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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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)