
The written radiology report

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The written radiology report is the most critical component of the service provided by a radiologist. It constitutes the formal documentation and communication of the results of a radiologic study or procedure.¹ The reports are usually dictated by a trained radiologist, but reports may vary greatly in style, format, and effectiveness. A major cause of litigation against radiologists is failure to effectively communicate results.^{2,3} As radiologists, it is time that we look at this issue with renewed diligence.

Part of the problem with radiology reports arises because we do not really understand how important this document has become to the nonradiologist caregiver.⁴ This lapse is more understandable when you realize that most major radiology textbooks do not address the subject of report composition. This would be equivalent to a journalism textbook without a chapter on how to write an article. But journalism and radiology have a lot in common. Both professions require spending a great deal of time gathering “facts” and “data” and then reporting that material in written form for a reader.

The purpose of this article is to help radiologists improve the quality of their written radiology reports by reviewing the components of a report, addressing grammar and writing style, and considering appropriate standardization.

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Communication

One of the 3 most common reasons for malpractice suits against radiologists is failure to communicate results clearly and effectively.^{2,3} Poor communication is a common reason patients choose to sue the doctor.^{5,6} In some situations, such as mammograms, it is helpful to give a copy of the report directly to the patient, which makes it even more important that the report is clear and understandable.^{6,7} If a report is written so that a patient can understand what is said, it is much more likely that a healthcare provider, who depends upon the report to make decisions concerning patient management, will also understand the report.⁸

In order to achieve clear communication, the radiologist should be aware of the intended reader of the report and how that reader will understand what is written. Most often, the reader of the radiology report is the individual responsible for providing direct patient care. In some cases, the reader will be the patient. The report should be written with these readers in mind.⁹ The use of difficult or ambiguous terms should be avoided. Esoteric terms and language not commonly understood will detract from effective communication.¹⁰ The radiology report may provide information critical to patient care, but these findings can be helpful only if the reader understands what is said. Unfortunately, the proper use of grammar becomes a part of understandable communication.^{9,11} Table 1 lists some guidelines that can help radiologists create an understandable report.

Effective report writing means that useful information obtained from the radiologic study will be transmitted clearly, concisely, and unambiguously. The report is the written communication of the radiologist’s interpretation, discussion, and conclusions about the radiologic study. The written report is frequently the only source of communication of these results. The report should communicate relevant information about diagnosis, condition, response to therapy, and/or results of a procedure performed.¹²

The written report should also answer any clinical question raised by the requesting patient-care provider that is relevant to the radiologic study. For example, if the study was requested with the clinical information “cough and fever,” then the report should specifically address whether or not the findings are consistent with pneumonia.

Legal issues

Ownership of the radiology report, its legal status, and its relationship to malpractice liability is sometimes misunderstood and can contribute to a confusing report. Ownership of the written report is held by the organization providing the radiologic service; this organization may be a hospital, clinic, health maintenance organization, imaging center, or private radiology office. Maintenance and security of the original record is the responsibility of the organization or individual who performed the imaging examination. Since the passage of the Health Insurance Portability and Accountability

Table 1. Grammar and structure guidelines for a written radiology report

- 1. Keep the intended reader in mind.** Consider whether or not the reader understands what you are describing. Avoid the use of obscure terms understood only by radiologists.
- 2. Use active voice.** For example, "I recommend" or "Recommend follow-up" instead of "Follow-up is recommended."
- 3. Use verb tenses effectively.** Use the present tense to describe the findings in a study that is before you at the time of dictation and use past tense for things that were seen during fluoroscopy or during a procedure.
- 4. Remember paragraphing.** Separate different topics or ideas in your discussion by paragraph. This will make it easier for the reader to find the explanation of your impressions.
- 5. Organize an orderly discussion.** Order the discussion logically, if possible. This can be done by anatomic location or ranked importance of findings.
- 6. Use complete sentences.** Use complete sentences in the body of the report, but avoid long run-on sentences.
- 7. Avoid report inversion.** The "Impression" section should not be longer than the body of the report.
- 8. Number your conclusions.** Number the conclusions in the "Impression" section. This helps the reader understand how you rank the importance of your conclusions. Try to use either nominative phrases or single sentences.

Act of 1996 (HIPAA), all patients have a legal right to a copy of their report.

The radiology report may generally be viewed as part of the medical record. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) considers the radiology report to be part of the medical record because it documents the results of a radiologic test or procedure.¹³ In addition, hospitals have specific

Table 2. Report formats for scientific reports versus radiology reports

Scientific report	Radiology report
Title	Title
Abstract	—
Introduction	Indication
Method	Procedure
Results & Discussion	Findings & Discussion
Conclusion	Impression

policies regarding the radiology report as part of the medical record. If the medical record is subpoenaed or when statutory regulations require specific documentation, the medical record can be regarded as a "legal document."

Malpractice suits are based on either damages or breach-of-contract issues. The most common cause of malpractice suits against radiologists is "failure to diagnose."¹⁴ Failure to diagnose may become the basis of malpractice if this failure is the proximate cause of injury or damages.¹⁵ The failure to diagnose may be the direct result of the written report. The second most common cause of malpractice suits against radiologists is "failure to clearly communicate the results."¹⁴

The report can be the proximate cause of damages if it failed to effectively communicate important information about the patient's condition.¹⁶ It is this aspect of liability risk that should also motivate radiologists to look at their reports as "communications" to referring physicians and patients and to compose them accordingly.

Report format

The key to a clear and concise radiology report that will provide reliable high-quality communication is a coherent format. The radiology report is a diagnostic test result that should stand independent of the individual interpreting radiologist. The quality of the report should not vary as a result of there being different interpreting radiologists. This is a key principle in statistical quality control. The control of variation reduces

liability risk because it ensures that important issues are addressed systematically.¹⁷ Using a standard format will significantly improve the ability of the report to communicate effectively. Variations in the report format create confusion for the reader, whereas a consistent location for the results, discussion, and conclusions assists the reader in understanding the report and its clinical implications.

The scientific report format is a practical choice for the radiology report.¹¹ This format is used by major scientific journals, is familiar to most physicians, and follows the general outline recommended by the American College of Radiology (ACR).¹² It also supports the notion that the radiologic study is a "scientific test." Table 2 presents a side-by-side comparison of the scientific report format and a corresponding radiology report format.

Title

In most situations, the title of the radiologic report is already standardized. In some institutions, this title is provided to the transcriptionist with the request. However, it is customary to include the report title for the purpose of identification. The name of the study that is used during ordering or scheduling the study may not be the desired title for the official report. The correct title of the study actually performed should be clarified at the time of dictation. Complicated procedures, such as arteriograms, biopsies, or drainage procedures, may require a statement of the title at the time of report dictation.

Indication

With many standard studies, a stated indication, or history, is not necessary in the written report. Requirements for an appropriate indication for a "test" do not necessarily require documentation of that indication within the report. In some institutions, the indication, or reason for the examination, is part of the request for the study and is automatically included in the heading of the report. However, this information may or may not represent the true indication for the study. As the consultant, the radiologist is responsible for

determining the appropriateness of the study. Often, the real reason for the study is determined from information from the patient's chart or from a verbal discussion with the referring provider. Therefore, recapitulation of the indication for the study at the time of the report dictation is appropriate because it will document the actual reason the study was performed.

In addition, many third-party payers and Medicare now require an appropriate indication before they will reimburse for a study. Therefore, the radiologist is responsible for ensuring that the study was performed for an appropriate reason. The ACR Standards also include this requirement and even suggest including the corresponding ICD-9 diagnosis code in the report.¹² This can greatly expedite billing.

The indication should be a simple, concise statement of the reason for the study and/or applicable clinical information or diagnosis. A clear understanding of the indication may also clarify appropriate clinical questions that should be addressed by the study. For example, a chest radiograph requested for "cough and fever" implies the question, "Does this study indicate the presence of pneumonia?"

Even without a stated reason for the study, it is the radiologist's responsibility to identify the appropriate indication. This may be as simple as the recognition of the implied indication as understood by the context of the study and does not necessarily need to be included in the report. This information may also be available from the patient, the patient's chart, or the referring provider. This information should be pursued with reasonable thoroughness, as it may significantly change the focus of the study.

Procedure

Every radiologic study has a procedure associated with performing the examination. For most routine studies, the procedure is implied by the title. For example, a routine study such as a "PA & LAT Chest," by accepted use, implies the procedure (posteroanterior and lateral chest radiograph), and a separate "Procedure"

section of the report is not necessary. However, a separate "Procedure" section may be convenient to document informed consent, technical limitations, drugs, and isotopes or contrast material associated with the study. Frequently, reports for invasive procedures are best organized in a separate "Procedure" section.

Findings and discussion

The "Findings and Discussion" section of the report includes the description of the results of the study, relevant information from previous studies, pertinent clinical information, and any discussion. The discussion should explain the relationship of the results, previous studies, clinical information, and the reasoning supporting the radiologist's conclusions. However, the statements in this section should be clear and concise. Long, wordy reports are less likely to be read by the intended reader.¹⁸

Approaching the radiologic study as if it were a scientific test will help limit the findings that need to be described. To do this, we assume a "null hypothesis" or we anticipate that the findings will fall within the expected range of normal for the given population. Therefore, it is necessary to describe only those findings that are abnormal and disprove the null hypothesis. These are referred to as positive findings. The exception occurs when a clinical question implies the possible presence of a specific abnormality. This introduces a positive hypothesis that the findings will document the questioned abnormality. In this case, normal findings that refute the presence of the questioned abnormality should be described and are referred to as pertinent negatives.

This section of the report must be organized in an orderly format so that the reader will understand the basis of the final conclusions and impressions. The reader should be able to find support in the "Findings and Discussion" section for each item listed in the "Impression" section.

Impression

The abstract is the summary of a scientific report. In a radiology report, the

summary has been referred to as the "Impression," "Conclusion," or "Diagnosis" section. Sometimes this summary is an impression, sometimes it is a conclusion or diagnosis, and sometimes it is a concise statement of the findings. Practice patterns seem to favor "Impression" for the name of this section of the report.

In a large survey, >50% of referring physicians read only the "Impression" section of a radiology report!¹⁸ This places great importance on this section of the report and emphasizes the need to view this section as a summary.

The common practice of using a numbered list for the "Impression" section helps produce a concise summation. Numbered statements or phrases should be ordered logically to make use of implied ranking. Statements in the numbered list should maintain a parallel structure—that is, if complete sentences are used, then complete sentences should be used throughout the list, or if phrases are used, then phrases should be used throughout. For clarity, it is best to limit each numbered item to a single sentence or phrase.

The "Impression" section is a list of summary statements that includes both conclusions about the radiographic study and recommendations for further evaluation and patient management. Recommendations are appropriate if the radiologist is knowledgeable about what is being recommended and if the recommendation will improve the care of the patient. Recommendations are based on the results of the radiologic study and the experience of the individual radiologist. The range of appropriate recommendations should be limited to the scope of knowledge of the individual radiologist. The use of appropriate recommendations can greatly contribute to the management of patient care and can provide consultative information that may not otherwise be available. However, the use of recommendations with the misguided notion that it is effective risk management should be avoided.

The "Impression" section is the most commonly read portion of the radiology report and is generally considered

to be a summary of the study. In addition, this section may be all that is required in certain routine "normal" studies. Consequently, the "Impression" section is the most important part of the radiologic report.

Footnotes to the report

Other, more timely forms of communication of the report are also important to good radiology practice. Phone, fax, and email communication of serious, time-critical, or life-threatening information is becoming the standard of practice, and documentation of these communications is good risk management. Since these forms of communication are separate from the report itself, it is convenient to use a postscript or footnote to document such communication. A short postscript at the end of the written report is sufficient. Here are some examples:

"P.S. Dr. Doctor was contacted by phone at 1300 on 1/1/01 and the results discussed";

"P.S. Fax of report sent to Dr. Doctor";

"P.S. A copy of the report was sent by email to Dr. Doctor"; or

"P.S. Patient contacted by telephone and informed of results and the need for follow-up."

Conclusion

The written radiology report is the critical service of radiology and should provide clear and concise communication that is understandable by the intended reader. Since increasingly more often the patient is the reader of the report, it is even more important to keep the report clear and concise. Additionally, failure to clearly communicate results continues to be a leading cause of delayed diagnosis and resultant lawsuits. It is time to take a new and positive look at the radiology report from a different perspective. Efforts to make the radiology report an effective means of communication that is independent of individual radiologists and that focuses on the intended readers can contribute to both improved patient care and reduced liability risk.

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