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General Information

Radiology-TEACHES (RT) follows a combination of house style and, particularly for the reference list, AMA style. Spelling follows *Merriam-Webster's Collegiate Dictionary* or www.merriam-webster.com. You will be able to find many medical terms in *Merriam-Webster*, but not all of them; Wikipedia is an excellent additional reference for terms only.

RT-supported browsers include Internet Explorer, Firefox, and Chrome. To ensure that you have the most recent version of your browser of choice, visit <https://updatemybrowser.org/>.

Getting Started – Selecting a Topic

The easiest way to select a topic for a case is to use the [ACR Appropriateness Criteria Portal](#) to search for those topics of interest. By using the Appropriateness Criteria as a starting point, the case will fit into the format for submission.

There is also a published list of cases and their topics for the Radiology-TEACHES program available at <https://app.smartsheet.com/b/publish?EQBCT=48da9504a81341389fb321858ba8e9a4>

Review this list and select a topic not already covered or author a variation on a topic. Acceptable variations would include a scenario for the topic where imaging is not required or a variation due to age or other factors.

Preferred Language

This guidance is aligned with the American Medical Association Manual of Style that requires authors to use patient-centered language in manuscripts.

Use Person-First Language: Person-First Language puts the person before the disease and describes what the person has, not who the person is. People are more than their cancer diagnosis or defined by a behavior.

Try this	Instead of this
Man / Woman / Patient / Child	Subject
Smoker	Patient/Person with active tobacco use
Woman / Man with breast cancer	Breast cancer patient

Eliminate Blame Language: Medical language is rooted in a historical tradition, but like treatment it needs to evolve and be more empathic and non-judgmental.

Try this...	Instead of this...
Unable to/Not able to	Non-compliant
Cancer progressed	Patient progressed
Treatment failed patient	Patient failed treatment

Chief concerns	Chief complaint
Risk reduction	Prevention (“Prevention” is population-centered, whereas “Risk reduction” is individual patient-centered.)

End Stigma: Promote judgment-free, bias-free, person-first language. Categorizing a person by a behavior, which has negative connotation, perpetuates the stigma.

Try this...	Instead of this...
Person with smoking history	Former smoker
Person with “substance” dependence	Addict / Alcoholic

Equity: Respectful language includes practicing cultural humility and sensitivity by following best practices regarding race, ethnicity, gender, socioeconomic, and geographic descriptions.

Authoring or Editing a Case and Case Setup

Basic Case format:

1. Case scenario
2. ACR Select question
3. Author / Co-Author information
4. References

Examples:

<https://cortex.acr.org/Presenters/CaseScript/CaseView?Info=WXIs88jOJ7tYNKINWcjISHmljFHG V20Q6NvXKi4LkXhiui1oqNjvTLc%2fJ62q6JTj>

<https://cortex.acr.org/Presenters/CaseScript/CaseView?Info=WXIs88jOJ7tPTDHQbfbAT3KniVJja 0lw%2f%2fBC9Ly%2bT0xIW12wQD93EYkrO3en6L5>

<https://cortex.acr.org/Presenters/CaseScript/CaseView?Info=WXIs88jOJ7vsk02hN%2fb2MavLX UOajljwhy6NEILnHL4XPRyw38v3Im5vj2lz6IJ4>

After creating a case or when editing a case, it is important to proceed through the case as a user would, from start to finish, clicking every answer choice (both correct and incorrect). You should review the case preview; in doing so you will be able to catch display errors.

Case Scenario

- The scenario should be written in complete sentences and generally follows the below format.

“A xx-year-old patient (man, woman, boy, girl) presents with X symptoms.”

- The scenario should contain the patient’s age as xx-year-old.
- “Male” or “female” should NOT be used when “man” or “woman” is meant. If a child, use boy or girl. Infants can be identified as male or female infant with age in months (xx-month-old).
- The patient’s race should NOT be included unless it is pertinent to the diagnosis.
- Present tense is preferred (ie, “presents” versus “presented”), however in cases where the history is several sentences and spans a relatively lengthy period of time, past tense may be more suitable.
- The scenario must include all important patient information and history including any other diagnostic testing (ie. D-Dimer, vitals, PMHx). If the scenario is directed towards follow-up testing, include the initial workups and all findings. Ex. Prior mammography findings were all normal.
- Add a statement to assist in the search for the indication in the ACR AC Portal: “You suspect x ...” unless the queried diagnosis is explicit.
- Consider scenarios with a health equity, radiation dose and/or cost component.
 - Lack of access to imaging studies, patient demographics
 - Radiation dose levels for pediatric / geriatric / pregnant patients
 - Transgender and racial disparities affecting imaging care.

Example(s):

An 18- month-old girl is brought to see you by her parents. They report a three-day history of cough, runny nose, and low-grade fever. Today, they noticed some mild wheezing. You suspect bronchiolitis as the diagnosis.

A 40-year-old woman presents with pelvic pain. On physical exam, the pain localizes to the right lower quadrant, and you suspect a non-gynecologic etiology. Her beta-HCG is negative. You suspect appendicitis.

Questions

The case should always start with the scenario and then the ACR Select question type. The ACR Select question must be multiple-choice format.

ACR Select (Appropriateness Criteria) Question Type

Question Stem

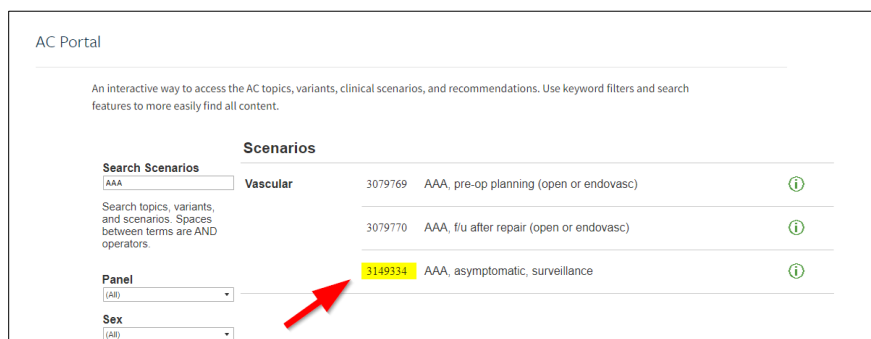
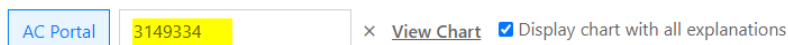
- The question stem should be: **“Which of the following is the most appropriate imaging option for this patient?”**
- For some specific scenarios, an example of an alternate stem might be:

After consultation with nephrology and the patient, which of the following is the most appropriate to order for this patient?

Which of the following is the most appropriate follow-up imaging option for this patient?”

ACR AC Portal Information

- All submitted cases **must** link to an ACR Appropriateness Criteria.
 - In the author portal, click the AC Portal button to launch the ACR AC Portal Tool.
 - Search the Appropriateness Criteria for the clinical scenario that match the case.
 - Copy and paste the Scenario ID # into the field in the authoring portal.
 - Click View Chart to verify that the chart is correct.



Questions Choices / Responses

- At least 4 question choices (responses/distractors) are required. Copy and paste your choices from the [ACR Appropriateness Criteria®](#) or ACR AC Portal tool for that scenario.

Stage I Breast Cancer: Initial Workup and Surveillance for Local Recurrence and Distant Metastases in Asymptomatic Women ← Back

Variants
6 Surveillance, Stage I breast cancer, Asymptomatic. Rule out local recurrence.

Documents
[Narrative](#)
[Evidence Table](#)
[Lit Search](#)
[Appendix](#)

Scenario	Scenario Id	Procedure	Adult RRL	Peds RRL	Appropriateness Category	
Breast cancer, stage I, surveillance for local recurrence	3084017	Digital breast tomosynthesis diagnostic	0.1-1mSv ☼☼☼	Not Assigned	Usually appropriate	●
		Digital breast tomosynthesis screening	0.1-1mSv ☼☼☼	Not Assigned	Usually appropriate	●
		Mammography diagnostic bilateral	0.1-1mSv ☼☼☼	Not Assigned	Usually appropriate	●
		Mammography screening	0.1-1mSv ☼☼☼	Not Assigned	Usually appropriate	●
		US breast bilateral	0 mSv ○	0 mSv [ped] ○	May be appropriate	●
		MRI breast without and with IV contrast bilateral	0 mSv ○	0 mSv [ped] ○	May be appropriate	●
		MRI breast without IV contrast bilateral	0 mSv ○	0 mSv [ped] ○	Usually not appropriate	●

- For the imaging choices, ensure the same nomenclature has been used as that provided in the ACR Appropriateness Criteria or ACR AC Portal Tool to avoid confusion. Include type of contrast (IV, oral, etc.). Also include identifiers such as chest, pelvis, head.
- For exams that might require contrast, provide choices that include with, without or with, and without contrast as appropriate. Do not use shorthand such as w, wo, w/wo for contrast choices.
- Answer choices should always start with a capital letter. Subsequent words should be lowercase except for abbreviations or proper nouns (ie, Crohn disease).
- The correct answer choice for the question should be the most appropriate exam or study, as rated by the ACR Appropriateness Criteria or ACR AC. If two exams are equivalent, select the choice that best fits the clinical scenario, radiation dose, and cost.
- The [“Click here to ask a Radiologist a question”](#) which will be added during the staff review should display under the question.

Examples of question and choices:

Scenario

An 18-month-old girl is brought to see you by her parents. They report a three-day history of cough, runny nose and low-grade fever. Today, they noticed some mild wheezing. You suspect bronchiolitis as the diagnosis.

AC Portal

Question

1.1 Which of the following is the most appropriate imaging option for this patient?

- A No imaging.
- B Xray, chest.
- C CT, Chest without intravenous contrast.
- D CT, Chest with intravenous contrast.
- E CT, Chest without and with intravenous contrast.

[Click here to ask a Radiologist a question](#)

Scenario

A 60-year-old man is brought to the ED after being involved in a high-speed (70 MPH) crash with multiple fatalities. No major injuries were reported by EMS, but there are many cuts and abrasions present on his extremities. He has normal mental status with no deficits on the neurological exam. There is midline spinal focal pain on physical exam.

AC Portal

Question

1.1 Which of the following is the most appropriate imaging option for primary evaluation of the cervical spine in this patient?

- A US of the neck (FAST - Focused Assessment with Sonography for Trauma)
- B Three-view XR cervical spine
- C CT cervical spine without IV contrast
- D MRI cervical spine without IV contrast

[Click here to ask a Radiologist a question](#)

Explanations

- Each choice, correct and all incorrect, require specific explanations for that specific choice. Do not reuse the same explanation for each incorrect choice. Provide specific reasons why an exam is incorrect.
- Explanations should start with “Correct.” or “Incorrect.” and should be written in full sentences.
- Links to open access, free outside resources are encouraged. Some examples are [Radiologyinfo.org](#), [Image Wisely](#), [Image Gently](#). Supplemental links in the explanations should work and open in new browser tabs.
- Charts and graphs may be included in the explanation to enhance the information available. Add charts and graph images to the image section of the case and provide instructions in the comments on placement when submitting the case.
- For choices with exams with, without or with/without contrast options, provide information on why contrast is or is not appropriate.
- For age specific indications (pediatric, geriatric) include in the explanation the criteria for the choice.
 - i.e., Use of ultrasound instead of advanced imaging options to reduce radiation exposure.
 - i.e., Use of alternate initial imaging to reduce cost.
- Correct choice explanations should include (added by staff during review process):

For further information, click on the "Display Evidence" tab within the clinical decision support chart . There is a summary of literature review under the tables.

Estimated cost ranges based on Centers for Medicare and Medicaid (CMS) data.

\$:	from	<input type="text" value="0.00"/>	up to	<input type="text" value="100.00"/>
\$\$:	from	<input type="text" value="100.00"/>	up to	<input type="text" value="250.00"/>
\$\$\$:	from	<input type="text" value="250.00"/>	up to	<input type="text" value="500.00"/>
\$\$\$\$:	from	<input type="text" value="500.00"/>	up to	<input type="text" value="10000.00"/>

[Click here to ask a Radiologist a question](#)

(Cost range table size 300w x 130h)

Example of explanations:

Explanation

Scenario

A 58-year-old woman presents with a recent diagnosis of colon cancer. You would like to perform pretreatment staging.

Appropriateness rankings for a 58 year old Female				Display Evidence...
Indications: Colon cancer, staging				
Appropriateness	Procedure	Cost	RRL	
9	CT chest abdomen pelvis with IV contrast	\$\$\$	☠☠☠☠	
8	MRI abdomen and pelvis without and with IV contrast	\$\$\$\$		
6	FDG-PET/CT whole body	\$	☠☠☠☠	
5	MRI abdomen and pelvis without IV contrast	\$\$\$\$		
4	CT chest abdomen pelvis without IV contrast	\$\$\$	☠☠☠☠	
3	CT chest abdomen pelvis without and with IV contrast	\$\$\$\$	☠☠☠☠	

Question

1.1 Which of the following is the most appropriate imaging option for this patient?

You Selected C: CT, Chest, abdomen and pelvis with intravenous contrast.

Explanation

- ✓ **Correct.** CT provides the ability to screen the chest, abdomen and pelvis for metastatic disease. Prior to submitting a request for the exam, discuss with a radiologist if dual phase contrast enhanced imaging of the liver would be appropriate to improve sensitivity of the liver screening, given the arterial and portal venous supply of the liver. Some institutions have this as a standard protocol for screening these patients, which highlights the need to provide an adequate and robust history when requesting imaging examinations to ensure the "right test" for the patient.

Information to share and discuss with the patient: Radiologyinfo.org

For further information, click on the "Display Evidence" tab within the clinical decision support panel. There is a summary of literature review under the tables.

Estimated cost ranges based on Centers for Medicare and Medicaid (CMS) data.

\$:	from	<input type="text" value="0.00"/>	up to	<input type="text" value="100.00"/>
\$\$:	from	<input type="text" value="100.00"/>	up to	<input type="text" value="250.00"/>
\$\$\$:	from	<input type="text" value="250.00"/>	up to	<input type="text" value="500.00"/>
\$\$\$\$:	from	<input type="text" value="500.00"/>	up to	<input type="text" value="10000.00"/>

[Click here to ask a Radiologist a question](#)

Other explanations:

- ✗ **Fluoroscopy, Contrast enema**
Incorrect. A contrast enema does not play a role in colon cancer staging.
- ✗ **CT, Chest, abdomen and pelvis without intravenous contrast**
Incorrect. Intravenous contrast improves the sensitivity for detection of metastatic disease.
- ✗ **CT, Chest, abdomen and pelvis with and without intravenous contrast.**
Incorrect. The dual phase imaging (with and without contrast) does not significantly add to the diagnostic value of the study in most cases, but it essentially doubles the radiation dose for the patient.
- ✗ **MRI, Abdomen-pelvis with and without intravenous contrast.**
Incorrect. CT is better suited for covering a large region of exam (chest, abdomen and pelvis). MRI is primarily reserved for problem solving in challenging cases.

Additional Advanced Case Content

- For advanced cases, there is an additional section where the case is linked to a Case in Point (CiP) case.
- CiP cases will be in the CiP Case Archive (<https://cortex.acr.org/CiP/Pages/CaseArchive>)
- The following text will be added on page 2 of the case by staff. Provide the link to the CiP case in the comments box of the case authoring portal. Refer to the Author Portal Guide for information.

Example:

Interested in an advanced case on this topic with additional images?

The following Case in Point case provides additional information on this topic: [Posterior shoulder dislocation with accompanying reverse Hill-Sachs fracture](#)

ACR Case in Point (CiP) provides access to the [Case in Point archives](#) to medical students. For the most recent cases with the newest topics, ACR provides free medical student membership. More information can be found at [Medical Student Membership](#)

Additional Resource: [22 Don't Miss X-ray Lesions - Shoulder Dislocation pg 44-46](#)

Images (Advanced Cases only)

- Minimum of two images are required for Advanced Cases, using the same modality for the case scenario:
 - One normal anatomy image annotated with the anatomy and representing the case
 - One image from the Case in Point case



- Make sure the same modality is used for both images. Do not use a radiograph for the anatomy and a CT or MR from the CiP case.

- Make sure to include captions for the images
 - For the anatomy image, if arrows or numbering are used, identify the anatomy in the caption for that image.

 - For the CiP image, start the caption with “XXX image provided courtesy of Case in Point.” Then follow with the caption provided with the image from the CiP case.

- Annotated Images
 - Annotations will need to be added using Photoshop or other image editing software.

 - Use only colored arrows or circles. Be sure your annotations are obvious; this may require creating thicker lines/arrows or changing the color.

 - Embed the annotations in the image.

 - Do not include the caption within the image itself. There is a place in this template to provide your captions.

- Image specifications
 - .jpg, .png, .tiff set at highest quality/lowest compression

 - Images should be 512 x 512 pixels or greater

 - Cropping:
 - All images should be centered with edges cropped.
 - Remove unused space, white lines or borders, patient information, and manufacturer/trademark information. In general, on CT and MR images, crop the images as close as possible to the body wall or skin surface.
 - On CT images, crop out the CT table or any pad visible beneath the patient.
 - Remove any identification or personal health information that might allow identification of the patient

Authors/Affiliations

Most cases are submitted by a medical student, a resident, or a fellow. Multiple co-authors are accepted. In these cases, the author must have an attending or other senior radiologist (usually a radiologist or professor) named as a co-author.

Verify the following:

- Each author's name, medical degree, professional title, institution, should be shown.
- Medical students must list a degree; BS is appropriate if nothing else is listed.
- Residents' titles can be listed as PGY#, Resident, or some variation thereof.

References

The reference list is styled in AMA format. Below are the most common formats used in RT. Examples are taken from samford.edu.

- En-dashes (accessible via the special characters menu in Word) should be used without spaces in page ranges.
- Article titles should be formatted with sentence case (ie, capitalize first word only as well as any proper nouns; words after a colon should also be capitalized.). Book titles are formatted by capitalizing each word (except articles [eg, a, the] and prepositions [eg, of]).
- For references with URLs, links should not be clickable.

Reference List

Citing the Appropriateness Criteria

If citing a specific ACR Appropriateness Criteria topic:

List authors. Title. Available at <URL>. American College of Radiology. Accessed <DATE>.

Example:

Bancroft LW, Kransdorf MJ, Adler RA, et al. ACR Appropriateness Criteria® Acute Trauma to the Foot. Available at <https://acsearch.acr.org/docs/70546/Narrative/>. American College of Radiology. Accessed DATE.

If citing the entire ACR Appropriateness Criteria:

American College of Radiology. ACR Appropriateness Criteria®. Available at <https://acsearch.acr.org/list>. Accessed <DATE>.

Journal article

Smith J, Canton EM. Weight-based administration of dalteparin in obese patients. *Am J Health-Syst Pharm*. 2003;60(7):683–687.

Journal article with more than 6 authors

Hunter DJ, Hankinson SE Jr, Laden F, et al. Plasma organochlorine levels and the risk of breast cancer. *N Engl J Med*. 1997;337(18):1253–1258.

Journal issue with supplement

Dworkin RH, Johnson RW, Breuer J, et al. Recommendations for the management of herpes zoster. *Clinic Infect Dis*. 2007;44(1)(suppl 1):S5–S10.

Book with one author or editor

Davis NM. *Medical Abbreviations: 26,000 Conveniences at the Expense of Communications and Safety*. 12th ed. Huntingdon Valley, PA: Neil M. Davis Associates; 2005:173.

McEvoy GK, ed in chief, Snow ED, ed. *AHFS: Drug Information*. Bethesda, MD: American Society of Health-System Pharmacists; 2008:1125–1126.

Book with two or more authors

Aronoff GR, Berns JS, Brier ME, et al. *Drug Prescribing in Renal Failure*. 4th ed. Philadelphia, PA: American College of Physicians; 1999:39.

Chapter in a textbook and StatDx

References should be treated as any peer-reviewed publication, which does not allow textbook chapters or websites or StatDx. If provided they should be removed.

Online Journal

Seal A, Kerac M. Operational implications of using 2006 World Health Organization growth standards in nutrition programs: secondary data analysis. *BMJ*. 2007; 334:733. <http://www.bmj.com/cgi/content/full/334/7596/733>. Accessed April 12, 2007.

Epub Ahead of Print

Kozyrskyj AL, Ernst P, Becker AB. Increased risk of childhood asthma from antibiotic use in early life [published online ahead of print April 5 2007]. *Chest*. 2007.

In-Text Citations

Radiology-TEACHES does not require in-text citations, but authors will sometime provide them. Unlike AMA style, Radiology-TEACHES does not follow the rule to use superscript numerals for in-text citations of each reference. If you see numerical reference citations in the text, either superscript or in brackets, they should be deleted. If, however, the author credits a particular reference by including

the author’s names, you can let that stand, but use the below formats.

Parenthetical Citations

- For one author:* (Black, 2007)
- For two authors:* (Black and Smith, 2007)
- For three or more authors:* (Black et al, 2007)

Nonparenthetical Citations

- For one author:*
O’Driscoll (1991) proposed that insufficiency of the lateral ulna collateral ligament...
- For two authors:*
Rotatory instability was originally reported by Osborne and Cotterill (1966) as an osteochondral fracture...
- For three or more authors:*
Subsequently, Jeon et (2008) proposed that the bony fracture results from...

Abbreviations

Standard Abbreviations

Table 2 lists standard terms that do not need to be defined (ie, spelled out) in RT cases. Though these abbreviations do not need to be defined, if an author does so, you may let the definition stand.

Abbreviation	Definition
2D	Two-dimensional
3D	Three-dimensional
AP	Anteroposterior
CT	Computed tomography
CTA	Computed tomography angiography
ER	Emergency room
MR	Magnetic resonance
MRI	Magnetic resonance imaging
PA	Posteroanterior
PET	Positron emission tomography
SPECT	Single-photon emission computed tomography
US	Ultrasound

Table 2. Standard abbreviations

Nonstandard Abbreviations

Nonstandard abbreviations must be defined (ie, spelled out) at first use. The long form should appear first, followed by the abbreviated form in parentheses. Do not define a term more than once. If an author defines a term multiple times, delete the long form after the first use.

Example: The image shows the inferior vena cava (IVC). The IVC is patent.

A term should NOT be given an abbreviation unless the abbreviation is used again later in the text. If an author provides both a long form and an abbreviated form but never uses the abbreviation again, delete the abbreviation and retain only the long form.

Author Resources

- [Costs of Care](#)
- [Image Gently](#)
- [Image Wisely](#)
- [RadiologyInfo.org](#)
- <https://radiopaedia.org>
- <https://edhub.ama-assn.org/health-systems-science/by-topic>
- <https://www.aha.org/high-value-care-resources>
- <https://vbhc.dellmed.utexas.edu/>