Using data derived from all outpatient plastic surgery procedures performed at our institution from June of 2016 through November of 2018, including demographic characteristics, surgery details, and details of both preoperative and postoperative prescriptions, we performed a binary logistic regression analysis to identify any possible predictors of requiring secondary refills of opioids. We found several statistically significant predictors of obtaining secondary opioid prescription refills following outpatient plastic surgery procedures (Table 1).

Female sex was found to be associated with increased preponderance of opioid prescription refills postoperatively. However, we largely attribute this to our sample being disproportionately female; other studies have shown that male sex may be related to increased opioid use postoperatively.\(^5\)

Increasing body mass index also was associated with increased opioid prescription refill. Perhaps most importantly, any exposure to opioids in the 30 days preceding surgery was a predictor of requiring opioid refills postoperatively (OR, 2.2), a finding that has been demonstrated in the orthopedic literature but, to our knowledge, never in plastic surgery patients.\(^5\)

Prescription of multimodal analgesia at the operative encounter was also predictive of needing postoperative opioid refills. However, there is evidence showing that multimodal pain control in the perioperative period can decrease the use of opioids in the postoperative period, leading us to believe that this finding is more reflective of prescriber anticipating pain needs based on the procedure or the patient rather than nonnarcotic pain medication being a contributor to higher narcotic use. This could also be explained by a population of patients who were started with only nonopioid prescriptions initially and who then subsequently required additional prescription for opioids for further pain control.

Our findings that increasing body mass index and preoperative opioid consumption are independently related to increased opioid prescription refills in the postoperative period are the first such reports in plastic surgery patients. This knowledge can be leveraged to assist in decision-making when writing postoperative opioid prescriptions and act as a starting point for future investigation into decreasing opioid use in postoperative patients.

Table 1. Predictors of Secondary Opioid Prescription following Outpatient Plastic Surgery Procedures

| Variable                        | OR  | p    |
|---------------------------------|-----|------|
| Female sex                      | 1.65| 0.042|
| Body mass index (each point increase) | 1.02| 0.035|
| Multiple surgical sites         | 1.02| 0.961|
| Preoperative opioid exposure    | 2.24| <0.01|
| Multimodal analgesia prescribed | 1.73| <0.01|
| Abdominoplasty                  | 2.66| 0.051|

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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Timing of COVID-19 Vaccination in Relation to Elective Surgery

With the outbreak of the COVID-19 pandemic, the medical profession has had to adapt and transform in order to ensure comprehensive and safe patient care. This has affected the way surgeons triage
patients and book and perform operations. The introduction of COVID-19 vaccines was an exciting advancement in disease prevention, but their long-term efficacy and effects remain unknown. We are often asked by patients when we would recommend they receive a COVID-19 vaccine in relation to undergoing surgery. Our goal was to investigate current recommendations regarding timing of COVID-19 vaccination in patients who are undergoing or have recently undergone surgery in an attempt to better inform our plastic surgery patient population.

Centers for Disease Control and Prevention recommendations surrounding vaccinations suggest that “current, recent or upcoming anesthesia/surgery/hospitalization” is not a contraindication to receiving any vaccine.1 If patients are acutely ill during the perioperative period, it has been recommended that they wait to receive vaccines as soon as possible once they have improved clinically.1 It is not unusual for patients to exhibit a myriad of acute symptoms related to receiving a vaccine that may confuse the picture of a perioperative illness or infection. Recent phase III trials have shown a significant incidence of side effects following COVID-19 vaccination. The majority appear to be self-limiting and a few days in duration. Such symptoms include flu-like symptoms and reactions restricted to the injection site (Table 1), but severe effects, such as anaphylaxis, although rare, may occur.2-3 These symptoms overlap with those observed in the setting of systemic illness, infection, or adverse drug reaction, all of which are a concern in the acute perioperative period. For example, if a patient presents with a concern for illness preoperatively, we are likely to delay surgery, and in the postoperative setting we may have a heightened suspicion for a surgically related pathogenesis.

Recently there have been reports of facial or lip swelling following receipt of the Moderna (Cambridge, Mass.) COVID-19 vaccine in patients who have a history of facial filler. This appears to be a relatively rare delayed hypersensitivity reaction that resolves when treated with oral steroids and antihistamines. It has been postulated this may result from a vaccine-driven immune response provoking a local inflammatory reaction targeting tissue containing filler.4,5 At this time, there is not enough information to determine with certainty whether this was the cause or how many people with a history of facial filler are likely to have a similar reaction. The Centers for Disease Control and Prevention currently states that people with a history of dermal fillers who have no contraindications to vaccines should proceed with vaccination.1 This is important for plastic surgeons to be aware of and disclose when counseling patients with a history of facial filler or who are considering facial filler in adjunct with the COVID-19 vaccine and may consider delaying such elective procedures until the final vaccine has been received.

There is currently no uniform recommendation regarding COVID-19 vaccination timing in respect to elective surgery. Surgery results in a generalized state of immunosuppression and we do not yet have a full understanding of the potential for immunocompromise after COVID-19 vaccination.5 We have therefore taken Centers for Disease Control and Prevention guidelines, available literature, as well as risk factors of surgical procedures into consideration when determining how to most safely and appropriately counsel our patients who are undergoing or have recently undergone surgery. For patients who are undergoing minor elective procedures without prolonged anesthesia and are at lower risk for postoperative complications (e.g., cutaneous oncologic excision and reconstruction, scar revision), we recommend they receive the vaccination at the earliest date possible without any limitation. For patients undergoing more extensive procedures (e.g., autologous and implant-based breast reconstruction, abdominal reconstruction, abdominal or lower body contouring), we recommend patients do not receive the vaccine within a week before or after the operation. We believe this may help prevent misinterpretation of any vaccine-related side effects as perioperative infection that may prompt an extensive workup or intervention.

At this time, we have limited available data with which to guide our vaccine recommendations in regard to elective surgery, and our priority is, first and foremost, the safety of our patients. In discussion with our institutions and after reviewing current recommendations and literature, we believe this is a safe and effective way to counsel our patients. We are prepared to make adjustments as we learn more about the impact of COVID-19 vaccination.

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Table 1. Side Effects Associated with Various COVID-19 Vaccinations

| Common Side Effects | Uncommon Side Effects |
|---------------------|-----------------------|
| Fatigue             | Anaphylaxis           |
| Headache            | Death                 |
| Fever and/or chills |                       |
| Nausea and/or vomiting |                   |
| Pain, swelling, or redness at injection site | |
| Enlarged lymph nodes |                       |
The Virtual Interview Process: What We Learned and What’s Ahead

The lessons of the past should steer us towards ensuring lasting legacies for generations yet to be born.

— Hun Sen

Because of COVID-19 pandemic travel restrictions, plastic surgery residencies and fellowships transitioned to virtual interviews for the 2020 to 2021 application season. For applicants, virtual interviews allowed for considerable savings regarding cost (airfare, hotel, car rental, taxi, meals, and so on) and time. Applicants could accept and coordinate interviews more easily with reduced stress. For programs, there were decreased costs from not hosting applicants and increased convenience as faculty, fellow, and resident interviewers could participate from their homes or offices. Both applicants and programs made the best of a difficult situation and learned important lessons about the feasibility of virtual engagement.

However, the virtual process had downsides. It was more difficult for applicants to evaluate a program’s culture because they could not observe resident–resident and resident–faculty interactions, especially without visiting subinternships. Programs had a more difficult time gauging the applicant’s personality, nonverbal cues, and interactions with others. The virtual interview format also may have harbored an increased risk of bias. As residency applicants were asked to commit to an institution for 6 to 7 years without ever physically visiting the site, it is likely more applicants matched at home institutions out of familiarity and proximity. For similar reasons, residency programs were more likely to rank “known” students (home students or those who had done research there) higher on rank lists. In integrated plastic surgery, the home institution match rate increased from 15 percent in 2019 and 18 percent in 2020 up to 26 percent in 2021, a trend likely to be identified in other specialties as well (Hollins et al., unpublished data, June of 2021).

With the availability and accessibility of COVID-19 vaccines, there are promising signs of a return to normal, including the Association of American Medical Colleges policy of allowing medical students to participate in one visiting subinternship for the 2021 to 2022 year. However, it has not yet been decided whether allowing thousands of applicants to travel cross-country for interviews is safe. If virtual interviews are not uniformly required, programs may consider developing a hybrid interview system that reduces the overall amount of travel but still allows for personal interview experiences. Such a system could be set up in multiple ways, including (but not limited to) these options:

1. Applicant choice: Applicants could elect to attend an in-person or virtual interview.
2. Program choice: Applicants could only be offered either an in-person or virtual interview.
3. Second look: Applicants could complete an initial virtual interview, and then be invited for an in-person “second look.”
4. Regional restriction: A program could limit in-person interviews to applicants from regional medical schools or residencies.

Although most applicants likely would prefer in-person interviews, virtual interviews could benefit applicants who cannot travel for personal, financial, familial, or medical reasons. Care should be taken to ensure that applicants are not disadvantaged by the virtual option. It should be considered that applicants may feel pressured to select an in-person option if given the choice. If the number of in-person interviews per applicant could be limited, they could serve as a helpful mechanism of preference signaling, a concept that has been explored in the otolaryngology match process.

For future application cycles, we suggest the implementation of a hybrid interview system to address the shortcomings of the traditional in-person method and additional pitfalls incurred by COVID-19. By applying the lessons learned from the past, we will develop creative solutions to ensure successful application cycles in the post–COVID-19 era.

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