

The American College of Radiology, with more than 30,000 members, is the principal organization of radiologists, radiation oncologists, and clinical medical physicists in the United States. The College is a nonprofit professional society whose primary purposes are to advance the science of radiology, improve radiologic services to the patient, study the socioeconomic aspects of the practice of radiology, and encourage continuing education for radiologists, radiation oncologists, medical physicists, and persons practicing in allied professional fields.

The American College of Radiology will periodically define new practice parameters and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice parameters and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice parameter and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review and approval. The practice parameters and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice parameter and technical standard by those entities not providing these services is not authorized.

Revised 2019 (Resolution 20)\*

## **ACR–SIR–SPR PRACTICE PARAMETER FOR THE REPORTING AND ARCHIVING OF INTERVENTIONAL RADIOLOGY PROCEDURES**

---

### **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<sup>1</sup>. 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 in light of 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 the condition of the patient, limitations of available resources, or advances in knowledge or technology subsequent to publication of this document. However, a practitioner who employs an approach substantially different from the guidance in this document is advised to document in the patient record information sufficient to explain the approach taken.

The practice of medicine involves not only the science, but also 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 sole purpose of this document is to assist practitioners in achieving this objective.

---

<sup>1</sup> [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

This practice parameter was revised collaboratively by the American College of Radiology (ACR), the Society of Interventional Radiology (SIR), and the Society for Pediatric Radiology (SPR) [1].

This practice parameter is intended to improve patient care by improving the consistency of medical record content, written or dictated reports, and image archiving for vascular/interventional radiology procedures (exclusive of breast interventional procedures). For information on breast interventional procedures, see the [ACR Practice Parameter for the Performance of Stereotactic-Guided Breast Interventional Procedures](#) or the [ACR Practice Parameter for the Performance of Ultrasound-Guided Percutaneous Breast Interventional Procedures](#) [2,3].

These practice parameters will serve the following specific purposes:

1. To document medical care
2. To be used in quality improvement programs and for credentialing purposes
3. To be used in teaching and research
4. To document procedures for appropriate coding
5. To provide practice parameters for state health codes for image archiving

## II. MEDICAL REPORT

### A. Medical Record

A medical record consists of a patient's medical information recorded in either hard copy or electronic format. This information may be recorded in the patient medical chart, nursing reports, radiology records, inpatient or outpatient medical information storage areas, or electronically. The medical record should include, as appropriate, the following information [4]:

1. Documentation of preprocedural inpatient and/or office consultation
2. Immediate preprocedure note
3. Immediate postprocedure note
4. Final report
5. Documentation of postprocedure patient follow-up, if applicable

### B. Documentation of Preprocedural Inpatient and/or Office Consultation

The preprocedural documentation provides a baseline record of patient status and documents the indication for the procedure. It should be entered in the chart before the procedure. Preprocedural documentation should, as appropriate depending on the complexity and/or clinical urgency of the procedure, include the following information:

1. Indication for procedure and brief history
2. Findings of targeted physical examination
3. Relevant laboratory and other diagnostic findings
4. The plan for each procedure to be performed
5. Plan for sedation/anesthesia and risk stratification, such as the American Society of Anesthesiologists Physical Status Classification, if it is going to be administered by the performing physician.
6. Documentation of informed consent (consistent with state and federal laws) or, in the case of an emergency, that it was an emergent medical procedure

### C. Updated Immediate Preprocedure Note

The updated immediate preprocedure documentation should be an interval note with any new information developed between the preprocedural evaluation/documentation and the presentation of the patient for the procedure. The physician performing the procedure should provide a note to administration of any sedation. In

situations where the preprocedural documentation is performed/completed immediately preceding the procedure, the updated immediate preprocedure note is not necessary, as per Joint Commission rules, unless otherwise required by local institution policy.

#### D. Immediate Postprocedure Note

Before a patient is transferred to the next level of care, an immediate postprocedure note or a final report should be completed and available. The immediate postprocedure note should include the following, as appropriate:

1. Preprocedure diagnosis
2. Postprocedure diagnosis
3. Procedure
4. Operator
5. Assistants
6. Anesthesia/Sedation
7. Medications, including contrast type and volume
8. Access
9. Closure
10. Implants
11. Estimated blood loss
12. Specimens
13. Complications
14. Disposition
15. Findings
16. Plan

It is not necessary for the listed items to be recorded in the order given above.

#### E. Final Report [5,6]

1. A final report is required for the following purposes:
  - a. To transmit procedural information to all members of the health care community who may participate in subsequent care of the patient
  - b. For legal purposes
  - c. For reimbursement
2. Additional functions of the final report include the following:
  - a. Quality improvement programs and for credentialing purposes
  - b. Data collection for research
  - c. Teaching
  - d. Informing patients and families
3. Specific information to be included in this report depends on the procedure. The following elements are recommended, although not all of them may be applicable:
  - a. Procedure name
  - b. Administrative information
    - i. Date
    - ii. Time
    - iii. Facility
  - c. Patient information
    - i. Patient Name
    - ii. Medical record number (MRN)
    - iii. Date of birth (DOB)
    - iv. Gender
  - d. Procedural personnel

- i. Attending(s)
- ii. Fellow(s)
- iii. Resident(s)
- iv. Advanced Practice Provider(s)
- v. Other assistant(s)
- e. Clinical history
  - i. Diagnosis
  - ii. Indications
  - iii. Comparison
- f. Procedure performed
- g. Procedural cleanliness
  - i. Sterile
  - ii. Clean
  - iii. Clean contaminated
  - iv. Contaminated
  - v. Dirty
- h. Intraoperative or immediate postoperative complications, occurrences, or unexpected events
- i. Observations
- j. Summary/impression
- k. Plan
- l. Procedure details
  - i. Informed consent
  - ii. Time out
  - iii. Anesthesia
    - Type and provider
    - Local anesthesia dose should be documented in the final report for pediatric patients as per local policy
  - iv. Medications and contrast should be documented in the patient's electronic health record as per local policy
- m. Technical details of the procedure
  - i. Patient position
  - ii. Surface antiseptic preparation
  - iii. Patient and provider barrier techniques used (eg, cap, gloves, gown, etc)
  - iv. Imaging guidance for access
  - v. Imaging guidance for procedure
  - vi. Access location/site
  - vii. Access technique
  - viii. Equipment utilized
  - ix. Closure
  - x. Estimated blood loss
  - xi. Radiation doses such as: [7]
    - Skin dose mapping
    - Peak skin dose (PSD)
    - Reference air kerma, ( $K_{a,r}$ ) Kerma-area product (KAP).
    - Fluoroscopy time/number of fluorographic images
    - Dose-length product (DLP).
    - Volume computed tomography (CT) dose index ( $CTDI_{vol}$ ).
- n. Attestation
  - i. Supervision
- o. Supplemental information

It is not necessary for the listed items to be recorded in the order given above.

## F. Structured Reporting

Structured reporting has gained popularity within the diagnostic radiology community as it may provide referring physicians with more consistent, definitive information, especially with complex examinations (eg, oncology staging) [8,9].

Structured reporting within interventional radiology has been shown to improve institutional compliance, quality, and reimbursement, as well as to help facilitate data collection for research [10,11]. One study suggested that referring physicians preferred reading structured reports compared to free-text reports [11], whereas another study found that interventional radiologists were more compliant and satisfied with structured reporting when they had input into the initial design of the report template, including a (free-text) executive summary and a detailed procedural narrative [12].

Indeed, the benefits of structured reporting within interventional radiology have been initially established [12]. Implementation has improved as the templates have automated importing of data into the report and as the templates have become increasingly compatible with existing voice dictation software. Additionally, the interventional radiologist has a vested role in the templates' creation and layout, all of which will help to increase satisfaction and compliance.

### **III. ARCHIVING OF IMAGES**

#### **A. General Principles**

All pertinent imaging data should be saved in permanently retrievable digital or hard-copy format. Legal requirements as to the length of time that images should be retained vary from state to state. Examples of pertinent imaging data include the relevant anatomy that will affect patient management, device position, complications, and any transient adverse events (such as emboli) that have been successfully treated during a procedure.

#### **B. Documentation of Device Position**

The final position of all devices inserted permanently or long term with imaging guidance (eg, stents, endovascular grafts, central venous catheters, inferior vena cava filters, embolic agents, drainage catheters) should be documented with imaging.

#### **C. Angiography**

Archived images are crucial to the overall diagnostic and/or therapeutic treatment plan of the patient. For saved digital subtraction angiography (DSA) runs, the operator should consider whether archiving unsubtracted or partially subtracted images might be useful and, if so, an attempt should be made to record such an image or images. This image is useful for orientation/localization purposes. It should be understood that, with the use of rapid-sequence imaging and fluoroscopy, some observations that are described in the report may not be adequately documented by the static archived images.

#### **D. Endovascular Interventions**

Predeployment and postdeployment intervention images should be obtained and archived. Intermediate stages that are pertinent to the performance of the endovascular procedure may also be documented with archived images. Images should detail the position of the device and, when appropriate, the effect of the device on target or nontarget vessels.

#### **E. Nonvascular Interventions**

Images should document the device's position and its effect on target and nontarget organs. The final position of drainage catheters within fluid collections, the biliary system, the urinary tract, or the gastrointestinal tract should be documented. If contrast material is injected for delineating cavity size, location, or communication with adjacent structures, at least one image should be archived. If imaging is used to mark a position for subsequent needle entry

(eg, ultrasound to mark an entry site for later paracentesis performed without imaging guidance), at least one image of this position should be saved. For needle placement (eg, biopsies, drug delivery, pain management interventions) under direct imaging guidance, at least one image should be saved with the needle in final position at each targeted site. The operator may choose to document every needle pass and the final condition of the accessed structure.

#### IV. ARCHIVING OF RADIATION DOSE DATA

If technically possible, all radiation dose data recorded by the fluoroscopy unit or CT scanner should be transferred and archived with the images from the procedure [7]. When possible, this should be performed electronically with automatic transfer of the data from the fluoroscopy unit or CT scanner to a picture archiving and communication system (PACS). Archiving of radiation dose data is of particular importance if the procedure is likely to be repeated or if the patient has received a clinically important radiation dose [4].

#### ACKNOWLEDGEMENTS

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/Practice-Parameters-and-Technical-Standards>) by the Committee on Practice Parameters – Interventional Cardiovascular of the ACR Commission on Interventional and Cardiovascular and the Committee on Practice Parameters - Pediatric Radiology of the ACR Commission on Pediatric Radiology in collaboration with the SIR and the SPR.

Collaborative Committee – members represent their societies in the initial and final revision of this technical standard

##### ACR

Sean R. Dariushnia, MD, Chair  
Drew M. Caplin, MD  
Kassa Darge, MD, PhD  
Matthew Lungren, MD

##### SIR

Lynn A. Brody, MD  
Mehran Midia, MD  
Jason W. Mitchell, MD

##### SPR

Manish N. Patel, DO  
Ranjith Vellody, MD

##### Committee on Practice Parameters – Interventional and Cardiovascular Radiology

(ACR Committee responsible for sponsoring the draft through the process)

Clayton K. Trimmer, DO, FACR, FAOCR, FSIR, Chair  
Chaitanya Ahuja, MBBS  
Drew M. Caplin, MD  
Douglas M. Coldwell, MD, PhD  
Mandeep S. Dagli, MD  
Kevin W. Dickey, MD  
Joshua A. Hirsch, MD, FACR, FSIR  
Kelvin Hong, MD, FSIR

Elizabeth A. Ignacio, MD, FSIR  
Sanjeeva P. Kalva, MD, FSIR  
Claire Kaufman, MD  
Kenneth F. Layton, MD, FACR  
Margaret Hsin-Shung Lee, MD, FACR  
John D. Prologo, MD  
Sanjit Tewari, MD

##### Committee on Practice Parameters – Pediatric Radiology

(ACR Committee responsible for sponsoring the draft through the process)

Beverley Newman, MB, BCh, BSc, FACR, Chair  
Timothy J. Carmody, MD, FACR  
Tara M. Catanzano, MB, BCh  
Lee K. Collins, MD  
Kassa Darge, MD, PhD  
Monica S. Epelman, MD  
Dorothy L. Gilbertson-Dahdal, MD  
Safwan S. Halabi, MD

Kerri A. Highmore, MD  
Sue C. Kaste, DO  
Terry L. Levin, MD, FACR  
Matthew P. Lungren, MD, MPH  
Helen Ruth Nadel, MD  
Sumit Pruthi, MBBS  
Pallavi Sagar, MD  
Richard B. Towbin, MD, FACR

Alan H. Matsumoto, MD, FACR, Chair, Commission on Interventional and Cardiovascular Radiology  
Richard A. Barth, MD, FACR, Chair, Commission on Pediatric Radiology  
Jacqueline Anne Bello, MD, FACR, Chair, Commission on Quality and Safety  
Matthew S. Pollack, MD, FACR, Chair, Committee on Practice Parameters and Technical Standards  
Mary S. Newell, MD, FACR, Vice Chair, Committee on Practice Parameters and Technical Standards

#### Comments Reconciliation Committee

Gregory N. Nicola, MD, FACR, Chair  
Samir B. Patel, MD, FACR, Co-Chair  
Richard A. Barth, MD, FACR  
Jacqueline A. Bello, MD, FACR  
Lynn A. Brody, MD  
Drew M. Caplin, MD  
Mandeep S. Dagli, MD  
Kassa Darge, MD, PhD  
Sean R. Dariushnia, MD  
Richard Duszak, Jr., MD, FACR  
Clair Kaufman, MD  
Matthew Lungren, MD

Alan H. Matsumoto, MD, FACR  
Mehran Midia, MD  
Jason W. Mitchell, MD  
Mary S. Newell, MD, FACR  
Beverly Newman, MB, BCh, BSc, FACR  
Manish N. Patel, DO  
Matthew S. Pollack, MD, FACR  
Michael S. Stecker, MD  
Timothy L. Swan, MD, FACR  
Clayton K. Trimmer, DO, FACR  
Ranjith Vellody, MD

## REFERENCES

1. Omary RA, Bettmann MA, Cardella JF, et al. Quality improvement guidelines for the reporting and archiving of interventional radiology procedures. *Journal of vascular and interventional radiology : JVIR*. 2002;13(9 Pt 1):879-881.
2. American College of Radiology. ACR practice parameter for the performance of stereotactic-guided breast interventional procedures. 2016; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/Stereo-Breast.pdf>. Accessed February 8, 2018.
3. American College of Radiology. ACR practice parameter for the performance of ultrasound-guided percutaneous breast interventional procedures. 2016; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/US-GuidedBreast.pdf>. Accessed February 8, 2018.
4. American College of Radiology. ACR–SIR–SNIS–SPR practice parameter for interventional clinical practice and management. 2014; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/irclin-prac-mgmt.pdf?la=en>. Accessed February 9, 2018.
5. Douglas PS, Hendel RC, Cummings JE, et al. ACCF/ACR/AHA/ASE/ASNC/HRS/NASCI/RSNA/SAIP/SCAI/SCCT/SCMR 2008 Health Policy Statement on Structured Reporting in Cardiovascular Imaging. Endorsed by the Society of Nuclear Medicine [added]. *Circulation*. 2009;119(1):187-200.
6. Kahn CE, Jr., Langlotz CP, Burnside ES, et al. Toward best practices in radiology reporting. *Radiology*. 2009;252(3):852-856.
7. Miller DL, Balter S, Dixon RG, et al. Quality improvement guidelines for recording patient radiation dose in the medical record for fluoroscopically guided procedures. *Journal of vascular and interventional radiology : JVIR*. 2012;23(1):11-18.
8. Travis AR, Sevenster M, Ganesh R, Peters JF, Chang PJ. Preferences for structured reporting of measurement data: an institutional survey of medical oncologists, oncology registrars, and radiologists. *Academic radiology*. 2014;21(6):785-796.
9. Folio LR, Nelson CJ, Benjamin M, Ran A, Engelhard G, Bluemke DA. Quantitative Radiology Reporting in Oncology: Survey of Oncologists and Radiologists. *AJR. American journal of roentgenology*. 2015;205(3):W233-243.
10. Durack JC. The value proposition of structured reporting in interventional radiology. *AJR. American journal of roentgenology*. 2014;203(4):734-738.
11. McWilliams JP, Shah RP, Quirk M, et al. Standardized Reporting in IR: A Prospective Multi-Institutional Pilot Study. *Journal of vascular and interventional radiology : JVIR*. 2016;27(12):1779-1785.

12. Nguyen Q, Sarwar A, Luo M, Berkowitz S, Ahmed M, Brook OR. Structured Reporting of IR Procedures: Effect on Report Compliance, Accuracy, and Satisfaction. *Journal of vascular and interventional radiology : JVIR*. 2018;29(3):345-352.

---

\*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.

Development Chronology for this Practice Parameter

2004 (Resolution 25)

Revised 2009 (Resolution 23)

Revised 2014 (Resolution 16)

Revised 2019 (Resolution 20)