DISINFECTANT UPDATE
& BEST PRACTICES FOR PRESERVING PPE
UPDATES FROM THE FRONT LINES: WASHINGTON, DC & SPAIN
MAY 6, 2020
### Webinar Series Partners

<table>
<thead>
<tr>
<th>Organization</th>
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<tbody>
<tr>
<td>American Academy of Clinical Toxicology (AACT)</td>
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<tr>
<td>American Academy of Emergency Medicine (AAEM)</td>
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<tr>
<td>American Association of Poison Control Centers (AAPCC)</td>
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<td>American College of Medical Toxicology (ACMT)</td>
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<td>Asia Pacific Association of Medical Toxicologists (APAMT)</td>
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<td>European Association of Poison Centers and Clinical Toxicologists (EAPCCT)</td>
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<tr>
<td>Middle East &amp; North Africa Clinical Toxicology Association (MENATOX)</td>
</tr>
</tbody>
</table>
ON-DEMAND RESOURCES

All webinars are recorded and posted to the ACMT website

www.acmt.net/covid19web

Questions?
Write to: info@acmt.net
Q&A

Will be at end of Webinar

Please type your questions into the Q&A or the Chat function during the webinar
NONE OF OUR SPEAKERS HAVE ANY CONFLICTS OF INTEREST TO DISCLOSE
MODERATORS

Paul M. Wax, MD FACMT, Executive Director, American College of Medical Toxicology (ACMT)
Ziad Kazzi, MD, FACMT, Board Member, American College of Medical Toxicology (ACMT); President, Middle East & North Africa Clinical Toxicology Association (MENATOX)
Diane P. Calello, MD FACMT FAACT FAAP, Board Member, American College of Medical Toxicology (ACMT); Medical and Executive Director, New Jersey Poison Information and Education System (NJPIES)
DISINFECTANT UPDATE

MEDICAL AND PUBLIC HEALTH CONSIDERATIONS OF COVID-19
### Antiseptics

A chemical that is applied to living tissue to kill or inhibit microorganisms.

- Soap & water
- Ethanol (alcohol)
- Isopropanol (rubbing alcohol)
- Chlorhexidine
- Iodophors

### Disinfectants

A chemical that is applied to inanimate objects to kill microorganisms.

- Sodium Hypochlorite (bleach)
- Hydrogen Peroxide
- Formaldehyde
- Quaternary ammonium compounds
- Phenol

DISINFECTANTS FOR USE AGAINST SARS-COV-2

- 1,2-Hexanediol
- Chlorine dioxide
- Citric acid
- Dodecylbenzenesulfonic acid; Lactic acid
- Ethanol
- Glycolic acid
- Hydrochloric acid
- Hydrogen peroxide
- Hypochlorous acid
- Isopropanol
- Lactic acid
- Octanoic acid
- Peroxyacetic acid
- Phenolic
- Potassium peroxymonosulfate
- Quarternary ammonium
- Silver ion; Citric acid
- Sodium chlorite
- Sodium dichloro-S-triazinetrione
- Sodium dichloroisocyanurate
- Sodium hypochlorite
- Thymol
- Triethylene glycol

- Demonstrate efficacy (e.g. effectiveness) against a harder-to-kill virus; or
- Demonstrate efficacy against another type of human coronavirus similar to SARS-CoV-2.

https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2
SODIUM HYPOCHLORITE

- Sodium salt of hypochlorous acid
- Pale greenish-yellow
- Known as liquid bleach or simply bleach
- Sodium hydroxide is usually added in small amounts
- Waste water treatment plants use 15% solution
Developed in 1916, during World War I as topical antiseptic for wound treatment
Sodium Hypochlorite 0.4-0.5%, often mixed with boric acid as a buffering agent
Decrease use after the advent of modern antibiotics
Randomized Comparison of Hypochlorous Acid With 5% Sulfamylon Solution as Topical Therapy Following Skin Grafting

Kevin N. Foster, MD, MBA, FACS, K. J. Richey, BSN, RN, J. S. Champagne, MA, RN, and M. R. Matthews, MD, FACS
The Arizona Burn Center at Maricopa Integrated Health System Phoenix.

Correspondence: kevin_foster@dmgaz.org
Keywords: hypochlorous acid, Sulfamylon, skin graft, healing, pain

Objective: Infections are a serious complication of thermal injury. Excision and grafting have led to a decrease in incidence, but to ensure successful skin grafting, antimicrobial irrigants are frequently utilized to prevent infection. A safe, efficacious, and cost-effective irrigant capable of preventing infections would be a valuable adjunctive therapy. The objectives of this study were to determine whether the test article was noninferior to current therapy in controlling infection and reducing postoperative pain in patients with skin graft. Methods: Patients with burns requiring skin grafting were randomized to hypochlorous acid or 5% Sulfamylon solution as topical dressings postoperatively. Inclusion criteria included thermal injury 20% or more total body surface area requiring

Vashe® Wound Therapy Solution

Aqueous solution:

Vashe® Wound Therapy Solution
(Produced from central manufacturing, packaging, and distribution from PuriCore in Malvern, PA) to the following product specifications:

- Upper specification expanded Available Free Chlorine (AFC) at 150 to 330 ppm
- Lower specification expanded pH at 3.5 to 6.75ppm

Approximate percentages:
Water 99.574%
Sodium Chloride (0.4%)
Hypochlorous Acid (0.025%)
Sodium Chlorate (0.001%)
SODIUM HYPOCHLORITE
Parozone Bleach contains amongst other ingredients:

<table>
<thead>
<tr>
<th>Range</th>
<th>Ingredients</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5%</td>
<td>Sodium Hypochlorite</td>
<td>Bleaching &amp; stain removal</td>
</tr>
<tr>
<td>&lt; 5%</td>
<td>Anionic Detergents</td>
<td>Cleaning</td>
</tr>
<tr>
<td>&lt; 5%</td>
<td>Limescale Detergent</td>
<td>Prevents limescale</td>
</tr>
</tbody>
</table>

**WORK SURFACES & CHOPPING**

1. Dilute 100ml per 5 litres of water. Wash then rinse.
2. BASINS & SINKS: Use 60ml per 5 litres of water.
3. FLOORS: Use 10ml per 5 litres of water.

**WARNING:** DO NOT USE WITH OTHER PRODUCTS. MAY RELEASE DANGEROUS GASES (CHLORINE).

- Irritating to eyes and skin.
- Avoid contact with skin and eyes.

If you have any queries, comments or suggestions on this product or any other Jeyes product, please write to: Consumer Relations, Jeyes Limited, Thetford, IP24 1HF.
NEVER MEANT FOR INGESTION OR INJECTION

- Toxicity - mainly a result of its irritant effects

- Ingestion may cause esophageal and gastric mucosal burns with subsequent stricture formation

- Systemic toxicity
- Minor irritation to permanent eye damage
BLEACH INGESTION

Bleach Ingestion
From the files of Z. Kazzi
CAUSTIC INGESTION

Potassium Hydroxide Ingestion From the files of P. Wax
Acute Kidney Injury Due to Intravenous Bleach Injection

Ashish Verma · Vijay K. Vanguri · Venkata Golla ·
Sean Rhyee · Matthew Trainor · Konstantin Abramov

Fig. 1 a Hemoglobin and creatinine trends. The serum creatinine and hemoglobin values are plotted over time. Self-administration of intravenous bleach through the tunneled catheter occurred on day 0. Values from day −1 were obtained from a routine follow-up visit with the pediatrician. Black arrows indicate days that hemodialysis was performed. b Patient’s black urine on the day of admission, within hours of bleach injection. c Kidney biopsy (×400) 4 days after self-administration of intravenous bleach. The kidney biopsy revealed diffuse tubular necrosis and large numbers of intratubular fragmented erythrocytes. No necrosis was seen outside of the tubules in the renal cortex or medulla.
REACtIONS WITH SODIUM HYPOCHLORITE

2NaOCl + H₂O → Na₂CO₃ + 2HCl (a)
2HCl → 2HCl + O₂

NaOCl + NH₃ → NaOH + NH₂Cl (b)
NH₂Cl + H₂O → NaOCl + NH₃

NaOCl + HCl + H₂O → 2NaOH + Cl₂ (c)
Cl₂ + H₂O → 2HCl + 1/2O₂

Figure 1. Chemical reactions of sodium hypochlorite with water (a), an amine, producing chloramine (b) and an acid, such as hydrochloric acid, producing chlorine gas (c).

- Chloramine
- Chlorine
- Hydrochloric Acid

DANGEROUS MIXTURE

\[ \text{HOCl} + \text{HCl} \leftrightarrow \text{Cl}_2 \text{ (gas)} + \text{H}_2\text{O} \]
CHLORINE
1ST CHEMICAL WARFARE AGENT WWI

Battle of Loos, Sept 1915

Chlorine Gas Respirators
HYDROGEN PEROXIDE

- An oxidizing agent
- Dilute hydrogen peroxide, with a concentration of 3–9% by weight (usually 3%), sold for home use;
- Commercial-strength hydrogen peroxide is most commonly found as a 27.5–70% solution

Investigating Decontamination and Reuse of Respirators in Public Health Emergencies

- Toxic by various routes
  - NOT meant for ingestion or injection
- Local tissue injury and gas formation
- Supportive care, endoscopy, hyperbaric oxygen therapy
### National Poison Data System (NPDS) Bulletin
#### COVID-19 (Bleach)

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>3,070</td>
<td>3,274</td>
</tr>
<tr>
<td>Feb.</td>
<td>2,924</td>
<td>2,960</td>
</tr>
<tr>
<td>Mar.</td>
<td>3,184</td>
<td>5,067</td>
</tr>
<tr>
<td>Apr.</td>
<td>3,241</td>
<td>5,733</td>
</tr>
<tr>
<td>May</td>
<td>358</td>
<td>469</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12,777</td>
<td>17,503</td>
</tr>
</tbody>
</table>

Results: According to data retrieved from the National Poison Data System (NPDS), there were 17,503 Bleach exposure cases reported to the 55 U.S. Poison Control Centers (Jan. 1, 2020 through May. 3, 2020), which resulted in an increase of 37% compared to the same time period during the previous year.

### National Poison Data System (NPDS) Bulletin
#### COVID-19 (Disinfectant)

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>1,621</td>
<td>1,706</td>
</tr>
<tr>
<td>Feb.</td>
<td>1,430</td>
<td>1,673</td>
</tr>
<tr>
<td>Mar.</td>
<td>1,755</td>
<td>3,401</td>
</tr>
<tr>
<td>Apr.</td>
<td>1,628</td>
<td>3,603</td>
</tr>
<tr>
<td>May</td>
<td>184</td>
<td>304</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6,618</td>
<td>10,687</td>
</tr>
</tbody>
</table>

Results: According to data retrieved from the National Poison Data System (NPDS), there were 10,687 Disinfectant exposure cases reported to the 55 U.S. Poison Control Centers (Jan. 1, 2020 through May. 3, 2020), which resulted in an increase of 61% compared to the same time period during the previous year.

*Confirmed nonexposure and Unrelated effect cases are not included in this pie chart.
DIDACTIC SPEAKERS

COVID-19: BEST PRACTICES FOR PPE PRESERVATION
- John F. Koerner, MPH, CIH
- Deputy – PPE Preservation WG, COVID-19 Response, FEMA/ASPR Healthcare Resilience Task Force; Strategic Plans, Office of the Assistant Secretary for Preparedness and Response

DECONTAMINATION AND REUSE OF N95 RESPIRATORS FOR HEALTHCARE FACILITIES
- Joselito Ignacio, MA, MPH, CIH, CSP, REHS, CBRN
COVID-19: BEST PRACTICES FOR PPE PRESERVATION

MEDICAL AND PUBLIC HEALTH CONSIDERATIONS OF COVID-19

John F. Koerner, MPH, CIH
Deputy – PPE Preservation WG, COVID-19 Response, FEMA/ASPR
Healthcare Resilience Task Force; Strategic Plans, Office of the Assistant Secretary for Preparedness and Response
To discuss and provide a venue to reflect upon best practices for the preservation of personal protective equipment in healthcare for current, emerging, and future surge operations.
Methods

1. FDA Emergency Use Authorizations beginning March 28, 2020
2. CDC “Strategies to Optimize the Supply of PPE and Equipment”
3. Expedited literature review for best practices
4. Informal interviews to gather experiential evidence
5. Focus group to assess Fact Sheet
6. Interagency review and published
7. Ad hoc Technical Working Group for Decontamination

This document contains references and links to non-federal resources and organizations. This information is meant solely for informational purposes and is not intended to be an endorsement of any non-federal entity by FEMA, U.S. Department of Homeland Security or the U.S. government.
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As supply decreases, different strategies are used to optimize PPE

- **Conventional**
  - Usual Standard of Care
  - Cached and usual supplies available

- **Contingency**
  - Functionally equivalent care
  - Conservation, adaptation, & substitution of supplies
  - Use during *expected* shortages

- **Crisis**
  - Crisis standards of care
  - Critical supplies lacking
  - If no gowns, use gown alternatives
  - Consider with *known* shortages

**Severity of shortage**

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FEMA Fact Sheet
Coronavirus (COVID-19) Pandemic: Personal Protective Equipment Preservation Best Practices
Published – April 12, 2020

https://www.fema.gov/media-library-data/1587131519031-6501ee8a0ce72004832fa37141c53bc0/PPE_FACTSHEET.pdf

This document contains references and links to non-federal resources and organizations. This information is meant solely for informational purposes and is not intended to be an endorsement of any non-federal entity by FEMA, U.S. Department of Homeland Security or the U.S. government.
FEMA Fact Sheet: *Published April 12, 2020*

**Personal Protective Equipment Preservation Best Practices**

1. Amplifies the CDC strategies for optimizing PPE.

2. Suggests appropriate actions based on the organizational/facility stage in the response and specific to user circumstances.

3. All U.S. healthcare facilities should begin using PPE contingency strategies NOW.

4. Pillars of Practice: **REDUCE – REUSE - REPURPOSE**
Non-healthcare industries should conserve medical PPE for medical care.

- Maintain social distancing.
- If feasible, conduct patient or civilian interactions outdoors or in large open spaces.
Contingency – Engineering, Barriers, and Technology

• Use barrier controls when possible to limit the need for PPE (e.g. masking patients, acrylic barriers, car windows, improved ventilation systems).

• Limit visitor access and offer technology-based alternatives (e.g., video chat).

• Use tele-consultation, internet-based interviews, or remote camera-based observation when available.

• When clinically appropriate, place IV towers and ventilators outside of patient rooms to allow monitoring and management without entering the room.
Contingency – Work Practices & Administrative Changes
• Minimize number of people with, and frequency of, direct patient or civilian contact.
• Work with cohorts of patients/civilians who test positive for COVID-19, rather than single subjects.
• Consolidate activities to a single visit.
• Modify supporting staff workflow to limit PPE use.

Contingency – Personal Protective Equipment
• Understand your PPE requirements and burn rates.
• Extend use-times of undamaged, non-visibly soiled PPE.
• Note: OSHA has relaxed enforcement of annual fit-testing requirements for N-95 FFR’s
REUSE

- Contingency – Implement strategies to optimize the supply of PPE and equipment.
- Crisis - Implement expanded facility-based PPE reuse policies and procedures.
- Crisis - Track “check in” and “check out” of PPE designated for reuse. Each worker is provided specific PPE at the beginning of the shift. At the end of the shift, all PPE is labeled, collected, and stored for reuse.
- Crisis – Implement guidance for decontamination and reuse of FFRs.
• Contingency - Use other NIOSH-approved respirators instead of N-95 FFR when respiratory protection is required.
• Contingency - Seek alternative supplies of PPE.
• Crisis - Use N-95 FFRs beyond their expiration dates if certain conditions are met.
• Crisis - Use FDA authorized imported, non-NIOSH-approved disposable FFRs.
Communicate, Communicate, Communicate

To ensure uniform application of modified practices, processes, and procedures, all workers must be trained, with recommended elements including:

- Reasons for changes from standard practice and for implementing contingency and crisis practices during COVID-19 related PPE shortages
- New PPE guidance (FDA. CDC, DOJ) related to COVID-19
- Proper methods to conduct new or changed work practices (e.g., staffing, social distancing)
- Methods to install or utilize any barrier controls (e.g., patient masking, Plexiglas shields)
- Proper donning and doffing of PPE to minimize self-infection
- Proper hand hygiene


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DECONTAMINATION AND REUSE OF N95 RESPIRATORS FOR HEALTHCARE FACILITIES

MEDICAL AND PUBLIC HEALTH CONSIDERATIONS OF COVID-19

CAPT Joselito Ignacio, MA, MPH, CIH, CSP, REHS
U.S. Public Health Service Officer Assigned As Dhs/FEMA CBRN Science Advisor
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New guidance recommends researchers, decontamination companies, healthcare systems, or individual hospitals should focus current efforts on ultraviolet germicidal irradiation (UVGI), vaporous hydrogen peroxide (VHP), and moist heat incubation.

- VHP is a promising method with a potential for high capacity throughput, but certain VHP systems, such as the Clarus® R VHP generator, may be more compatible with FFR decontamination.
- Moist heat caused minimal degradation in the filtration and fit performance of the tested FFRs. One limitation of the moist heat method is the uncertainty of the disinfection efficacy for various pathogens.
- UVGI is a promising method but the disinfection efficacy is dependent on dose. Moreover, UVGI is unlikely to kill all the viruses and bacteria on an FFR due to shadow effects produced by the multiple layers of the FFR’s construction.

<table>
<thead>
<tr>
<th>Method</th>
<th>Treatment level</th>
<th>Antimicrobial efficacy</th>
<th>Filtration performance</th>
<th>Fit performance</th>
<th>Material degradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHP</td>
<td>Various concentrations and dwell times tested</td>
<td>&gt;99.99%</td>
<td>Passed</td>
<td>Unaffected for up to 20 treatments</td>
<td>Degradation of straps notes after 30 cycles</td>
</tr>
<tr>
<td>Moist heat</td>
<td>99.9%</td>
<td>99.9%</td>
<td>6 of 6 models passed after 3 cycles</td>
<td>Passed</td>
<td>Some respirators experienced seal compromise</td>
</tr>
<tr>
<td>UVGI</td>
<td>0.5-950 J/cm²</td>
<td>99.9% for all tested viruses</td>
<td>Passed</td>
<td>90-100% passing rate after 3 cycles</td>
<td>Reduction of material durability at higher doses</td>
</tr>
</tbody>
</table>

Summary prepared by the Healthcare Resiliency Task Force Preservation Thread
Source: CDC, “Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies,” Last Updated March 31, 2020
### Table 3. Summary of decontamination method antimicrobial efficacy

<table>
<thead>
<tr>
<th>Method</th>
<th>Treatment level</th>
<th>Microbe tested</th>
<th>Antimicrobial efficacy</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaporous hydrogen peroxide (VHP)</td>
<td><strong>Battelle report:</strong> Bioquell Clarus C HPV generator: The HPV cycle included a 10 min conditioning phase, 20 min gassing phase at 2 g/min, 150 min dwell phase at 0.5 g/min, and 300 min of aeration.</td>
<td><em>Geobacillus stearothermophilus</em> spores, T1, T7, and phi-6 bacteriophages</td>
<td>&gt;99.999%</td>
<td>3, 4, 6</td>
</tr>
<tr>
<td></td>
<td><strong>Bergman et al.:</strong> Room Bio-Decontamination Service (RBDS™, BIOQUELL UK Ltd, Andover, UK), which utilizes four portable modules: the Clarus® R HPV generator (utilizing 30% H₂O₂), the Clarus R20 aeration unit, an instrumentation module and a control computer. Room concentration = 8 g/m³, 15 min dwell, 125-min total cycle time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Kenney personal communication:</strong> Bioquell BQ-50 generator: The HPV cycle included a 10 minute conditioning phase, 30–40 min gassing phase at 16 g/min, 25 min dwell phase, and a 150 min aeration phase.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>Treatment level</td>
<td>Microbe tested</td>
<td>Antimicrobial efficacy</td>
<td>References</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Ultraviolet germicidal irradiation (UVGI)</td>
<td>0.5–1.8 J/cm²</td>
<td>Influenza A (H1N1), Avian influenza A virus (H5N1), low pathogenic Influenza A (H7N9), A/Anhui/1/2013, Influenza A (H7N9), A/Shanghai/1/2013, MERS-CoV, SARS-CoV, H1N1, Influenza A/PR/8/34, MS2 bacteriophage</td>
<td>99.9% for all tested viruses</td>
<td>12, 13, 14</td>
</tr>
<tr>
<td>Microwave generated steam</td>
<td>1100–1250 W microwave models (range: 40 sec to 2 min)</td>
<td>H1N1 influenza A/PR/8/34</td>
<td>99.9%</td>
<td>14</td>
</tr>
<tr>
<td>Microwave steam bags</td>
<td>1100 W, 90 sec (bags filled with 60 mL tap water)</td>
<td>MS2 bacteriophage</td>
<td>99.9%</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: CDC, “Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies,” Last Updated March 31, 2020
<table>
<thead>
<tr>
<th>Method</th>
<th>Treatment level</th>
<th>Microbe tested</th>
<th>Antimicrobial efficacy</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moist heat incubation</td>
<td>15–30 min (60°C, 80% RH)</td>
<td>H1N1 influenza A/PR/8/34</td>
<td>99.99%</td>
<td>14</td>
</tr>
<tr>
<td>Liquid hydrogen peroxide</td>
<td>1 sec to 30 min (range: 3–6%)</td>
<td>Not evaluated</td>
<td>Not evaluated</td>
<td></td>
</tr>
<tr>
<td>Ethylene oxide</td>
<td>1 hour at 55°C; conc. range: 725–833 mg/L</td>
<td>Not evaluated</td>
<td>Not evaluated</td>
<td></td>
</tr>
</tbody>
</table>

Source: CDC, "Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies," Last Updated March 31, 2020
FDA Emergency use authorized n95 decontamination systems

Sterilucent HC 80TT

Steris VPro

ASP Sterrad 100NX

Sterizone VP4

Battelle Critical Care Decontamination System

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Battelle CCDS™ Process

HEALTH CARE PROVIDER SIGN-UP PROCESS
Battelle CCDS Critical Care Decontamination System™

1 Sign up with Battelle
- Visit battelle.org/decon to fill out the enrollment form
- Battelle emails enrollee links to the enrollment contract, instructions, and the Battelle POC

2 Contact Us to Get Your Code
- Enrollee signs contract and contacts Battelle POC to receive their 3-digit codes for each facility

3 Properly Label Respirators
- Once the 3-digit codes are received from Battelle, enrollee collects N95 respirators
- N95 respirators must be unsoiled (free of blood, mucus, make-up, lip balm, etc.) and labeled with a permanent marker

4 Collect & Bag All N95 Respirators
- Enrollee collects all N95 respirators into a single plastic bag
- Once the plastic bag is filled, tie off the bag and put it into another plastic bag

5 Properly Package
- Clean the outside bag with disinfectant
- Shipping box must be labeled with the 3-digit code and a biohazard sticker

6 Ship to CCDS Site
- Enrollee contacts their chosen logistics provider to coordinate pick-up and delivery of their N95 respirators
- Enrollee can either use a logistics provider of their choice or Battelle’s preferred logistics provider

7 Decontaminated & Returned
- Your shipments are barcoded to ensure chain of custody
- Your N95 respirators are processed and then verified to ensure they are free of decontaminant
- Your decontaminated N95 respirators are returned to your facility

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Patent Pending
Conclusion

- Preservation of PPE (Reduce, Reuse, Repurpose) can manage demand at healthcare facility level as resupplies can resume;

- Reminder to use hierarchy of controls
  - Elimination
  - Substitution
  - Engineering Controls
  - Safe Work Practices
  - PPE

- COVID-19 crisis, there are authorized capabilities to decontaminate N-95 respirators for safe reuse;
THANK YOU
UPDATES FROM THE FRONT LINES

DR. SHIKHA KAPIL
WASHINGTON, DC

DR. FRANCISCO MOYA
MALAGA, SPAIN
UPDATES FROM THE FRONT LINES:
WASHINGTON, DC

Shikha Kapil, MD
- Attending Physician, Surgical and Cardiovascular ICU, Department of Critical Care, MedStar Washington Hospital Center
- Assistant Professor, Emergency Medicine, Georgetown University School of Medicine
VV ECMO

Diagram showing the components of ECMO:
- Blender
- Oxygenator
- Pump
- Console
COVID-19 Cases on ECMO in the ELSO Registry:

<table>
<thead>
<tr>
<th>COVID-19</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspected or Confirmed</td>
<td>Confirmed Cases</td>
</tr>
<tr>
<td>702</td>
<td>694</td>
</tr>
</tbody>
</table>

COVID-19 Discharged Alive

84/180 (46%)

Total counts of COVID-19 confirmed patients and count of COVID-19 suspected but not confirmed by testing.

COVID-19 ECMO counts by ELSO Chapter

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>467</td>
</tr>
<tr>
<td>Europe</td>
<td>181</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>23</td>
</tr>
<tr>
<td>Latin America</td>
<td>17</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
</tr>
<tr>
<td>Capacity</td>
<td>Inclusion criteria</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------</td>
</tr>
<tr>
<td>50%</td>
<td>Severe ARDS defined as • P:F &lt;50 for 3 hours • P:F &lt;80 for 6 hours After failure of proning/paralysis</td>
</tr>
<tr>
<td>50-75%</td>
<td>In house only – no transfers</td>
</tr>
<tr>
<td>&gt;75%</td>
<td>None</td>
</tr>
</tbody>
</table>

Who can we help?

- Beds
- Nursing staff
- Equipment

50-75%

>75%

None
Local Context

- 5000 confirmed cases in DC
- Currently 190 COVID inpt
- 120 ICU beds/1000 bed hospital
- Capacity for 9 ECMO circuits

- Have cannulated 14
- 5 remain on ECMO
- 2 discharged
- 3 died
- 4 decannulated but remain vented
Insight (not evidence... ...yet)

- Anticoagulation
- Coagulation profiles

- Relative lack of ‘shock’ after initial resuscitation period

- Young, single organ system do better

- Adjunctive therapy
- Remdesivir
- Tocilizumab
- Convalescent plasma
UPDATES FROM THE FRONT LINES:
MALAGA, SPAIN

Francisco Moya, MD, FFSEM
- Clinical Lead, International Services
- Consultant In Emergency, Sport and Exercise Medicine, Vithas Xanit International Hospital
- Board Member, Spanish Society of Emergency Medicine (SEMES)
- Member, Research Committee, European Society of Emergency Medicine (EUSEM)
CURRENT SITUATION IN SPAIN

- More than 500 deaths per million (2nd worst worldwide behind Belgium)
- 1st in Infected HCW with currently more than 43000 and 50 Deaths plus
- Lack of Protective Equipment has been and is still a BIG Issue
- Still No Massive PCR Testing
- Currently Phase 0 of De-escalation of one of the world hardest Lockdowns
THE IMPACT OF SETTING UP A MULTIDISCIPLINARY HOSPITAL COVID-19 TASK FORCE: OUR EXPERIENCE

- OBSERVATIONAL RETROSPECTIVE COHORT STUDY N=57
- PRELIMINARY RESULTS:
  - Optimization of PPE and Drugs Use
  - Ability to Individualize Treatments
  - Reduction of In Patients needing NIV or ICU
  - Effective Implementation of Pathways between ED, Primary Care and Hospital Care
Q&A
ON-DEMAND RESOURCES

All webinars are recorded and posted to the ACMT website

www.acmt.net/covid19web

Questions?
Write to: info@acmt.net
NEXT WEBINAR

Psychological Resilience During COVID-19 and Beyond
Nadine Kaslow, PhD, ABPP, Past President, American Psychological Association (APA)

Wednesday, May 13, 2020
3:00 PM EDT

www.acmt.net/covid19web