

ACR Appropriateness Criteria[®] Hematuria-Child

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Abstract

Hematuria is the presence of red blood cells in the urine, either visible to the eye (macroscopic hematuria) or as viewed under the microscope (microscopic hematuria). The clinical evaluation of children and adolescents with any form of hematuria begins with a meticulous history and thorough evaluation of the urine. The need for imaging evaluation depends on the clinical scenario in which hematuria presents, including the suspected etiology. Ultrasound and CT are the most common imaging methods used to assess hematuria in children, although other imaging modalities may be appropriate in certain instances. This review focuses on the following clinical variations of childhood hematuria: isolated hematuria (nonpainful, nontraumatic, and microscopic versus macroscopic), painful hematuria (ie, suspected nephrolithiasis or urolithiasis), and renal trauma with hematuria (microscopic versus macroscopic).

The American College of Radiology Appropriateness Criteria are evidence-based guidelines for specific clinical conditions that are reviewed annually by a multidisciplinary expert panel. The guideline development and revision include an extensive analysis of current medical literature from peer reviewed journals and the application of well-established methodologies (RAND/UCLA Appropriateness Method and Grading of Recommendations Assessment, Development, and Evaluation or GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios. In those instances where evidence is lacking or equivocal, expert opinion may supplement the available evidence to recommend imaging or treatment.

Key Words: Appropriateness Criteria, Appropriate Use Criteria, AUC, Children, Hematuria, Nephrolithiasis, Trauma, Urolithiasis

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Disclaimer: The ACR Committee 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, radiation oncologists, 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 FDA 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.

Variant 1. Child. Isolated microscopic hematuria (nonpainful, nontraumatic) without proteinuria. Initial imaging.

Radiologic Procedure	Rating Recommendation	Relative Radiation Level
US kidneys and bladder	Usually Not Appropriate	0
Arteriography kidneys	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠⚠
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	0
MRI abdomen and pelvis without IV contrast	Usually Not Appropriate	0
Voiding cystourethrography	Usually Not Appropriate	⚠⚠
Voiding urosonography	Usually Not Appropriate	0
X-ray abdomen and pelvis (KUB)	Usually Not Appropriate	
X-ray intravenous urography	Usually Not Appropriate	⚠⚠⚠

IV = intravenous; US = ultrasound.

Variant 2. Child. Isolated microscopic hematuria (nonpainful, nontraumatic) with proteinuria. Initial imaging.

Radiologic Procedure	Rating Recommendation	Relative Radiation Level
US kidneys and bladder	Usually Appropriate	0
Arteriography kidneys	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠⚠
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	0
MRI abdomen and pelvis without IV contrast	Usually Not Appropriate	0
Voiding cystourethrography	Usually Not Appropriate	⚠⚠
Voiding urosonography	Usually Not Appropriate	0
X-ray abdomen and pelvis (KUB)	Usually Not Appropriate	
X-ray intravenous urography	Usually Not Appropriate	⚠⚠⚠

IV = intravenous; US = ultrasound.

Variant 3. Child. Isolated macroscopic hematuria (nonpainful, nontraumatic). Initial imaging.

Radiologic Procedure	Rating Recommendation	Relative Radiation Level
US kidneys and bladder	Usually Appropriate	0
Arteriography kidneys	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	⚠⚠⚠⚠⚠
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	⚠⚠⚠⚠
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	0

(continued)

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