

# Multicenter Research Studies in Radiology

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## Abbreviations and Acronyms

### ACRIN

American College of Radiology Imaging Network

### COARDRI

Clinically Oriented Academic Radiology Department Research Initiative

### MRR

multicenter radiology research

**Rationale and Objectives:** Here we review the current state of multicenter radiology research (MRR), and utilize a survey of experienced researchers to identify common advantages, barriers, and resources to guide future investigators.

**Materials and Methods:** The Association of University Radiologists established a Radiology Research Alliance task force, Multi-center Research Studies in Radiology, composed of 12 society members to review MRR. A REDCap survey was designed to gain more insight from experienced researchers. Recipients were authors identified from a PubMed database search, utilizing search terms “multi-center” or “multisite” and “radiology.” The survey included investigator background information, reasons why, barriers to, and resources that investigators found helpful in conducting or participating in MRR.

**Results:** The survey was completed by 23 of 80 recipients (29%), the majority (76%) of whom served as a primary investigator on at least one MRR project. Respondents reported meeting collaborators at national or international (74%) and society (39%) meetings. The most common perceived advantages of MRR were increased sample size (100%) and improved generalizability (91%). External funding was considered the most significant barrier to MRR, reported by 26% of respondents. Institutional funding, setting up a central picture archiving and communication system, and setting up a central database were considered a significant barrier by 30%, 22%, and 22% of respondents, respectively. Resources for overcoming barriers included motivated staff (74%), strong leadership (70%), regular conference calls (57%), and at least one face-to-face meeting (57%).

**Conclusions:** Barriers to MRR include funding and establishing a central database and a picture archiving and communication system. Upon embarking on an MRR project, forming a motivated team who meets and speaks regularly is essential.

**Key Words:** Multicenter research; Radiology Research Alliance (RRA).

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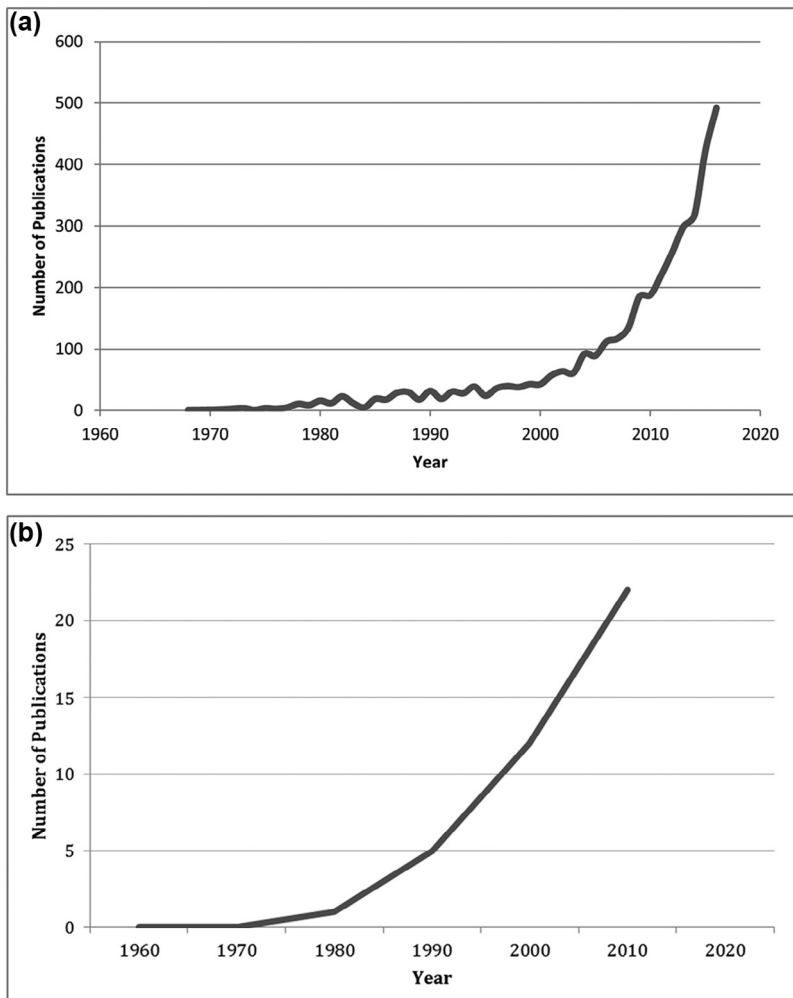
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## INTRODUCTION

Multicenter research studies are collaborative efforts between three or more medical centers. Although two centers may allow for external validation, once extended to three centers, findings may be more widely applicable to a given population. By leveraging larger and more diverse patient populations and sharing resources, multicenter studies offer many advantages over single-institution studies (1). Health-care practice guidelines based on value and appropriateness criteria require the strongest available scientific evidence for their validation. Performed appropriately, multicenter research studies can provide higher-quality research data than single-institution studies (2,3). Accordingly, multicenter research trial publications over the past decade have increased dramatically in all fields of medicine (Fig 1a).

However, multicenter radiology research (MRR)-related publications have not grown to the same degree as other specialties (Fig 1b). Potential reasons for this include the



**Figure 1.** (a) Multi-institutional and multicenter publications between 1968 and 2016. PubMed search results with titles containing the words “multi-institutional” or “multicenter” demonstrate an increase in publications from 1968 to 2016 when including all medical specialties (biomedical literature from MEDLINE, life science journals, and online books) (search results circa September 2016). (b) Slower increase in multi-institutional and multicenter imaging publications between 1968 and 2016. PubMed search results of imaging-related publications with titles containing the words “multi-institutional” or “multicenter” demonstrate a slower rate of increase in this type of publication from 1968 to 2016 relative to other specialties (search results circa October 2016). Imaging journals included *Radiology*, *Radiographics*, *American Journal of Roentgenology*, *American Journal of Neuroradiology*, *Journal of Ultrasound In Medicine*, *Magnetic Resonance in Medicine*, *Journal of Magnetic Resonance Imaging*, *Journal of Nuclear Medicine*, *Skeletal Radiology*, *Academic Radiology*, *Journal of the American College of Radiology*, *Abdominal Radiology*, *Emergency Radiology*, *Pediatric Radiology*, *Journal of Thoracic Imaging*, *Journal of Vascular and Interventional Radiology*, and *Medical Physics*.

infrastructure, personnel, and policy requirements for inter-institutional image sharing (4,5), protection of patient privacy, and confidentiality according to state and federal guidelines (6,7), data access and storage, and long-term maintenance of imaging data (8). There is a need to increase the number of MRR studies, given their potential impact on clinical practice. Although many medical subspecialties have published white papers addressing multicenter research in their discipline, a few have been published in radiology to guide the novice investigator, or even those experienced in MRR who may benefit from such a review.

The primary aim of the present study was to define the current state of MRR by surveying radiology researchers who have taken part in this type of work. Based on these responses, we hoped to define the advantages and barriers associated with MRR as well as resources to overcome these barriers, which may better inform radiologists interested in taking part in this type of research.

## MATERIALS AND METHODS

The Association of University Radiologists Radiology Research Alliance convened a task force on MRR, composed

of 12 society members tasked with gaining a better understanding of the current state of MRR. The task force utilized a cloud-based team collaboration tool (Slack; Slack Technologies, Inc., San Francisco, CA) and teleconferences to discuss the topic as a group. After this review, the task force concluded that (1) the information in the published literature was deficient and (2) our task force had insufficient MRR experience to adequately address all topics. Thus, we designed a survey to gain more insight on MRR.

Survey participants were radiologists with experience in MRR, with radiologists compiled from a literature search using the PubMed database, with search terms “multicenter” or “multisite” and “radiology.” The listed publications were reviewed to confirm relevance. The names and e-mails (when available) of the first and the last authors were collected. The list of researchers was composed of radiologists from a wide range of subspecialties who have participated in different multicenter trials, including but not limited to the Digital Mammography Imaging Screening Trial (DMIST), the National Lung Screening Trial (NLST), the Pelvic Angiography Project, and the Alzheimer’s Disease Neuroimaging Initiative. Additional survey participants were added to this list at the recommendation of Radiology Research Alliance task force

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