

# Advanced Imaging Digest

## COVID-19 vaccines and lymphadenopathy

### Introduction

As COVID-19 vaccinations have become more widespread, physicians need to be familiar with post-vaccination imaging findings which could potentially mimic pathology, especially in patients with a known or suspected history of malignancy.

One such finding is unilateral axillary/supraclavicular adenopathy after the COVID-19 vaccine. This hyperplastic adenopathy is thought to be related to the strong immune response that is evoked by the vaccine. Therefore, these findings are not unique to the COVID-19 vaccine and have been found in association with the smallpox, Bacille Calmette-Guerin (BCG), human papillomavirus (HPV) and H1N1 influenza A virus vaccines as well.

Ipsilateral axillary lymphadenopathy/swelling was the second most frequently reported local reaction in Moderna COVID-19 vaccine trial data, occurring in 11.6% (versus 5.0% placebo) and 16.0% (versus 4.3% placebo) following first and second doses, respectively. In comparison, the Pfizer vaccine trial adenopathy was reported in 0.3% vaccine recipients (versus less than 0.1% in the placebo group). The median duration of this lymphadenopathy was 2-10 days, based on the vaccine received (Moderna 1-2 days versus Pfizer 10 days).

While the axillary adenopathy/swelling reported in the trial data was noted on physical exam and not on imaging, it has been suggested that the imaging appearance could persist longer than the duration times reported in the vaccine trial. Furthermore, the time of imaging resolution of unilateral axillary adenopathy on short-term follow-up exams is currently unknown and likely to vary by examination/study type (e.g., PET/CT versus mammography) and patient characteristics (e.g., comorbidities).

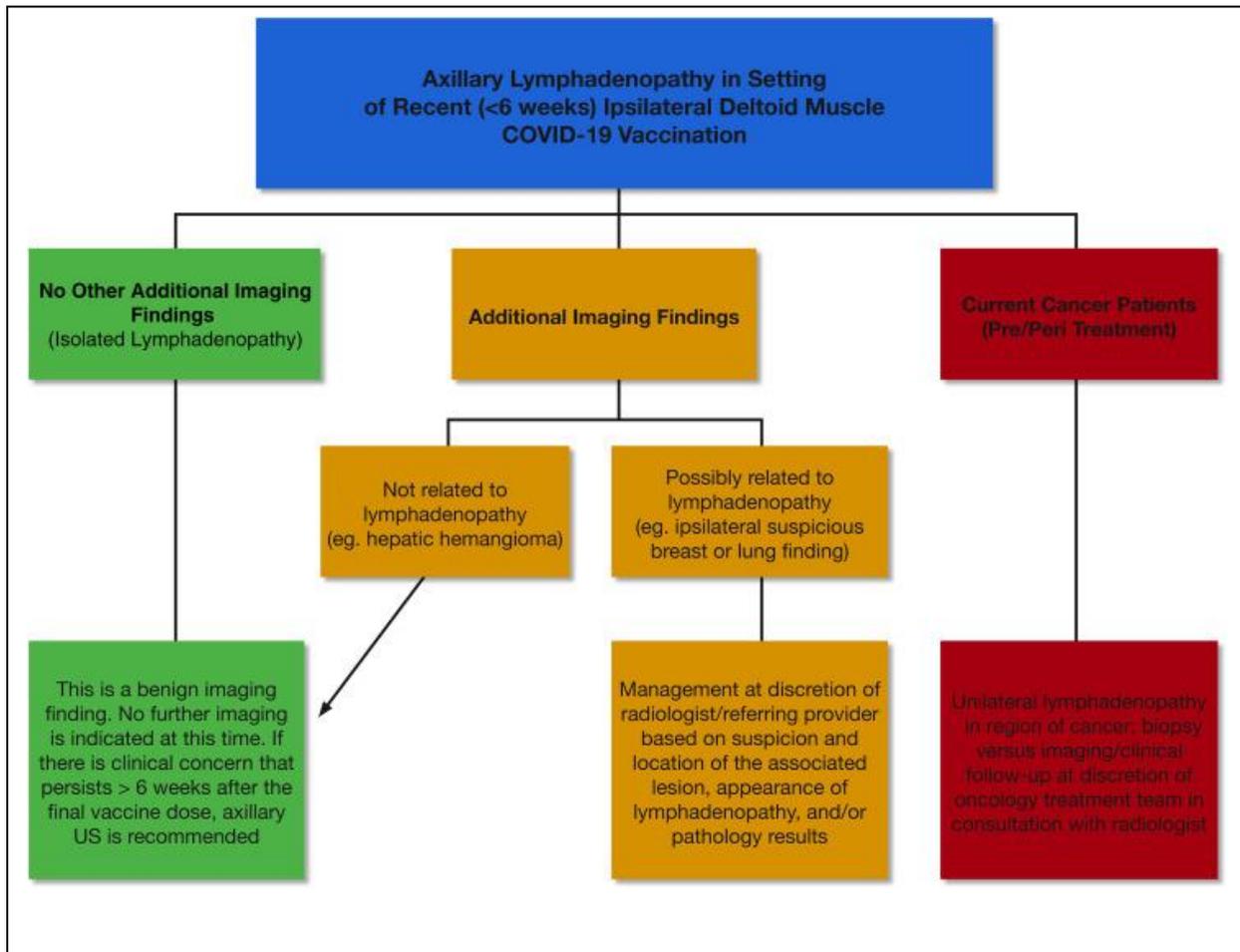
## Breast imaging

The Society of Breast Imaging issued a statement regarding management of ipsilateral axillary lymphadenopathy following COVID-19 vaccinations, recommending a short-term follow-up exam in 4-12 weeks (BI-RADS category 3) following the second vaccine dose. If axillary adenopathy persists after short-term follow-up, lymph node sampling should be considered to exclude breast and non-breast malignancy. Furthermore, imaging centers should consider gathering date of vaccination and where the vaccine was administered on the patient intake form/questionnaire to help the interpreting radiologist.

## Journal of American College of Radiology recommendations

Lehman et al. recommendations are based on three key factors:

1. Timing and location of the vaccine injection
2. Clinical context
3. Imaging findings (see chart below)

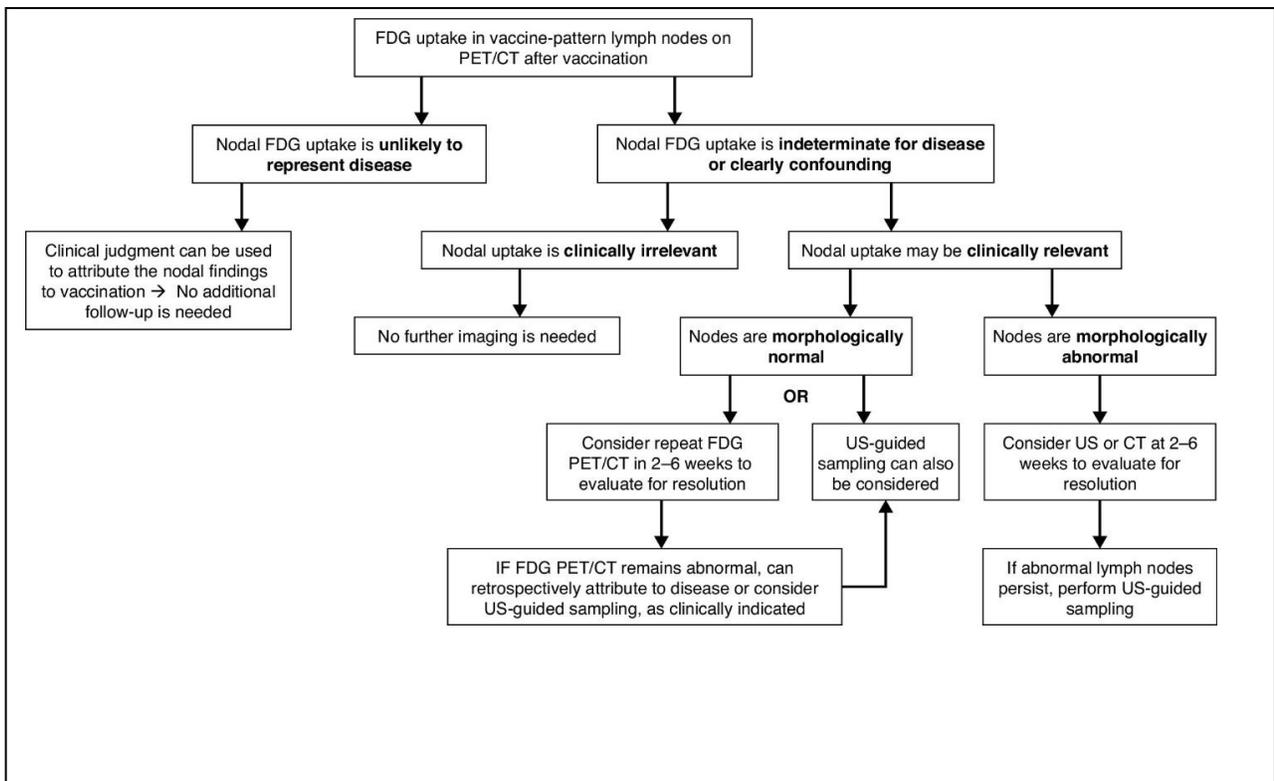


Lehman CD, D'Alessandro HA, Mendoza DP, Succi MD, Kambadakone A, Lamb LR. Unilateral lymphadenopathy after COVID-19 vaccination: A practical management plan for radiologists across specialties. *J Am Coll Radiol.* 2021;18(6):843-852. doi:10.1016/j.jacr.2021.03.001

**\*Exclusions to above algorithm:** Patients should be treated as part of the standard non-COVID-19 vaccinations workup if:

- Unilateral axillary adenopathy is:
  - Contralateral to site of known malignancy
  - Beyond six weeks after vaccination
- Bilateral lymphadenopathy is present

Follow-up of patients with unilateral lymphadenopathy (ipsilateral to recent vaccination) and known history of malignancy should be individualized based on the type of cancer, staging, lymph node drainage pathway and overall malignancy risk profile (see treatment algorithm below from McIntosh et al.).



McIntosh LJ, Bankier AA, Vijayaraghavan GR, Licho R, Rosen MP. COVID-19 vaccination-related uptake on FDG PET/CT: An emerging dilemma and suggestions for management. *American Journal of Roentgenology*. 2021;217: 975-983. 10.2214/AJR.21.25728

### Conclusion

Currently, there is no long-term data available regarding the duration of imaging follow-up for unilateral axillary lymphadenopathy or appropriate follow-up intervals. Until this data becomes available, Magellan Healthcare recommends overall management must be guided by the clinical picture, utilizing a multidisciplinary approach, especially in patients with histories of cancers and the overall propensity of those cancers to metastasize to the axillary lymph nodes. Ultrasonography may

be a viable alternative to follow up these findings in select patients, as detailed in the algorithms above.

## About the authors



**M. Atif Khalid, M.D., senior medical director, Magellan Healthcare**

Dr. Khalid joined Magellan in 2014. As a board-certified diagnostic radiologist with a career spanning more than twenty years, he has a thorough understanding of the complexities of the U.S. healthcare system and current standards of care. In his current role, Dr. Khalid is involved in training new physicians, auditing, continuing education and policy development.

**Joseph Mazzie, D.O., physician clinical reviewer, Magellan Healthcare**

Dr. Mazzie, a board-certified radiologist with over 19 years of experience, joined Magellan in 2014. He is a graduate of the New York Institute of Technology College of Osteopathic Medicine, where he is currently an associate professor of radiology.



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