



CLINICAL PRACTICE STANDARD — Aeromedical Operations AO.CLI.23 – Novel Coronaviruses

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Appendices	Nil				
Associated Policy Directive/s and/or Operating Procedures/s	Ambulance Skill Sheet - PPE				
Directorate	Aeromedical Operations				
Author Branch					
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Summary	This procedure provides guidance on the management of patients with suspected or proven novel coronavirus infection				
Applies to	NSW Ambulance aeromedical clinical crews				
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Previous Reference	Nil				
Status	Active				
Approved by	Executive Director, Aeromedical Operations				
Related Legislation	Nil				
Related Documents	Nil				

Compliance with this operating procedure is mandatory



CLINICAL PRACTICE STANDARD — Aeromedical Operations AO.CLI.23 – Novel Coronaviruses

1. Introduction

Coronaviruses are a large family of viruses, some causing illness in humans, and others causing illness in animals, such as bats, camels, and civets. Human coronaviruses typically cause mild illness, such as the common cold.

Rarely, animal coronaviruses can evolve to infect and spread among humans, causing severe diseases such as Severe Acute Respiratory Syndrome (SARS) which emerged in 2002, and Middle East Respiratory Syndrome (MERS) which emerged in 2012.

Novel coronavirus (SARSCov2) is a new strain of coronavirus that has not been previously identified in humans which has spread rapidly from central China from December 2019 throughout the world.

2. Purpose

The purpose of this procedure is to outline appropriate management of patients with suspected or confirmed coronavirus infection, in particular PPE, precautions for intubation, transport and treatment considerations. ^{1,2,5,10}

3. Procedure

Staff protection is the priority of the service.

Correct use and fitting of the appropriate level of PPE is key to protecting staff and other patients. This should be practiced by all staff regularly in accordance with NSW Ambulance protocols. Patients should not be transported in aeromedical resources without due consideration of all alternatives.

Unnecessary individuals such as non-medical ride-alongs/observers and family members should not attend missions or be transported with patients.

Post transport vehicle cleaning protocols should be followed to ensure safety for other crews and patients. See reference Skill Sheet 114.5.7 Ambulance Cleaning. ²

3.1 Triage and Transport Decision-Making

The decision to transport suspected or confirmed coronavirus infected patients should be made in conjunction with State Retrieval Consultant (SRC) and Senior Second On-call SRC. The DRC is available in cases of increased complexity. Most patients with suspected coronavirus requiring medical retrieval will require respiratory support, although as the disease becomes more prevalent in the community some patients will be transported predominantly for other medical reasons (eg STEMI, trauma, stroke) and are more likely to be non-intubated.



Where possible (ie all adult patients) place a surgical mask over face-mask or nasal prong O₂ delivery system.

Avoid disconnections during transport where possible – confirm all airway connections are tight (push and twist technique).

In the past tracheal intubation, CPAP, BiPAP and Hi-Flo Nasal Prong therapy were suggested to have increased risks of generating respiratory aerosols. Several reviews and opinion-based consensus statements suggested a high degree of caution when considering retrieval of patients on these therapies especially where staff may not have airborne PPE (ward-based care). In lieu of better evidence many services (including our own) had elected not to perform these therapies in COVID-19 positive patients^{1,2,9}.

During the last two years of the COVID-19 pandemic further evidence has accumulated suggesting that this risk is overstated. Studies examining aerosol production and viral particle contamination demonstrate that well-fitted CPAP, BiPAP (and to a lesser extent) Hi-Flo Nasal Prong therapies are likely to be lower risk than standard mask oxygen therapies particularly compared with the degree of aerosol generated by patients coughing.^{4,5}

Studies examining nosocomial transmission of COVID from patients to medical and paramedical staff show that Airborne PPE (fit-tested N95/P2 mask, eye protection and gloves/gown) is highly protective of transmission particularly in fully vaccinated staff, regardless of variants^{6,7}. Many national and international services have changed guidelines to allow judicious use of NIV for COVID-19 with no evidence of increased nosocomial transmission.

Some risk factors for transmission may be avoided by patient selection or optimisation:

- Active coughing
- Agitated or un-cooperative patients
- Large mask leaks (> 5L/min)
- Patients in acute phase of illness (First few days of symptoms)

Any NIV retrievals should be risk assessed in a teleconference between the SRC, DRC and Medical team.

3.2 PPE

Recommendations for PPE are based on NSW Health recommendations² and those established by the US Centre for Disease Control (CDC) for SARS and MERS and have been re-emphasised following the spread of Novel Coronavirus (2019-nCoV)^{1,3}.

The following PPE should be available for use by direct-care providers: ^{1,2,3,10,11}

- Non-sterile patient-care gloves
- Disposable isolation gowns
- Goggles or face shield (corrective eyeglasses alone are not appropriate protection)
- Fit-tested P2/N95 masks



- Hand hygiene product (eg alcohol-based hand rub) available at all times.

Disposable non-sterile gloves, gown, and eye and respiratory protection must be worn when entering the “isolation area” and for all patient contact including during transport phases. Eye protection, gown and gloves should be removed and discarded into contaminated waste bags after patient care is completed or when soiled or damaged. The respirator should remain on until the wearer is in the area designated as safe for respirator removal.

Hands must be washed with soap and water or a waterless, alcohol-based hand rub immediately after removal of PPE.

Cough- or aerosol-generating procedures like open tracheal suction should be avoided during transport unless medically necessary (e.g., life-saving).

Unintubated patients should wear a surgical mask for the transport.

3.3 Principle of Donning and Doffing including buddy checks and P2 mask fit testing

See NSW Ambulance Skill Sheet 114.2 Additional Precautions (Transmission Based) and PPE donning/doffing video. ⁸

During clinical care all equipment/bags that have been handled whilst in ‘hot zone’ will need to be decontaminated so clinical teams must plan ahead to avoid unnecessary use of packs or equipment.

3.4 PPE for Crew Helicopter Operations

- It is recommended that non-essential rear cabin equipment be removed before each mission to reduce additional decontamination steps (eg rescue basket/strop etc). When IAM cover is certified for use the IAM can remain equipped if weight and balance permits.
- The decision about whether doctor and paramedic need to wear harness and life jacket during flight will depend on specific flight details and a discussion will need to occur with the pilot in command. Ask pilot to plan, if possible, an overland route to allow medical team to not wear life jacket or harness and hence limit decontamination required at conclusion of mission. Fitting harness and life-jacket post patient care will require a cycle of doffing and re-donning of PPE.
- Specific PPE is not required by the pilot or crewperson during front cabin operations provided the patient is intubated and ventilated but full PPE is required for direct assistance with loading and unloading. ^{10,11}
- A fit-tested N95/P2 mask should be worn by pilot and crewperson for patients who are not intubated.
- Air-conditioning should be set to non-recirculate. ¹⁰



- The cabin curtain of the helicopter should be closed throughout the mission. Be aware this may create a barrier to communications and crews should brief a specific communications plan during flight.
- Assistance with loading or unloading patients should only be done by staff wearing full PPE. This can be accomplished by the doctor and paramedic in the cabin (in full PPE) with the crewperson standing outside to operate the PLD (if required) but away from direct patient care to minimise need for PPE but it is recommended that the crewperson be prepared to don PPE in case of need to troubleshoot loading.

Fixed Wing

- PPE is to be worn over the top of the uniform as per NSW Ambulance Skill Sheet 114.2 Additional Precautions (Transmission Based) and PPE donning/doffing video NSW Ambulance Skill Sheet 114.2 Additional Precautions (Transmission Based) and PPE donning/doffing video. Scrubs are to be discarded in the appropriate contaminated linen receptacle in the doffing area.
- The front stretcher is removed for a flight nurse only mission. The front bridge is removed for a medical retrieval (the litter is required to secure medical kits).
- Medical kits need to be in plastic bags and opening of same avoided during the mission.
- Crew are to take minimal personal effects on board the aircraft. Crew are to use specially allocated headsets.
- Flight nurses are to take a pre-packed single use clinical kit to limit the opening of aircraft medical cabinets. If any aircraft cabinet is opened, contaminated stock needs to be discarded and the drawers/cabinets terminally cleaned.
- It is recommended that non-essential rear cabin equipment be removed before each mission to reduce additional decontamination steps.
- Patients should be loaded onto the rear stretcher to provide sufficient space for the pilot to enter the cabin and doff their PPE under supervision.
- Once the patient is loaded, the pilot will need to doff his/her PPE prior to entering the cockpit. The Flight Nurse will be seated outside the cockpit and at the rear of the front pod (front stretcher will be removed) with an opened infectious waste bag. The Flight Nurse will go through the doffing procedure with the pilot and all PPE must be disposed of in the yellow waste bag. The pilot will do hand hygiene before entering the cockpit. Once in the cockpit the curtain will be closed and a P2 mask and eye protection applied. No other PPE is required during flight. The headset mouthpiece must be positioned outside the P2 mask.
- No documentation is to be undertaken during the transfer. Retrospective documentation with a print summary from the monitor should be obtained to accurately reflect clinical condition and cares.
- Assistance with loading or unloading patients should only be done by staff wearing full PPE.^{10,11}



- Aircraft ventilation should remain on at all times during transport of respiratory patients, including during ground delays.

Road Ambulance

- It is recommended that non-essential rear cabin equipment be removed before each mission to reduce additional decontamination steps but an ability to respond to an urgent prehospital mission be maintained.
- Specific PPE is not required by a driver, provided the patient is intubated and ventilated, but full PPE is required for direct assistance with loading and unloading. In the unlikely event that a patient needs to be transported without tracheal intubation they should follow the NSW policy on PPE with the driver wearing an N95/ P2 mask throughout transport.
- Airconditioning should be set to non-recirculate and windows opened (weather permitting)

3.5 Post-mission vehicle cleaning protocol

Procedures already in place for aircraft and equipment cleaning following transport of a patient with an infectious illness such as influenza are sufficient.⁸

Follow NSW Ambulance Skill Sheet 114.5.7 Ambulance Cleaning for post-mission cleaning but ensure all staff attending cleaning are wearing full PPE.⁸

3.6 Reporting of staff illness in association with Coronavirus infection

Follow NSW Health policies and procedures for management of staff members who become unwell following potential exposure. The specific requirements continue to change as the course of the pandemic progresses.

4. References

1. World Health Organization Transmission of SARS-CoV-2: implications for infection prevention precautions: (WHO), 2020.
2. NSW Health "Infection Prevention and Control - Novel Coronavirus 2019 (2019-nCoV) - Hospital Setting 9th Feb 2020.
3. CDC Interim Guidance for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points (PSAPs) for COVID-19 in the United States.N.
4. T. Gaeckle et al Aerosol Generation from the Respiratory Tract with Various Modes of Oxygen Delivery Am J Respir Crit Care Med 2020 Oct 15;202(8):1115-1124.
5. R L Winslow et al SARS-CoV-2 environmental contamination from hospitalised patients with COVID-19 receiving aerosol-generating procedures. Thorax.
6. Häikiö, K., Andersen, J.V., Bakkerud, M. et al. A retrospective survey study of paramedic students' exposure to SARS-CoV-2, participation in the COVID-19 pandemic response, and health-related quality of life. Scand J Trauma Resusc Emerg Med 29, 153 (2021).



7. Braude, D et al Safety of air medical transport of patients with COVID-19 by personnel using routine personal protective equipment JACEP Open 05 March 2021
8. NSW Ambulance Skill Sheets 2019.
9. Huang C et al., (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China.
10. Information for aeromedical retrieval of patients with COVID-19 (Version 1 - 6/03/2020).
11. NSW Health - Application of PPE in Response to COVID-19 Pandemic V1.4
http://cec.health.nsw.gov.au/_data/assets/pdf_file/0006/572883/Application-of-PPE-in-Response-to-COVID-19-19-March-2020-V1.4.pdf

5. Resources

1. <https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-for-aeromedical-retrieval-of-patients>.

6. Annexes

1. Workflows

Road Workflow

- Teleconference with Clinical Crew
- Prepare Ambulance for COVID-19 mission – mission ready in case diverted to primary
- Respond in standard flight suit
- Arrive at hospital and receive clinical handover
- Don PPE and enter room to assess and treat patient
- Transport patient to receiving hospital
- Remain in PPE and clean vehicle
- Doff PPE
- Complete paperwork and attend to personal needs

Helo and Fixed Wing Workflow

- Teleconference with Clinical Crew
- Prepare Helicopter/Fixed Wing for COVID-19 mission - mission ready in case diverted to primary (Helo only)
- Respond in standard uniform
- Arrive at hospital and receive clinical handover
- Don PPE and enter room to assess and treat patient
- Transport patient to receiving hospital
- Remain in PPE for return to base.
- Whilst in PPE clean vehicle
- Doff PPE
- Complete paperwork and attend to personal needs



APPENDICES

Nil

REVISION HISTORY

Version (Document #)	Amendment notes
Version 2.0 Issued	NIV COVID transfers allowed Intubation section removed Appendix – COVID-19 contact – removed Removed references to scrubs rather than uniform Removed references to Tyvek suits for intubation since Level $\frac{3}{4}$ gowns now available widely Approved by Executive Director, Aeromedical Operations
Version 1.0 Issued 11 March 2020 WI2020-007	Approved by Executive Director, Aeromedical Operations