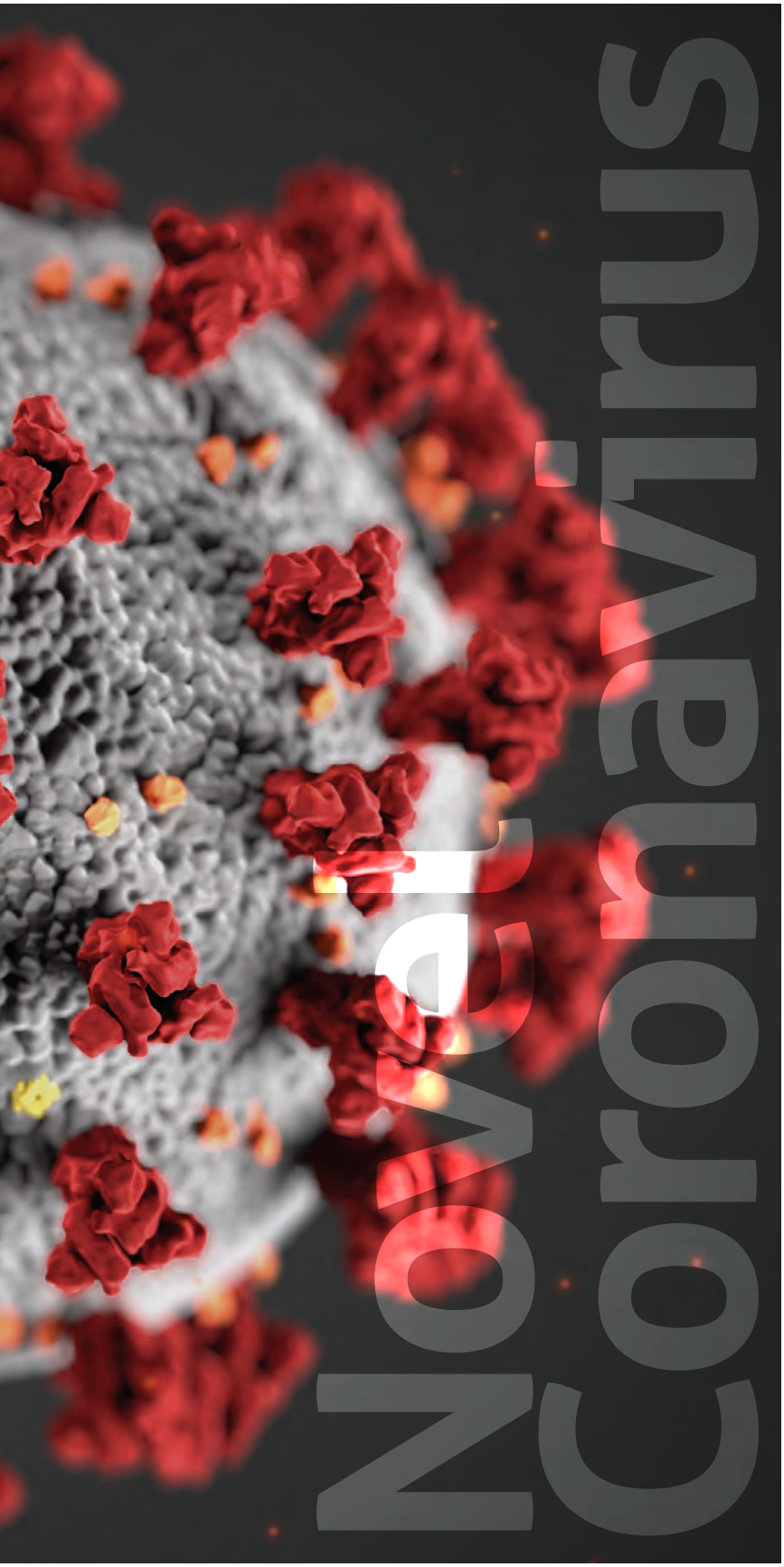

Novel Coronavirus or COVID-19

No matter what term is used to describe this deadly virus, it creates high anxiety in all of us. There are so many questions, yet so few answers about this mysterious virus. As we go to print with this issue, I struggled with which angle to take when discussing the virus and considered what information would be most beneficial to our members. I hope that the information provided in this article is both informative as well as useful to your practice.

Background and timeline

The outbreak of this virus occurred in Wuhan, China, in December, 2019. The World Health Organization (WHO) released a statement declaring that China was dealing with a mysterious pneumonia in individuals that had visited a live animal market in Wuhan on December 31st. At that time, it was thought that the virus was not capable of spreading from person-to-person. In early January, China reported the first death of an individual who had visited the live animal market, with cause of death being credited to novel coronavirus. The virus was first considered an epidemic (outbreak of a disease in a community), as it was for the moment, contained in Wuhan. To prevent the spread of the virus, China issued travel restrictions by shutting down their mass transit system. Monitoring the situation, the WHO and the Centers for Disease Control and Prevention (CDC) were quick to issue warnings that this could quickly become a pandemic (outbreak of a disease on a global level). Although every effort is made on China's behalf to contain the virus within its own borders, by the end of January the US, Thailand, South Korea and Japan were also reporting citizens being diagnosed with the virus. In early February, the WHO released a statement that the novel coronavirus will now be formally recognized as COVID-19. The "CO" stands for coronavirus, the "VI" for virus and the "D" for disease. **Click here** for a news article on how the virus got started.

SUE CHRISTIAN, CER.A.T.T.

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COVID-19 and hand washing

What we know about COVID-19 is that the virus is not a living organism. Its structure is that of a protein molecule (DNA) that is protected by a layer of lipid (fat). When the molecule is absorbed by the cells in our nose, mouth or eyes, the molecule's genetic code is rewritten, and is considered an aggressor because the cells multiply. Since it is not a living organism, the virus cannot be killed; it has to disintegrate on its own. The length of time to reach disintegration is dependent on the temperature, humidity and the type of metal, fabric or material on which the virus has adhered. The virus's protection is a thin layer of fat and therefore it is very fragile. Because of this composition, the best defense is to scrub your hands with soap and apply steady friction for 20 seconds (kill time). The foam from the soap penetrates the fat layer, thereby breaking down the protein molecule. There has been discussion in the news and articles surfacing on the internet stating that the temperature of the water for handwashing (or any other item for that matter) doesn't matter. However, a point to consider is that heat melts fat, and obviously hot water would appear to be more effective than lukewarm or cold water. Hand washing is one of the two best defenses against this virus, social distancing being the other.

Isopropyl alcohol can be used as a disinfectant because it is capable of dissolving lipids.

A concentration of 70% is effective at dissolving the external lipid layer of COVID-19.

Other cleaning products

Isopropyl alcohol can be used as a disinfectant because it is capable of dissolving lipids, which makes it effective against lipid-wrapped viral cells. Isopropyl alcohol contains ethanol and ethanol is safe to use around food. Another advantage is that it does not leave behind a residue like other cleaning products. A concentration of 70% is effective at dissolving the external lipid layer of COVID-19.

Other household items that are effective in combating the virus are bleach and hydrogen peroxide. When using bleach, it is important to know the type of bleach you have, as not all products are effective in treating this virus (see call out box). I called the Clorox Company to find out what percentage of sodium hypochlorite is in the bleach in order to mix the proper amount with water for disinfecting purposes. Turns out Clorox Splashless and Clorox Scented bleach are not registered as disinfectants with the EPA and will not kill the coronavirus. Hydrogen peroxide will also dissolve the protein molecule, as long as you use it in the pure form. Pure hydrogen peroxide is not recommended for use on skin as it can result in significant damage with long term use.

Kill time

There are many cleaning agents available, both for hospital and home and it is wise to understand the kill time for each product as well as knowing that not every cleaning agent will kill this virus. To be effective against COVID-19, most of your bleach formulas used in the hospital setting require a four-minute kill time, yet household bleach products require a 10+ minute kill time to be effective. If you are wondering what is meant by kill time - it is the amount of time that a cleaning agent must stay wet to be effective at eradicating bacteria, viruses or other microorganisms.

Various news agencies have reported that COVID-19 may survive on fabric and porous surfaces for up to three hours, copper and wood up to four hours and cardboard or paper up to 24 hours. It has also been reported that the virus will survive on metal for up to 42 hours and plastic for 72 hours.

Single use, to multiple use items

We all have been taught that single-use items are just that-single use and attempting to reprocess could alter the functionality of that item. The COVID-19 pandemic has resulted in high demand of PPE thereby resulting in the supply chain struggling to keep up with the demand. Healthcare workers are trying to grapple with the simple fact that there may not be enough N-95 masks to go around. As employers struggle to obtain PPE to protect their employees, we find ourselves in situations which require single use items to be re-used.

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New technology

The University of Nebraska has published a process that they have employed to extend the useful life of the N-95 mask by exposing masks to UV light. Science has shown that objects exposed to UV light that may contain the virus breaks down the virus protein and renders it safe for reuse. To reference exact specifics, please refer to the documents posted on the **ASATT website**.

In using UV light methods, a designated space is required to perform this decontamination process, the room must be painted with a special paint and you have to have the right equipment. My understanding is that the FDA will soon be releasing a statement on the use of this technology.

Elective surgery

Elective surgeries, for the most part, have been canceled, thereby decreasing the surgical volume. Just understand that there are some electives that will continue to be performed if the patient meets certain criteria. One reason an elective procedure may take place is if the patient is at risk of losing their insurance in the next 90 days. Another reason is if the patient's disease process would worsen by not having the surgical procedure performed.

Safety best practices

If the patient is asymptomatic or even pre-symptomatic, what precautions have to be taken to prepare the anesthesia machine? Is there a need to take precautions? What is the risk of cross contamination when an asymptomatic but infected patient precedes uninfected patients? Obviously, no HEPA filter inline for the asymptomatic patient. Is COVID-19 small enough to cross contaminate? What happens if the patient does not exhibit any signs when presenting to the OR but tests positive for the virus five, seven or even 10 days out? Is there a possibility of cross-contamination from machine to patient?

Let's face it, there is no chapter in any medical book dedicated to providing best practices for combatting this virus. We are learning as we go and there are long hours, sleepless nights and high anxiety for many of us. I am not an expert and the information contained herein is not gospel. I am only sharing with you what steps our department has taken to combat this virus. Whether it was right or wrong will be determined at a later date.

First piece of advice I have to offer is to determine if the manufacturer of your anesthesia machine has provided a

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statement on precautions that should be taken and then refer to the APSF website page titled "**FAQ ON ANESTHESIA MACHINE USE, PROTECTION, AND DECONTAMINATION DURING THE COVID-19 PANDEMIC**"

If we apply the universal precaution or standard precaution rationale and if there ever was time that we should be doing this, we need to consider that any patient coming into the OR has the potential to have the virus or at the very least, been exposed to someone who has tested positive.

Because our circuits have filters on both inspiratory and expiratory limbs and are by the manufacturer's definition a bacterial/viral filter and we are trying to conserve the PALL HEPA filter for confirmed positive patients, we have reconfigured our breathing circuit. The inspiratory limb filter has been removed and placed between the HME and elbow. The gas sampling line is connected at the wye. The reason that it is imperative to place the gas sampling line on the machine side is that the newer models will return the sampled gas back through the breathing circuit (inhalation agent cost savings measure). If the gas sampling line is connected at the elbow and an asymptomatic but infected patient precedes uninfected patients, then the machine has become contaminated and will have to be removed from service. Should this happen, check with your manufacturer to determine the length of time the machine would have to be quarantined before it would once again become safe for use.

If we have a confirmed positive patient in the OR, we will place the bacterial/viral filter back on the inspiratory limb and replace it with a Pall filter. Again, we keep the gas sampling line on the machine side. Be sure to double check your connections. We use a flex connector to connect the Pall filter to the ETT tube (remember your numbers 22mm/15mm OD/ID).

Regardless of which filter we employ, one benefit that we have for swapping the filter location is that in the event that the circuit has to be disconnected, the bacterial/viral filter or the PALL filter will prevent the patients aerosolized breath from escaping into the room, thereby exposing the entire team in the room. If nothing else, it decreases everyone's anxiety level.

For our COVID-19 positive patients, we have a dedicated airway team that is responsible for the intubation and extubation of these patients. They wear full PPE, including a PAPR unit and use video laryngoscopy to place the ETT tube. We also follow this same procedure for any ENT procedure, regardless if the patient tests positive or negative for the virus.

To increase safety of the staff, ENT procedures, patients suspected as potential candidates for the virus and especially for the positive patients, only the anesthesia provider will be present in the room for intubation. We also use a closed suction system in the event that it is needed.

Another process we have initiated is that all equipment, including any and all support carts are removed from the

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room. The provider will draw up the needed drugs and take a kit into the room. The kit contains the bare essentials needed for the case so as not to accidently cross contaminate. This can be a bit risky, especially if you have an unstable patient, and to reduce the risk we station a provider outside the door who would pass in any needed items.

In the event that your facility has the possibility of using anesthesia ventilators to supplement the respiratory fleet, special precautions need to be taken as well. A surplus of disposables will be required, above and beyond what is considered "normal" (extra CO2 absorbent, water traps, etc.). Previous reports show that patients needing ventilatory support will be vent dependent somewhere between 10-20 days. Remember that our machines weren't designed for this use, and to keep them operational, there are published recommendations by the ASA as to how frequently the absorbent, HME's and other disposables should be changed. For those of you who have called and asked for help with connections for converting the anesthesia machine over for use with two-to-four patients, I hope that it didn't come to that, but if it did, I would be curious to know how it worked and if there were any machine issues.

Follow this link to view an article on "**APSF/ASA Guidance on Purposing Anesthesia Machines as ICU Ventilators**".

We have purchased a Tru-D UV robot, with installation being completed earlier this week. Our first "run" of decontamination of the masks has been completed. It is a time-consuming project, handing out masks and bags, providing instructions, collecting used masks and having the secure space to separate both. There is some controversy over the writing of the name, location and date on the front of the mask with a Sharpie, as it is felt it might compromise the filter. Another concern is the integrity of the seal after several uses and undergoing numerous decontamination processes. Wearers must ensure that they have a good seal.

Colleagues, I could continue with other processes that we have implemented and would be happy to share, but duty calls. Please refer to the ASATT website for a list of important documents that might help to address your questions. I will close by saying, "stay safe, follow social distancing guidelines and use common sense as we rise together to combat this virus."

Products registered with the EPA and will kill the virus:

- Clorox Disinfecting Bleach *(has a red stripe across the top of the label that states "kills 99.9% of germs")*
- Clorox Chloromax Technology Disinfecting Bleach
- Clorox Performance Bleach *(for HE washers)*
- Clorox Germicidal Bleach

If the bleach is concentrated, mix 1/3 cup/gallon of water. If the bleach is not concentrated, add 1/2 cup/gallon of water.

Take the QUIZ On The Next Page

Continuing Education Quiz

To test your knowledge on this issue's article, provide correct answers to the following questions on the form below. Follow the instructions carefully.

1. A concentration of _____ is effective at dissolving the external lipid layer of COVID-19:
a) 15%
b) 70%
c) 95%
d) None of the above

2. An outbreak of a disease in a community, as the definition for:
a) Epidemic
b) Pandemic
c) Pandemonium
d) High anxiety

3. The amount of time that a cleaning agent must stay wet to be effective at eradicating bacteria, viruses or other microorganisms is the definition for:
a) Decontamination
b) High level disinfection
c) Sterilization
d) Kill time

4. Heat melts fat.
a) True
b) False

5. Other cleaning products that are effective in destroying the COVID-19 virus include:
a) Bleach
b) Ammonia
c) Sodium bicarbonate
d) All of the above

6. N-95 masks are able to be reused again if they are exposed to:
a) Ultrasonic wave
b) UV light
c) Hydrogen peroxide
d) High level disinfection

7. Good hand hygiene will help prevent acquiring the COVID-19 virus:
a) True
b) False

8. Outbreak of a disease on a global level is the definition for:
a) Epidemic
b) Pandemic
c) Chaos
d) High anxiety

9. The COVID-19 virus can survive on plastic for up to:
a) 4 hours
b) 24 hours
c) 42 hours
d) 72 hours

10. The COVID-19 is a virus whose structure is that of a protein molecule (DNA) that is protected by a layer of _____:
a) Fat
b) Lipid
c) Grease
d) Both A & B

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2) Provide correct answers to this issue's quiz in this box > > >
3) Mail this form along with $10.00 Member $20 Non-Member *(check or money order, payable to ASATT) to:*
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The answers to the Spring 2020 Best Practices in Healthcare Continuing Education Quiz are:
(circle answers)

1:	A	B	C	D	**6:**	A	B	C	D
2:	A	B	C	D	**7:**	T	F		
3:	A	B	C	D	**8:**	A	B	C	D
4:	T	F			**9:**	A	B	C	D
5:	A	B	C	D	**10:**	A	B	C	D

Quiz 2 of 2

Name: _____ ASATT Number: _____
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Signature: _____ Date: _____

SUBMISSIONS FOR THIS ISSUE'S QUIZ EXPIRE **DECEMBER 31, 2021**.
ACHIEVE 80% IN THIS QUIZ TO EARN ONE (1) CONTINUING EDUCATION CREDIT.