

AHS PPE Taskforce Guidance

Topic: Chemical / Biological / Radiological / Nuclear (CBRN) Program
Breathe Easy Powered Air Purifying Respirator (PAPR) Units
Date: April 11, 2020

Protection of our staff, physicians and volunteers from exposure to COVID-19 at work is the #1 priority of AHS. The Point of Care Risk Assessment (PCRA) is a fundamental component of every single patient interaction. On the basis of this PCRA, we support the decisions of our frontline staff and physicians to choose Personal Protective Equipment (PPE) appropriate to the risk and planned healthcare interventions. Droplet and Contact precautions are recommended for most interactions with individuals confirmed or potentially infected with COVID-19.

Decision: PAPRs and CAPRs will not be deployed as PPE for the COVID-19 response.

Background to the use of PAPRs

The [CBRN program](#) within AHS is designed as a First Receiver's Program targeting frontline ED/UCC staff. The program is utilized when a patient arrives with a suspected or known CBRN/Hazmat exposure. The CBRN program provides a methodical all hazards approach to continuity of care with regards to the decontamination of patients arriving at ED/UCC, ensuring the safety of staff and patients, and allowing for business continuity for healthcare facilities in the event of a CBRN / HazMat incident. Once the patient has gone through the decontamination process the patient is moved into a treatment area and staff don PPE that is selected based on routine clinical practice.

This document was prepared at the request of the AHS PPE Task Force. The Task Force was asked to explore the CBRN Program PAPRs for use during the COVID-19 response due to requests from ZEOCs, Physicians and AHS Unions. The Emergency/Disaster Management program manages the CBRN Program and uses the [Breathe Easy](#) PAPR system and Tyvek hood and suit. Some [CAPR](#) systems are in use by a select few ICU physicians due to religious beliefs or the inability to pass a fit test for an N95 mask. The CAPR system is comparable in respiratory protection but not comparable in functionality. The CAPR is specifically designed for a clinical environment, allowing for patient assessment and long duration of use. In contrast, the PAPR system used by the CBRN Program is designed for short durations specific to situations where patients require decontamination and there is high risk of secondary exposure to the health care worker.

The CBRN Program equipment is readily available in small quantities at all AHS and Covenant Health facilities that have an ED/UCC. The information in this summary is intended to help the PPE Task Force make an informed decision about the use of the CBRN Program equipment --

specifically the use of PAPRs -- during the pandemic response. Additional information is available if required.

Training

CBRN Training Program is divided into two components; an online theory and a hands on practical training session. The training takes a total of 5.5-6 hours to complete.

- The CBRN/HazMat for First Receivers training program is targeted to emergency department and urgent care staff. Very few AHS staff outside of ED/UCC are trained in CBRN/HazMat donning/doffing and response procedures.
- The practical (donning/doffing and site-specific response) of the training takes 4 hours.
- Since program inception in 2012, there has been limited training completion among two key groups (information among other programs is available at request):
 - 20 physicians province-wide have participated in the online pre-requisite training. 10 of these physicians have completed the practical donning/doffing training.
 - 15 AHS respiratory therapists province-wide have participated in the online pre-requisite training. 6 have completed the practical donning/doffing training.

There is the potential to look into the creation of a just in time training component for the practical session around donning and doffing of the PPE if required. This has not been done previously in the program but could potentially meet the needs of this response. The content that was developed for the CBRN Refresher Course could be used to develop this if needed. Training of additional trainers may be required, or the reorganization of the ZEOCs and ECC to free up current trainers as the Emergency/Disaster Management staff are currently tasked to other roles during this response.

Operational Considerations

The PAPR's filter system is capable of protecting staff against [bacteria and viruses](#) like COVID-19, but may not be the most appropriate type of PPE for a clinical environment. Things to consider when looking to use the PAPR unit for clinical setting are:

- Staff do not need to be fit tested to use this product like they do with an N95 respirator.
- The PPE could work for individuals that are unable to wear/fit an N95.
- The PPE would protect staff during aerosol generating procedures.
- The requests that have come forward for this product are primarily ICU staff who have not received this training previously, as the target audience was ED/UCC staff.
- This PPE is different from the standard level required for ILI precautions, including AGMPs.
- This PPE is not routine, and there is significant training required for staff to safely use as described above under training.
- This PAPR is specifically designed to be used for short term protection during the process of patient decontamination, and this is why the suits and hoods are made from Tyvek.
- The maximum duration this PPE is designed to be worn is 90 minutes per use.
- This PPE takes significant staff resources to safely don and doff. A minimum requirement would be a staff health nurse to monitor the staff's condition while wearing PPE and two people to assist with donning/doffing process.

- A [Staff Health Check](#) is required to be completed before staff don the PPE; staff with health conditions, claustrophobia, pregnancy etc. would be excluded from wearing this type of PPE.
- Patient medical assessments and interventions may be difficult due to limited mobility, impaired hearing, and reduced visibility, as well as potential heat stress of the staff while wearing this type of PPE.

Logistical Considerations

Important logistical considerations need to be considered for the use of the CBRN PAPR system during the COVID-19 response.

- Currently the PPE is disposed of after single use due to the CBRN exposure, so no cleaning procedures are in place. 3M has some general [guidance](#) on cleaning available. This would be applicable to the breathing hose and blower unit only as the hoods, gloves, filters, and suits are single use disposable items.
- AHS could look into purchasing [covers](#) for the breathing hose and PAPR blower to keep the system clean and aid in the ability for blower unit and hose to be used reused. The availability or timeline for procuring this product are unknown, as these have not been ordered before.
- There have been some research and studies that suggest that the filters could be decontaminated and reused but [CDC and NIOSH](#) does not endorse/recommend this practice.
- The Breath Easy PAPR system and hoods used by the CBRN program have been discontinued from 3M production. Right before this incident, a trial of an interim solution that did not involve replacing the PAPR unit had just been completed. However, the new product is not yet in stock.
- Replacement parts typically take between 6-9 months to receive from 3M and Ackland's. AHS may experience procurement issues from 3M following the US announcement of the [Defense Production Act](#).
- Only small amounts of product are kept in stock, as they are only used for CBRN incidents in which AHS acts as a First Receiver. These occur infrequently.
- The current process when stock is used from the CBRN/Hazmat carts at the ED/UCC facilities is that Emergency/Disaster Management staff in the zone are contacted and they would drive to the facility and replace components.
- CBRN carts are located at all of AHS and Covenant ED/UCC facilities. These carts contain between 8 PAPR sets at rural sites and 12 sets at urban sites.
- Covenant Health maintains their own carts now but they were provided by AHS so we know they are the same products and availability for the sites
- There is no additional stock located at these facilities to replace items that are used.
- Stock is located in Edmonton and Calgary Warehouses but managed by Emergency/Disaster Management staff not CPSM.
- Small amounts of additional stock are also located in the other zones.
- CBRN/Hazmat incidents and supplies were not part of the stock pile or pandemic planning.
- There currently is no separate operational budget for this program.

AHS-only PAPR Stock

The main items on hand for the program (April 2020):

- 100 PAPR blower units
- 100 Breathing Hoses
- 142 Old Style Hoods Regular
- 705 Old Style Hood Large
- 360 Filters = this is enough for 120 (PAPR takes 3 filters)
- 47 Batteries (each battery is good for 12 hours of use)
- 10 New Hoods and Breathing Hoses
- 550 Tyvek suits (L, XL, 3XL) – may not need as able to use other type of gowns instead for this application.

There are PAPR units located in CBRN/Hazmat carts located at all of AHS ED/UCC Facilities as well as four spare carts at AHS warehouses.

- 90 Rural sites (8 PAPRs per cart) = 720 PAPR sets (this includes all pieces needed to get dressed)
- 16 Urban sites (12 PAPRs per cart) = 192 PAPR sets (this includes all pieces needed to get dressed)

Cost of PAPRs

The cost of these PAPRs are significantly higher than that of the traditional N95 respirators but many of the components could potentially be reused if proper cleaning procedures are developed based on manufacture and IPC recommendations.

- \$980.0 PAPR Blower unit
 - \$380.00 PAPR battery
 - \$395.00 PAPR filters x3 = \$1,185.00
 - \$25.00 Hood
 - \$40.00 Breathing hose
- Cost per use would be \$1,820.00 per single use, assuming regular stockpile gloves and gowns.
 - If PAPR blower units, batteries, and hoses could be cleaned, the price would be \$420.00 per use.
 - Some studies include re-use of filters, although not recommended by CDC. This practice would decrease the cost to \$25.00 per use.

Summary and Recommendation

Based on a review and discussion of the above information, the PPE Task Force concluded that the use of PAPRs and CAPRs as regular PPE for COVID-19 are not recommended.

The reasons include:

1. Inappropriate protection for the clinical presentation of COVID-19, which requires contact and droplet precautions and an N95 respirator for AGMPs.

2. Difficulty maintaining appropriate infection / prevention / control standards with more than a single use.
3. Lack of functionality for routine clinical interactions.
4. Significant training required for competent use.
5. Significant logistical issues related to limited access and supply.
6. Significant cost for practical application.

Note that these devices may be appropriate in situations related to a medical or religious accommodation.

Conclusion: PAPRs and CAPRs will not be deployed as PPE for the COVID response.

Source information:

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