Background
The concept of a task force to develop appropriateness guidelines for radiology arose in 1993 as the leadership of the American College of Radiology (ACR) formulated its response to President Clinton's initiative to reform the health care delivery system in the United States.

At that time, one proposal for legislation that was being circulated called for all hospital-based physicians to be salaried. The impetus behind this plan, which would have eliminated the independent practice of radiology in hospitals, was to save large amounts of money for the Medicare and Medicaid programs. When speaking before the House Ways and Means Subcommittee on Health, Dr. K.K. Wallace, Jr., then Chair of the ACR Board of Chancellors, pointed out that changing the way radiologists are paid would not result in any significant savings. Instead, he offered a counterproposal that the ACR would develop a system to ensure the appropriate use of diagnostic and therapeutic radiology services, thus eliminating waste and, just as importantly, improving the quality of care.

It is well known that variations in the practice of medicine exist. The reasons are multifactorial. The empirical practice of medicine, based on individual experience and practicing in a manner growing out of the way a physician is trained, is prevalent. Our system of reimbursement also is a major factor. Patient demands, the availability of technology, and local expertise are just a few of the other factors influencing practice patterns.

Are differences in practice patterns justifiable? Is there a preferred way to approach the diagnosis and treatment of disease? Intuition says that a preferred way exists to manage most clinical situations, depending on the local availability of technology and expertise.

The ACR Task Force on Appropriateness Criteria
The structure and function of the ACR Task Force on Appropriateness Criteria were developed during the latter half of 1993, and the process of creating appropriateness criteria began in the summer of 1994.

The major objective of the Task Force is to create the most credible patient care guidelines possible for physicians and their patients. The method of creating guidelines is based on principles developed by the Institute of Medicine for the Agency for Health Care Policy and Research (AHCPR) of the federal
Agreement on appropriate therapeutic management is based on current peer-reviewed medical literature, clinical case scenarios, and a consensus-building process.

The Task Force is made up of ten consensus panels, eight of which concentrate on specific diagnostic areas and two of which focus on therapeutic aspects of radiology practice (Table 1). A modified Delphi process (a system of anonymous voting) is used that combines available research findings and group consensus.

Each panel consists of 11 to 16 experts who represent a variety of practice settings from locations throughout the country. Together, the ten panels have a total of 233 panelists, including 118 diagnostic radiologists, 78 radiation oncologists, and 37 physicians from 20 other specialties. Each consensus panel prioritizes and addresses clinical situations based on prevalence, degree of variation in practice, cost, and potential morbidity or mortality.

Thus far, 108 clinical topics with 592 variants have been published in three volumes. Eight other completed topics with 74 variants are unpublished but available through the Internet (http://www.acr.org). Seventy-nine other clinical conditions with 269 variants are pending.

Although treatment pathways, guidelines, and appropriateness criteria are becoming commonplace in today’s healthcare environment, the details about the selection and appropriate use of diagnostic and therapeutic radiology resources are typically omitted. The ACR Appropriateness Criteria are designed to address this shortcoming by including perspectives on quality and appropriate patient care as well as on utilization and cost-effectiveness.

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| Expert Consensus Panels of the American College of Radiology Task Force on Appropriateness Criteria |
|------------------------------------------------------------------------------------------------|
| Cardiovascular Imaging | Pediatric Imaging |
| Gastrointestinal Imaging | Thoracic Imaging |
| Interventional Imaging | Urologic Imaging |
| Musculoskeletal Imaging | Women’s Imaging |
| Neuroradiologic Imaging | Radiation Oncology |
clude a listing of the major references, the identity of the panelists, and the date of review. A face sheet for each condition and variant displays the ranking of the tests, procedures, and treatments on a scale of 9 to 1, in which 9 is the most appropriate and 1 is the least appropriate. Each page of the ACR Appropriateness Criteria contains a paragraph at the bottom making it clear that the criteria are guidelines only, meant to apply to many but not all patients. The statement also indicates that the radiologist or radiation oncologist and the referring physician make final diagnostic and treatment decisions together, as dictated by individual patient situations, and that the criteria are not intended as standards for reimbursement purposes.

Oncology-Related Conditions

Oncology-related clinical conditions addressed by the Task Force relate to the diagnosis of suspected disease and, after disease is diagnosed, its staging, treatment, and follow-up to determine the effectiveness of therapy.

Clinical diagnosis and staging guidelines are addressed in the panels corresponding to the site of origin of disease. For example, the Panel on Musculoskeletal Imaging develops recommendations for the imaging evaluation of patients presenting with soft-tissue masses or suspected bone tumors. The Thoracic Imaging panel addresses subjects such as the work-up of the solitary lung nodule and the staging of non–small cell carcinoma of the lung. The Women’s Imaging Panel makes recommendations for ovarian cancer screening, and the other panels have similar approaches to neoplastic disease specific to their areas of responsibility.

The Panel on Radiation Oncology is divided into seven work groups addressing cancers of the breast, lung, prostate, and rectum and anus; bone metastases; brain metastases; and Hodgkin’s disease. Recognized experts head each group, guiding the panels through the standardized process of reaching a consensus about staging and treating neoplastic disease.

When applicable, the groups examine the relative merits of radiotherapy, including new radiotherapeutic technologies, surgery, chemotherapy, and combinations of these modalities. The groups also examine the appropriate-
Clinical Condition: Squamous Cell Lung Cancer, Negative Surgical Margins Postresection

Variant 1: T2N1 (hilar), no mediastinal surgical staging

| Treatment                                      | Appropriateness Rating |
|------------------------------------------------|------------------------|
| Postoperative Mediastinal Radiotherapy         | 8                      |
| **Dose Utilized**                              |                        |
| 50.4 Gy/28 fractions                          | 8                      |
| 50.0 Gy/25 fractions                          | 8                      |
| 54.0 Gy/30 fractions                          | 7                      |
| 45.0 Gy/25 fractions                          | 3                      |
| 59.4 Gy/33 fractions                          | 3                      |
| 30.0 Gy/10 fractions                          | 2                      |
| 40.0 Gy/20 fractions                          | 2                      |
| 70.2 Gy/39 fractions                          | 2                      |
| 69.6 Gy/58 fractions (bid)                    | 2                      |
| **Postoperative Mediastinal RT + CH**          |                        |
| Neoadjuvant chemotherapy                      | 2                      |
| Concurrent radiotherapy + chemotherapy        | 2                      |
| Postradiotherapy chemotherapy                 | 2                      |
| **Radiotherapy Procedures**                   |                        |
| Computer planning                             | 8                      | Two-dimensional calculation. |
| CT-based planning                             | 8                      | Utilize CT scan to assist in defining tumor volume. |
| 3-D treatment planning                        | 3                      | The role of 3-D treatment planning in this clinical setting is being evaluated and remains to be defined. |
| **Radiotherapy Technique**                    |                        |
| Multifield technique                          | 8                      |
| Complex blocking                              | 8                      |
| AP/PA only                                    | 2                      |

Appropriateness criteria scale: 1=least appropriate; 9=most appropriate.

AP/PA = anteroposterior/posteroanterior; bid = twice a day; CH = chemotherapy; CT = computed tomography; RT = radiation therapy; 3-D = three-dimensional.

An American College of Radiology (ACR) Task Force on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the Food and Drug Administration have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination. ACR appropriateness criteria are not designed as a guide for third-party reimbursement.

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ic treatment techniques. The full complement of oncology-related criteria is available through the Internet (http://www.acr.org) and in print. A CD-ROM with these criteria also is available.

**Use of Appropriateness Criteria**

It is likely that use of the ACR Appropriateness Criteria will vary depending on local needs and practices. In some instances the criteria will serve as a basis for discussion and as a framework for local adaptation. The criteria will undoubtedly go unnoticed or be ignored in other practices. Dissemination and education are key components of any implementation program. Communication of this work is ongoing, including presentations at scientific assemblies and publication in specialty journals.

The ACR program of appropriateness criteria development is a dramatic example of volunteerism. Hundreds of busy physicians are contributing many thousands of hours because they believe that the results are credible and have the potential to improve quality of care. We hope that this effort will result in improved and more cost-effective care, and we look forward to the results of future health services research on the subject.

**References**

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