Aerospace Medicine Sub-Community

COVID-19 Return to Flight Duty Status
BUMED Guidance for Aerospace Medicine

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Sub-Community Contributors

The following individuals are subject matter experts from across the Navy Medicine Enterprise that contributed to the development of return to duty protocol. These individuals represent a variety of clinical backgrounds and military experiences relevant to the delivery of Aerospace Medicine.

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**Disclaimer:**

The *Operational Medicine Clinical Community* (OpMed CC) mission is to foster collaboration and knowledge sharing across Naval Medicine to implement leading practices that improve medical readiness, while also supporting operational clinicians and staff in delivering the highest quality care to all Active Duty Sailors and Marines.

The *Aerospace Medicine Sub-Community* (SC), under the Navy’s OpMed CC, has the goal of “supporting aerospace medicine [and safety] clinicians and staff through the promotion of best practices” and an objective to “decrease variation and increase standardization in the delivery of patient care in operational environments.” The Aerospace Medicine SC responded to the COVID-19 pandemic by generating the protocols contained in this document. These protocols reflect official Navy Medicine guidelines in this format and are the best recommendations as of this time from BUMED for returning service members to Flight Duty Status.
Return to Flight Duty Status Protocol

The Aerospace Medicine Sub-Community (SC) is recommending Flight Surgeons and Aerospace Medicine Specialists use the following protocol to evaluate service members (SMs) who are in a flight duty status to return them to an “Up” flight status after close contact or contracting Coronavirus Disease 2019 (COVID-19).

**Readiness Tenant:** Personnel in a special duty flight status work in an occupational environment that requires optimal respiratory function and maximum physiological margin to safely operate aircraft and support the Naval Aviation Enterprise mission.

- These protocols are derived from reviewing Navy and Marine Corps Aerospace Medicine COVID-19 cases and are promulgated to synchronize the community’s approach to medical evaluation when returning aircrew to flight duty status.
- The return to flight duty status or “Up” flight status protocol applies to Class I&II flight duty status service members (SMs). Class I&II SMs are those who are aircrew in Navy and Marine Corps aircraft.¹
- Class III&IV SMs may return to an “Up” flight status when they meet standard Navy criteria for return to work found in the most current NAVADMIN on COVID-19 Standardized Operational Guidance. The NAVADMIN notes that local fleet, type command, and operational commanders may issue more specific guidance to personnel within their respective areas of responsibility.²

  - **Example:** These protocols could be applied to critical flight deck personnel who work in hot and humid conditions for long periods of time.

**NOTE TO FLIGHT MEDICINE PROVIDERS:** The following flow charts provide a basic framework and should not substitute for sound clinical judgement. Additional work-up, testing and specialty consult may be required on a case by case basis to return AC to an “Up” flight status.

¹ Manual of the Medical Department, NAVMED P-117, Chapter 15, Article 15-63.
Aircrew Who Are Close Contacts

Aircrew (AC) who meet the definition of a “close contact” to a confirmed or probable case of COVID-19 should see their Flight Medicine provider and be evaluated and dispositioned based on the following protocol.

**Legend**

- **Questions / Decisions**
- **Actions**
- **Duty Dispositions**

**AC meets “close contact” definition (<6 ft for >15 mins)**

Did the SM receive a test for COVID-19?

- **NO**
- **YES**

**Testing is recommended but not required**

Did the AC test positive for COVID-19?

- **NO**
- **YES**

Transfer to:

- **Aircrew Who Are COVID-19 Test Positive Protocol (slide 5)**

Transfer to:

- **Aircrew Who Are COVID-19 Symptoms Positive Protocol (slide 6)**

See Current NAVADMIN for guidance regarding general duty. Place AC in an “Up” Flight Status after consultation with Flight Medicine Provider. No specific examination or NAMI submission required.*

*Aircrew must meet all requirements of most current NAVADMIN to return to general duty and may return to work in a “Down” status until seen by a Flight Medicine Provider to verify they meet the “Close Contact” definition.¹

Aircrew Who Are COVID-19 Test Positive

Aircrew (AC) tested for COVID-19 for any reason and resulted in a positive test should see their Flight Medicine provider and be evaluated and dispositioned based on the following protocol. See slide 8 for clinical criteria for diagnosis and slide 9 for confirmatory laboratory evidence.

**Legend**
- Questions / Decisions
- Actions
- Duty Dispositions

**AC tests positive for COVID-19. [Testing can be for any reason]**

**Did AC develop Fever or COVID-19 Symptoms during 14 days after positive test?**

- **NO**
  - See Current NAVADMIN for guidance regarding general duty. AC in an “Up” Flight Status after consultation and normal examination with Flight Medicine Provider.* No NAMI submission required.

- **YES**
  - **Transfer to:**
    - Aircrew Who Are COVID-19 Symptoms Positive Protocol (slide 6)

**Questions / Decisions**

- Did AC develop Fever or COVID-19 Symptoms during 14 days after positive test?

- **NO**
  - **YES**
    - Transfer to: Aircrew Who Are COVID-19 Symptoms Positive Protocol (slide 6)

**NOTE TO FLIGHT MEDICINE PROVIDERS:**

- COVID-19 RT-PCR testing is highly specific but only moderately sensitive especially depending on what day tested during the disease course. A positive test can mean prior infection, current infection, or false positive. (slide 9)

- AC who do not develop symptoms 14 days after a positive test need a thorough evaluation and review of systems to ensure they did not have a prior or current COVID-19 course. Even a subjective fever or mild cough during the 14 days should be treated as positive for COVID-19 symptoms.

- Additional work-up, testing and specialty consult may be required on a case by case basis to return AC to an “Up” flight status. Provider should have a low threshold for testing and specialty consultation.

*If Flight Medicine Provider is not available, another physician may administer.*
Aircrew Who Are COVID-19 Symptoms Positive

Aircrew (AC) who develop symptoms consistent with COVID-19 are considered in a “Down” flight status and should see their Flight Medicine provider. Three days after fever and symptoms resolution and at least 14 days since fever or symptoms onset, they should be evaluated and dispositioned based on the following protocol.*

AC develops Fever (subjective or >100.4°F) or other COVID-19 Symptoms

Was the AC’s test result positive for COVID-19?

Yes

Obtain discharge summary and address all abnormal labs, radiologic imaging, and disease course complications. Obtain ECG and consult Pulmonology to include Pulmonary Function Test (PFT).***

NSR, SpO2 ≥96%, and PFT DLCO value 80-120% of predicted? Cleared by Pulmonologist?

Yes

See Current NAVADMIN for guidance regarding general duty. AC require evaluation and review of systems with Flight Surgeon. NAMI submission required for review. COVID-19 is NCD unless changed status of granted waiver.

No

Obtain ECG, SpO2, and PFT***

NSR, SpO2 ≥96%, and PFT DLCO value 80-120% of predicted? Cleared by Pulmonologist?

Yes

NSR and PFT DLCO value 80-120% of predicted? Cleared by Pulmonologist?

Yes

Contact Senior Regional Flight Surgeon, or Fleet Surgeon if deployed, and inform them of case. Place consults for all abnormal labs, radiology, and physical findings. Transfer out of theater per AC’s Command or Fleet Surgeon’s direction. Initiate LIMDU as appropriate.

No

Repeat test no sooner than 24 hours. Ideal test day is day three of symptoms.

Test Positive?

Yes

Follow Clinical Criteria for COVID-19 diagnosis per CDC guidelines. If AC meets Clinical Criteria, follow this protocol as if their test was positive.

No

Contact Senior Regional Flight Surgeon, or Fleet Surgeon if deployed, and inform them of case. Place consults for all abnormal labs, radiology, and physical findings. Transfer out of theater per AC’s Command or Fleet Surgeon’s direction. Initiate LIMDU as appropriate.

Did AC require hospitalization?

No

Yes

See Current NAVADMIN for guidance regarding general duty. AC require evaluation and review of systems with Flight Surgeon. NAMI submission required for review. COVID-19 is NCD unless changed status of granted waiver.

***NOTE TO FLIGHT MEDICINE PROVIDERS:

- AC operate with flight gear that reduces lung vital capacity and tidal volume requiring them to maintain optimum pulmonary function.
- COVID-19 has been associated with pulmonary scarring and continued bronchiole inflammation even after subjective symptoms resolve.
- Full PFT with DLCO is the “gold standard” to evaluate AC for this issue. If PFT is not available for operational reasons or remote location, spirometry is acceptable with a Forced Vital Capacity (FVC) greater than 80% of predicted and AC must pass an exercise screening test (slide 12).

*Reference slides 10, 11, and 12 for medical evaluation guidance

*Reference slides 13 and 14 for NAMI submission guidance
References
Reference: Clinical Criteria for Case Definition

“A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient’s health needs.”

Use the Clinical Criteria for guidance, not as an alternative to clinical judgement

Clinical Criteria:
At least two of the following symptoms: fever (measured or subjective), chills, rigors, myalgia, headache, sore throat, new olfactory and taste disorder(s).

OR
At least one of the following symptoms: cough, shortness of breath, or difficulty breathing.
Note: If initial symptom occurred during a flight or experienced in the flight environment, follow the Physiological Episodes protocol (16 JUN 2020) but consider COVID-19 in differential diagnosis.

OR
Severe respiratory illness with at least one of the following:
Clinical or radiographic evidence of pneumonia.

OR
Acute respiratory distress syndrome (ARDS).

AND
No alternative more likely diagnosis.¹, ²

Note: Anosmia, hyposmia, and dysgeusia are unique to SARS-CoV-2 and infection should be strongly considered in patients without other respiratory disease, even without other symptoms.³

Reference: Laboratory Criteria

Laboratory evidence should be obtained by using a method approved or authorized by the U.S. Food and Drug Administration or designated authority. Available test types will vary location to location and therefore so will the sensitivity and specificity.

Confirmatory Laboratory Evidence:
Detection of severe acute respiratory syndrome coronavirus 2 ribonucleic acid (SARS-CoV-2 RNA) in a clinical specimen using a molecular amplification detection test.

Common test type available is the real time reverse transcription Polymerase Chain Reaction (RT-PCR) and specimens are obtained either by nasopharyngeal or oropharyngeal swab. **Nasopharyngeal is preferred as it is more sensitive**

**Negative tests cannot rule out COVID-19 with clinical suspicion.** Meta-analysis of testing false negative rate shows decreases from 100% on day 1 post-exposure to low of 20% on day 8 (on average symptom day 3) followed by an increase to 66% on day 21. The best day to obtain the lowest chance of a false negative test is day three of fever/symptoms or alternatively day eight in close contact SMs. Therefore, RT-PCR testing has limited ability to rule out COVID-19 on the basis of a single point-in-time upper respiratory tract sample. Overall false negative rate for COVID testing is thought to be around 30%. This may vary from lab to lab, and depends on technique with nasopharyngeal swabs. High pre-test probability patients based on clinical presentation should be in isolation and have repeat testing even if testing is initially negative.

Testing for Fleet screening or host country protocol will be determined by those agents

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Reference: Medical Evaluation and ECG

COVID-19 test or symptoms positive Aircrew can return to squadron spaces based on the most current NAVADMIN general duty return to work guidance but will remain in a “Down” status until Flight Medicine Provider clearance. A comprehensive medical evaluation and review of systems is required and should be documented in the medical record and the Aeromedical Electronic Resource Office (AERO).

Medical Evaluation:
Complete medical evaluation to include at a minimum, assessment of fatigue, anorexia, headaches, anosmia, and cardiac, ENT, neurologic, and respiratory exams. Address all medications and prior waivers granted. ECG changes or any cardiac symptoms (arrhythmia, angina, prolonged QT interval, limited exercise tolerance) will require cardiology consult. PFT changes or any respiratory symptoms (SpO$_2$ ≤95%, shortness of breath, limited exercise tolerance, etc.) will require pulmonology consult.

Evaluations must be done face-to-face and may not be done via telehealth

Electrocardiogram (ECG):
ECGs to be performed based on recommendations from the American College of Cardiology in physically active populations with symptomatic COVID-19 due to a 22x increase in significant cardiac morbidity in hospitalized COVID-19 patients. ECG findings that may indicate myocardial injury include pathological Q waves, ST segment depressions, (new) diffuse ST segment elevation, and T wave inversions that are outside of the normal parameters. If treatment included hydroxychloroquine, a manually calculated QT interval is required. Automated QT intervals are based on the Bazett formula and can overestimate the QT interval, especially at elevated heart rates. Recommend using Hodges formula for manual calculation. On-line calculator is located here: https://www.mdcalc.com/corrected-qt-interval-qtc

Pulmonary Function Tests (PFT):
Optimum respiratory system function is essential in aviation. COVID-19 patients can show diffuse alveolar damage on postmortem histopathology in patients with radiographic bilateral ground-glass opacities.\(^1\) PFT is the gold standard in evaluating alveolar injury compared to spirometry because spirometry can be normal with early or mild disease while PFT will still show low DLCO.\(^2\)

Normal and Restrictive Pattern PFT with Low DLCO Differential Diagnosis:
**Low DLCO with Restriction:** Asbestosis, berylliosis, hypersensitivity pneumonitis, idiopathic pulmonary fibrosis, Langerhans cell histiocytosis, lymphangitic spread of tumor, miliary tuberculosis, sarcoidosis, silicosis (late)
**Low DLCO with Normal PFT:** pulmonary emboli, congestive heart failure, connective tissue disease with pulmonary involvement, dermatomyositis/polymyositis, inflammatory bowel disease, interstitial lung disease (early), primary pulmonary hypertension, rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis, Wegener granulomatosis.\(^2\)

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Reference: PFT and Exercise Screening Test

Aircrew that are COVID-19 symptoms positive require functional evaluation of ventilation and pulmonary physiological margin to support safe return to the flight environment. Further specialist evaluation will be required on a case by case basis.

**Exercise Screening Test with Monitored SpO\textsubscript{2} and Heart Rate:**

SpO\textsubscript{2} alone is unable to measure ventilation but is a noninvasive method of assessing oxygenation. SpO\textsubscript{2} monitored while AC are moderately exercising for 10 minutes along with spirometry will screen for functional decline in respiratory function.

**Exercise Screening Test Protocol**

1. Initially screen SpO\textsubscript{2} and heart rate (HR) at rest (sitting for five minutes). If resting SpO\textsubscript{2} less than or equal to 96%, then do not proceed, evaluate patient for pulmonary pathology/abnormalities. Consult pulmonary for evaluation to include PFT (DLCO) and chest CT.

2. Have AC start exercise on a treadmill or elliptical or exercise bike. Once at a moderate exercise heart rate (HR 120-130), monitor SpO\textsubscript{2} and HR for 10 minutes of moderate exercise. An exertional SpO\textsubscript{2} less than or equal to 88% or a decrease of 5% or more from resting baseline is a positive test needing pulmonary or cardiology evaluation.

**Note:** SpO\textsubscript{2} and HR should be back to baseline 30 minutes after test.

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COVID-19 Evaluation Submission in AERO:

Recovery from a COVID-19 symptoms positive course can vary from immediate return of full physical capability or take weeks of gradual rehabilitation. Some physiological deficits can remain asymptomatic until the specific injured body system is stressed in the flight environment. Evaluation by an Aerospace Medicine Provider is required to return AC back to “Up” flight status.

The diagnosis of COVID-19 is Not Considered Disqualifying (NCD). Disease course complications resulting in permanent deficits are Considered Disqualifying (CD).

Submission of the Medical Evaluation in AERO to NAMI requires the following:

- DD Form 2808 and DD Form 2807-1 “Long Form” Flight Physical. A full physical is not required, but should be focused to patient’s specific disease course and complete review of systems with focus on the pulmonary, cardiac, vascular, neurologic, and renal systems.
- Aeromedical Summary (AMS) documenting the results of the PFT with focus on DLCO, ECG comparison to last “5 year” Flight Physical ECG, SpO2 value, and summary of COVID-19 course to include start date, maximum fever measured, symptoms and duration, any remaining physical limitations or symptoms, and date of fever/symptoms resolution.
- Document Uploads required include PFT, ECG, last prior ECG, any consults obtained, and hospital discharge summary as applicable.
- E-mailed or faxed submissions will NOT be accepted.

Reference: NAMI Submission

AC recovered from a COVID-19 symptoms positive course may return to “Up” flight status by their local Flight Medicine Provider unless they were hospitalized for significant symptoms or complications. AC hospitalized require Naval Aerospace Medical Institute (NAMI) review of their post-COVID-19 evaluation prior to being issuing an “Up” chit (DD 2992). Hospitalization only to obtain a COVID-19 test or other non-clinical reasons does not constitute a hospitalized disease course. The next two slides guide through submission procedures to NAMI in the Aeromedical Electronic Resource Office (AERO).
Reference: NAMI Submission

Contact NAMI when submitting a post-COVID-19 evaluation to fast track review. NAMI Physical Expedite Request Email: usn.pensacola.navmedotcnamefl.list.nami-physqualtech@mail.mil

Submissions for AC that were hospitalized will be priority review status at NAMI to ensure the quickest return to “Up” flight status. Non-hospitalized AC reviews are supportive in nature and will confirm local duty disposition decisions.

COVID-19 Evaluation Specific Submission:
To identify and code the flight physical and AMS submission as a COVID-19 evaluation, perform the following on the DD Form 2808 and AMS.¹

- **DD Form 2808:** In block 15 c. “Purpose of Examination” check “Other” and type in one of the following:
  - COVID Outpatient
  - COVID Hospitalized

- **AMS:** Disqualifying Conditions
  - List “COVID” as the number “1” diagnosis
  - Use ICD-10 code “U07.1”
  - List all other diagnoses that require a waiver submission and prior granted waivers
  - Fill in complete evaluation findings and results of PFT, ECG comparison, and SpO₂
  - Blocks in the AMS marked as “N/R” or “See xxxxx” will not be accepted.

Contact your Senior Regional Flight Surgeon or Marine Air Group Surgeon for assistance