



A Novel Approach for Improving COVID-19 Vaccine Rates: Administration During the Perioperative Period

by Celeste Day, MS, CRNA, and Edward A. Bittner, MD, PhD

As of November 13, 2021, the COVID-19 pandemic has infected more than 253 million people worldwide causing more than 5 million deaths. At the time of this writing, the United States alone has had 46 million cases, resulting in 762,000 deaths.¹ The available COVID-19 vaccines have had a positive impact on disease severity and population survival,² yet only 59% of the U.S. population that is eligible for the vaccine is fully vaccinated at the time this article was authored.¹ The estimated total cost of this pandemic is 16 trillion USD.³ A variety of reasons exist for the low rates of vaccination in the United States, which do not necessarily relate to individual refusal. Such reasons can include needle phobia, fear of health care settings, lack of access to vaccination sites, government distrust, long-term safety concerns, and fear of deportation for illegal immigrants.

The preoperative period may be an excellent opportunity to provide COVID-19 vaccine education and offer vaccine administration. Patients may be receptive to education from their perioperative care providers and the convenience of vaccination during their hospital stay. At present, there are no prior reports of COVID-19 vaccination during the perioperative period and no published guidelines. The Center for Disease Control recommends each patient speak to their health care providers about vaccination in relation to surgical or other procedures.⁴ The risks of administration of vaccines during the perioperative time period and the benefits of vaccination must be weighed, taking into

Table 1: Protocol for Perioperative COVID-19 Vaccination

1. Screen patient for vaccine status, thanking the vaccinated and providing vaccine teaching to the unvaccinated.
2. Ask patient about willingness to receive the vaccine, excluding contraindications.
3. Discuss with surgeon/proceduralist.
4. Contact pharmacy and identify vaccine options available, ordering available vaccine, obtaining the dose and vaccine card through our facility's process.
5. Administer vaccine during perioperative period, in contralateral deltoid muscle if surgical site is a factor. For needle phobic patients, this can occur during anesthesia.
6. Document vaccination in medical record and on vaccine card. Provide patient with vaccine card and date for second administration.
7. Provide information regarding vaccine side effects and contact information for questions/concerns.

account the potential immune response to vaccination and effect on surgical healing.⁵

In collaboration with the Anesthesia and Surgical Teams, Nursing and the OR Pharmacy, here at the Massachusetts General Hospital, the authors developed a protocol (Table 1) for perioperative COVID-19 vaccination. To date five patients (Table 2) have actively sought COVID-19 vaccination and have been provided

a first dose during the perioperative period. During the one-month period between September 15, 2021, to October 15, 2021, in caring for 94 patients, the authors encountered eight unvaccinated patients during regular anesthesia practice. Among this cohort, 50% of the unvaccinated patients were open to receiving vaccination. We have been able to accommodate each of these requests with the availability of vaccine doses at the time of request in our central pharmacy. No untoward side effects have been reported after vaccine administration at the present time. Vaccine cards were filled out and distributed to patients with instructions given to assist with scheduling second vaccine appointments in collaboration with primary surgical teams, patients, and caregivers.

Vaccination administration during anesthetic care may be an effective way to improve vaccination compliance, patient, and population wellness. While the number of unvaccinated patients presenting for surgery is unknown, it is likely to approximate the 40% of unvaccinated patients in the US population overall and even be higher in regions with lower vaccination rates. The patients at MGH who have received these doses had varying reasons to not yet be vaccinated and all were grateful to receive their first dose.

Next steps for the initiative include extending the program more widely across the institution and its affiliates, facilitating second dose administration, and monitoring rates of success.

See "Vaccine Rates," Next Page

Table 2: Patient Characteristics and Reasons for Perioperative Vaccination

Age	Gender	ASA Classification	Surgical Procedure	Reason for Perioperative Vaccination Request	Timing of vaccination
52	Female	2	Bilateral mastectomy with lymph node dissection for cancer	Needle phobic and requesting vaccination under general anesthesia. She stated that she would then follow up for her second dose having received the first dose	Intraoperative
32	Female	3	Left foot debridement and vacuum-assisted closure (VAC) dressing placement	Limited access to resources	Intraoperative
63	Male	4	Right index finger amputation	Just learned of an unvaccinated friend who died of COVID-19	Postoperative (vaccination dose was not ready during surgery)
18	Female	3	Laparoscopic sleeve gastrectomy	Developmental delay and limited access to resources	Intraoperative
55	Female	2	Right upper arm Schwannoma excision	Vaccination anxiety	Postoperative (vaccination dose was not ready during surgery)

Perioperative Vaccination Program May Increase Overall Vaccination Rates

From “Vaccine Rates,” Preceding Page

A number of questions remain unanswered including whether there are differences in vaccination efficacy based on surgical procedure type, patient characteristics, and the optimal timing of administration during the perioperative period. Such questions warrant study on a larger scale.

Despite large population-wide vaccine efforts, a significant number of people remain unvaccinated during the COVID-19 pandemic. A prime opportunity for perioperative providers to join together to improve the health of our unvaccinated patients and our society with vaccination is present. We encourage institutions worldwide to join in these efforts by establishing their own vaccination programs.

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