ACR PRACTICE PARAMETER FOR THE SUPERVISION AND PERFORMANCE OF CROSS-SECTIONAL IMAGING AT REMOTE LOCATIONS, REMOTE IMAGING

PREAMBLE

This document is an educational tool designed to assist practitioners in providing appropriate radiologic care for patients. Practice Parameters and Technical Standards are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care[1]. For these reasons and those set forth below, the American College of Radiology and our collaborating medical specialty societies caution against the use of these documents in litigation in which the clinical decisions of a practitioner are called into question.

The ultimate judgment regarding the propriety of any specific procedure or course of action must be made by the practitioner considering all the circumstances presented. Thus, an approach that differs from the guidance in this document, standing alone, does not necessarily imply that the approach was below the standard of care. To the contrary, a conscientious practitioner may responsibly adopt a course of action different from that set forth in this document when, in the reasonable judgment of the practitioner, such course of action is indicated by variables such as the condition of the patient, limitations of available resources, or advances in knowledge or technology after publication of this document. However, a practitioner who employs an approach substantially different from the guidance in this document may consider documenting in the patient record information sufficient to explain the approach taken.

The practice of medicine involves the science, and the art of dealing with the prevention, diagnosis, alleviation, and treatment of disease. The variety and complexity of human conditions make it impossible to always reach the most appropriate diagnosis or to predict with certainty a particular response to treatment. Therefore, it should be recognized that adherence to the guidance in this document will not assure an accurate diagnosis or a successful outcome. All that should be expected is that the practitioner will follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The purpose of this document is to assist practitioners in achieving this objective.

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1 *Iowa Medical Society and Iowa Society of Anesthesiologists v. Iowa Board of Nursing, 831 N.W.2d 826 (Iowa 2013) Iowa Supreme Court refuses to find that the "ACR Technical Standard for Management of the Use of Radiation in Fluoroscopic Procedures (Revised 2008)" sets a national standard for who may perform fluoroscopic procedures in light of the standard's stated purpose that ACR standards are educational tools and not intended to establish a legal standard of care. See also, Stanley v. McCarver, 63 P.3d 1076 (Ariz. App. 2003) where in a concurring opinion the Court stated that "published standards or guidelines of specialty medical organizations are useful in determining the duty owed or the standard of care applicable in a given situation" even though ACR standards themselves do not establish the standard of care.*

I. INTRODUCTION

Remote scanning refers to the practice of performing MRI and CT imaging examinations where the scanning is initiated or guided by a technologist who is not physically present at the imaging site. This practice utilizes networked systems and secure communication protocols to ensure the same level of quality, safety, and compliance as in-person scanning.

This document outlines the key aspects of remote scanning for compliance with ACR policies, focusing on

operational protocols, patient safety, data security, staff responsibilities, quality assurance, and emergency procedures. It is designed to support the increasing reliance on remote technologies to address workforce shortages, geographic disparities, and the growing demand for imaging services in rural and underserved areas.

For the purposes of this practice parameter, the discussion applies to the modalities of CT and MRI. There may be other applications of remote scanning that are being used in practice, other modalities may be addressed in a future practice parameter.

Applications for remote scanning may include, but are not limited to:

A. After-hours imaging
B. Sites with technologists' shortage
C. Rural or underserved locations
D. Multi-site healthcare systems
E. Training technologist imaging techniques

II. INDICATIONS AND CONTRAINDICATIONS

Facilities should establish when remote scanning should be performed and for which procedures remote scanning can be performed. This may include contrast studies

A. Indications:
Indications for remote scanning include the need to extend access to imaging services to rural and underserved populations, a shortage of qualified technologists in certain regions, and the potential for improved workflow efficiency.

B. Contraindications:
Contraindications may include insufficient onsite support, inadequate network infrastructure, or procedures considered inappropriate for remote scanning.

III. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

Personnel for the practice of remote scanning must meet all applicable federal and local requirements for the supervision and performance of imaging examinations. Overall staffing should take into account the timeliness of available emergency response systems and a team approach to crisis management. On-site personnel must be trained in basic life support (BLS), with access to ACLS-certified staff as needed. There should be a minimum of 2 on-site personnel and 1 off-site personnel to perform this study.

Procedure specific qualifications and responsibilities of personnel may be found in existing Practice Parameters and Technical Standards available on the ACR Practice Parameters and Technical Standards Portal.

A. Supervising physician
B. Radiologist
    1. Provides protocol guidance and final image interpretation.
    2. Available for consult if complications arise.
C. On-site personnel
    1. Qualified On-Site Operator (QOO): A trained, on-site individual (e.g., technologist assistant, nurse) who has completed institution-specified training in the safe operation and assistance of the scanner, patient interaction, and remote-scan workflows. A QOO must be in direct two-way communication with the individual supervising the examination. May include a medical assistant, nurse, or trainee technologist.
    2. Responsibilities for onsite personnel include, but are not limited to:
        a. Patient identification and verification
        b. Preprocedure documentation such as consent and screening forms (e.g., MR safety, contrast administration, if applicable, etc.)

c. Patient positioning (or coil placement for MRI)
d. Emergency response initiation, when needed

3. Facilities providing contrast studies under a remote scanning policy must have an individual qualified to administer contrast [2]. Direct supervision is required whenever contrast material is administered. This direct supervision requirement can be met by an on-site radiologist, other physician, or qualified licensed practitioner.
    a. Tasks for this individual include meeting requirements for placing and managing patient IV, monitoring for extravasation, injection of medications and/or contrast, able to act on adverse events related to contrast administration. Individuals must meet applicable Federal, state, local, institutional and site requirements.

D. Remote Personnel: A fully credentialed radiologic technologist licensed in the location where the study is performed.

1. Responsibilities of remote personnel include, but are not limited to:
    a. Reviews imaging orders and protocols.
    b. Communicate with on-site staff and/or patient.
    c. Initiates scanning sequences and adjusts parameters.
    d. Reviews image quality and repeats scans as needed.
    e. Remote Technologist
    f. The remote scanning operation should also serve as a training exercise for local technologists, i.e., that the qualified onsite operator should be in training (in some capacity) to become a fully qualified technologist to run the scanner.
2. Qualifications of the remote personnel include, but are not limited to:
    a. Licensed and credentialed in the state of the scanning location.
    b. Certified by ARRT or appropriate registry.
    c. Completes remote scanning training and competency evaluation.

E. Qualified Medical Physicist

1. Responsibilities of the Qualified Medical Physicist for remote scanning include:
    a. Verification of remote operability enabled through manufacturer-supported remote access software.
    b. Performance Monitoring: Ensure compliance with ACR–AAPM Technical Standards by conducting routine performance tests on all remote-operable imaging equipment. This includes:
        i. Annual equipment performance evaluations for MRI and CT systems
        ii. Verification of scanner output, image quality, and system integrity
        iii. Monitoring radiation dose indices and alignment with ACR benchmarks
    c. Acceptance Testing and Upgrades:
        i. Conduct acceptance testing of new scanners or major software upgrades that enable or modify remote functionality, to ensure continued compliance with safety and imaging standards.
    d. System Integration Validation:
        i. Validate the end-to-end technical setup for remote scanning, including remote access software (Citrix, VMware, etc.), workstation performance, data encryption protocols, and communication tools.
    e. Emergency Protocol Review:
        i. Confirm that emergency shutdown and fail-safe procedures for remotely operated scanners are documented, tested, and understood by on-site personnel.
    f. Quality Assurance Oversight:
        i. Collaborate with imaging leadership to review quality assurance (QA) data, investigate imaging artifacts or anomalies, and provide corrective recommendations as needed.
    g. Documentation and Reporting:
        i. Maintain written records of all physics evaluations, QA reports, and scanner operability verifications in compliance with ACR, state, and federal guidelines.
    h. Consultative Support:
        i. Serve as a technical advisor for remote scanning program development, workflow

optimization, and compliance planning, including risk mitigation strategies for remote operations.

IV. SPECIFICATIONS OF THE EXAMINATION

The written or electronic request for remote MRI or CT examination should provide sufficient information to demonstrate the medical necessity of the examination and allow for its proper performance and interpretation.

Documentation that satisfies medical necessity includes 1) signs and symptoms and/or 2) relevant history (including known diagnoses). Additional information regarding the specific reason for the examination or a provisional diagnosis would be helpful and may at times be needed to allow for the proper performance and interpretation of the examination.

The request for the examination must be originated by a physician or other appropriately licensed health care provider. The accompanying clinical information should be provided by a physician or other appropriately licensed health care provider familiar with the patient's clinical problem or question and consistent with the state scope of practice requirements. (ACR Resolution 35, adopted in 2006 – revised in 2016, Resolution 12-b)

The patient should be screened and prepared for a study in accordance with applicable procedure parameters and standards.

IV. SPECIFICATIONS OF THE EXAMINATION

A. Patient Selection and Preparation

All patients undergoing remote scanning must be pre-screened for appropriateness based on exam type and, risk factors.

For MRI, the patient must complete the MRI safety screening questionnaire and be cleared for any contraindicated implants or devices (eg, pacemakers, aneurysm clips).

For CT, renal function and contrast allergies should be evaluated when IV contrast is planned. The contrast administration can be initiated by the onsite personnel.

Patient education should be provided regarding the remote nature of the scan, and consent must be documented in the medical record.

IV. SPECIFICATIONS OF THE EXAMINATION

B. Facility Requirements

Sites performing remote scanning must have established policies and procedures for emergencies, patient preparation, examination techniques, and hardware/software requirements.

IV. SPECIFICATIONS OF THE EXAMINATION

C. Emergency Protocols

Emergency medications, including those for contrast reactions.

1. On-site personnel trained in BLS/ACLS and emergency shutdown procedures.
2. Clear escalation protocol for medical emergencies.
3. Immediate access to emergency contact numbers (radiologist, physician, EMS).

Documented emergency response protocols for:

1. Contrast Reactions
2. Patient Deterioration or Injury
3. Technical Failures
4. Code Blue Protocol

Sites must be equipped with:

1. Functional and accessible emergency equipment (e.g., crash cart, oxygen).
2. On-site personnel trained in basic life support (BLS), with access to ACLS-certified staff as needed.
3. The scanner must support remote control through secure and compliant software platforms.

IV. SPECIFICATIONS OF THE EXAMINATION

D. Patient Preparation

1. Consent and education
2. Questions addressed prior to procedure

IV. SPECIFICATIONS OF THE EXAMINATION

E. Examination Technique

Remote technologists must use protocols reviewed and approved by the supervising radiologist. Any deviations from standard protocols must be justified and documented in the scan record.
Scanning techniques (eg, slice thickness, sequences) must align with ACR modality-specific standards.

IV. SPECIFICATIONS OF THE EXAMINATION

F. Specialized Techniques and Indications

Contrast-enhanced imaging must follow appropriate pre-screening and documentation. Sites performing advanced protocols (eg, cardiac MRI or CTA) must ensure trained support personnel are available on-site and remote technologists have experience in these examinations.

IV. SPECIFICATIONS OF THE EXAMINATION

G. Hardware and Software Requirements

Scanner Compatibility:

1. Remote operability enabled through manufacturer-supported remote access software.
2. Workstation Setup:
3. Secure, HIPAA-compliant workstations with encrypted access.
4. Redundant network connectivity for uninterrupted operations.
5. Continuous IT support.

Software Tools:

1. Remote desktop access tools.
2. Integrated PACS/RIS systems with remote access capabilities.
3. Voice communication tools (VoIP, intercom, two-way radios).

Network and Cybersecurity Protocols

1. Encryption: End-to-end encryption of data transmission.
2. Authentication: Two-factor authentication (2FA) for technologists and radiologists.
3. Access Control: Role-based access to systems to ensure only authorized personnel can operate or view data.
4. Audit Trails: Full logging of remote access sessions, actions taken, and time stamps.

5. Firewall & VPN: Use of VPN and firewalls to secure remote connections.

IV. SPECIFICATIONS OF THE EXAMINATION

H. Communication and Workflow

Pre-procedure:

1. On-site staff enters the order and communicates with remote technologist.

During procedure:

1. Continuous communication (audio/video/intercom) between on-site and remote staff.
2. Live monitoring of scan progress by the remote technologist.

Post-procedure:

1. Image review and initial QC check by remote technologist.
2. Images sent to PACS for radiologist interpretation.

General considerations about the examination, or if more detail is required this subsection could include, a brief mention of contrast agents may be appropriate but the reader should be referred to the ACR Manual on Contrast Media for information that is more detailed and current. Also refer to Statement from Drugs and Contrast Media Committee on Supervision of Contrast Material Administration.

ACR Statement on Remote Scanning
AHRA Collaborative Statement on MR Remote Scanning

Examinations performed remotely must adhere to the standards of medical necessity. The requesting provider must include clinical history, signs and symptoms, and provisional diagnosis.
The equipment used must support real-time control and monitoring and follow modality-specific protocols. Facility requirements must ensure the availability of emergency medications and trained personnel.

V. DOCUMENTATION

Reporting should be in accordance with the ACR Practice Parameter for Communication of Diagnostic Imaging Findings

All examinations conducted through remote scanning must be thoroughly documented in compliance with ACR and applicable legal standards. Documentation should be timely, complete, and clearly reflect the roles of all personnel involved.

Technologist Log:

1. Full name, credentials, and state license number of the remote technologist.
2. Time-stamped record of start and end times.
3. Site name and modality used.
4. Brief summary of scan activity, including any technical difficulties or protocol deviations.

Patient Record Documentation:

1. Pre-screening and safety checklists (e.g., MRI implant screening).
2. Documentation of patient identification verification (2 identifiers).
3. Notation of contrast use, type, dose, and administration route (if applicable).
4. List of scanning parameters used for each sequence or protocol.

Quality Control Log:

1. Daily image QC check results and any corrective actions taken.
2. Any quality-related incidents (e.g., artifact, incomplete exam) and follow-up.

Radiologist Report:

1. Final interpretation must be documented in accordance with the ACR Practice Parameter for Communication of Diagnostic Imaging Findings.
2. If significant findings are noted, communication must follow critical result notification protocols.

VI. EQUIPMENT SPECIFICATIONS

Equipment used in remote scanning must meet or exceed current ACR–AAPM standards. Proper functionality, diagnostic image quality, and safety are paramount to ensure patient care parity with in-person scanning.

VI. EQUIPMENT SPECIFICATIONS

A. Modality-Specific Requirements

MRI and CT systems must be accredited and meet performance criteria defined by the ACR–AAPM technical standards. Remote scanning capabilities must be native to or officially supported by the equipment manufacturer.

VI. EQUIPMENT SPECIFICATIONS

B. Remote Control and Monitoring

Systems must enable full technologist control of scan parameters and real-time monitoring. Audio-visual communication tools must allow interaction with on-site personnel and patients as needed.

VI. EQUIPMENT SPECIFICATIONS

C. Performance Monitoring

Routine maintenance and quality checks must be conducted under the supervision of a Qualified Medical Physicist.

Annual performance testing must align with:
ACR–AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of CT Equipment.
ACR–AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of MR Imaging Equipment.

VI. EQUIPMENT SPECIFICATIONS

D. Redundancy and Failover

Facilities must have redundancy plans in place (backup power, secondary network access). Failover systems must allow for quick transition in the event of primary system failure.

VI. EQUIPMENT SPECIFICATIONS

E. Infection Control and Hygiene

On-site staff must follow proper cleaning protocols for coils, pads, gantries, and all patient-contact equipment, in compliance with infection control standards.

Radiation exposures or other dose indices should be periodically measured by a Qualified Medical Physicist in accordance with the applicable ACR Technical Standards. Monitoring or regular review of dose indices from patient imaging should be performed by comparing the facility's dose information with national benchmarks, such as the ACR Dose Index Registry and relevant publications relying on its data, applicable ACR Practice Parameters, NCRP Report No. 172, Reference Levels and Achievable Doses in Medical and Dental Imaging: Recommendations for the United States or the Conference of Radiation Control Program Director's National Evaluation of X-ray Trends; 2006, 2009, amended 2013, revised 2023 (Res. 2d).

Compliance encompasses ALARA principles, Image Wisely, and Image Gently initiatives. Facilities should use dose reduction technologies and regularly benchmark radiation dose levels against national standards.

For information on the ACR Position Statements on Teleradiology, Off-Site Radiology, Interpretation of Radiology Images Outside of the U.S., see the ACR policy finder and the ACR–AAPM–SIIM TECHNICAL STANDARD FOR ELECTRONIC PRACTICE OF MEDICAL IMAGING.

Equipment performance monitoring should be in accordance with the ACR–AAPM TECHNICAL STANDARD FOR DIAGNOSTIC MEDICAL PHYSICS PERFORMANCE MONITORING OF COMPUTED TOMOGRAPHY (CT) EQUIPMENT.

Equipment performance monitoring should be in accordance with the ACR–AAPM TECHNICAL STANDARD FOR DIAGNOSTIC MEDICAL PHYSICS PERFORMANCE MONITORING OF MAGNETIC RESONANCE (MR) IMAGING EQUIPMENT

Programs must undergo quarterly quality assurance (QA) reviews and performance benchmarking. This includes tracking incidents, analyzing patient satisfaction, and identifying opportunities for continuous improvement.

VI. EQUIPMENT SPECIFICATIONS

F. Quality Assurance & Performance Monitoring

Routine QA Reviews:

1. Peer reviews and random audits of remote scans.
2. Evaluation of adherence to protocols and image quality.

Technologist Competency:

1. Annual competency assessments.
2. Continuing education on remote operation and safety.

Patient Feedback:

1. Patient satisfaction surveys with specific questions about remote scanning experience.

Incident Reporting:

1. Mechanism to report and review technical or patient safety incidents.

VI. EQUIPMENT SPECIFICATIONS

G. Regulatory and Accreditation Compliance

State Licensure:

1. Ensure technologists meet licensure requirements in both remote and on-site states.

HIPAA Compliance:

1. Maintain patient confidentiality in all communication and data handling.

ACR Requirements:

1. Remote scanning must meet the same standards as on-site imaging, including:
2. Equipment calibration and maintenance logs.
3. Documentation of technologist training and qualifications.
4. Proof of QA program implementation.

VI. EQUIPMENT SPECIFICATIONS

H. Limitations and Risk Mitigation

Limitations:

1. Limited ability to respond to real-time physical issues.
2. Dependence on network stability.

Mitigation Strategies:

1. Redundant systems and failover protocols.
2. On-site staff training for limited technical adjustments.
3. Real-time monitoring of connection stability.

VII. RADIATION SAFETY IN IMAGING

Radiologists, medical physicists, non-physician radiology providers**,** radiologic technologists, and all supervising physicians have a responsibility for safety in the workplace by keeping radiation exposure to staff, and to society as a whole, "as low as reasonably achievable" (ALARA) and to assure that radiation doses to individual patients are appropriate, taking into account the possible risk from radiation exposure and the diagnostic image quality necessary to achieve the clinical objective. All personnel who work with ionizing radiation must understand the key principles of occupational and public radiation protection (justification, optimization of protection, application of dose constraints and limits) and the principles of proper management of radiation dose to patients (justification, optimization including the use of dose reference levels). https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1775_web.pdf

Nationally developed guidelines, such as the ACR's Appropriateness Criteria®, should be used to help choose the most appropriate imaging procedures to prevent unnecessary radiation exposure.

Facilities should have and adhere to policies and procedures that require ionizing radiation examination protocols (radiography, fluoroscopy, interventional radiology, CT) to vary according to diagnostic requirements and patient body habitus to optimize the relationship between appropriate radiation dose and adequate image quality. Automated dose reduction technologies available on imaging equipment should be used, except when inappropriate for a specific exam. If such technology is not available, appropriate manual techniques should be used.

Additional information regarding patient radiation safety in imaging is available from the following websites – Image Gently® for children (www.imagegently.org) and Image Wisely® for adults (www.imagewisely.org). These advocacy and awareness campaigns provide free educational materials for all stakeholders involved in imaging (patients, technologists, referring providers, medical physicists, and radiologists).

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VIII. QUALITY CONTROL AND IMPROVEMENT, SAFETY, INFECTION CONTROL, AND PATIENT EDUCATION

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented in accordance with the ACR Policy on Quality Control and Improvement, Safety, Infection Control, and Patient Education appearing under the heading Position Statement on QC & Improvement, Safety, Infection Control, and Patient Education on the ACR website (https://www.acr.org/Advocacy/Position-Statements/Quality-Control-and-Improvement).

ACKNOWLEDEGEMENTS

This practice parameter was revised according to the process described under the heading The Process for Developing ACR Practice Parameters and Technical Standards on the ACR website (https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Practice-Parameters-and-Technical-Standards) by the Committee on Practice Parameters – General, Small, Emergency and/or Rural Practices, the ACR Commission on General, Small, Emergency, and/or Rural Practice

Writing Committee – members represent their societies in the initial and final revision of this practice parameter

Comments Reconciliation Committee

REFERENCES

*Practice parameters and technical standards are published annually with an effective date of October 1 in the year in which amended, revised, or approved by the ACR Council. For practice parameters and technical standards published before 1999, the effective date was January 1 following the year in which the practice parameter or technical standard was amended, revised, or approved by the ACR Council.