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Identifying Factors Important to Patients for Resuming Elective Imaging During the COVID-19 Pandemic

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Abstract

Purpose: To identify factors important to patients for their return to elective imaging during the coronavirus disease 2019 (COVID-19) pandemic.

Methods: In all, 249 patients had elective MRIs postponed from March 23, 2020, to April 24, 2020, because of the COVID-19 pandemic. Of these patients, 99 completed a 22-question survey about living arrangement and health care follow-up, effect of imaging postponement, safety of imaging, and factors important for elective imaging. Mann-Whitney U, Fisher’s exact, $\chi^2$ tests, and logistic regression analyses were performed. Statistical significance was set to $P < 0.05$ with Bonferroni correction applied.

Results: Overall, 68% of patients felt imaging postponement had no impact or a small impact on health, 68% felt it was fairly or extremely safe to obtain imaging, and 53% thought there was no difference in safety between hospital-based and outpatient locations. Patients who already had imaging performed or rescheduled were more likely to feel it was safe to get an MRI (odds ratio [OR] 3.267, $P = 0.028$) and that the hospital setting was safe (OR 3.976, $P = 0.004$). Staff friendliness was the most important factor related to an imaging center visit (95% fairly or extremely important). Use of masks by staff was the top infection prevention measure (94% fairly or extremely important). Likelihood of rescheduling imaging decreased if a short waiting time was important (OR 0.107, $P = 0.030$).

Conclusion: As patients begin to feel that it is safe to obtain imaging examinations during the COVID-19 pandemic, many factors important to their imaging experience can be considered by radiology practices when developing new strategies to conduct elective imaging.

Key Words: COVID-19, elective imaging, pandemic, patient survey

INTRODUCTION

On December 31, 2019, the Wuhan Municipal Health Commission in China reported a cluster of pneumonia cases of unknown etiology in Wuhan, Hubei Province, which was discovered to be a novel strain of enveloped RNA virus from the coronaviridae family, severe acute respiratory syndrome coronavirus 2, later becoming known as coronavirus disease 2019 (COVID-19) [1]. On March
11, 2020, the World Health Organization officially declared the coronavirus outbreak a pandemic [2]. Across the United States, hospitals became inundated with COVID-19, with New York City (NYC) being severely affected early on by the spreading disease relative to the rest of the country [2,3].

In mid-March 2020, New York Presbyterian hospital announced that all nonemergent procedures, including elective medical imaging, would be postponed to help flatten the infection curve [4]. Infection rates rose sharply during this period, and by April 2020, New York state was recording over 10,000 new cases of infection and over 1,000 new cases of death each day [2]. As a result, during the peak of the COVID-19 pandemic, many patients awaiting important but nonurgent medical imaging had their examinations delayed as extreme demands were placed on all city hospitals.

As of this writing, although the status of the pandemic is in flux across large parts of the United States and in the rest of the world, NYC has experienced a recent decrease in infection rates and is currently undergoing a multiphased reopening plan. Subsequently, patients who previously had their imaging postponed are beginning to return for their examinations. With the increase in imaging demand coupled with an ongoing risk of infection, the way elective imaging is conducted must change to incorporate measures that slow the spread of COVID-19 [2,5,6]. It is important to ensure patients’ safety and to help set a high comfort level for them to obtain their medical imaging, particularly because prolonged delay in health care may lead to worse health outcomes [5,6].

The purpose of this study was to identify factors important to patients for their return to elective imaging during the COVID-19 pandemic. This may reveal information that radiology practices can use as they implement new strategies to change how elective imaging is conducted during these times.

MATERIALS AND METHODS

This was a prospective survey-based study approved by the institutional review board and compliant with HIPAA. Verbal informed consent was obtained from all participants via telephone.

Patient Selection

In the electronic health record, a total of 399 patients were identified who had an outpatient MRI examination originally scheduled between March 23, 2020, and April 24, 2020, that required postponement because of the COVID-19 pandemic. After applying exclusion criteria, a study group of 249 patients was obtained (Fig. 1). Patient demographics and other information related to MRI examinations were obtained from the electronic health record (Table 1).

Patient Survey

A 22-question survey was constructed for telephone administration to study participants (e-only Supplementary
Material A). This survey evaluated the following: living arrangement and health care follow-up during the COVID-19 pandemic (6 questions), effect of imaging postponement on health (1 question), safety of imaging and location preference (4 questions), importance of factors related to the elective imaging visit (10 questions), and a free response for open-ended commentary (1 question). Responses to questions that were related to patient perception were recorded on 5-point Likert scales. At the end of the survey, patients who did not already have their MRI examination completed or rescheduled were offered the opportunity to reschedule their appointment.

Responses to open-ended commentary were reviewed manually (TTW) while blinded to patient information and other survey responses. Each comment was classified with a coding frame into three categories (concern regarding imaging visit, satisfaction with imaging visit, and nonrelated to imaging visit). Comments classified as “concern regarding imaging visit” were further divided into two subcategories (safety related or not safety related).

Survey Participation
Members of the study team underwent a training session and were instructed on the use of a uniform script to administer the survey (GC, AB, JRZ, SS, ZNB). Patients were then called between June 13, 2020, and July 9, 2020.

The survey was administered during a government-directed phased reopening of NYC. Telephone calls were placed across several of these phases: 36% (91 of 249) in phase 1, 55% (136 of 249) in phase 2, and 9% (22 of 249) in phase 3. All patients who did not respond to the initial call were called a second time between 7 and 14 days afterward. A total of 40% (99 of 249) participated in the survey.

For context, an abbreviated description of key features in each phase specific to New York state follows [7]. Phase 1 involved reopening of construction sites, some retail stores for delivery and pickup, and outdoor businesses. Phase 2 involved reopening of several nonessential indoor businesses with limits on capacity and social distancing requirements as well as outdoor dining for restaurants. Phase 3 involved allowance of small gatherings of up to 25 people and reopening of various outdoor recreation venues such as tennis and basketball courts.

During the time this survey was conducted, the average number of new COVID-19 cases per day and the percent increase in new cases per day relative to the cumulative confirmed cases in New York state were as follows: phase 1 (688 cases per day, 0.18% increase per day), phase 2 (669 cases per day, 0.17% increase per day), phase 3 (599 cases per day, 0.15% increase per day) [1].

Statistics
Descriptive statistics were used to express results of the survey. A Mann-Whitney U test was used for evaluation of Likert scale ordinal variables between populations. Fisher’s exact and χ² tests were used for assessment of Likert scale data collapsed into binary categories. Multivariate binary and ordinal logistic regression were performed for analyses. In addition to demographic factors and survey responses, independent variables for regression analyses were also obtained from publicly available epidemiologic data regarding COVID-19 infection [2]. Statistical significance was set at $P \leq .05$ and adjusted for multiple comparisons using a Bonferroni correction. All statistics were performed on SPSS, version 26 (IBM, Armonk, New York) and Microsoft Excel 2019 MSO (version 2003, Microsoft Corporation, Redmond, Washington).

RESULTS
Demographic Details and Survey Timing
All 99 patients completed the entire survey; 51% (50 of 99) were completed in phase 1, 39% (39 of 99) in phase 2, and 10% (10 of 99) in phase 3 of the New York State reopening plan.

Patients With Imaging Already Completed or Rescheduled
At the time of survey 37% (37 of 99) of patients already had their imaging completed or rescheduled after initial delay. A
binary logistic regression analysis found that age, sex, presence of children at home, presence of elderly at home, and Medicaid insurance were not significant predictive factors for this (all $P > .134$).

**Living Arrangement and Health Care Follow-Up**

Survey responses for living arrangement and health care follow-up are shown in Figure 2. During a defined time of the pandemic (from March 1, 2020, up to time of survey), 64% (63 of 99) of patients had completed a clinical health care appointment. Of these, 65% (41 of 63) of the encounters occurred through telehealth. At the time of the survey, 34% (34 of 99) of patients reported having a future clinical health care appointment scheduled. Of these, 28% (11 of 39) of the encounters were scheduled to be through telehealth.

**Effect of Imaging Postponement on Health**

Half of the patients did not feel that the postponement in obtaining an MRI affected their health at all (Fig. 3). Patients were stratified into several groups for comparison using age, sex, whether imaging was already completed at the time of survey, Medicaid insurance, and evaluation of neoplasm as an examination indication.

Univariate analyses demonstrated no significant difference between how these various groups of patients felt that the imaging postponement affected them (Table 2). An ordinal logistic regression was performed using the same patient groups as independent variables and Likert scale data as outcomes. This showed that patients who already had their MRI scheduled or completed were significantly less likely to think that their health was affected (odds ratio [OR] 0.337 [0.145-0.785], $P = .012$). None of the

| Table 1. Patient demographics and MRI examination details          | Participants (n = 99) | Declined Participants (n = 9) | $P$ Value |
|---------------------------------------------------------------|----------------------|-------------------------------|-----------|
| **Demographic and Examination Information**                  |                      |                               |           |
| Age (y), mean ± SD (range)                                    | 57.2 ± 15.8 (23-87)  | 47.3 ± 17.5 (21-69)           | .079      |
| Sex (male:female)                                            | 48:51                | 5:4                           | .740      |
| Race                                                         |                      |                               | .786      |
| Asian                                                        | 3% (3 of 99)         | 0% (0 of 9)                   |           |
| Black or African American                                     | 12% (12 of 99)       | 0% (0 of 9)                   |           |
| White                                                        | 62% (61 of 99)       | 67% (6 of 9)                  |           |
| Combination of more than one                                  | 6% (6 of 99)         | 0% (0 of 9)                   |           |
| Unlisted or declined to provide                               | 17% (17 of 99)       | 33% (3 of 9)                  |           |
| Ethnicity                                                     |                      |                               | .550      |
| Hispanic or Latino                                           | 12% (12 of 99)       | 12% (1 of 9)                  |           |
| Not Hispanic or Latino                                       | 74% (73 of 99)       | 44% (4 of 9)                  |           |
| Unlisted or declined to provide                               | 14% (14 of 99)       | 44% (4 of 9)                  |           |
| MRI examination status at time of survey                      |                      |                               | .728      |
| Already completed or rescheduled examination                 | 37% (37 of 99)       | 44% (4 of 9)                  |           |
| Did not complete or rescheduled examination                  | 63% (62 of 99)       | 56% (5 of 9)                  |           |
| MRI examination types                                         |                      |                               | .968      |
| Abdomen and pelvis                                           | 55% (54 of 99)       | 67% (6 of 9)                  |           |
| Chest and cardiac                                            | 10% (10 of 99)       | 0% (0 of 9)                   |           |
| Musculoskeletal (including spine)                            | 10% (10 of 99)       | 11% (1 of 9)                  |           |
| Neurological                                                  | 19% (19 of 99)       | 22% (2 of 9)                  |           |
| Mammography                                                  | 6% (6 of 99)         | 0% (0 of 9)                   |           |
| Insurance types                                               |                      |                               | .015*     |
| Medicaid                                                     | 20% (20 of 99)       | 0% (0 of 9)                   |           |
| Medicare                                                     | 44% (43 of 99)       | 11% (1 of 9)                  |           |
| Commercial                                                   | 36% (36 of 99)       | 89% (8 of 9)                  |           |

Note that “unlisted or declined to provide” data for race and ethnicity were excluded in statistical analysis.

*Statistical significance at $P < .05$. 
other factors were significant in the regression analysis (all other \(P\) values > .197).

Safety of Imaging and Location Preference
Of the 99 patients, 67 (68%) felt it was fairly safe or extremely safe to obtain imaging examinations at the time of the survey. The perception of safety in obtaining an MRI at a hospital-based location compared to an outpatient center is shown in Figure 4. The majority of patients (53%) felt that there was no difference in safety between the two locations (Fig. 5). Regardless of the feelings of safety pertaining to the imaging location, 89% (88 of 99) of the patients reported they were fairly likely or extremely likely to go wherever their referring clinician directed them to.

Likert scale data for safety questions was collapsed into binary categories. Responses of fairly safe (4) and extremely safe (5) were grouped into a single safe category. The other responses of extremely unsafe (1), fairly unsafe (2), and neither unsafe or safe (3) were grouped into a single unsafe or equivocal category.

Patients were stratified into several groups for comparison using age, sex, presence of children at home, presence of elderly at home, Medicaid insurance, and whether imaging was already completed or rescheduled at the time of survey. Univariate analyses demonstrated significantly more patients who had already completed or rescheduled their MRI examinations at the time of survey felt that it was a safe time to get an MRI (84% versus 58%, \(P = .008\)) and that it was safe to get an MRI in the hospital setting (76% versus 42%, \(P = .001\); Table 3). A binary logistic regression was performed using the same patient groups as independent variables and safe versus unsafe or equivocal as outcomes. This showed that patients with completed or rescheduled examinations were more likely to feel it was safe to get an MRI (OR 3.267 [1.136-9.394], \(P = .028\) and that it was safe to get an MRI in...
the hospital setting (OR 3.976 [1.551-10.192], \( P = .004 \)). No other factors were significant in the regression analysis (all other \( P \) values > .073).

A similar binary grouping was performed to assess the likelihood patients would obtain imaging where their referring clinician specifies. Responses of fairly likely (4) and extremely likely (5) were grouped into a single likely category. The other responses of extremely unlikely (1), fairly unlikely (2), and neither unlikely or likely (3) were grouped into a single unlikely or equivocal category. No significant differences were identified between groups (Table 4). A binary logistic regression was performed using the same patient groups as independent variables with likely versus unlikely or equivocal as outcomes. This demonstrated no significant predictive factors (all \( P \) values > .302).

Important of Factors Related to Elective Imaging Experience
The patient perception of various factors related to their imaging visit is shown in Figure 6. The factor that the most patients found fairly or extremely important was staff friendliness (95%). The factor that the most patients found fairly or extremely unimportant was parking cost (53%). Among the safety measures assessed that were relevant to COVID-19 transmission, masks being used by the health care staff was the most important (94%).

Requests for Rescheduling of Examination After Survey
After the survey, 37% (23 of 62) of the patients who had not already completed or rescheduled their examination requested rescheduling. A binary logistic regression analysis was performed to assess for likelihood of rescheduling or not when controlling for age, sex, presence of children at home, presence of elderly at home, Medicaid insurance, evaluation of neoplasm as an examination indication, perceived safety in getting an MRI, New York state reopening phase at the time of survey, percent change in the number of new COVID-19 cases in New York state in the day preceding the survey, and all 10 of the subjective importance factors related to the imaging experience shown in Figure 6. This showed a decreased likelihood of rescheduling if a short waiting time was important (OR = 0.107 [0.014-0.803], \( P = .030 \)). No other factors were found to be significant in the regression analysis (all other \( P \) values > .094).

Free Responses
A total of 35% (35 of 99) of the patients responded to the open-ended question of “Is there anything else you would like to share?” The answers were categorized as follows: 17% (6 of 35) had concerns related to the safety of imaging visit (eg, “How often is machine cleaned?”); 17% (6 of 35) had non-safety-related concerns of imaging visit (eg, “Felt very stressed going into the city”); 20% (7 of 35) expressed satisfaction with imaging visit (eg, “Want to give high remarks to staff”); and 46% (16 of 45) had concerns unrelated to imaging visit (eg, “Concerned about second wave of infection”).

DISCUSSION
The manner in which elective imaging resumes in the midst of the COVID-19 pandemic will be unique to each individual practice and will likely be subject to state and federal governance. At the time of this writing, we found that the majority of patients in the NYC area who had MRI examinations postponed because of the pandemic felt that it was safe to return for imaging. Patients felt that both hospital-based imaging locations and outpatient imaging centers were safe locations to obtain their MRIs. Even if there were individual preferences, the majority of patients would still be willing to get their imaging at the specific locations their

### Table 2. How health has been affected by imaging postponement

| Demographic and Examination Information | How Health Is Affected by Imaging Postponement* | \( U \) | \( P \) |
|-----------------------------------------|-----------------------------------------------|------|------|
| Patient age (y)                         |                                               |      |      |
| \( \geq 60 \) (n = 48)                   | 1.85 ± 1.11 (1)                               | 1,066| .235 |
| <60 (n = 51)                            | 2.20 ± 1.36 (2)                               |      |      |
| Sex                                     |                                               |      |      |
| Male (n = 48)                           | 2.00 ± 1.07 (2)                               | 1,172| .698 |
| Female (n = 51)                         | 2.06 ± 1.41 (1)                               |      |      |
| Already had examination scheduled or completed at time of survey |                                               |      |      |
| Yes (n = 37)                            | 1.70 ± 1.10 (1)                               | 865.5| .029 |
| No (n = 62)                             | 2.23 ± 1.30 (2)                               |      |      |
| Medicaid insurance                      |                                               |      |      |
| Yes (n = 20)                            | 2.30 ± 1.45 (2)                               | 698.5| .392 |
| No (n = 79)                             | 1.96 ± 1.19 (1)                               |      |      |
| Imaging indication: surveillance or suspicion of neoplasm |                                               |      |      |
| Yes (n = 52)                            | 1.96 ± 1.20 (1.5)                             | 1,162| .651 |
| No (n = 47)                             | 2.11 ± 1.31 (2)                               |      |      |

Statistical significance set at \( P \leq .01 \) after Bonferroni correction.

*Values based on Likert scale (1 = none, 2 = small amount, 3 = moderate amount, 4 = large amount, 5 = extreme amount); data reported as mean ± standard deviation with medians in parentheses.
referring clinician directed them to. There were several factors important to patients regarding their imaging center visits, which should be considered for implementation by radiology practices.

The patient demographic factors we analyzed were not associated with whether patients already had their imaging completed or rescheduled at the time of the survey. Other factors we did not assess may influence this, including how much the clinician encouraged imaging, the patient perception of imaging urgency, and scheduling availability. The willingness of patients to obtain imaging examinations during the COVID-19 pandemic should also be considered. Although this will vary depending on location and timing, we found that 68% of patients in the NYC area thought they could safely return for imaging. Patients who had already completed their imaging or had it rescheduled were more likely to feel that it was safe compared with others. This may indicate satisfaction these patients had with their imaging experience or a desire to validate their decision to get imaging. They also felt that their health was less affected by the postponement of imaging, which is logical in that their imaging results were either already known at the time of survey or would be known soon afterward. Although subgroup analyses did not reveal any other significant findings, a couple of notable trends were identified. Patients older than 60 years old and patients living with people older than 60 years old tended to feel less safe. This likely reflects the well-publicized higher COVID-19 mortality rates among older individuals [8].

A recent statement by the ACR advises proceeding with radiology care if the risk of illness or death to a health care worker or patient from health care-acquired COVID-19 is less than illness or death resulting from delayed care [9]. The risk-benefit ratio for a patient’s visit to an imaging center, therefore, ultimately depends on the urgency of the pathology in question and also on the infection rates within each local community. It is critical for radiology practices to deliver a safe imaging experience so that patients feel reassured in getting their examination when referring clinicians determine that the benefits outweigh the risks. This is particularly important because some patients may be easily deterred because of a lack of urgency. As an example, neoplasm
evaluation was the MRI indication for 53% of the patients we surveyed and yet there was no significant difference in how these patients felt the imaging delay impacted their health compared with others. Although it remains to be seen what consequences will be incurred by pandemic-induced delays in health care, some patients already have had negative health outcomes, with one example being the delayed presentation for acute appendicitis [10]. It is safe to assume that other patients will have similar experiences. The risk is probably greater and increases with the length of delay for those who have more urgent imaging indications, such as cancer evaluation. It has already been shown that rates of cancer detection have dramatically decreased during the COVID-19 pandemic because of lower procedure volumes [11]. Some types of cancer screening may be appropriate to delay; however, there is a possibility that this will result in a future increase in the number of patients with more advanced disease [12,13].

One important determination that radiology practices need to make is what appropriate interval to schedule patients at to avoid overcrowded waiting rooms and to allow for proper equipment cleaning between examinations. Sparsely scheduling patients may be challenging if there are only a limited number of imaging locations available. Further scheduling constraints may exist if some patients are more selective about where they would be willing to go for their imaging. At our institution, we have made a concerted effort to expand the availability of all our imaging services. Part of our considerations included the possibility that some patients would want to avoid the hospital setting entirely because of the perception that infection risk would be higher with closer proximity to hospitalized COVID-19 patients. However, the majority of patients in our survey actually felt that hospital-based imaging locations were similar in safety compared with outpatient imaging centers. If resources (eg, technicians, nursing staff) become limited and need to be allocated, this suggests that hospital-based locations may not need to be deprioritized. Furthermore, because patients are likely to listen to their referring clinician when it comes to where they go for their imaging, there is an opportunity for radiology practices to coordinate with clinicians to deliver a streamlined and unified message that optimizes operations.

### Table 3. Safety in obtaining an MRI examination

| Demographic and Examination Information | Current MRI Safety | | MRI Safety at Hospital | | MRI Safety at Outpatient Center |
|----------------------------------------|-------------------|---|------------------------|---|-----------------------------|
|                                        | Safe | Unsafe or Equivocal | P Value | Safe | Unsafe or Equivocal | P Value | Safe | Unsafe or Equivocal | P Value |
| Patient age (y)                        |      |                    |         |      |                    |         |      |                    |         |
| ≥60 (n = 48)                           | 58% (28) | 42% (20) | .054 | 46% (22) | 54% (26) | .091 | 48% (23) | 52% (25) | .138 |
| <60 (n = 51)                           | 76% (39) | 24% (12) |     | 63% (32) | 37% (19) |     | 63% (32) | 37% (19) |     |
| Sex                                    |      |                    |         |      |                    |         |      |                    |         |
| Male (n = 48)                          | 71% (34) | 29% (14) | .515 | 60% (29) | 40% (19) | .255 | 58% (28) | 42% (20) | .589 |
| Female (n = 51)                        | 65% (33) | 35% (18) |     | 49% (25) | 51% (26) |     | 53% (27) | 47% (24) |     |
| Children living at home                |      |                    |         |      |                    |         |      |                    |         |
| Yes (n = 30)                           | 67% (20) | 33% (10) | .887 | 53% (16) | 47% (14) | .873 | 63% (19) | 37% (11) | .304 |
| No (n = 69)                            | 68% (47) | 32% (22) |     | 55% (38) | 45% (31) |     | 52% (36) | 48% (33) |     |
| Elderly living at home                 |      |                    |         |      |                    |         |      |                    |         |
| Yes (n = 67)                           | 66% (44) | 34% (23) | .537 | 48% (32) | 52% (35) | .050 | 49% (33) | 51% (34) | .068 |
| No (n = 32)                            | 72% (23) | 28% (9)  |     | 69% (22) | 31% (10) |     | 69% (22) | 31% (10) |     |
| Already had examination completed or rescheduled at time of survey |      |                    |         |      |                    |         |      |                    |         |
| Yes (n = 37)                           | 84% (31) | 16% (6)  | .008* | 76% (28) | 24% (9)  | .001* | 68% (25) | 32% (12) | .063 |
| No (n = 62)                            | 58% (36) | 42% (26) |     | 42% (26) | 58% (36) |     | 48% (30) | 52% (32) |     |
| Medicaid insurance                     |      |                    |         |      |                    |         |      |                    |         |
| Yes (n = 20)                           | 90% (18) | 10% (2)  | .017 | 65% (13) | 35% (7)  | .293 | 65% (13) | 35% (7)  | .341 |
| No (n = 79)                            | 62% (49) | 38% (30) |     | 52% (41) | 48% (38) |     | 53% (42) | 47% (37) |     |

Raw numbers are in parentheses.  
*Statistical significance at P ≤ .008 after Bonferroni correction.
Patients felt that there were several safety measures important for their imaging visit. These included use of masks by staff, social distancing, short waiting times, and temperature and health screening upon patient arrival. It is noteworthy that all of these measures can be controlled by the practice and, therefore, are feasible to implement. Other traditional logistical concerns for patients that are more difficult or impossible to change, such as parking availability or proximity of an imaging center, were actually less important.

There are many examples of how radiology practices can incorporate these safety measures into the imaging experience. Patient entry sites can be limited to locations in which health screening stations are set up. These entrances can potentially be separated from staff entry sites to decrease crowd congestion. Screening personnel and front desk staff can ensure that both patients and staff members have masks upon entry. In terms of social distancing, chairs can be limited and separated in the waiting room, places to stand while in queue can be marked, physical partitions may be used, and the number of people accompanying patients on their visit can be restricted. If possible, patients may wait outside of the imaging center and be alerted by telephone or text after checking in. To decrease waiting times, paperwork can be given to patients at the time of scheduling so they can be filled out before the visit.

It is notable that patients who found a short waiting time to be important were much less likely to reschedule their MRI examinations. Strategies aimed toward reducing the time spent in the waiting room may not only be important for safety but also for convincing patients to obtain elective imaging.

Other interventions may require higher scale planning and coordination. Limiting the number of trips outside of the

| Demographic and Examination Information | Likely | Unlikely or Equivocal | P Value |
|-----------------------------------------|--------|-----------------------|---------|
| Patient age (y)                         |        |                       |         |
| <60 (n = 48)                            | 90% (46) | 10% (5)               | .755    |
| ≥60 (n = 51)                            | 88% (42) | 12% (6)               | .755    |
| Sex                                     |        |                       |         |
| Male (n = 48)                           | 88% (42) | 12% (6)               | .755    |
| Female (n = 51)                         | 90% (46) | 10% (5)               | .755    |
| Children living at home                 |        |                       |         |
| Yes (n = 30)                            | 87% (26) | 13% (4)               | .731    |
| No (n = 69)                             | 90% (62) | 10% (7)               |         |
| Elderly living at home                  |        |                       |         |
| Yes (n = 67)                            | 88% (59) | 12% (8)               | >.999   |
| No (n = 32)                             | 91% (29) | 9% (3)                |         |
| Already had examination completed or rescheduled at time of survey | | | |
| Yes (n = 37)                            | 95% (35) | 5% (2)                | .202    |
| No (n = 62)                             | 85% (53) | 15% (9)               |         |
| Medicaid insurance                      |        |                       |         |
| Yes (n = 20)                            | 100% (20) | 0% (0)                | .072    |
| No (n = 79)                             | 86% (68) | 14% (11)              |         |

Fig 6. Perceived importance of factors related to imaging center visit. All unlabeled bars are ≤4%.
home may be paramount for some patients, which is probably why 71% of those surveyed thought it was important that their imaging examination took place on the same day as their clinical appointment. This may be a particular priority if long distance travel is needed for tertiary care center visits. Although there are scheduling challenges to overcome to facilitate this, novel strategies may be developed that leverage the changing landscape of health care. One such strategy involves consideration of the prominent role that telehealth has played during this pandemic. During the peak of the pandemic in NYC, 66% of clinical visits for our patients were conducted via telehealth. After the peak, telehealth visits still accounted for 28% of scheduled appointments. One way our institution has tried to meet patient needs is to facilitate telehealth visits in designated locations within the radiology department immediately after imaging examinations. Imaging results are made available to clinicians after the examination and patients simultaneously receive assistance in logging onto their telehealth visit. In keeping with this concept, we have also established locations in which patients can have their blood drawn for laboratory tests during their imaging center visit. These interventions remove the need for multiple visits and decreases the overall amount of time a patient needs to spend in the health care facility.

In establishing a comfort level for patients to return for imaging, it is important not to overlook how small interventions can also be effective. A simple telephone call to inquire if patients want to schedule their examination while simultaneously offering them an opportunity to ask questions or voice their concerns can have a large impact. This is evidenced by our experience in which 37% of patients, who did not have an imaging appointment already scheduled, requested one after conducting our survey. Finally, it is important to reinforce the need for overall staff friendliness, (2) wearing of masks by staff, (3) social distancing in the imaging center, (4) a short waiting time, (5) patient temperature check and health screening, and (6) scheduling imaging examinations the same day as clinical visits.

In conclusion, this study highlights patients’ perceptions of factors important for their imaging center visit, including those centered on safety. As patients begin to feel that it is safe to obtain imaging examinations during the COVID-19 pandemic, these factors can be considered by radiology practices when developing new strategies to conduct elective imaging. Specifically, the top six most important were (1) staff friendliness, (2) wearing of masks by staff, (3) social distancing in the imaging center, (4) a short waiting time, (5) patient temperature check and health screening, and (6) scheduling imaging examinations the same day as clinical visits.

**TAKE-HOME POINTS**

- Most patients perceive that postponement of elective imaging does not impact their health to a large degree. A prolonged lack of urgency in some cases may lead to a future increase in negative health outcomes.

- Staff friendliness, use of masks, social distancing, short waiting times, health screening upon patient arrival, and imaging examinations scheduled on the same day as clinical visits were among the most important factors for patients for an imaging center visit during the COVID-19 pandemic. Many of these can be implemented by radiology practices.

- Coordinated efforts between radiology practices and referring clinicians, particularly as it pertains to scheduling of imaging appointments, may improve overall health care delivery while simultaneous addressing some patient concerns for a return to elective imaging.

- Patients who prioritized a short wait time were significantly less likely to reschedule an MRI examination postponed by the COVID-19 pandemic (OR = 0.107, P = .030).

**ADDITIONAL RESOURCES**

Additional resources can be found online at: https://doi.org/10.1016/j.jacr.2020.09.068.

**REFERENCES**

1. CNN Editorial Research. Coronavirus outbreak timeline fast facts. CNN. Available at: https://www.cnn.com/2020/02/06/health/wuhan-
