SASA COVID-19 UPDATE

Issued 7 May 2020 Version 5.0

SASA Recommendations on Personal Protective Equipment (PPE) for anaesthesia providers during the COVID-19 pandemic

Due to the rapidly changing nature of the pandemic, these recommendations may change with time. This version has been updated on **6 May 2020 at 21h00.** Allowing time for the revisions…… Corrections, updates and suggestions may be directed to covid19@sasaweb.com This document is intended to update and replace earlier versions, and incorporate the SASA PPE Update and Position Statement published on 4 April 2020.

Summary of minimum recommended PPE for COVID-19

Routine care during COVID-19 (all clinical care in all areas)	**High-risk procedures* in *all* patients** (includes asymptomatic and/or COVID negative)
Surgical mask Disposable gloves Apron (Recommended: Eye protection)	Fit-tested N95/FFP2 respirator** or better Disposable gloves Apron Eye protection and/or full face shield
High-risk procedures for COVID-19 patients (including persons under investigation)	
Fit-tested N95/FFP2 respirator** or better Impermeable long-sleeve gown Eye protection and/or full face shield Disposable cap Disposable gloves (ideally double gloves) Disposable shoe covers (as per clinical area)	

*High-risk procedures are those that generate aerosols, **including intubation** (see below)
**The term 'respirator' includes disposable N95 and other 'masks' which filter inspired air.

WHAT'S NEW IN THIS UPDATE?

- **N95 respirators recommended for *all* intubations**
- **Updated decision tree and PPE use matrix**
- **Increased clarity on (not) reusing disposable PPE**

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Introduction

Healthcare workers as a group are at high risk of infection with SARS-CoV-2 and the subsequent development of COVID-19 during the current pandemic. Anaesthesia providers are frontline staff often involved in managing critically ill COVID-19 patients, and are at particularly high risk due to their likelihood of performing aerosol-generating procedures such as tracheal intubation. Furthermore, the training and skill sets of anaesthesiologists make them ideal candidates to expand the capacity for providing intensive care, as ICUs are overwhelmed. Protecting the practitioners to safeguard the workforce is therefore particularly important.

South Africa has clearly moved from a containment to a mitigation phase in terms of the COVID-19 pandemic. Most COVID-19 infections in the country are through community transmission, so it is essential to focus on protection of staff, social isolation and "flattening the curve" of cases to prevent the healthcare system from being overwhelmed. We must therefore all be champions in our communities, and in promoting preparedness in every facility in which we work. Adequate quantities of, and training in the use of personal protective equipment is essential in this context.

The very broad criteria for identification of persons under investigation (PUIs) and reality of pre- and asymptomatic transmission coupled with the only 70% sensitivity of the current mainstream PCR testing mean that healthcare workers are working in an environment of mandated caution. All current figures indicate that, as in other countries, HCWs in SA will form a significant proportion (8-10%) of COVID-19 cases. As anaesthesiologists, we are exposed to the highest transmission risk (aerosol-generating) procedures, and must therefore take enhanced precautions. In the ideal situation, all HCWs would be enabled to use AGP PPE for any procedure that could progress to aerosol generation, but we acknowledge that where PPE supply is limited, a responsible approach needs to be adopted.

Worldwide, supplies of PPE are constrained by greatly increased usage, panic purchasing and hoarding by the general public, impact of border closures on distribution, and impact of the disease on production facilities. We must therefore educate the public and practitioners alike in the appropriate levels and use of PPE, and ensure that our recommendations allow for the constraints in resource-limited settings. See WHO guidance on the rational use of PPE. There is also significant concern regarding counterfeit respirators flooding the market. Please see the CDC guidance regarding known counterfeits.

This guidance therefore serves to propose a rational individualised approach to selection of PPE on a per-patient-per-procedure basis.

SASA's five key messages to enhance protection and reduce transmission

Personal interventions:

1. Know how to protect yourself in clinical practice (see WFSA guidelines).
2. Apply social distancing and/or self-isolation to protect yourself and your family.
3. Recognise and take steps if you are at higher risk of morbidity and mortality from COVID-19.

Workspace interventions:

4. Engage immediately at facility level to prepare for the surge of COVID-19, including ensuring adequate supplies and training in the use of PPE.
5. Know what to do in the case of occupational exposure.

General principles

Administrative controls

All healthcare providers should be trained in infection control and prevention strategies, and in procedures for donning and doffing PPE. Simulation is particularly useful; a clearly marked set of simulation items can be reused, thereby avoiding supply depletion.

Healthcare facilities should provide healthcare workers with adequate PPE and isolation facilities to meet the requirements for airborne, droplet and contact precautions.

Patient rooms with suspected or confirmed COVID-19 should be labelled with a sign (such as available in the NICD IPC Guidelines), so that all healthcare workers and support staff are aware of the risk before entering the area. Although single isolation units are preferred, it is acceptable to triage people with possible COVID-19 together while awaiting diagnostic results.

Environmental controls

This aims to reduce the contamination of surfaces and inanimate objects. Patients and health workers should wash their hands with soap and water or alcohol-based handrub. Rooms should provide adequate space to allow social distance of at least 1 m to be maintained between patients and between patients and healthcare workers. Particular attention needs to be given to spacing of beds in areas such as theatres and recovery rooms, where the event of large equipment is also required (See NICD IPC Guidelines)

Measures directed towards patients

Patients should be instructed to wear a disposable face mask to limit droplets spread by coughing, and encouraged to practice good cough etiquette and hand hygiene through either regular washing with soap and water (preferred) or alcohol-based solutions (>70% alcohol required).

PPE for general management of COVID-19 patients

SASA has been guided by the recommendations of the World Federation of Societies of Anaesthesiologists (WFSA), World Health Organisation, United States CDC and other specialist organisations, and have drawn heavily on their expertise. A list of resources can be found at the end of this document.

It has become increasingly apparent that the supply of PPE internationally has been inadequate to meet the demand of caring for victims of the pandemic. Recent statements issued by organisations such as the ASA/ASPF/AAAA/AANA and AAGBI/RCOA/FICM illustrate the desperate ethical challenge facing clinicians - provide care without adequate protection, or deny care to some patients in order to preserve the most crucial resource: the staff themselves.

To avoid depleting PPE supplies during the pandemic, routine personal protection (eg. regular hand-washing and non-sterile gloves) used for non-COVID-19 patients should be supplemented by additional PPE for care of confirmed or suspected COVID-19 patients. This means that PPE for **contact and droplet precautions** should be used at all times. If sufficient resources exist and caseload is low, isolation rooms and additional application of **airborne precautions** may be possible, but is unlikely in low-resource settings or when caseload increases. **Any high-risk or aerosol-generating procedures (including *all* intubations) should make use of an enhanced level of PPE** (See below).

It is increasingly apparent that pre- and asymptomatic patients can transmit SARS-CoV-2, particularly during aerosol-generating procedures such as intubation. Optimal PPE for *all intubations* (regardless of COVID status) therefore includes an N95/FFP2 or better respirator and eye protection. In contingency or crisis situations where stocks of PPE are unsatisfactory, stratifying PPE use according to the assessed risk is prudent, but does not absolve the facility of a responsibility to acquire adequate levels of PPE.

Principles of PPE use:

- In order to provide adequate care, it is reasonable for HCWs to expect their environment to be safe and not place them at unnecessary risk. The first rule of care is to ensure safety of one's surroundings.
- It is indefensible and unethical for a healthcare worker to undertake patient care as part of a team where another member of the team participates without access to or not wearing appropriate PPE.
- The NICD guidelines provide reference for appropriate PPE use. The latest version (released in April 2020) can be accessed here.

Decisions relating to procedural care and PPE use:

There is clarity regarding appropriate use of PPE and AGP PPE. It must however be appreciated that all documents are guidelines, and cannot reasonably cater for every patient,

procedure and circumstance. Specific issues (by example and not limited to the following) not considered in many guidelines include:

- Procedural conduct around asymptomatic or false-negative patients (approximate 30% false-negative rate for PCR testing with nasal and oropharyngeal swabs)
- Procedures which unexpectedly require an AGP (e.g. unplanned intubation after failed regional anaesthesia or during a prolonged procedure)
- Procedures for which transmission is unproven but which may be inherently more likely to be AGP (e.g. hip fracture under spinal anaesthetic that requires reaming or high-power drills).
- Requirement for appropriate time for donning and doffing, which would not be achieved in many rapidly evolving situations, leaving either the patient or practitioner at risk.

Principles of the SASA Proposed Procedural PPE Pathway

- The pathway is a guideline for decision making in selecting appropriate PPE and not an absolute or exhaustive pathway.
- A reasonable and responsible approach to utilisation and conservation of PPE should always be considered (e.g. Keep N95 respirator on for longer durations and to protect the HCW for multiple sequential patients and in accordance with correct infection control procedures). This includes decision making on the least number of staff required to participate in a procedure should resource limited PPE be mandated for use.
- Where dispute arises, reference to the dispute resolution points is encouraged.
- Ensuring healthcare workers are appropriately protected from harm and illness in an effort to ensure a sustainable healthcare workforce.

Recommended PPE for routine care during the COVID-19 pandemic

- Disposable gloves
- Disposable apron
- Face mask (disposable surgical mask)
- Eye protection (glasses, goggles or face shield) highly recommended
- Surgical gown if sterile procedure

Hand hygiene should be practiced as per the WHO "5 moments" campaign. Importantly, hands must be washed or have alcohol hand scrub decontamination **before and after removing gloves**, as well as after removal of other protection (apron, mask, etc).

This level of PPE is appropriate for clinical examination, preoperative assessment, transfer of patients between care areas, and post-operative visits. Importantly, **all** staff (including nursing staff and porters) must be adequately alerted and trained in the correct use of PPE. N95/ FFP2 respirators are **not** required for these tasks, and should be reserved for high-risk procedures (See below).

Enhanced PPE for intubation and other high-risk aerosol-generating procedures

Examples of aerosol-generating procedures (AGPs)

- Intubation
- Extubation
- Bronchoscopy and other endoscopy
- Airway suctioning
- Cardiopulmonary resuscitation
- Jet ventilation
- Tracheostomy
- Possibly: High-flow nasal oxygen therapy

Recommended PPE for AGPs:

- A fit-tested N95/FFP2 respirator or alternative of equivalent standard
- Eye protection and/or full face shield
- Long-sleeved, preferably impermeable gown
- Disposable head covering/theatre cap
- Double gloves (preferably long gloves over gown)
- Disposable shoe covers dependant on institutional policy

Despite the lists provided above, much confusion and debate exists in the literature regarding what may be considered aerosol-generating, and whether certain procedures (such as laparoscopy and the use of high-speed drills) can cause airborne transmission of SARS-CoV-2.[1] **It is clear, however, that intubation and extubation are strongly associated with risk of transmission of SARS viruses.**[2,3] It is also increasingly apparent that transmission of SARS-CoV-2 can and does occur from pre- or asymptomatic patients.

To provide protection against transmission by pre- and asymptomatic patients, **for *all* routine intubations and extubations in non-COVID/non-PUI patients, standard PPE (gloves, apron and eye protection) enhanced by an N95 (or equivalent) respirator is mandated.** The use of additional items (long sleeve gowns, caps, double gloves and shoe covers) can be determined by the institutional and procedural requirements.

Recommendations for performing high-risk procedures:

- Use of a checklist for preparation and performance is advisable.
- Enhanced PPE (as above) must be donned before entering the procedural area.

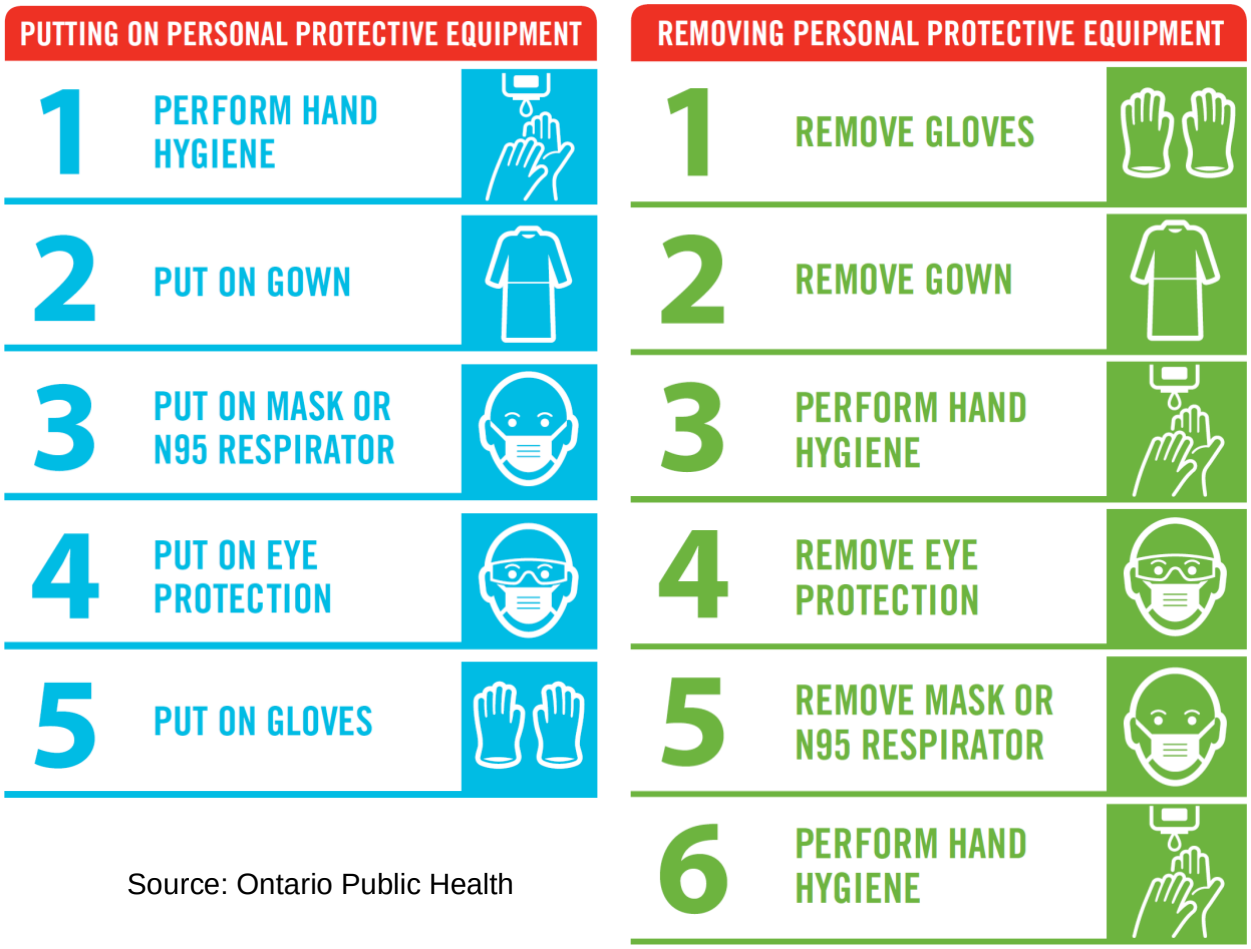
[1] NHS Health Protection Scotland review: Aerosol Generating Procedures: https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2893/documents/1_tbp-lr-agp-v1.pdf
[2] Tran *et al* PlosOne 2012: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3338532/
[3] Fowler *et al* Am J Resp Crit Care Med 2003 http://www.linkicu.org/LINKICU/experts/docs/Fowler_Infection_Risk.pdf

- A “PPE-coach” to supervise donning and doffing PPE is advised.
- Limit personnel in the room to the minimum required.
- Negative-pressure rooms (if available) may confer a benefit in limiting aerosol spread
- Use of disposable equipment is advisable.
- The most experienced clinician should perform the procedure.
- Video laryngoscopy, RSI and avoidance of awake tracheal intubation is recommended.
- High efficiency particle or at least heat and moisture exchange filters (HMEFs) should be used on all ventilatory devices to limit droplet and aerosol spread.
- Closed suction devices should be connected at the time of intubation to avoid unnecessary disconnections for suctioning.
- Consider avoiding high-flow nasal cannulae/CPAP/BiPAP to reduce aerosol generation.[4] If needed, negative-pressure rooms would be ideal.
- Disposable equipment should be bagged for disposal in the room. Placement of a cart with sterilisation solutions for reusable equipment in the anteroom or at the doorway to allow immersion for decontamination and disinfection is advisable.
- Correct doffing of PPE (including hand hygiene at each step) should be observed by the PPE coach to ensure compliance.

See the SASA Recommendations for Airway Management in COVID-19 Patients. A thorough resource for airway management of COVID-19 patients is available on OpenAirway.

A note on masks and respirators: N95/N99/FFP2/FFP3 devices are commonly referred to as masks, but these are in fact disposable respirators, as they are designed to filter inspired air and protect the user, rather than prevent droplet contamination from the user to others. Therefore in no circumstances should N95 respirators be provided to patients, as their use will most likely exacerbate dyspnoea.

[4] May be the best course of action if ventilators are in short supply. See PMID 30336170, 30705129, and 25392954

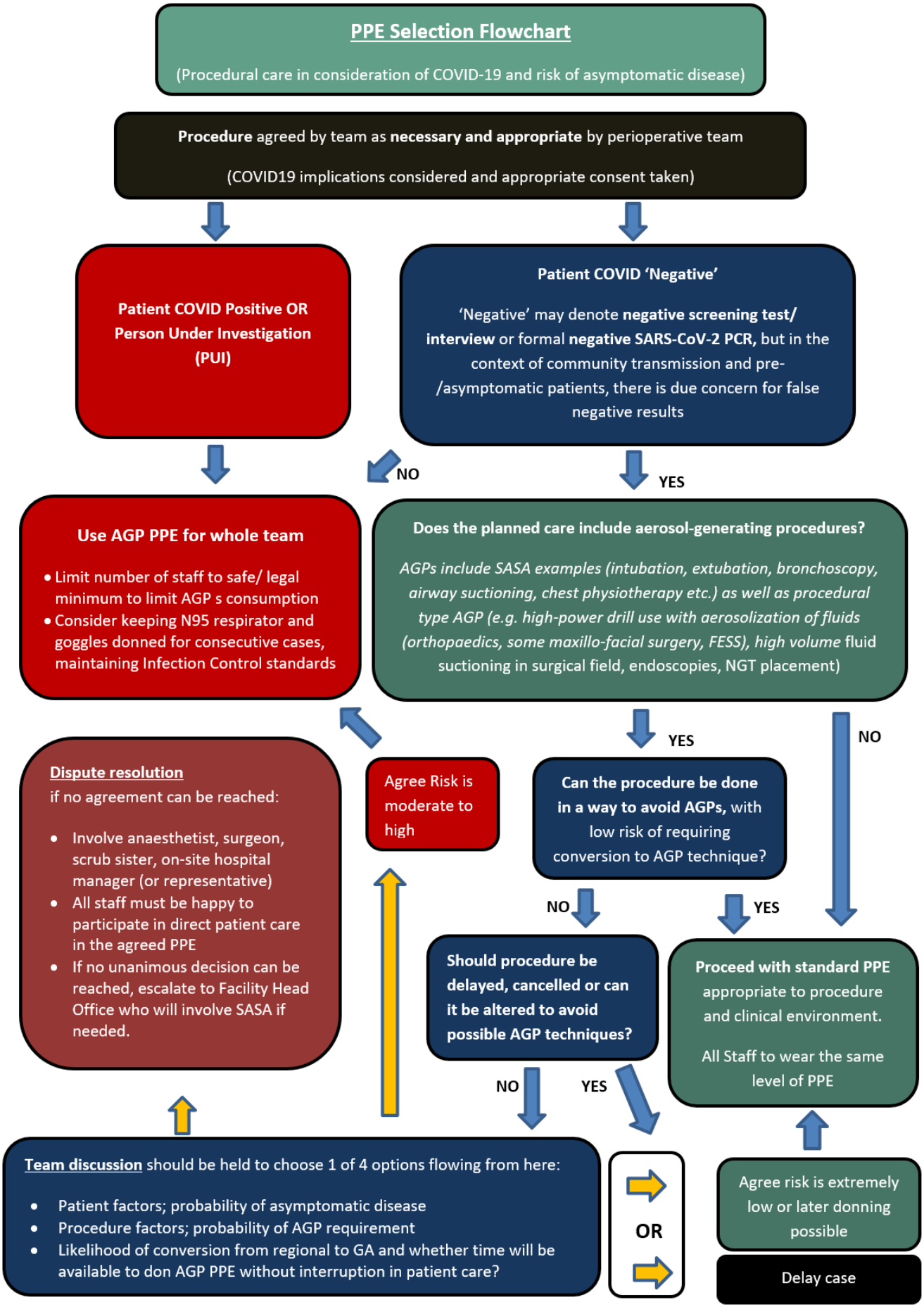


Source: Ontario Public Health

How to fit a respirator:

Respirators must be correctly fitted to be effective. This is done by conducting a fit-test using a test kit. In the absence of a test kit, health workers should 'don' the respirator, making sure it has a tight seal. Mould (do not pinch) the respirator over the bridge of your nose. Breathe out deeply against the resistance of the respirator and check for any air leaking from the sides. Breathe in deeply and again make sure there is not air entering the mask from the side. Facial hair like beards prevent a good seal and should be shaved off. The orange duckbill respirators expand and contract as you breathe through them. When removing ('doffing') the respirator, only touch the straps and not the respirator itself. In the absence of an adequately fitted respirator, powered air purifying respirator (PAPR) devices can be used.

A good video demonstration of respirator fitting/donning is available online here.


PPE Selection Flowchart
(Procedural care in consideration of COVID-19 and risk of asymptomatic disease)
Procedure agreed by team as necessary and appropriate by perioperative team
(COVID19 implications considered and appropriate consent taken)
Patient COVID Positive OR Person Under Investigation (PUI)
Patient COVID 'Negative'
'Negative' may denote negative screening test/ interview or formal negative SARS-CoV-2 PCR, but in the context of community transmission and pre-/asymptomatic patients, there is due concern for false negative results
NO
YES
Use AGP PPE for whole team
• Limit number of staff to safe/ legal minimum to limit AGP s consumption
• Consider keeping N95 respirator and goggles donned for consecutive cases, maintaining Infection Control standards
Does the planned care include aerosol-generating procedures?
AGPs include SASA examples (intubation, extubation, bronchoscopy, airway suctioning, chest physiotherapy etc.) as well as procedural type AGP (e.g. high-power drill use with aerosolization of fluids (orthopaedics, some maxillo-facial surgery, FESS), high volume fluid suctioning in surgical field, endoscopies, NGT placement)
YES
NO
Dispute resolution
if no agreement can be reached:
• Involve anaesthetist, surgeon, scrub sister, on-site hospital manager (or representative)
• All staff must be happy to participate in direct patient care in the agreed PPE
• If no unanimous decision can be reached, escalate to Facility Head Office who will involve SASA if needed.
Agree Risk is moderate to high
Can the procedure be done in a way to avoid AGPs, with low risk of requiring conversion to AGP technique?
NO
YES
Should procedure be delayed, cancelled or can it be altered to avoid possible AGP techniques?
Proceed with standard PPE appropriate to procedure and clinical environment.
All Staff to wear the same level of PPE
NO
YES
Team discussion should be held to choose 1 of 4 options flowing from here:
• Patient factors; probability of asymptomatic disease
• Procedure factors; probability of AGP requirement
• Likelihood of conversion from regional to GA and whether time will be available to don AGP PPE without interruption in patient care?
OR
Agree risk is extremely low or later donning possible
Delay case

PPE Selection Guide Post Team Discussion/ Flowchart

(Negative Screen or Positive Screen with Negative Test requiring necessary procedures)

RECOMMENDED STANDARD (NEW NORMAL) FOR GA

- Viral (ideally HEPA) filter on expiratory limb
- Practice safe airway techniques, avoid cough, avoid airway leaks
- Avoid aerosol-generating devices
- Use aerosol-limiting devices (e.g. plastic sheeting peri-extubation
- Extubate IN operating theatre
- Surgical mask on patient prior to leaving theatre
- Preserve theatre ventilation
- Standard PPE plus N95 respirator for intubation/extubation

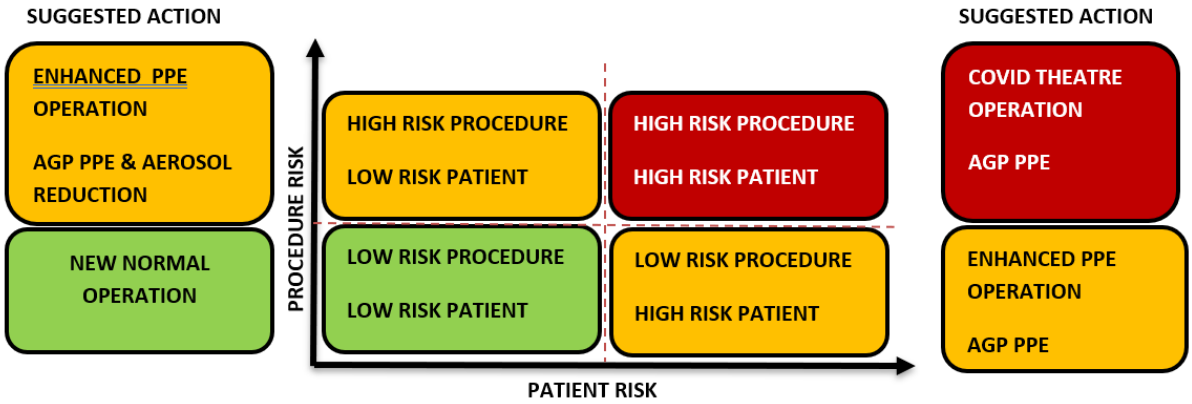
ENHANCED PPE OPERATION

- All standard precautions

AND

- In-line/ closed suction for each case
- Ensure NO aerosol-generating devices OR use aerosol-limiting devices AND/OR AGP PPE for all staff in theatre

PPE MATRIX - RISK & ACTION SELECTOR



NOTES

- HIGH RISK PROCEDURES: AEROSOL GENERATING PROCEDURES
- HIGH RISK PATIENT: Positive contact; travel history; HCW in contact with COVID
- Patient unable to screen to be treated as PUI
- NO URGENT COVID THEATRE OPERATION AFTER HOURS
- PPE Definitions as per SASA GUIDELINE – AGP PPE: Gown, Visor, N95, Gloves

Guidance on the use of N95 respirators during the CoVID-19 pandemic

Indications for use of N95 respirators

- ✓ Used for protection of **healthcare workers only**
- ✓ Worn during care of patients with **airborne diseases** e.g. pulmonary TB, measles, varicella (chicken pox)
- ✓ For droplet-transmitted diseases e.g. influenza, CoVID-19, N95's are worn for **aerosol producing procedures only.**

Types of N-95 respirators available:



Aerosol producing procedures are:

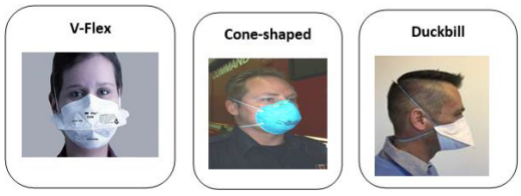
manual bag-mask ventilation
tracheal intubation
non-invasive ventilation (BIPAP, CPAP and high flow)
open suctioning
tracheotomy
bronchoscopy
cardiopulmonary resuscitation

Priority areas for provision of N-95 respirators are:

- ✓ CoVID-19 triage areas and isolation wards
- ✓ Intensive care and high care units
- ✓ Operating theatres with CoVID-19 cases
- ✓ TB and other airborne isolation rooms

Care of and re-use of N95 respirators for care of patients with pulmonary TB	Disposal of N95 respirators used during aerosol-producing procedures for CoVID-19
Can be re-used by the same healthcare worker for not more than one week provided that: - the respirator is not damp, damaged or loose. - a seal test is performed before each use - it is stored in a paper bag labelled with HCW's name - hand hygiene is done before & after touching the N95.	As the outside surface of the N95 respirator will become heavily contaminated with virus during aerosol-producing procedures: - the N95 respirator must be discarded in a red box in the patient's room immediately after use - hand hygiene must be performed after removing the N95 respirator and other PPE (goggles, gown and gloves).

How to wear a N-95 respirator:





Perform the seal test with every use to ensure the respirator fits properly around the face and nose

Negative seal check
Cone-shape: cup hands over respirator lightly. Breathe in sharply. No air should leak in around the face. to-Duck- bill + V-flex: Breathe in sharply. The respirator should collapse inwards

Positive seal check
Cone-shape: Cup hands over respirator. Blow out. A build-up of air should be felt with no air leaks.
Duck-bill + V-flex: Breathe out forcefully; the respirator should expand on the exhale.

Source: Western Cape Government Guidance on the use of N95 respirators during the COVID-19 pandemic

Recommendations for practitioners exposed to COVID-19

- If you have occupational exposure with appropriate PPE, you can continue to work with monitoring for symptoms for 14 days. If you become symptomatic, self-isolate.
- If you have occupational exposure without PPE, then you need to self-isolate immediately. Do not visit your GP, but contact your occupational health unit, GP or professional association (eg. SASA) regarding testing, and monitoring of symptoms. As a healthcare worker needing testing during this critical time, SASA believes it would be appropriate for you to ensure that your testing is expedited.

The testing space is particularly dynamic. As April 2, the Minister of Health has moved to a proactive testing strategy with increased capacity, including mobile testing units. Currently, **criteria for testing are persons with acute respiratory illness, with sudden onset of at least one of cough, sore throat, shortness of breath or fever (≥ 38°C measured or a subjective history of fever).** Note that travel or contact history is no longer required. However, this situation is evolving daily, and we encourage practitioners to check the latest NICD guidance and technical resources. This will likely continue to change with new information and tests being developed. An established NICD hotline for Covid-19 is 0800 029 999 or a WhatsApp connection at 0600 123 456.

See the flow-chart in Appendix 2 for additional clarity on managing exposure to COVID-19. For comprehensive guidance for HCWs exposed to COVID-19, please refer to the detailed NICD guidance.

Concepts for dealing with PPE shortages in resource-limited settings

The following guidance is offered for dealing with shortages of PPE:

- Reusable half- and full-face respirators with interchangeable filters are an acceptable alternative to disposable respirators, but require more stringent cleaning and disinfection between uses. Filters should be of P2/P3 standard and changed according to the manufacturer's recommendations. Careful planning and attention to doffing and cleaning is important to ensure the user does not get contaminated during this process (as for any reusable items).
- Aerosol-generating procedures require an N95 respirator. Regular (surgical) face-masks are an **unacceptable** alternative when respirators are not available.
- If surgical mask supplies are severely limited, they should be utilised to protect health workers and not given to patients in an attempt to limit spread. Patients should be advised on cough hygiene.
- If there is a shortage of gowns, their use should be limited to aerosol-generating procedures, activities where splashes or sprays are anticipated, and high-contact

patient care activities. Disposable aprons can be used as an alternative in other situations.

- Permeable, reusable surgical gowns are not ideal for providing protection, but are certainly better than nothing. Where used, they can be donned over a disposable apron, and removed after outer gloves are disposed of, bagged, and sent for washing/sterilisation.
- Pulmonary tuberculosis (PTB) is endemic to South Africa. Patients presenting with symptoms suggestive of PTB (cough for > 2 weeks, weight loss, fever, night sweats) should still be managed by health workers wearing N95 respirators. If a patient with confirmed drug sensitive PTB has been on treatment for two weeks with improving symptoms, it is not necessary to continue to use an N95 respirator. Patients with PTB start becoming less infectious as early as 24 - 48 hours on treatment. Patients with pleural TB or extra-pulmonary TB with no lung involvement do not pose a risk of infection. Ensuring good ventilation by opening windows is important for TB as it spreads through the air via droplet nuclei.
- While it is not recommended to reuse N95 respirators, guidance has been given on reuse by the same health worker in the setting of PTB prevention. The duration depends on the manufacturer, but can be between 6 and 12 cumulative hours. However, as SARS-CoV-2 is spread by contact as well as droplet/aerosol, repeated touching of the mask for doffing, storage and donning for reuse is a significant risk, and **N95 respirators should not be reused for COVID-19**. Wearing a mask for longer periods (until breathing becomes difficult due to moisture saturation) is safer than removal and re-use. In *dire shortages*, it would be preferable to alternate masks that are being reused to allow time for decontamination by UV light or other sterilisation. In this case, always inspect the respirator for signs of damage before reusing it. Steps to reduce risk of contamination could include: (1) Wash gloves while wearing respirator; (2) Remove the respirator after hand washing, touching only the straps, and avoiding touching the inside of the respirator; (3) Store the respirator under UV light or bright sunlight (not a plastic packet, as moisture can damage the filter); (4) Remove gloves and wash hands afterwards.
- There has been a large amount of documentation circulated regarding re-use of PPE, sterilisation of single use PPE, and proposed waiting periods without specific sterilisation of single use PPE. The COVID19 task team has investigated the various references and suggestions. **Universally, any advice regarding re-usability of single-use PPE is not within manufacturer specification, and has not been scientifically validated, and is at best an expert opinion**. Sterilisation and re-use protocols have typically only been validated on a small number of specific combinations of manufacturer and process. While most claims that sterilisation techniques are effective are true with respect to the sterilisation component, the risk and concern remains with whether the mask remains as efficacious in filtering particles (particularly, SARS-nCoV-2 virions), and meets manufacturer required standards. **At this time, SASA cannot endorse any strategy for sterilisation and reuse of disposable respirators.**
- Some authors have proposed methods for safe reuse of non-sterile gloves, gowns and respirators, through the use of rotation systems, immersion in hypochlorite

solutions and exposure to steam treatment and/or ultraviolet radiation, respectively. PPE use should conform to SASA PPE guidance for patient interaction. **Healthcare worker safety cannot be guaranteed and has not been validated using any published protocol for re-use of single use PPE**. While unproven, further evidence in the effectiveness of these methods for COVID-19 in severely resource-limited settings is being actively solicited.

- Various make-shift systems using anaesthetic or diving masks combined with HMEF or HEPA filters have been proposed. This is a rapidly developing field of innovation without formal evidence, and while such systems may be shown to confer good protection, the same provisions regarding meticulous fit testing, doffing and sterilisation apply. It is important for the user of any innovative system of PPE to ensure that the manufacturer has pursued and complied with relevant regulatory requirements in order to ensure HCW safety can be assured.

What to do in a "No PPE" Situation

The Medical Protection Society has published the following in its most recent FAQ document for Covid19: "*While the HPCSA expects health care professionals to put the best interests of patients first there is a strong argument that healthcare workers are a finite resource and the resource needs to be protected for future patients. It is the South African Medical Association's opinion, and we have independent legal advice, that one is not obliged to see or treat a patient in the absence of adequate PPE."*

The HPCSA has published this in its Covid19 guidance:

"6. Personal protective equipment
Employers and employing institutions should take all necessary steps to ensure that staff members are always suitably equipped and afforded personal protective equipment (PPE). Employers also have a responsibility to provide staff with the right information to minimise the risk of transmission. Should PPE not become immediately available, information on what to do may be sought from the NICD's clinical guidance on COVID-19. In this regard, factors to consider include, but are not limited to:

- *whether treatment can be delayed*
- *whether additional steps can be taken to minimise the risk of transmission*
- *prioritisation of practitioners at a higher risk of infection*
- *identification of action likely to result in the least harm under the circumstances."*

It is the SASA COVID19 task team's considered opinion that:

- The requirement for healthcare workers to provide care in a safe environment and not put their lives at risk is an essential proviso of care. The first rule of care is to ensure safety of one's surroundings and not put one's life at risk.
- In the public and private sector, facilities that ordinarily provide PPE are expected to, and have a responsibility to, provide PPE in accordance with NICD and WHO guidelines.

- Where shortages of PPE exist or are anticipated, rational policies to ensure continued supply of PPE for healthcare workers is reasonable and supported, provided PPE is available for all patient interactions compliant with NICD and WHO guidelines.
- We do not believe healthcare workers should be expected to purchase or provide their own PPE. Despite this, we respect the decision of healthcare workers to protect their health in an effort to continue to provide healthcare.
- It is indefensible and unethical for a healthcare worker to undertake patient care as part of a team where another member of the team participates without access to (or not donned with) the appropriate PPE.

With respect to a NO PPE STOCK situation for a specific patient care intervention where NICD or SASA guidelines exist for that intervention, our recommendation to practitioners is:

1. **Where the healthcare professional is satisfied their protection and safety can be secured and personally wish to proceed with care, that healthcare worker may do so – specifically without coercion or duress.**
2. **Where the healthcare professional considers their safety cannot be ensured in accordance with guidelines, the professional is entitled to withdraw from participating in the patient care intervention until PPE is provided in accordance with SASA/ NICD guidelines.**
3. **The healthcare professional should remain available/ ensure a replacement is available and on-site to deliver care as soon as the required PPE is made available.**
4. **It is unreasonable for another healthcare worker to agree to engage in patient care with inadequate PPE after the initial HCW has refused to do the same due to lack of PPE.**
5. **The Healthcare worker should NOT place his/ her life at risk.**

The strong argument proposed by MPS that healthcare workers are a finite resource and the resource needs to be protected is specifically applicable for our current and future patients.

In this situation, and aligned to HPCSA and MPS recommendations and guidance:

1. Clinicians should document their concerns regarding their conditions of work and risk to their health to facility management, and copy this to the HPCSA and OHSC as they become aware of the low or no stock situation. This may be copied to the SASA COVID19 task team.
2. In the event of required patient care and the appropriate PPE is not available, any decision not to treat a patient may require subsequent justification. In this event it is important to document and retain the relevant facts.
3. Remain in attendance and provide any supportive care possible with PPE that may be available and to the level of care available PPE will permit in accordance with PPE guidelines.

References and other resources

1. WFSA Coronavirus guidance for anaesthesia and perioperative providers (https://www.wfsahq.org/resources/coronavirus)
2. WHO guidelines on rational use of PPE during the COVID-19 pandemic (https://apps.who.int/iris/bitstream/handle/10665/331215/WHO-2019-nCov-IPCPPE_use-2020.1-eng.pdf)
3. CDC Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings (https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html)
4. Personal Protective Equipment for clinicians - ICMAnaesthesia COVID-19 https://icmanaesthesiacovid-19.org/personal-protective-equipment-ppe-for-clinicians (See APPENDIX-1)
5. Cook T.M. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic - a narrative review. *Anaesthesia*, 2020 https://onlinelibrary.wiley.com/doi/epdf/10.1111/anae.15071
6. First10EM, “Aerosol Generating Procedures”, last accessed 2020/05/01, https://first10em.com/aerosol-generating-procedures/

Revision and Peer Review

This is a living document based on the best understanding of the available information reviewed as the pandemic evolves. If you have concerns or find errors, please contact the South African Society of Anaesthesiologists. This document certainly plagiarises excellent material from others, and has been reviewed and edited by the following experts:

- **SASA COVID Task Team**: Ross Hofmeyr, Andre Roux, Anthony Reed, Bruce Biccard, Caroline Corbett, Dean Gopalan, Dirk van Zijl, Edwin Turton, Gareth Davies, Lance Lasersohn, Lliam Brannigan, Jan Swanepoel, Johan Kotze, Sean Chetty, Michael Blackburn, Peter Belasyse-Smith.
- **Jeremy Nel**, MBChB, FCP(SA), Cert ID (SA), DTM&H. Infectious Diseases Consultant, University of the Witwatersrand.
- **Helene-Mari van der Westhuizen**, MBChB, DipHiv Man, Doctoral student in TB infection control, Department of Primary Care Health Sciences, University of Oxford.

Appendix 1 - Personal Protective Equipment (PPE) for COVID-19 positive or suspected patients

The below is produced by the ICMAnaesthesia COVID-19 group comprised of the Faculty of Intensive Care Medicine, The Royal College of Anaesthetists, Association of Anaesthetists and the Intensive Care Society and is reproduced under a Creative Commons License(CC-BY-NC-SA 4.0).
It is endorsed by SASA. The document in this appendix was accessed from https://icmanaesthesiacovid-19.org/personal-protective-equipment-ppe-for-clinicians on 4 April 2020

The South African NICD Guidelines on Infection Prevention and Control provides a further detailed resource, which should be referenced by any policy-makers during the current pandemic.

Obstetric Anaesthetists' Association — Promoting the highest standards of anaesthetic practice in the care of mother and baby

Donning PPE for obstetric anaesthesia

Labour epidural

☐**Prior to entering room:**
- Put on theatre hat, FRSM & eye protection
- Scrub up
- Put on disposable fluid resistant sterile gown, sterile gloves
- Perform epidural procedure and ensure epidural is working

☐**Prior to exit of room:**
- Remove gloves, clean hands with gel
- Remove gown & turn inside out
- Remove eye protection.
- Dispose of all items in clinical waste bin
- Gel hands

☐**Outside room:**
- Remove FRSM (avoid touching outside) & hat
- Dispose of in clinical waste bin
- Wash hands with soap and water

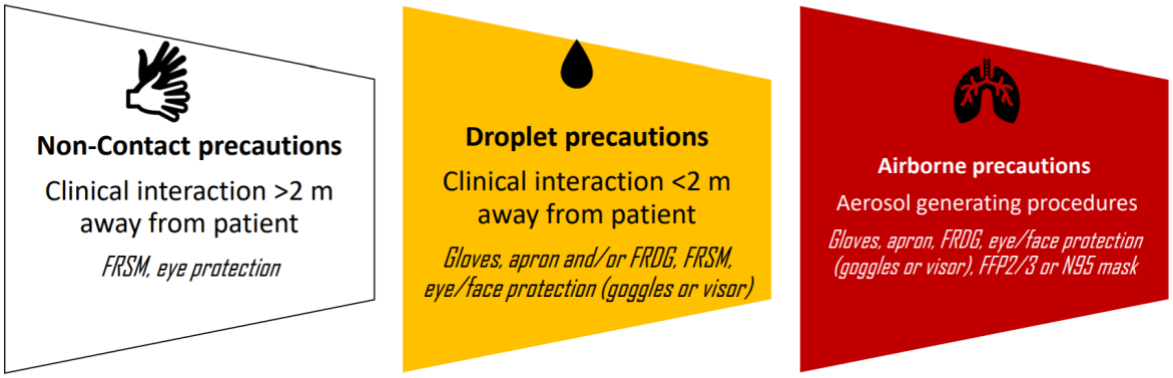
Caesarean delivery spinal anaesthesia

☐**Theatre:**
☐Put on sterile PPE as described, in an area at least 2m away from patient
☐Perform spinal procedure
☐Wear this PPE throughout case.
☐**Prior to transfer from theatre:**
☐Ask patient to put on FRSM after cleaning hands with gel prior to transfer back to room
☐**After transfer:**
☐Move at least 2m away from patient
☐Remove PPE as described
☐Wash hands with soap and water

Caesarean delivery general anaesthesia

☐**Theatre:**
☐Put on AGP PPE in an area at least 2m away from patient prior to induction
https://youtu.be/kKz_vNGsNhc
☐Undertake induction and intubation
☐Keep AGP PPE on until after extubation
☐**Prior to transfer from theatre:**
☐Put well fitted oxygen mask on patient
☐Wait in theatre till patient's airway is safe before transfer of patient to room
☐Hand over to clean team who will be wearing standard PPE (midwife looking after patient + someone to push bed)
☐Patient transferred to room by clean team
☐Remove AGP PPE as per doffing procedure
https://youtu.be/oUo5O1JmLH0
☐Wash hands with soap & water

Choice of PPE for obstetric anaesthetists according to mode of transmission risk



PHE guidance as updated on 5 April 2020 is that for possible and confirmed COVID-19 cases:
- Where AGPs are performed PPE guidance set out for AGPs (airborne precautions) should be followed
- For operative procedures without AGPs standard infection prevention and control practice (droplet precautions) should be followed
- Otherwise, for care of possible or confirmed cases during the second and third stage of labour (vaginal delivery) long-sleeved disposable fluid repellent gowns, plastic aprons, FRSMs, eye protection and gloves should be used
- Such PPE in labour wards and theatres may be indicated regardless of case status of patients, subject to local risk assessment

Personal Protective Equipment (PPE) for COVID-19 positive or possible patients

Based on Public Health England guidance

All equipment is single use unless indicated by 'session'

Category	Location and procedures	Gloves*	Waterproof Apron	Fluid repellent long sleeve gown*	Fluid-resistant surgical mask	FFP2/3 or N95 respirator mask	Eye/face protection (goggles or visor)	Rows in PHE guidance
AIRBORNE (session)	In hotspot areas: theatres, ICU, ED resus, NIV wards and others†	✔	✔	✔ Session	✘	✔ Session	✔ Session	2 (7)
AIRBORNE (case)	Any aerosol generating procedure (AGP) outside hotspot areas	✔	✘	✔	✘	✔	✔	1
DROPLET (apron and gown)	In second or third stage of labour	✔	✔	✔ Session	✔ Session	✘	✔ Session	8
DROPLET (apron only)	Outside hotspot areas during clinical care less than 2 metres from patient and during patient transfer***	✔	✔	✘	✔ Session	✘	✔ Session	3,5,6
CONTACT	Outside hotspot areas, no physical contact, more than 2 metres from patient	✘	✘	✘	✔ Session	✘	✔‡ Session	4
Patient at high risk	All locations: patient who is being shielded	Standard surgical mask only						9

* Gloves and gown: only sterile when indicated
† Also: endoscopy units for upper Respiratory, ENT endoscopy, upper GI endoscopy, other clinical areas where AGPs are regularly performed
‡ During transfer – risk assess need for eye protection

Sessions: A single session refers to a period of time in which a healthcare worker is undertaking duties in a specific care setting or exposure environment, e.g. on a ward round or in an operating theatre. A session ends when the healthcare worker leaves the care setting or exposure environment. PPE should be disposed of after each session or earlier if damaged or soiled.

AGPs: These include intubation/extubation, bag-mask-valve ventilation, SGA insertion/removal, HFNO, NIV, AFOI, bronchoscopy, tracheostomy, FONA, tracheal suctioning chest compression during resuscitation (list currently under review). Surgical AGPs include dental drilling, bone drills and saws, pulsed lavage.

Common Clinical Scenarios – COVID-19 positive or suspected

Operating theatre	Any anaesthetic technique	**AIRBORNE (session)**
Labour Ward	Non-sterile procedures in Labour Room	**DROPLET (apron only)**
	During epidural insertion in labour room (use sterile gloves and gown) or during second or third stage in labour room	**DROPLET (apron and gown)**
	Procedure in theatre (sterile gloves and gown for regional anaesthesia)	**AIRBORNE (session)**
ICU	Patient contact	**AIRBORNE (session)**
	Ward round more than 2 metre from patient	**AIRBORNE (session)**
Emergency Department	Assessing patients	**AIRBORNE (session)**
	Resus room or intubating	**AIRBORNE (session)**

Transfer of patient	**DROPLET (apron only)**
Assessing patients in ward or theatre admission area; no physical contact and more than 2 metres from patient	**CONTACT**
Assessing patients in ward or theatre admission area; physical contact or less than 2 metres from patient	**DROPLET (apron only)**
Resuscitation of COVID-19 patients	**AIRBORNE (case)**

SASA COVID-19 UPDATE

Personal Protective Equipment (PPE) for COVID-19 positive or possible patients

Based on Public Health England guidance

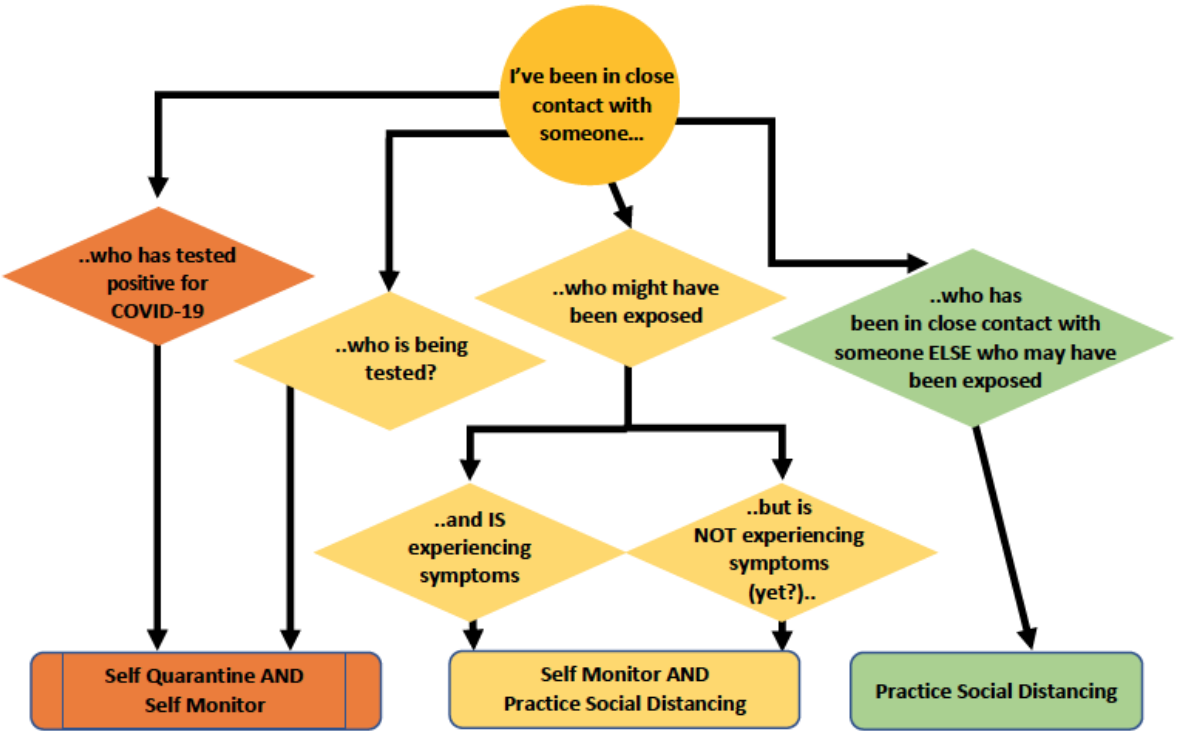
This interpretation of PHE's guidance relates primarily to the care of patients who are 'COVID-19 positive or possible' but not to those whose COVID status is 'not currently a possible or known case', in which situation PHE guidance recommends the following:

	Definition	Gloves* (single use)	Waterproof Apron (single use)	Gown*	Fluid-resistant surgical mask	FFP2/3 or N95 respirator mask	Eye/face protection
DROPLET (apron only)	During clinical care less than 2 metres from patient	✔	✔	✘	✔‡ Session	✘	✔‡ Session
AIRBORNE (case)	Any aerosol-generating procedure	✔	✘	✔	✘	✔	✔

‡ Risk assess need

One of the factors that clinicians should take into account when making this determination is the likely prevalence of asymptomatic infection in their patient population.

Appendix 2 - SASA Post COVID-19 Exposure Guideline



How do I.....?

...self quarantine?

- STAY AT HOME for 14 days
- AVOID CONTACT with other people (>2metres)
- DON'T SHARE household items (drinking glasses, towels or other items)
- WASH your hands frequently and after coughing or sneezing. Never cough or sneeze in direction of others.
- Throw dirty tissues in the bin
- Know who to contact in event of worsening symptoms

...self monitor?

- BE ALERT for symptoms of COVID-19 – dry cough and shortness of breath
- TAKE YOUR TEMPERATURE every morning and night and write it down (don't take your temperature within 6 hours of aspirin or paracetamol consumption
- CALL your doctor if you experience any symptoms or a fever (Temperature over 38° Celsius
- DO NOT seek medical attention without calling your doctor first!

...practice social distancing?

- STAY AT HOME as much as possible
- DON'T get physically close to other people – remain at least 2m away
- DON'T hug or shake hands
- AVOID groups of people and frequently touched surfaces.

IN SHORT – everyone should be practicing social distancing!

HYGIENE IS VERY IMPORTANT!
WASH your hands often and well •DON'T TOUCH your face •WIPE DOWN frequently touched surfaces often

What counts as 'close contact':

- Face-to-face contact (< 1m)
- Being in a closed space for ≥ 15 min
  - Living in the same household
  - Working closely in the same environment
- Healthcare workers providing direct care without PPE
- Direct respiratory contact – coughed/sneezed on