COVID-19

Toolkit for the Perianesthesia Nurse

ASPAN

American Society of PeriAnesthesia Nurses

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TABLE OF CONTENTS

Opening Statement

If you are a perianesthesia nurse working under customary work conditions and caring for typical perianesthesia patient populations, continue to follow the ASPAN 2019-2020 Perianesthesia Nursing Standards, Practice Recommendations and Interpretive Statements. However, if you are a perianesthesia nurse who has been deployed to another unit, caring for patients in a surge situation or critical care unit, or other types of patients, or working under a different type of care delivery system due to the emergency response of your institution, follow the institutional standards of care that have been put in place for this pandemic.

ASPAN recognizes that current conditions in US hospitals and ambulatory surgery centers are rapidly shifting/escalating from standard operations to emergent/extreme/surge activity(ies). The following recommendations are intended to guide perianesthesia nurses who may be working in those extreme situations.

ASPAN Practice Experts

I. A Year of Pandemic

a. Returning to Surgery

i. There are some varying reports regarding the most appropriate time for a patient to return to the operating room following a recovery from COVID-19 infection.

1. The American Society of Anesthesiologists and the Anesthesia Patient Safety Foundation published a joint statement on elective surgery after COVID recovery (ASA & APSF, 2020). See Table 1.

SYMPTOMS WHEN ILL	RECOMMENDED WAIT
Asymptomatic or recovered from mild, non-respiratory symptoms	Four weeks
Symptomatic (e.g., cough) but did NOT require hospitalization	Six weeks
Symptomatic with diabetes, immunocompromise, hospitalized	Eight to ten weeks
Required intensive care unit care due to COVID-19	Twelve weeks

Table 1: ASA/APSF Recommendations

2. A large international study involving 3,127 patients concluded that surgery should be postponed until at least seven weeks after a positive coronavirus test (Phend, 2021). See Table 2.

MORTALITY RATES	WEEKS SINCE POSITIVE TEST
9.1%	Surgery within two weeks of diagnosis
6.9%	Surgery within three to four weeks of diagnosis
5.5%	Surgery within five to six weeks of diagnosis
2%	Surgery within seven weeks of diagnosis

Table 2: International Study on Return to OR

b. Long Term Impact

i. Given the wide range of symptoms (from asymptomatic presentation to debilitating challenges to death), studies continue to emerge describing some long term sequela from the infection.

ii. Suggested etiology of lingering symptoms include:

1. Organ damage incurred during acute infection
2. Persistent hyperinflammatory state
3. Ongoing viral activity
4. Inadequate antibody response

iii. Persistent symptoms include, but are not limited to:

1. Fatigue
2. Dyspnea and/or cough
3. Headache
4. Joint and/or muscle pain
5. Chest pain
6. Cognitive impairment (foggy head)

c. Vaccinations: HOPE

i. Find reliable resources for current vaccination information.

1. Current vaccines are not LIVE vaccines therefore one cannot get COVID from the vaccine.
2. Immunity seems to last at least three months following the vaccine.
3. More data is required…….

ii. For information on current standings related to vaccines, see Table 3.

VACCINE	Effectiveness	Age	# Shots	Storage
Pfizer	95%	16+	2/21 days	100°Below 0
Moderna	94.5%	18+	2/28 days	Above freezing
Johnson & Johnson	72%	18+	1	In refrigerator
AstraZeneca	60%	18+	2/4-12 weeks	Above freezing

Table 3: Summary of vaccines (March 2021)

2. Strategies for Caring for the Nurse: Self-Care and Resilience

1. Stay active

- Exercise benefits both our physical and mental health.
- Try some of the many different types of exercise you can do from home, thanks to YouTube and apps.
- Even performing simple stretches each day can improve your sleep quality!

2. Practice "ZEN"

- When we are stressed about something (such as coronavirus), our thoughts tend to speed up.
- Take 10 minutes or so to practice mindfulness which can help produce some calm.
- Try doing an everyday activity in a mindful way – in other words, put aside distractions and focus fully on one small task. For example, while you are having a cup of tea, pay attention to your senses (the smell of the tea, the warmth of the cup in your hand, the taste…).

3. Check in with your family and friends while practicing social distancing

- Stay in touch via text, Messenger™, WhatsApp™, FaceTime™, or (gasp!) a good ol' fashioned phone call.
- Ask them how they're feeling, share your own experience if you feel safe to do so.

4. Check out online forums

- If you're feeling isolated, reach out to online virtual support groups.
- Get support from your community, join your neighbors as they sing Neil Diamond on the streets

5. Find nourishing new recipes

- Good nutrition is always important, but during stressful times there is nothing better than a tasty, healthy homemade meal – especially if you made it yourself.
- If you're running low or not able to get certain things, it's totally fine to keep it really simple. You could also get creative with substitutions or Google™ '[ingredient] substitute' for ideas.

6. Take a break from the news

- It's important to stay informed but try to limit your media intake to a couple of times a day and use only trustworthy sources such as the Centers for Disease Control and the World Health Organization.
- Enjoy the silence.

7. Make a music playlist

- Music can make us feel so much better.
- Hop on Spotify™ or Pandora® or Amazon Music™ (to name a few) and make a playlist with your fave songs.

8. Declutter for five minutes (or make your list of other favorite indoor things to do!)

- If you're suddenly spending a lot more time at home, it can help to have an environment that feels good to you.

9. Watch or read something uplifting

- Distraction can be a good thing.
- Watch something that you find uplifting and allow yourself to zone out from what's going on in the world.
- If you like to read, go to your bookshelf and choose an old favorite or something you've been meaning to get to for a while.
- If you don't have physical books, then e-books are a great option.

10. Learn something new

- Have you wanted to get into drawing, knitting, or learning a musical instrument? Now's a great time to make a start!
- YouTube™ has great free online tutorials for nearly everything you would like to try.

11. Improve your sleep quality

- High quality sleep is so important, yet, it is often hard to come by during stressful times. Here are some sleep hygiene hints:
  - Limit caffeine intake after 3 PM
  - Go outside during daylight hours for at least 15-30 minutes a day to help your body clock reset
  - Exercise and stretching have been shown to improve sleep quality, but limit rigorous physical activity right before bedtime

SOURCES:

- https://au.reachout.com/articles/10-ways-to-take-care-of-yourself-during-coronavirus
- https://www.eatingrecoverycenter.com/blog/march-2020/how-to-practice-self-care-during-the-coronavirus
- https://www.cnn.com/2020/03/23/health/sleep-craving-carbs-coronavirus-wellness/index.html

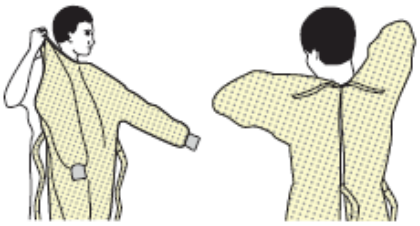
Strategies for Caring for the Nurse: Donning and Doffing Review (CDC)

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



2. MASK OR RESPIRATOR

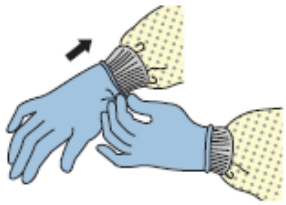
- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator

3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit

4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

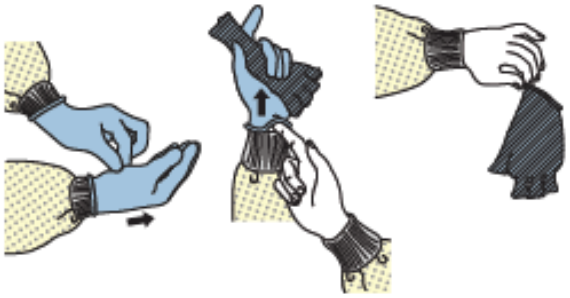
- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

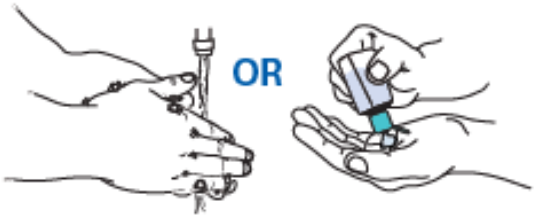
3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container

5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



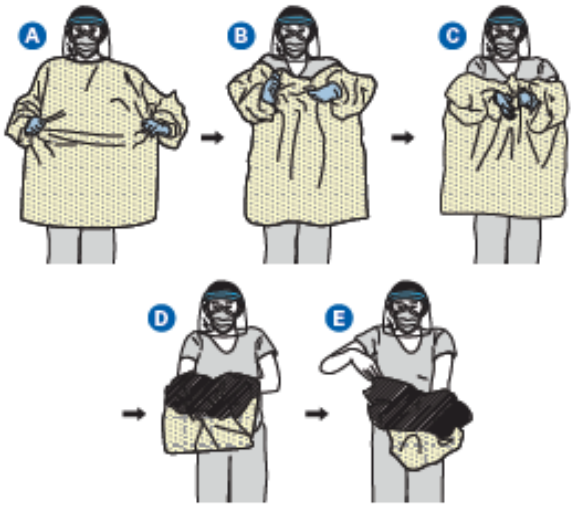
PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



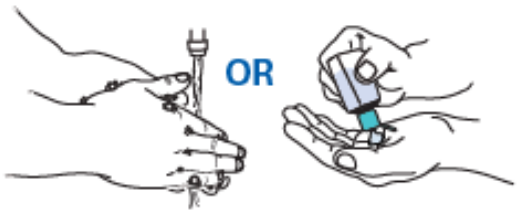
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container

4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

3. Strategies for Caring for the COVID Positive Patient

Pathophysiology of COVID-19

- COVID-19 is classified as an infectious inflammatory disease
- Officially designated a pandemic by the World Health Organization on March 11, 2020
- In a severe case, an acute respiratory distress syndrome (ARDS) clinical picture evolves
    - ARDS is an acute inflammatory lung injury due to activation of circulating neutrophils that migrate to the lungs and release the content of their cytoplasmic granules.
    - This is called the respiratory burst and is designed to kill microorganisms, but unfortunately, also damages the capillary walls in the lungs, leading to protein-rich exudate, erythrocytes, and platelets. This inflammatory exudate leads to fibrin accumulation, which causes structural remodeling and pulmonary fibrosis
- Patients with severe cases can also go into septic shock due to the "cytokine storm"
    - Massive inflammation and systemic vasodilation can be caused by cytokines that are released with a large and severe viral load
        - Cytokines are a broad and loose category of small proteins that are important in cell signaling
    - Sepsis is considered a 3-pronged cascade that occurs in response to severe infection:
        - Inflammation
        - Suppression of the immune system
        - Activation of the coagulation cascade

Characteristics of COVID-19 Patients

- Based upon available information to date, those at high-risk for severe illness from COVID-19 include:
    - People who live in a nursing home or long-term care facility
    - Other high-risk conditions could include:
        - People with chronic lung disease or moderate to severe asthma
        - People who have serious heart conditions
        - People who are immunocompromised including cancer treatment
        - People of any age with severe obesity (body mass index [BMI] >40) or certain underlying medical conditions, particularly if not well controlled, such as those with diabetes, renal failure, or liver disease might also be at risk
    - People who are pregnant should be monitored since they are known to be at risk with severe viral illness, however, to date data on COVID-19 has not shown increased risk
- Imaging
    - Bilateral ground-glass or patchy opacity (89.6%) was the most common sign of radiological finding
- Lab findings
    - Lymphopenia (75.4%) and eosinopenia (52.9%) were observed in most patients.

- Blood eosinophil counts correlate positively with lymphocyte counts in severe ($r = .486$, $P < .001$) and non-severe ($r = .469$, $P < .001$) patients after hospital admission.
- Significantly higher levels of D-dimer, C-reactive protein, and procalcitonin were associated with severe patients compared to non-severe patients (all $P < .001$).

COVID-19: General Treatment and Nursing Considerations

- **Infection Prevention**
  - Prevent spread with isolation & strong infection prevention protocols
    - Standard precautions and transmission-based precautions (contact, droplet, airborne, plus eye protection)
    - Clean environment frequently
  - If patient is too sick to remain home, can be admitted on medical/surgical unit or to critical care unit (ICU), depending on manifestations

- **Treatment – Supportive Therapy**, similar to (or consistent with) in-hospital influenza management
  - Rest
  - High-flow O2 via nasal cannula
    - Nasal Cannula to Mechanical Ventilation with proning and/or extracorporeal membrane oxygenation (ECMO) as needed
  - Anticoagulation therapy
  - Vital signs monitoring
  - Nutrition support
  - Conservative fluid and electrolyte balance management
  - Lab monitoring to evaluate organ function
  - Chest imaging: Xray or computerized tomography (CT) scan
  - Extracorporeal Membrane Oxygenation (ECMO) for refractory hypoxemia
  - End-organ supportive therapies (e.g., dialysis for Acute Kidney Injury etc.)

- **Medications**
  - FDA approved Remdesivir (antiviral) for Covid-19 adult pts requiring hospitalization
    - Shortens LOS by approx. 4 days
    - WHO does not recommend the therapy (Nov 2020)
  - Regeneron Cocktail (casirivimab & imdevimab): FDA approved monoclonal therapy in Fall 2020 to treat mild to moderate Covid-19 in adults who are not hospitalized
  - Bamlanivimab: FDA issued an EUA for this monoclonal antibody therapy to treat mild to moderate Covid-19 in adults and children; ameliorates some symptoms and reduces the risk of hospitalization
  - Glucorticoids have a mortality benefit and a reduction in use of mechanical ventilation in adult critically ill patients
  - Symptomatic treatment of fever (e.g., acetaminophen)

- **Conservation Bronchodilator Therapy Strategies**
    - To deliver bronchodilator therapy to either persons under investigation (PUI) or confirmed COVID-19 patients, inhalers are preferred over nebulizers in order to limit the risk of viral exposure to other patients or staff due to aerosolization. There is currently a nationwide shortage of albuterol and ipratropium.
        - Patients with documented reactive airways disease who are COVID-19 positive or PUI may receive albuterol metered dose inhalers (MDIs).
            - Patients ruled out for COVID-19 should be switched to nebulized albuterol once the MDI canister is depleted.
            - Mechanically ventilated patients on continuous nebulized epoprostenol may receive albuterol MDIs.
            - Dose for patients on mechanical ventilation: 4 Puffs every 1-6 hours
        - All other patients should receive nebulized albuterol.

- **Manage and prevent complications**
    - While the CDC estimates that <1% of those infected will die in the US, approximately 88% of those hospitalized with Covid-19 go on to become "Covid long haulers" reporting at least one symptom 60 days after onset
        - Dysautonomia: miscommunication between the ANS & the rest of the body, involving heartrate, breathing, sleep, and digestion issues
        - Excessive fatigue
        - Numbness in extremities
        - Memory issues, foggy cognition, and psychosis
        - Chronic loss of sense of taste and smell
        - Anxiety & depression
    - Antibiotics for secondary infection
    - Recognize septic shock early; fluids and vasopressors for shock
    - Gastrointestinal (GI)/venous thromboembolism (VTE) prophylaxis
    - Prevention of pressure injury, falls, catheter associated urinary tract infection (CAUTI), central line-associated bloodstream infection (CLABSI), ventilator associated pneumonia (VAP), etc.

References

Centers for Disease Control and Prevention. (2020). Preventing the spread of coronavirus disease 2019 in homes and residential communities. Retrieved from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-prevent-spread.html

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Zhang, J. J., Dong, X., Cao, Y. Y., Yuan, Y. D., Yang, Y. B., Yan, Y. Q., . . . Gao, Y. D. (2020). Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. *Allergy*. doi:10.1111/all.14238

Jin, Y. H., Cai, L., Cheng, Z. S., Cheng, H., Deng, T., Fan, Y. P., . . . Wang, X. H. (2020). A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Mil Med Res, 7*(1), 4. doi:10.1186/s40779-020-0233-6

Care of the Critically Ill COVID Patient[1, 2]

[1]These are suggested guidelines, but follow institutional protocols

[2] Critical care is a condition, not a location and critically ill patients are on a continuum, ranging from acutely ill to critically ill

NEUROLOGICAL Care

- Neuro assessment every 1-4 hours as needed (prn) severity of symptoms and intensity of treatments, including but not limited to:
    - Glasgow Coma Scale (GCS)
    - Level of Consciousness (LOC)
    - Pupils Equal Reactive and Round, reactive to Light (PERRL)
    - Richmond Agitation-Sedation Scale (RASS)
    - Movement of All Extremities (MAE)
    - Pain using VAS (Verbal Analog Scale) or CPOT (Crit. Care Pain Observation Tool)
    - Speech and swallow assessment
- If patient on sedation – daily awakening when INDICATED
- CAM (Confusion Assessment Method) ICU – daily when applicable
- Propofol, dexmedetomidine, midazolam infusions for sedation – if sedated, RASS documented every 1-2 hours
- Fentanyl infusion or PRN for pain
- If on continuous neuromuscular blocking agent (cisatracurium/vecuronium), patient should also be on continuous sedation and be monitored with bispectral index (BIS)/train of four
- Patients on sedation that do not require neuromuscular blocking agents will most likely need restraints. Restraints in the critical setting need to be renewed every 24 hours and are documented every 1-2 hours

CARDIAC Care

- Patient should be on continuous cardiac monitoring
- Monitor blood pressure (BP) every 1 hour at a minimum
    - If patient is on vasoactive medications, need BP at least every 10-15 minutes if not continuously monitored with an arterial line (AL). With initiation of new infusions (sedation or cardiac), BP/heart rate (HR) should be monitored more frequently.
- Cardiac assessment every 1-4 hours prn severity of symptoms and intensity of treatments, including but not limited to: rate, rhythm, presence of dysrhythmias, murmurs, pulses, skin temperature, and color
- Remember to print rhythm as well as central venous pressure (CVP)/AL strip for chart (per facility policy)
    - Zero AL/CVP at the beginning of shift and whenever hemodynamic results are questioned
    - Ensure transducers are leveled at the phlebostatic axis
- Hemodynamic lines should be continuously monitored for safety, but follow institutional protocols
- Vasoactive medications need to be charted hourly and/or utilize smart pump data in electronic health record (EHR)
    - Best practice: titrate only one vasoactive medication at a time
- VTE prophylaxis

RESPIRATORY

- Assessment every 1-4 hours prn severity of symptoms and intensity of treatments
- Assess quality and bilaterality of breath sounds and need for suction and suctioning (e.g., increased peak pressures/rhonchi)
- If your patient is on a ventilator, always assess the patient first, ventilator second!
- Evaluate arterial blood gases (ABGs)
- Document SPO_2 (pulse oximetry) and $ETCO_2$ (end tidal CO_2) if present
- Document location of endotracheal tube (ETT) once chest x-ray has confirmed proper position (e.g., 23cm @ lip)
- Assess for skin breakdown around ETT holder
- Ventilator weaning trials as appropriate
- VAP Bundle: head of bed (HOB) at 30 degrees (when tolerated), oral care every 2-4 hours, daily weaning

GI/Genitourinary (GU)

- Assessment of abdomen and all tubes q 1-4 hours. Irrigate as appropriate and ensure patency of all tubes/drains.
- Ensure no skin breakdown at tube sites and all are secured appropriately
- Date of last bowel movement (BM)
- Daily assessment of nutrition: when to start and what type is appropriate
- Sliding scale or insulin infusion for glycemic management
- Hourly urine output and daily fluid balance
    - With COVID-19, likely will initiate fluid sparing resuscitation
- Need for indwelling urinary catheter assessed daily: must be secured, tubing below bladder, bag never in bed or on floor
    - CAUTI Prevention

SKIN

- Critically ill patients are at highest risk for breakdown; follow institutional guidelines regarding specialty beds for critically ill patients
- Turn and reposition every 2 hours
- Heels floated or pressure reducing boots
- Check all pressure point areas, especially where tubes are secured
- Document using institutional skin/pressure injury tool/scale every 4 hours

LINES

- Peripheral intravenous (PIV), central lines and arterial lines needed to be assessed continually and charted every 1-4 hours, depending on institutional protocol
- Central lines dressing changes every 7 days with Chlorhexidine gluconate (CHG) () (or per facility policy)
- Arterial line (AL) dressing and tubing changes every 7 days (or per facility policy)

COVID resources

American Association of Critical-Care Nurses – the education is free, but you have to create a free account

https://www.aacn.org/newsroom/coronavirus-update?sc_camp=D89A9158E9C34910A638BAF9931DE4F0&_zs=ru2Ja&_zl=n5B22

- Scroll down to the "AACN Clinical Resources" section
- Click on the different bullets under "PULMONARY" – there are some really awesome videos

  Watch:
  - Evidence-Based Early Recognition and Management of ARDS Drives Outcomes
  - Standard vs. Alternative Vent Modes: What's the Difference?
  - Why Prone? Why now? Improving Outcomes for ARDS patients.

American Nurses Association

ANA Enterprise COVID-19 Resource Center
- https://www.nursingworld.org/coronavirus

ANA's COVID-19 Self-Care Package for Nurses
- https://www.nursingworld.org/continuing-education/anas-covid-19-self-care-package-for-nurses/

ANA Webinar Series – FREE on demand
- https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=&eventid=2285760&sessionid=1&key=2937CB7A2F02B094D7E87DF06AAB71C5&regTag=941556&sourcepage=register
  - Ventilator Management: Essential Skills for Non-ICU Nurses
  - Be Confident Protecting Yourself and Providing the Best Care to Your Patients during this COVID-19 Pandemic
  - How to Respond to Ethical Challenges and Moral Distress during the COVID-19 Pandemic

Body Interact: Free COVID-19 simulated patient
- https://covid19.bodyinteract.com/#biapp

Centers for Disease Control

Calculating PPE Burn Rate
- https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/burn-calculator.html

Implementing Safety Practices for Critical Infrastructure Workers
- https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html

Use of Cloth Face Coverings to Help Slow the Spread of COVID-19
- https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

Cochrane Library – great resources regarding care of the patient

- Coronavirus (COVID-19): evidence relevant to critical care: Available at: https://www.cochranelibrary.com/collections/doi/SC000039/full
- Coronavirus (COVID-19): infection control and prevention: Available at: https://www.cochranelibrary.com/collections/doi/SC000040/full

Features, Evaluation and Treatment Coronavirus (COVID-19) – great resources regarding overview and care of the COVID-19 patient

- https://www.ncbi.nlm.nih.gov/books/NBK554776/

Handbook of COVID-19 Prevention and Treatment: Lessons learned from China
https://video-intl.alicdn.com/Handbook%20of%20COVID-19%20Prevention%20and%20Treatment.pdf

JAMA: Care for the Critically Ill Patients with COVID-19
Murthy, S., Gomersall, C. D., & Fowler, R. A. (March 11, 2020). Care for the Critically Ill Patients with COVID-19. JAMA. Available online at: https://jamanetwork.com/journals/jama/fullarticle/2762996

Maryland Framework for the Allocation of Scarce Life-sustaining Medical Resources in a Catastrophic Public Health Emergency
https://www.law.umaryland.edu/media/SOL/pdfs/Programs/Health-Law/MHECN/ASR%20Framework_Final.pdf

National Institute of Health
COVID-19 Treatment Guidelines
- https://covid19treatmentguidelines.nih.gov/introduction/

Occupational Safety and Health Administration – Guidance on Preparing Workplaces for COVID-19
https://www.osha.gov/Publications/OSHA3990.pdf

Society of Critical Care Medicine – again, the education is free, but you have to create a free account

- Click on the link "Critical Care for Non-ICU Clinicians" = GREAT resource https://www.sccm.org/disaster
- U.S. ICU Resource Availability for COVID-19 https://sccm.org/getattachment/Blog/March-2020/United-States-Resource-Availability-for-COVID-19/United-States-Resource-Availability-for-COVID-19.pdf?lang=en-US

University of Washington Medicine – great site for algorithms and patient care protocols
https://covid-19.uwmedicine.org/Pages/default.aspx

YouTube has some great mini clips and teaching videos for some very basic skills for critical care:

- https://youtu.be/zf28Rjbu3VM (Vasopressors Explained Clearly: Norepinephrine, epinephrine, vasopressin, dobutamine….)
- https://youtu.be/okg7uq_HrhQ (How Coronavirus Kills)
- https://youtu.be/E_6jT9R7WJs (Prone positioning)
- https://www.youtube.com/watch?v=YC4bnI16KPg (Into to Hamilton G5 Ventilator – teaches how vents work)

Vanderbilt University Medical Center

COVID-19 Database

- http://researchguides.library.vanderbilt.edu/covid19ebp

Links to Expert Resources

American College of Surgeons

https://www.facs.org/covid-19

American Nurses Association

https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/

Centers for Disease Control

https://www.cdc.gov/coronavirus/2019-ncov/index.html

Emergency Care and Research Institute

https://www.ecri.org/coronavirus-covid-19-outbreak-preparedness-center

National Association of Clinical Nurse Specialists

https://nacns.org/professional-resources/covid-19-resources/

World Health Organization

https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Please note: As new and relevant articles are published they are posted on the ASPAN website at https://www.aspan.org/Home/COVID-19

Sample Critical Care Unit Skills Training Checklist

	Date Completed	Preceptor Initials
Cardiovascular		
▪ Echocardiogram		
o Contrast administration		
o Bubble study		
▪ Defibrillator		
o Review use		
▪ Pacemaker insertion and management/monitoring		
o Box- supply/equipment review		
o Nursing role during insertion		
▪ Therapeutic Hypothermia		
o Equipment		
o Policy		
▪ Transesophageal Echocardiogram		
o Nursing role during procedure		
GI/GU		
▪ Bladder Pressure Monitoring		
o Equipment set-up		
o Procedure review		
▪ Endoscopy (Colonoscopy/EGD)		
o Nursing role during procedure		
▪ Temperature Sensing Urinary Catheter		
o Equipment		
Neurological		
▪ Train of Four		
o Equipment		
▪ Bispectral Index (BIS) or electroencephalogram (EEG) Monitor		
o Equipment		
Respiratory		
▪ Chest Tubes		
o Equipment		
o Nursing role during insertion		
o Troubleshooting		
▪ Bronchoscopy		
o Nursing role during procedure		
▪ Intubation/Extubation		
o Nursing role during procedure(s)		

	Date Completed	Preceptor Initials
▪ Positive Pressure Ventilation (BiPAP, CPAP, Mechanical Ventilation)		
o Equipment		
o Rationale for each		
o Troubleshooting		
***Infusion Devices*:**		
▪ Infusion Pumps		
▪ Patient Controlled Analgesia (PCA) Pump		
▪ Enteral Feeding Pump		
▪ Epidural Pump		
▪ Magnetic Resonance Imaging (MRI) Pump		
Medications/Medication Policies:		
▪ Blood Administration		
▪ Continuous IV Sedation		
o Lorazepam, dexmedetomidine, propofol, midazolam		
▪ Continuous IV Analgesics		
o Fentanyl, morphine, ketamine		
▪ Diabetic ketoacidosis (DKA) Protocol		
▪ Heparin Protocol		
▪ Insulin		
o Diabetic ketoacidosis (DKA)/Non-KDA		
o Online calculators		
▪ Moderate Sedation		
▪ Neuromuscular Blocking Agents		
▪ Total parenteral nutrition (TPN): Policy, Tracking Flowsheet		
▪ Vasopressors:		
o Dopamine, dobutamine, norepinephrine, phenylephrine, vasopressin		
Miscellaneous Policies:		
▪ Cardiac Arrest		
o Nursing Role		
o Policy Review		
▪ Rapid Response		
o Nursing Role		
o Policy Review		
▪ Restraints		
o Acute Med-Surg, Non-Violent Behaviors		
o Violent Behaviors		

	Date Completed	Preceptor Initials
Obtaining Lab Specimens:		
▪ Blood sampling		
o Arterial Line		
o Central Line (Introducer)		
o PICC Line		
o Peripheral IV		
o Peripheral Draw		
o Blood Cultures		
o Other		
o Pulmonary Artery Catheter		
Vascular Access:		
▪ Arterial Line		
o Nursing role		
o Troubleshooting		
▪ Central Line (Introducer/Triple Lumen)		
o Equipment		
o Nursing role during insertion		
o Management		
o Pressure monitoring (CVP to Monitor)		
▪ PICC Line		
o Management		
o Pressure monitoring (CVP to Monitor)		
▪ Peripheral IV Insertion & Management		
▪ Pulmonary Artery Catheter		
o Equipment for insertion		
o Monitor set-up		
o Nursing role		
o Obtaining measurements		
o Transducer set-up		
o Troubleshooting		
o Vasoactive intestinal polypeptide (VIP) vs. Thermodilution (TD) catheter		

Surge Care in the PACU: COVID-19

The perianesthesia setting is recognized as a site for possible unrecognized exposure to COVID-19. It is therefore imperative to implement measures to mitigate perianesthesia transmission. Nosocomial transmission represents a serious threat.

Goal: To protect and ensure the safety of perianesthesia health care workers and patients by preventing nosocomial transmission of the coronavirus.

Issue	Concerns	Solutions
More ICU beds needed to cope with surge of critical care patients – proposed use of PACU	• Limited physical space • 6 feet required between patients • PACU is not designed for infectious diseases spreading via respiratory droplets (not negative pressure)	• PACU as back-up for non-respiratory ICU patients, staffed by ICU nurses • PACU for recovery of patients post-anesthesia, angiography, interventional radiology (IR) staffed by PACU nurses • Respiratory post-anesthesia patients recovered by PACU staff in the OR or in the ICU • Use GI lab/medical procedure units for recovery of GI/bronchoscopy pts
Staffing	• Residents, respiratory therapists not always available to PACU immediately • Potential for delay in medical orders	• Preparation and assignment of residents and RTs to PACU
Proper droplet, sputum, and bodily fluids precautions	• Negative pressure room(s) in the PACU	• Infection prevention and control measures per regulatory agencies and institutional policy (contact, airborne, droplet) • Monitoring of staff • Limited visitation • Temporary redesign of the PACU to accommodate COVID-19 patients by creating unit-wide negative pressure

Issue	Concerns	Solutions
Proper decontamination processes	• Single environmental services (EVS) person assigned to all perianesthesia depts • Plans to terminally clean PACU areas between patients and when the surge is over	• Dedicated EVS for PACU • Ultraviolet (UV) irradiation for isolation
Adequate supply of personal protective equipment	• Limited supply available	• Masks • Gowns and gloves • Face shields/goggles • Powered Air-purifying Respirator (PAPR)/Controlled Air Purifying Respirator (CAPR) • Footwear • Supply based on patient volume, staffing, and real-time consumption
High-efficiency particulate air (HEPA) filter use	• How many would be needed to filter the entire PACU • If emitting to outside, any possibility of transmission of pathogens thru intake vents of nearby buildings	• Assess area by PACU windows to ensure pathogens would not be transmitted to nearby buildings • Define schedule for changing filters • Supply based on patient volume, staffing, and real-time consumption

Source: Qiu, H., Tong, Z., Ma, P. *et al.* (2020). Intensive care during the coronavirus epidemic. *Intensive Care Medicine*. Retrieved from https://doi.org/10.1007/s00134-020-05966-y

APPENDIX A

Strategies for Caring for the Nurse: Home Recipes

- ***Do it yourself: Clorox Wipes***
  - ***1 cup water***
  - ***2 tsp bleach***
  - ***2 tsp dish soap***
  - ***6 drops essential oil (optional)***

- ***Do it yourself: Lysol Wipes***
  - ***1 cup water***
  - ***6 Tbsp 91% isopropyl alcohol***
  - ***2 Tbsp dish soap***
  - ***6 drops essential oil (optional)***

- ***Do it yourself: Baby Wipes***
  - ***1 cup water***
  - ***1 Tbsp liquid baby bath soap***
  - ***2 Tbsp baby oil or coconut oil***

- ***Do it yourself: Gentle Disinfecting Wipes***
  - ***1 cup water***
  - ***6 tsp white vinegar***
  - ***2 tsp dish soap or baby shampoo***
  - ***6 drops essential oil (optional)***

Soak paper towels or fabric in solution.
Wring out to "just moist enough"
Store in airtight container

No hand gel at the store?
Make your own - it's simple! Buy rubbing alcohol (preferably at least 91% isopropyl alcohol since the final product needs to be at least 60%) and plain aloe vera gel (It's usually near the sunscreens.) Mix 3 parts rubbing alcohol with 1 part aloe vera gel. Use a funnel to pour into a dispenser. Voila! Proper hand washing with soap and water is better but is not always available.

Bleach and **ammonia** are two common household cleaners that should never be mixed. They react together to form toxic vapors!!!

**Also – do not use more than directed, use caution when mixing, wear protective gear, ensure good ventilation!
Lastly, please store ALL chemicals out of reach of children.

Do it yourself: Handmade Face Masks

Use of homemade masks:

In settings where facemasks are not available, HCP might use homemade masks (e.g., bandana, scarf) for care of patients with COVID-19 as a last resort. However, homemade masks are not considered PPE, since their capability to protect HCP is unknown. Caution should be exercised when considering this option. Homemade masks should ideally be used in combination with a face shield that covers the entire front (that extends to the chin or below) and sides of the face. (CDC. (March 17, 2020). Strategies for optimizing the supply of facemasks. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html)

Patterns for homemade masks can be found at the following sites:

- https://www.sewcanshe.com/blog/5-free-diy-face-mask-tutorials-using-fabric
- https://www.craftpassion.com/face-mask-sewing-pattern/
- https://so-sew-easy.com/face-mask-sewing-patterns/

In some cases, the suggestions for filters vary.

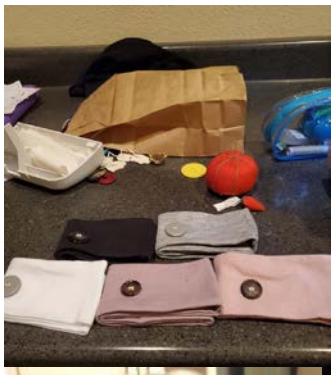
- If you add a filter pocket, suggestions include:
  - HEPA vacuum cleaner bags (cut to fit), non-woven interfacing (usually polyester - varying thickness), HEPA furnace filters (need to ensure correct side for face is used).

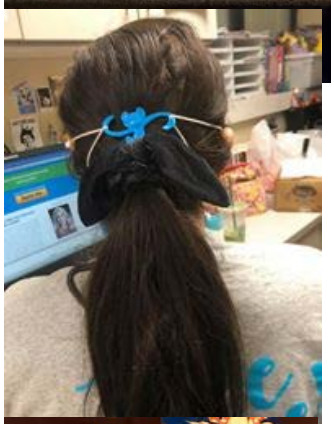
It is advisable to use NIOSH approved PPE at all times but follow institutional protocols and all of these would be better than nothing or a scarf/bandana!

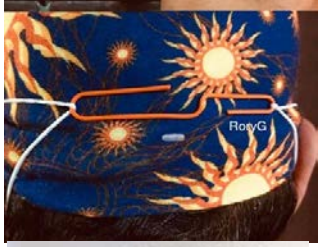
Additional Reading:

Mason, D. J., & Friese, C. R. (2020). Protecting health care workers against COVID-19 – and being prepared for future pandemics. *JAMA*. Retrieved from https://jamanetwork.com/channels/health-forum/fullarticle/2763478

MacIntyre CR, Seale H, Dung TC, et al. 2015. A cluster randomised trial of cloth masks compared with medical masks in healthcare workers. BMJ Open 2015;5:e006577. doi: 10.1136/bmjopen-2014-006577







MORE GREAT INNOVATIONS!!
How to protect your ears from prolonged masks wearing!!!

Try using a headband with two buttons sewn onto the sides where the ear elastic can sit and not put pressure on your ears!

Other solutions?

- Try a paper clip
- Commercial plastic ear protectors
- Use your pigtails
- Crochet a small band and sew buttons on both ends to loop the ear elastic around

How to protect your skin from prolonged masks wearing!!!

Two major problems exist from prolonged mask wearing:

1. Masks can produce tremendous prolonged pressure on delicate facial tissue, particularly across bony areas like the nose
2. Masks can trap heat and humidity which can lead to greater skin irritation

What can you do?

- Avoid wearing makeup
- Keep your skin clean
- Keep your skin moisturized (best applied ½ hour before donning the mask)
- Provide your skin breaks every two hours if you can
- Avoid dressings – this changes the fit of the mask

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