows</li> </ul>  |
| <p>8</p> | <p>Doff PPE. Perform hand hygiene and don clean gloves to return dirty bins for cleaning and disinfection. Doff gloves and perform hand hygiene. Wait outside the room for UV disinfection cycle to complete.</p>   |

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| 9  | At completion of the UV disinfection cycle: <ul style="list-style-type: none"> <li>– Don clean gloves and mask</li> <li>– Check UVC dosimeter sticker on clothesline (from step 2) against reference chart to verify colour on sticker shows a total exposure on 100mJ/cm<sup>2</sup>. Stickers will change from yellow to dark pink depending on the amount of UV exposure             <ul style="list-style-type: none"> <li>○ If dosimeter sticker shows and exposure less than 100mJ/cm<sup>2</sup> <ul style="list-style-type: none"> <li>• Return to step 7 and repeat the disinfection process</li> </ul> </li> <li>○ If dosimeter sticker shows and exposure greater than 100mJ/cm<sup>2</sup> (dark pink)               <ul style="list-style-type: none"> <li>• Disinfection process is complete, proceed to next step</li> </ul> </li> </ul> </li> <li>– Document results</li> </ul> |
| 10 | Remove filters from clothesline and place into a clean bin.   |
| 11 | Transport clean bin to reassembly room using one-way flow if possible.  |

| Step | Reassembly of Half Respirators  |
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| 1    | Wear correct PPE (gloves, mask) when handling clean respirators/filters for reassembly.   |
| 2    | Inspect the respirator for damage, wear and missing parts based on the model. If present, confirm <ul style="list-style-type: none"> <li>– All straps, buckles and fasteners are present and in good working order</li> <li>– Inhalation and exhalation valves and gaskets are present and intact. There should be no rips, tears, gouges or bunching of these parts</li> <li>– If the respirator can be disassembled into multiple pieces, confirm all parts are present and secured appropriately</li> </ul>  |
| 3    | Pick one same model respirator and two matching filters from the clean bins.<br>Confirm in-service day of filter (date located on filter) or if a new filter is used, record date with a fine tipped black permanent marker. <ul style="list-style-type: none"> <li>– If filter has been in use for more than 6 months             <ul style="list-style-type: none"> <li>○ Set filter aside in a clean bin for storage and further consideration for use if PPE shortages continue</li> <li>○ Open new filter and record current date on back side of new filter with a thin tipped black permanent marker</li> </ul> </li> <li>– If filter has been in-service for less than 6 months, proceed to step 4</li> </ul> |
| 4    | Reassemble respirator and filters according to site processes. If filters are reapplied prior to distribution, make sure they are attached firmly and will not fall off when shaken or bumped.<br>Consider establishing a quality assurance program or a 2 person check for additional safety.  |
| 5    | Place reassembled respirator into clear sealable bag (e.g., Ziploc bag).  |

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| <p>6</p> | <p>Seal the bag and label the size. Use additional markings per site process. Such markings may include but are not limited to</p> <ul style="list-style-type: none"> <li>- Indication this product has been disinfected</li> <li>- Initials of the person who assembled the respirator</li> <li>- Date of reprocessing</li> </ul> |
| <p>7</p> | <p>Place reprocessed respirators in designated secure storage area.</p>  |