

Perioperative and Periprocedural Personal Protective Equipment and Workflow Guidance During the COVID-19 Pandemic

Last updated: 2/6/21

I-Discontinuing Isolation and Testing for Patients with a History of COVID-19: Please see the recently published UCSF Infection Control Guidelines on this topic for full details. These revised guidelines are based on updated [CDC recommendations](#) and apply to all UCSF healthcare settings. The basis for this change rests on the fact that many people continue to shed detectable SARS-CoV-2 RNA debris for weeks after recovery from COVID-19 (and may test positive by RT-PCR) but are no longer infectious.

Please note that for this document and other, previously published UCSF protocols relating to PPE workflows in the perioperative/periprocedural setting, the term “COVID-19-positive” refers to a patient with confirmed, acute COVID-19 illness who is expected to present a possible infectious risk to providers. This is in contrast to a patient who has recovered from COVID-19 and may continue to test positive but meets criteria for discontinuation of isolation.

- Novel Respiratory Isolation precautions will be **discontinued** according to the following criteria, with some exceptions*:

Inpatient/Outpatient	NOT severely immunocompromised and NO severe/critical COVID-19 illness	Severely immunocompromised and/or severe/critical COVID-19 illness*
Symptomatic, initial infection	<ul style="list-style-type: none"> 10 days since symptom onset AND 24hrs since last fever (without antipyretics) AND Symptomatic improvement 	<ul style="list-style-type: none"> 20 days since symptom onset AND 24hrs since last fever (without antipyretics) AND Symptomatic improvement
Asymptomatic, initial infection	<ul style="list-style-type: none"> 10 days since first positive test 	<ul style="list-style-type: none"> 20 days since first positive test
*See full document for definitions of immunocompromised states and severity of COVID-19 illness		

- Approach to Perioperative/Periprocedural COVID-19 RT-PCR testing **following recovery from COVID-19:**
 - Patients who are **asymptomatic, recovered from COVID-19 (i.e., “COVID Confirmed” infection flag has been discontinued)** and **≤ 90 days since the first positive test** will **NOT** be re-tested before procedures. Use PPE and perioperative

procedures recommended for asymptomatic patients with negative pre-procedure COVID-19 PCR test results (scenarios 2-4 below). Routine use of N95 + face shield or PAPR continues to be recommended for all AGPs (see section II below). If asymptomatic patients are re-tested within this period and found to be positive, they will not be placed on Novel Respiratory isolation.

- Consistent with current practices, patients with **new signs/symptoms concerning for COVID-19, including those who are ≤ 90 days since the first positive test**, will be placed on Novel Respiratory Isolation and decisions about re-testing and the need for continued isolation will be handled on a case-by-case basis by Infectious Disease and HEIP.
- Patients who are **asymptomatic, recovered from COVID-19 and > 90 days since the first positive test** will be considered at risk for re-infection, will undergo the usual pre-procedure and admission COVID-19 PCR testing and, if positive, will be placed on Novel Respiratory isolation.

II-Universal N95/PAPR recommendation for Aerosol-Generating Procedures (AGPs): As of 9/17/20, it is **recommended** that providers don an N95 respirator + face shield or PAPR for all AGPs in the setting of negative pre-procedure COVID-19 PCR test results or those who have recovered from COVID-19 within 90 days since the first positive test. This change to the perioperative and periprocedural PPE guidance is based on the following:

- This change is aimed at protecting healthcare personnel from possible exposure events that can result in increased infection risks and staff quarantines.
- Though in the setting of universal testing any one procedure carries a tiny risk of undetected infection, because UCSF performs thousands of procedures a year, the cumulative risk of having patients with undetected infections come through the perioperative area rises.

Patients will continue to be clinically screened and tested for COVID-19 within 4 days of their procedure (**or 7 days for asymptomatic inpatients**) – this remains a requirement for all elective surgeries **except** within 90 days of the first positive test in a patient who has recovered from COVID-19 and meets the criteria for discontinuation of isolation.

- **For emergency cases in non-PUI patients (no clinical suspicion of COVID-19) whose COVID RT-PCR test is pending (or who only have a negative Rapid test – see below), providers MUST don N95 respirator + eye protection or PAPR plus gown for all aerosol-generating procedures and portions of the case (see Scenario 5)**

The time recommended for providers to remain in N95-level PPE during and after an AGP is based on the number of air changes per hour (ACHs) in the procedure room needed for ≥99% efficiency in airborne contaminant removal. For most O.R.s at ML, MB and MZ, this equates to 15 minutes but varies significantly in most NORA locations (see Table below). After that time period has elapsed, providers may choose to don standard PPE.

- In addition to AGPs (e.g., intubation/extubation), for surgical procedures that might pose higher risks for transmission if the patient has COVID-19 (see “High-Risk Surgeries”

below), it is recommended that providers continue to wear N95 respirators or PAPRs for the entirety of the case (Scenario 2)

- When AGPs are performed, appropriate signage must be left on the entrances to the procedure room/area indicating what time providers may enter with standard PPE
- Persons with standard PPE (i.e., not wearing an N95 respirator or PAPR) should remain outside the procedure room during the AGP and for the appropriate period of time after the AGP
- **Providers do NOT need to wait in a given location with the patient after the termination of an AGP before transport but signage must be left on the entrance to the location indicating the time at which providers may enter with standard PPE**
 - It is recommended that any healthcare worker (e.g., Hospitality staff, anesthesia technicians) entering the room before the air clearance time period is complete don an N95 respirator + face shield or PAPR prior to procedure room entry
 - Room turnover should proceed on schedule in appropriate PPE

For high-turnover locations or NORA areas with slower ACHs, patients WILL be allowed to enter rooms after AGPs in test-negative patients even before the 99% turnover occurs so that the pace of cases can continue as usual. However, it is recommended that providers still don N95-level PPE if entering within the previous AGP time window.

The original perioperative Scenarios have been updated below to reflect this new guidance

- Patients who are COVID-19 positive or PUIs will continue to be managed according to protocol (Scenario 1)

III-Operational Principles: This document provides guidance around the perioperative and periprocedural management of patients receiving anesthesia. It reflects the evolving understanding of COVID-19 transmission, the need for responsible use of personal protective equipment (PPE), the importance of ensuring the protection of healthcare personnel, and expanding access to COVID-19 RT-PCR testing.

- All perioperative and periprocedural patients will continue to be clinically screened for symptoms of and risk factors for COVID-19 infection
- Patients with COVID-19 infection can shed SARS-CoV2 in their nasopharynx prior to onset of symptoms and may present an infection risk, particularly during aerosol generating procedures
- COVID-19 RT-PCR testing should be performed for all asymptomatic patients (assuming they do not have a history of prior COVID-19 infection and are within the timeframe for exclusion of repeat testing) within 4 days prior to elective surgical and other invasive procedures involving general anesthesia or other potentially aerosol-generating procedures. Emergency procedures should proceed with testing done during or after the procedure.
- Inpatients who are asymptomatic will continue to be tested on a 7 day testing schedule as indicated according to current UCSF protocol.

- This document provides guidance around the use of PPE and surgical workflows based on clinical suspicion for COVID-19 infection, level of procedural risk, and availability of COVID-19 test results
- See Scenario 5 below for guidance on the use of **COVID-19 Rapid Test platforms**

Definitions:

- **High-Risk Surgeries:**
 - Any procedures on the airway, throat, mouth or sinuses (bronchoscopy, tracheostomy, glossectomy, laryngoscopy procedure...etc)
 - Endoscopy/ERCP, TEE, ECT
 - Surgery under regional anesthetic with high likelihood of requiring GA
 - Active CPR
 - Thoracic surgery/procedures
- **Symptomatic or High-Risk Patient:**
 - Any of the following *new acute* symptoms:
 - Fever (objective or subjective)
 - Myalgias
 - Respiratory symptoms (dyspnea or cough)
 - URI symptoms (headache, rhinorrhea, sore throat)
 - GI symptoms (diarrhea, nausea, vomiting)
 - ENT symptoms (loss of taste or smell)
 - Eye symptoms (conjunctivitis)
 - Other clinical concern for COVID-19
 - Chest imaging findings suggestive of COVID-19 (bilateral, ground glass, peripheral distribution)
 - Sustained close contact (e.g. household contact) with a known case of COVID-19
 - Unable to provide history and no collateral regarding symptoms available
 - Newborns born to mothers with known COVID-19
- **Asymptomatic patient:**
 - Meets none of the Symptomatic or High-Risk patient criteria

Guidance (also see Summary Table):

Please note that in addition to the guidance below, providers should don **eye protection** and **surgical mask** for any encounter with patients in the pre-operative and post-operative settings.

1-For patients with suspected or confirmed COVID-19 infection (prior to meeting discontinuation of isolation criteria), follow the [Adult Perioperative Guidelines for Patients with Suspected/Confirmed COVID-19](#). Also see [Anesthesia Perioperative Adult, Pediatric and Obstetric Guidelines for the Care of Patients with Known/Suspected COVID-19](#). **N.B. A patient may still be considered a PUI even with a negative test – this is a clinical decision.**

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2-For **asymptomatic patients with a confirmed negative COVID-19 RT-PCR test within 4 days or COVID-recovered within 90 days of infection** undergoing **high-risk** procedures (Scenario 2), it is recommended that all team members don full N95 respirator with face shield/goggles or PAPR for the **entire duration of the case**. Any provider entering the room during the case should wear an N95 respirator with face shield/goggles or PAPR in addition to other appropriate PPE. When the case is finished, providers may leave with the patient when clinically appropriate but a sign **MUST** be placed at the room entrance indicating what time providers may enter without the recommendation for N95-level PPE. This refers to the time required following completion of the last AGP event to ensure 99% air clearance as determined by the number of air changes per hour (ACH) in that location. For main ORs at ML, MB and MZ, 15 minutes is required. Please note the modifications required in most **NORA** settings (table below). In these cases, N95 respirators, face shields or PAPR shields may be re-used and stored in accordance with UCSF PPE reuse policies. Additionally, anesthesia providers should minimize mask ventilation when feasible.

3-For **asymptomatic patients with a confirmed negative COVID-19 RT-PCR test within 4 days or COVID-recovered within 90 days of infection NOT undergoing a high-risk procedure**, but requiring **general anesthesia** (Scenario 3), it is recommended that providers don full N95 respirator with face shield/goggles or PAPR when present for airway placement, manipulation (if necessary), removal or any other AGP portions of the case. Any providers present during an AGP as well as the designated time after completion of the AGP to ensure 99% air clearance should also wear an N95 respirator or PAPR in addition to other appropriate PPE. For main ORs at ML, MB and MZ, 15 minutes is required. Please note the modifications required in most NORA settings (table below). Afterwards, **team members can choose to don standard PPE (surgical mask, eye protection, gloves)**. When the case is finished, providers may leave with the patient when clinically appropriate but a sign **MUST** be placed at the room entrance indicating what time providers may enter without the recommendation for N95-level PPE. In these cases, N95 respirators, face shields or PAPR shields may be re-used and stored in accordance with UCSF PPE reuse policies. Additionally, anesthesia providers should minimize mask ventilation when feasible.

4-For **asymptomatic patients with a confirmed negative COVID-19 RT-PCR test result within 4 days or COVID-recovered within 90 days of infection NOT undergoing a high-risk procedure and NOT requiring general anesthesia** (Scenario 4), standard PPE can be worn by all team members. However, if providers anticipate a high likelihood of requiring deep sedation and a general anesthetic option is deemed safe, consider following Scenario 3 and performing general anesthesia from the start. Providers may elect to don N95/PAPR as long as they are re-used and stored in accordance with UCSF PPE reuse policies.

5-For **asymptomatic/non-exposed/non-PUI** patients requiring **emergency** surgery where standard COVID-19 RT-PCR testing is **pending**, a **Rapid Test** platform can be used to provide preliminary information. **The result should appear as “Rapid” or “POCT” in Apex**. If the test is **negative**, follow Scenarios 2-4 depending on the case but providers **MUST** don N95 respirator +

eye protection or PAPR + gown for all aerosol-generating procedures and portions of the case. This does **NOT** require the full COVID-19 confirmed/PUI protocol (Scenario 1)– i.e. no dedicated O.R., ante-room or pre-op huddle required. However, if providers have any suspicion for possible COVID-19 infection, providers should have a low threshold for designating the patient a PUI and proceeding according to Scenario 1 above. If the test is **positive**, treat as a confirmed positive, and follow Scenario 1. In either case, ensure that a standard confirmatory COVID-19 RT-PCR test has been sent – if not, consider collecting the specimen in the O.R. while donning appropriate **airborne PPE**.

Scenario	Anesthesia Provider PPE	Surgery/ Nursing/ Scrub PPE	Workflow
1 – COVID-19 PUI/ Confirmed (prior to meeting discontinuation of isolation criteria) for ANY surgery/procedure	<ul style="list-style-type: none"> • <u>Reusable</u> N95 + face shield/goggles or PAPR • Gown • Double gloves 	<ul style="list-style-type: none"> • <u>Reusable</u> N95 + face shield/goggles or PAPR • Gown • Double gloves 	<ul style="list-style-type: none"> • Adult Perioperative Guidelines for Patients with Suspected/Confirmed COVID-19 • Anesthesia Perioperative Adult, Pediatric and Obstetric Guidelines for the Care of Patients with Known/Suspected COVID-19
2 – Asymptomatic patient WITH TESTING WITHIN 4 DAYS or COVID-recovered within 90 days of infection for HIGH RISK surgery/procedure	<ul style="list-style-type: none"> • <u>Reusable</u> N95 + face shield/goggles or PAPR 	<ul style="list-style-type: none"> • <u>Reusable</u> N95 + face shield/goggles or PAPR 	<ul style="list-style-type: none"> • See Scenario 2 details in Guidance section above
3 – Asymptomatic patient WITH TESTING WITHIN 4 DAYS or COVID-recovered within 90 days of infection for LOW RISK surgery/procedure involving general anesthesia	<ul style="list-style-type: none"> • <u>Reusable</u> N95 + face shield/goggles or PAPR for AGP events • Standard PPE can be worn outside of AGP events and corresponding time afterwards for 99% air clearance* 	<ul style="list-style-type: none"> • If present in the room during or within period before 99% air clearance: • <u>Reusable</u> N95 + face shield/goggles or PAPR • Standard PPE can be worn outside of AGP events and corresponding time afterwards for 99% air clearance* 	<ul style="list-style-type: none"> • See Scenario 3 details in Guidance section above
4 – Asymptomatic patient WITH TESTING WITHIN 4 DAYS or COVID-recovered within 90 days of infection for LOW RISK surgery/procedure WITHOUT general anesthesia	<ul style="list-style-type: none"> • Standard PPE* 	<ul style="list-style-type: none"> • Standard PPE* 	<ul style="list-style-type: none"> • See Scenario 4 details in Guidance section above
5 – EMERGENCY case in ASYMPTOMATIC/NON-PUI patient +/- NEGATIVE COVID-19 RAPID Testing and PENDING confirmatory test	<ul style="list-style-type: none"> • See Scenario 5 details in Guidance section above • Full COVID-19 confirmed/PUI precautions (Scenario 1) NOT required (i.e. pre-op huddle, special O.R. with anteroom...etc), unless the patient is designated a PUI • Follow Scenarios 2-4 but providers MUST don N95 respirator + eye protection or PAPR + gown for all aerosol-generating procedures and portions of the case. • Ensure a confirmatory standard COVID RT-PCR has been sent. If not, send from O.R. (Airborne PPE for specimen collection) 		

*Providers may elect to don N95/PAPR as long as they are re-used and stored in accordance with UCSF PPE reuse policies.

Please note that for asymptomatic INPATIENTS, the testing window may be extended to 7 days for the above scenarios

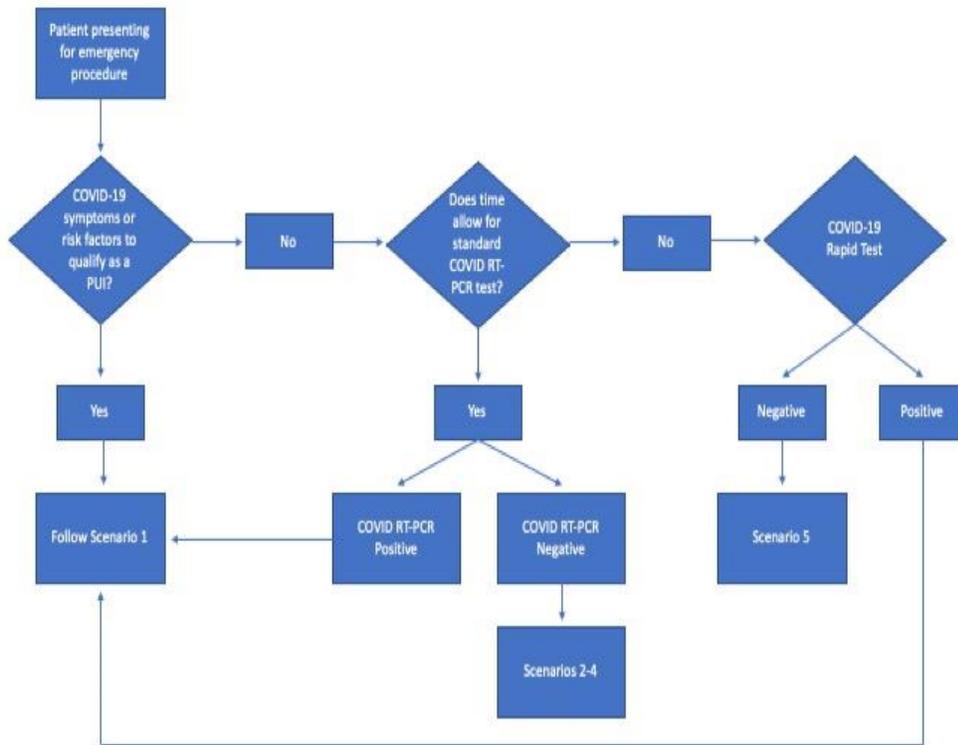
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Please note:

- Please keep in mind that if circuit disconnects are necessary (flipping, turning 180 degrees), it is best to place a second filter directly at the airway before the circuit is disconnected. Ensure the ventilator and flows are paused before and during any disconnect. If feasible, the airway can also be briefly clamped during this time.
- For reuse PPE guidelines see https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tksra4681/f/Reuse_Guidelines_PPE.pdf

Figure 1: Flowchart for Emergency Procedures and COVID-19 Rapid Testing in Patients Without Known History of COVID-19



*Please note that in a non-PUI patient with only a negative COVID-19 Rapid Test (pending confirmatory RT-PCR test), providers **MUST** don N95 respirator + eye protection or PAPR + gown for all aerosol-generating procedures and portions of the case according to Scenarios 2-4.

Appendix A: Waiting Times After Aerosol-Generating Procedures (AGPs)

A Note on Waiting Times after AGPs:

- These times are derived from airflow characteristics in different O.R.s/procedural areas needed to achieve a 99% efficiency of clearance of airborne contaminants. If anyone is present in the location during/after an AGP in test-negative patients in this time period, it is recommended that they don N95-level respiratory protection
- The most efficient way to achieve this process in a positive pressure environment is to keep the doors closed to avoid interrupting the airflow.
- **However, if a provider needs to leave the location during that time, they may do so as long as they leave quickly and minimize the amount and time the door is opened**
- **For high-turnover locations or NORA areas with slower ACHs, patients WILL be allowed to enter rooms after AGPs in test-negative patients even before the 99% turnover occurs so that the pace of cases can continue as usual. However, it is recommended that providers still don N95-level PPE if entering within the previous AGP time window.**

A Note on NORA Cases at Moffitt Long in Asymptomatic Patients WITH TESTING:

- For most non-OR locations (NORA), air exchanges take longer. In some cases, proceduralists may elect to don N95/PAPR to avoid delay in starting a case.
 - **For IR:** In general, most IR rooms require 30 minutes to 1 hour for 99% air exchange after AGPs in asymptomatic patients with testing (see IR Protocol document in Box Folder for further details). However, providers may choose to use the negative pressure induction rooms for intubation/extubation (**M345** and **M347**). Providers may leave the induction room with the patient immediately after an AGP (including extubation), but a time of 30 mins for asymptomatic patients with testing must still elapse before anyone should enter the induction room without N95-level PPE. Please use a circuit filter connected directly to the airway during transport. If this additional filter needs to be removed upon arrival to the destination, make sure to briefly clamp the airway during disconnect. Appropriate signage must be in place at every entrance of the induction room indicating what time staff may enter without N95-level PPE.
 - **For ERCP suite:** This is a negative pressure environment. 15 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE. If providers leave with the patient at the end of a procedure before this time has elapsed, appropriate signage must be in place as above.
 - **For Endoscopy suites:** This is a negative pressure environment. 30 minutes (East rooms) vs. 1hr (West rooms) must elapse after an AGP before anyone should enter the room without N95-level PPE. If providers leave with the patient at the end of a procedure before this time has elapsed, appropriate signage must be in place as above.
 - **For EP/Cath on 5th floor:** These are positive pressure environments. 30 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.

- **For EP/Cath on 12th floor:** These are positive pressure environments. Differences depending on which room is used: M1233 15 minutes applies, M1230 30 minutes applies after an AGP before anyone should enter the room without N95-level PPE.

A note on Adult NORA Cases at Mission Bay in Asymptomatic Patients WITH TESTING:

- **Endoscopy:** O.R. 29 (A2601) is a negative pressure environment. 30 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.
- **ERCP:** When performed in the IR hybrid O.R. 23 (C2675), 15 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.
- **Interventional Radiology:** IR hybrid O.R. 23 (C2675) requires 15 minutes, as noted above. In IR hybrid OR 24 (A2683), 30 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.
- **MRI 2nd floor:** The air exchanges here are very low. The recommendation is to use a free, neighboring O.R. for intubation and extubation, with an expected 15 minute wait time.
- **MRI 1st floor:** In the induction room (C1755), 15 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.
- **CT-Guided Procedures:** In MBCT1 (C1769), MBCT2 (C1716) and MBCT3 (C1714), 30 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.
- **Radiation Oncology/Nuclear Medicine at PCMB:** Please consult the chart below (**Imaging Suite Downtimes**) for the various procedural locations and their corresponding waiting times.
- **IVF at 499 Illinois Street:** 15 minutes must elapse after an AGP before anyone should enter the room without N95-level PPE.

Parnassus			Mission Bay		
Room Number	Radiology Name	Room Downtime	Room Number	Radiology Name	Room Downtime
M365	IR Room 8	30 minutes	C2675	IR Hybrid/OR23	15 minutes
M375	IR Room 9	45 minutes	A2683	IR/OR24	30 minutes
M337	IR Room 4	15 minutes	C1769	MBCT1	30 minutes
L367	NIR Z	30 minutes	C1716	MBCT2	30 minutes
L382	NIR S	15 minutes	C1714	MBCT3	30 minutes
L389	NIR Q	30 minutes	C1755	MRI Induction Room	15 minutes
L361	CT 2	15 minutes	C1729	Nuclear Medicine	45 minutes
L363	CT 4	30 minutes	C1721	PET/CT	45 minutes
L300	MRLP	45 minutes	C1778	Fluoro 1	45 minutes
L314	MR4	30 minutes	C1782	Fluoro 2	45 minutes
M345	Room 5	30 minutes	C1758A	RN Holding 1	45 minutes
M347	Room 6	30 minutes	C1758B	RN Holding 2	45 minutes
M337	ERCP	15 minutes	C1758Q	US1	45 minutes
L376	US Room 2	15 minutes	C1758V	US4	60 minutes
L506	EP/Cath 5 th floor	30 minutes			
L508	EP/Cath 5 th floor	30 minutes			
L514	EP/Cath 5 th floor	30 minutes			
L518	EP/Cath 5 th floor	30 minutes			
M1230	EP/Cath 12 th floor	30 minutes			
M1233	EP/Cath 12 th floor	15 minutes			
Mt. Zion			PCMB		
Room Number	Radiology Name	Room Downtime	Room Number	Radiology Name	Room Downtime
A237	MZ IR 1	30 minutes	L2141-A	PCMB1	30 minutes
A239	MZ IR 3	30 minutes	L2141-B	PCMB2	30 minutes
A241	MZ Holding Room	45 minutes	L2171	PCCT1	15 minutes
A134	MZ CT	30 minutes	L2131	Holding Room 3	45 minutes
			L2131	Holding Room 4	45 minutes
			L3180E	Breast Biopsy	45 minutes
			L2128	US Room 2	45 minutes

Appendix B: Performance of the COVID-19 RT-PCR test

COVID-19 Diagnostic Testing in Perioperative Setting:

Reverse transcriptase PCR (RT-PCR) testing for COVID-19 detects RNA from SARS-Coronavirus-2 and is the primary test used for diagnosis of acute infection. Analytical sensitivity of PCR testing is very high at >98%¹.

Clinical sensitivity of RT-PCR varies by site of sampling, likely due to variation in quality of sampling technique, time of sampling with respect to disease course (viral titers are highest early in infection²), and variation in the distribution of virus in the lower versus upper respiratory tract. Our understanding of clinical sensitivity of RT-PCR is based on a) prior studies using RT-PCR to detect respiratory viruses, and b) limited data on SARS-CoV-2³. Prior studies of respiratory viruses have found that sampling by nasopharyngeal (NP) swab may be more sensitive than oropharyngeal (OP) swab sampling, and that a combination of NP + OP may increase sensitivity, although variation by virus was observed³⁻⁵. Two limited studies of SARS-CoV-2 have compared percent test positivity based on sampling site but were not done in a way that allowed accurate calculation of sensitivity. The larger study (213 patients, not-yet peer reviewed) found that test positivity in the first 14 days of symptom onset was higher in NP swabs (72%) versus OP swabs (61%)². The smaller study (9 patients) found 100% test positivity during the first five days of symptoms and 46% test positivity after the first five days, independent of swab type⁶. Additional studies suggest that sputum and lower respiratory specimens (endotracheal aspirate) may have higher viral loads and thus possibly higher sensitivity when tested compared to the nasopharynx or oropharynx, especially earlier during disease course^{2,7,8}.

What does a negative RT-PCR test mean? The negative predictive value [(true negatives)/(true negatives + false negatives)] allows us to understand the significance of a negative test, which differs depending on the prevalence of disease in the population being tested. In asymptomatic patients, the prevalence of SARS-CoV-2 in the Bay Area and in the U.S. is not yet known, but based on data in other countries⁹, is estimated to be approximately 1%. Given that the estimated prevalence of asymptomatic patients in the Bay Area is very low, the negative predictive value for a test in an asymptomatic patient prior to surgery is very high. For example, if the COVID-19 prevalence is assumed to be 1% and the sensitivity/specificity of a NP swab test is estimated at 75%/98%, then the negative predictive value of the test is 99.7%.

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