

Real World Considerations Regarding MRI Use in a Clinic Setting

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INTRODUCTION

Magnetic resonance imaging (MRI) is considered by many to be the gold standard for the diagnosis and monitoring of multiple sclerosis (MS). Imaging markers are often primary outcome measures in clinical trials to assess efficacy and safety profiles of new therapies. However, in a research setting, parameters such as MRI strength, image sequences, analysis software, and scanning frequency are strictly controlled by the protocol. In the real world, ordering frequency of an MRI is largely at the discretion of the treating physician, institution, and/or insurance coverage. Patients and physicians must consider proximity, convenience, accessibility, and costs. The quality of imaging acquisition and scan interpretation also varies widely.

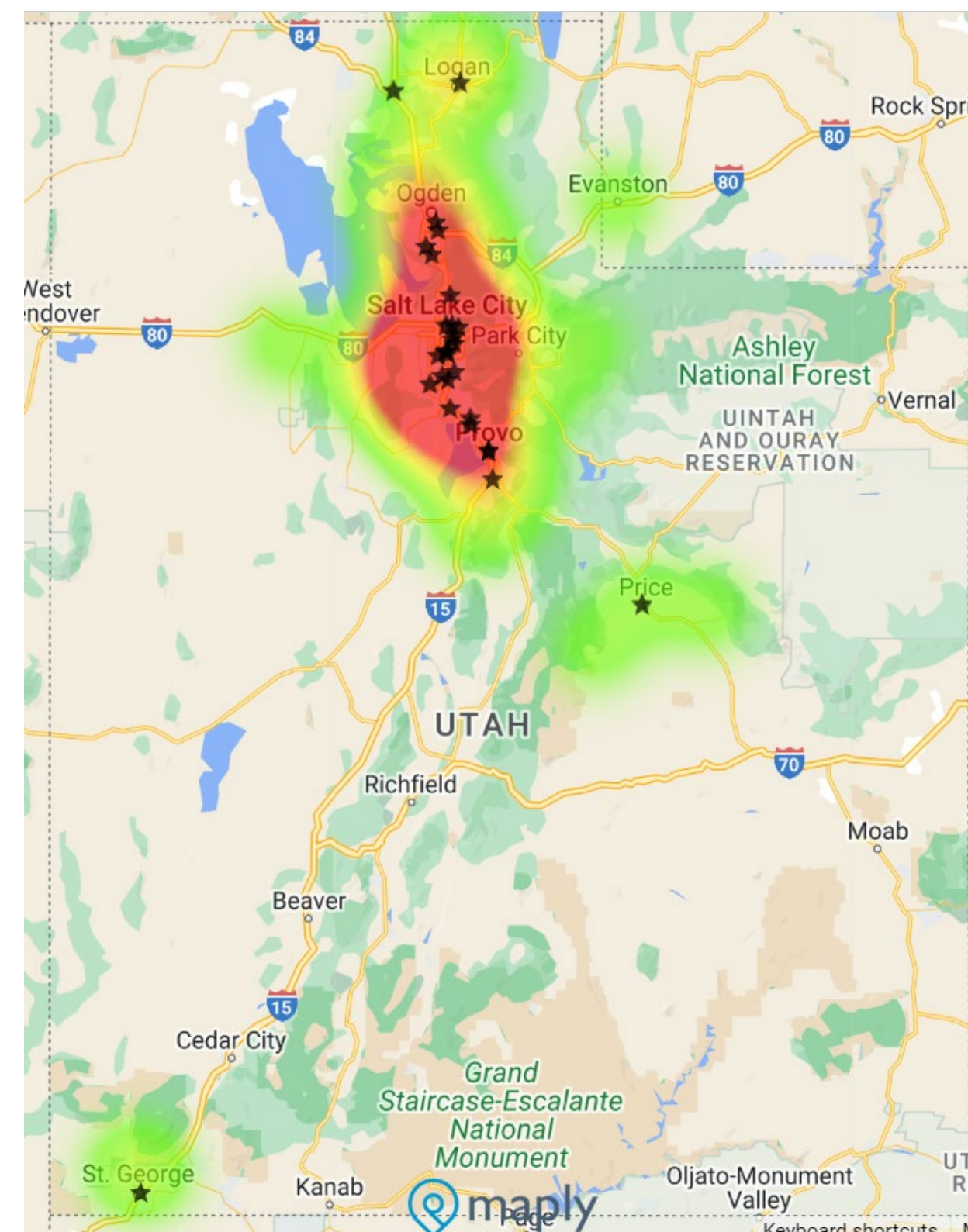


Figure 1: Heat map by patient zip code. Star symbol indicates MRI facility locations. (7 patients and facilities located outside map area.)

METHODS

Rocky Mountain MS Clinic (RMMSC) is a single specialty practice with six prescribers in Salt Lake City, UT USA serving MS patients in several states throughout the Intermountain West. On average, between 100-200 MRIs are ordered by the clinic monthly from over 50 different facilities. In May 2021, patients completed a total of 141 brain MRIs. MRIs completed by those patients in the subsequent 18 months are also reported.

RESULTS

In May 2021, 141 brain MRI scans were received from 34 facilities, as summarized in **Table 1**. The average time from the order date to the scan acquisition was 36 days (0-121 days).

Table 1. Summary of the MRI facilities in May 2021

Network Name	#	Percentage	# Facilities	Facility Type
Intermountain Health	82	58%	14	Hospital Affiliated
University of Utah	9	6%	2	Hospital Affiliated
MountainStar	4	3%	3	Hospital Affiliated
Mountain Medical	26	18%	2	Independent
OpenImaging	5	4%	2	Independent
Revere	3	2%	1	Independent
Wasatch Imaging	3	2%	1	Independent
USMRI	3	2%	3	Independent
Other	6	4%	6	2 Hospital Affiliated / 4 Independent

*Owned by a hospital, but operated independently

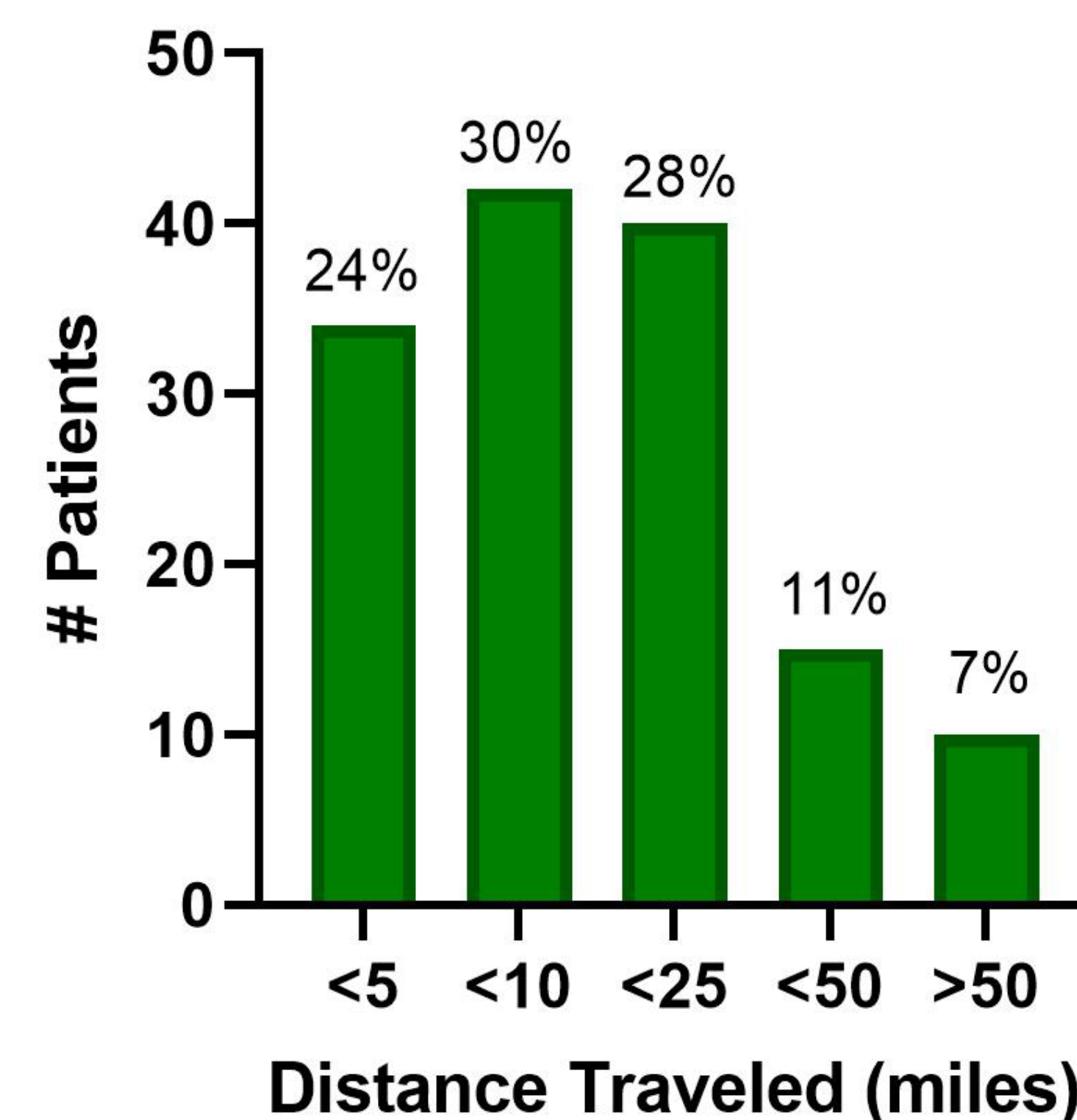


Figure 2: Distance between patient's home zip code and MRI facility

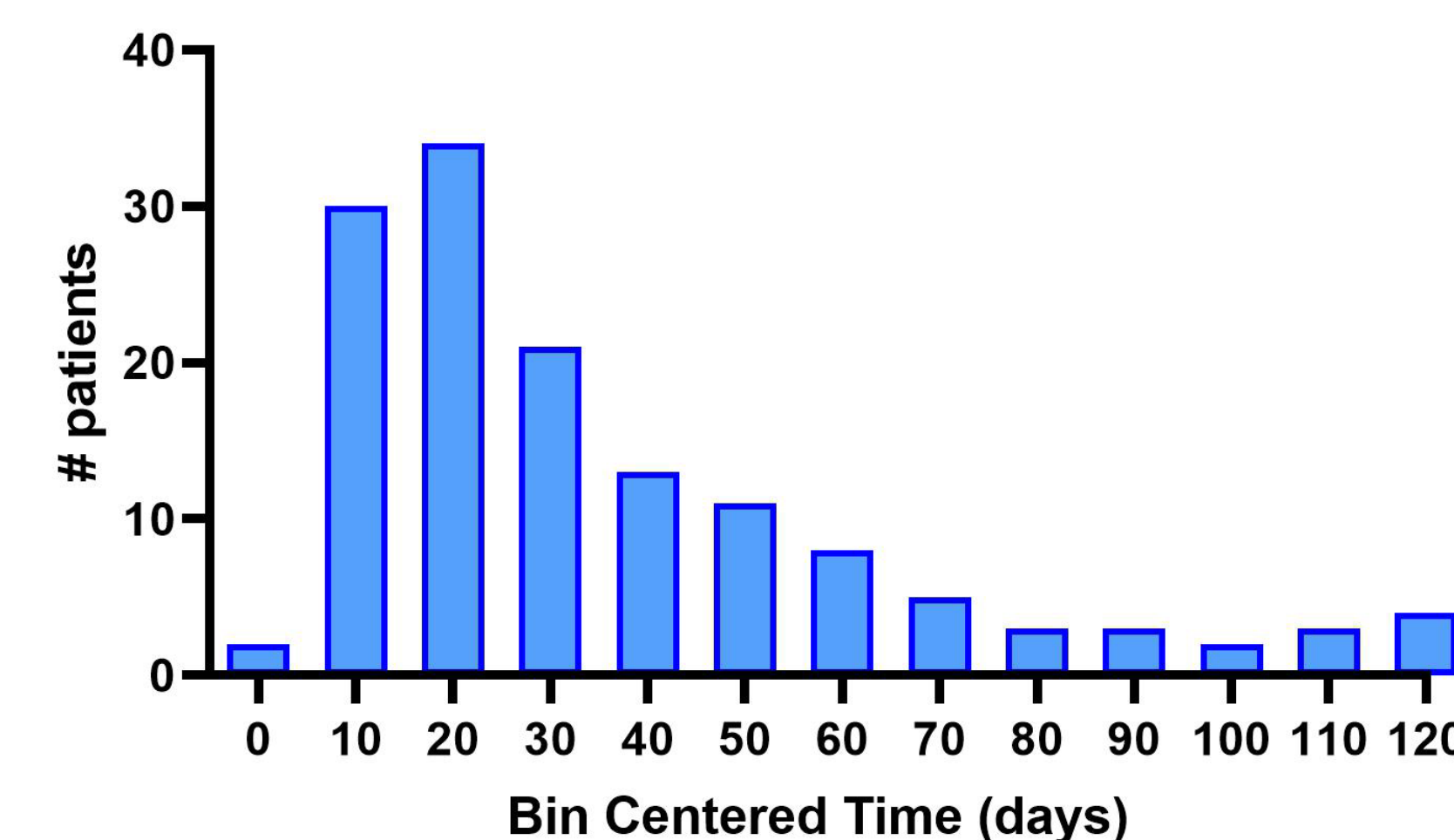
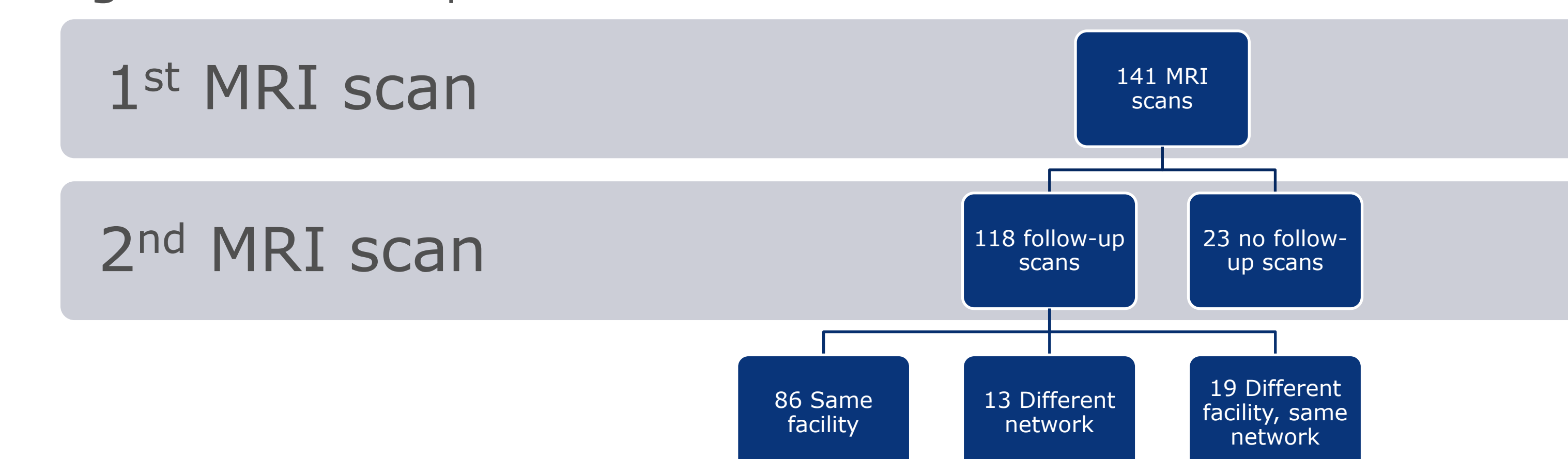


Figure 3: Frequency distribution of time from MRI order to acquisition

Twenty-three patients (16%) did not have a follow-up scan in the 18-month period. Of the 118 patients who had a subsequent scan, 19 patients (16%) had the follow up MRI at a different facility but within the same network, 13 patients (11%) switched to a different network entirely, while 86 patients (73%) remained at the same location. The average time between scans was 305 days (31-532 days).

Figure 4: Follow-up scan location distribution



DISCUSSION

- 54% of patients traveled less than 10 miles to obtain their MRI with only 7% of patients traveling more than 50 miles.
- While the majority (69%) of MRIs are still conducted at a hospital affiliated facility, although there was a 3% increase in MRIs done at an independent free-standing center during the follow-up period.
- Patients who switched networks were on average 8 years younger than those who stayed at the same facility but factors such as changes to insurance coverage could greatly influence this decision.
- Nearly 30% of patients obtained their follow up scan at a different facility. This increases the likelihood of different acquisition protocols and variable radiology reports. Prior scans are often not readily available for comparison between networks, adding to clinic and facility workload.
- 15% of patients required greater than 60 days to complete the MRI after the order was placed. There was no difference in the time to schedule between the hospital and the free-standing facilities.

CONCLUSION

Within the field of MS research, there have been significant advances in MRI technology, which allow for better monitoring of disease activity and progression, especially longitudinally. The routine use of MRI in the clinical setting has traditionally been limited by high patient burden, including costs and accessibility. With an increasing number of free-standing MRI facilities offering competitive imaging services some obstacles such as cost and scheduling conflicts may be reduced. However, this data highlights some of the new challenges that have arisen including high volumes of scans with distinct scanning procedures, varying interpretation quality and excessive lag time from order to acquisition. To more efficiently utilize MRI in a clinic setting more work is needed to standardize MS imaging acquisition protocols and reporting among facilities.

REFERENCES

1. Weinstein, David, et al. Am Health Drug Benefits. 2022 Mar; 15(1): 13-20.

