

E•QUAL | EMERGENCY QUALITY NETWORK

Consensus: Imaging for Renal Colic

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Multispecialty Consensus on Optimal Imaging for Renal Colic Using a Modified Delphi Approach

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Disclosures

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Background

- There are over 2 million Emergency Department visits for suspected renal colic (RC) in the U.S. annually
- Computed tomography (CT) is accurate for diagnosis but carries potential radiation risk, increases cost, and has not been shown to alter patient-centered outcomes
- Alternative imaging including ultrasound (US) may be used, but perspectives on imaging may differ by specialty
- We sought to develop a nationally representative multi-specialty panel to seek evidence-based consensus on RC scenarios where CT might be avoided

Methods

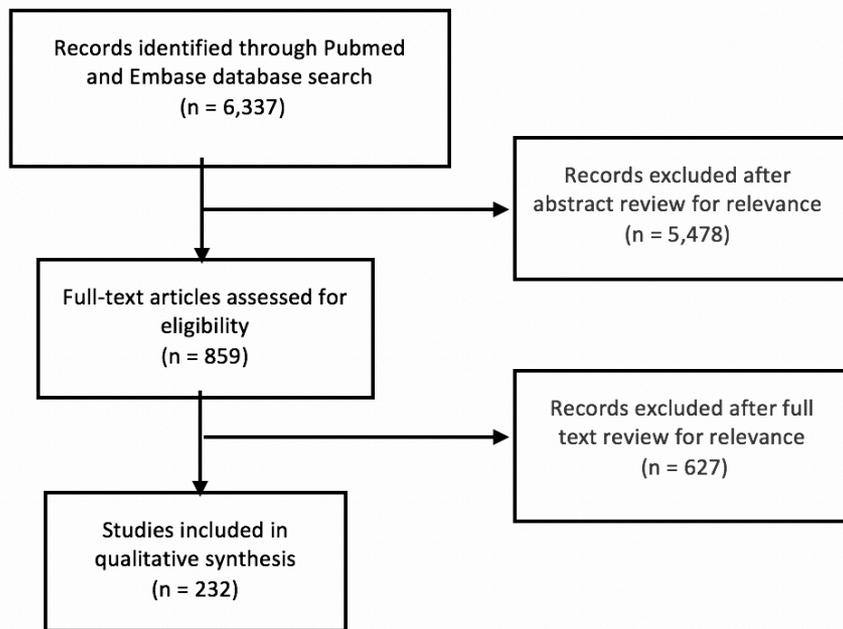
- Under ACEP Emergency Quality Network (eQual) a nine-member expert panel convened with representatives from:
 - American College of Emergency Physicians (ACEP)
 - American College of Radiology (ACR)
 - American Urological Association (AUA)
- Following a systematic review of literature, the panel created 29 clinical vignettes for suspected RC in which CT might not be the optimal imaging approach.



American
Urological
Association

Literature Review

PRISMA flow diagram and evidence grading



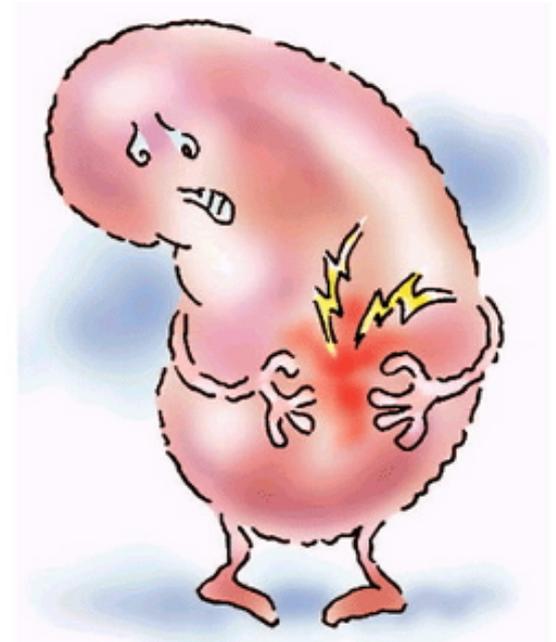
Articles eligible for full text review (n=232)					
	Grading of Evidence				
Relevance	one	two	three	n/a	Total
One	12	54	51	8	125
Two	5	31	53	18	107
Grand Total	17	85	104	26	232

Vignettes

- The vignettes varied with different patient ages, likelihood of stone, gender, clinical presentations, and special populations.
- Uncomplicated stone was assumed in all vignettes (no signs of infection, no pre-existing renal disease)

Vignette Example

A 55 year-old male with no prior history of kidney stones presents with an acute onset of flank pain over the last 3 hours. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesia.



Vignette Imaging Options

The imaging modalities options the panel selected from were:

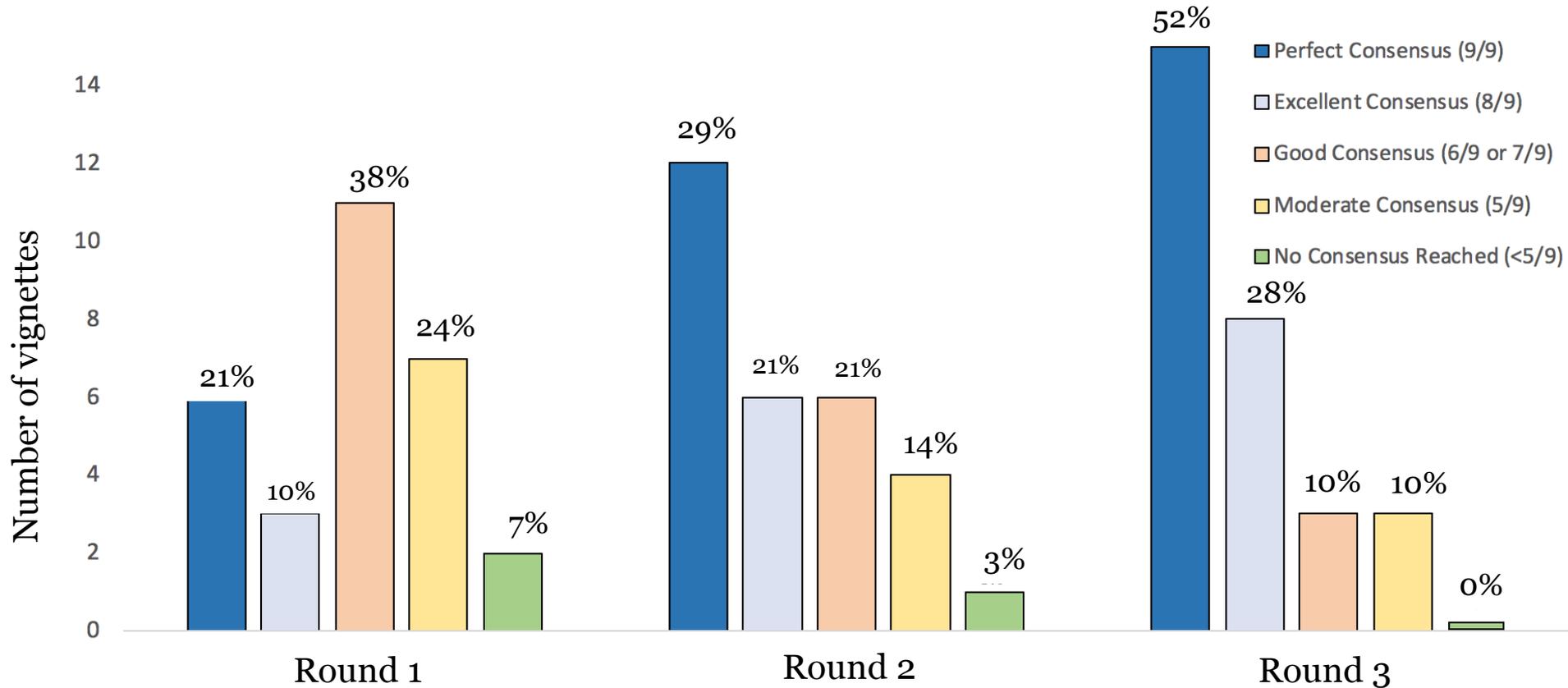
- No imaging
- Point-of-care US
- Radiology performed US
- Reduced radiation CT
- Standard non-contrast CT
- CT with IV contrast

Methods

- A modified Delphi approach with 3 rounds of voting was completed.
- Consensus was defined a priori as:
 - Perfect (9/9 panel members)
 - Excellent (8/9)
 - Good (6/9 or 7/9)
 - Moderate (5/9)
 - No Consensus (< 5/9)
- Imaging modalities were grouped as:
 - No imaging
 - Any ultrasound
 - Any CT

Results

Imaging Recommendations Consensus through the Voting Rounds



Vignettes and Consensus – 29 total

Vignettes:	Agreement	Answers
1. A <u>35 year-old male</u> with two prior kidney stones that passed spontaneously presents with an acute onset flank pain over the last 3 hours. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesics.	Moderate	5 POCUS, 4 No Imaging
2. A <u>55 year-old male</u> with two prior kidney stones that passed spontaneously presents with an acute onset of flank pain over the last 3 hours. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesics.	Moderate	5 No Imaging, 4 POCUS
3. A <u>75 year-old male</u> with two prior kidney stones that passed spontaneously presents with an acute onset of flank pain over the last 3 hours. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesics.	Good	7 RDCT, 2 US (1 POCUS, 1 RPUS)

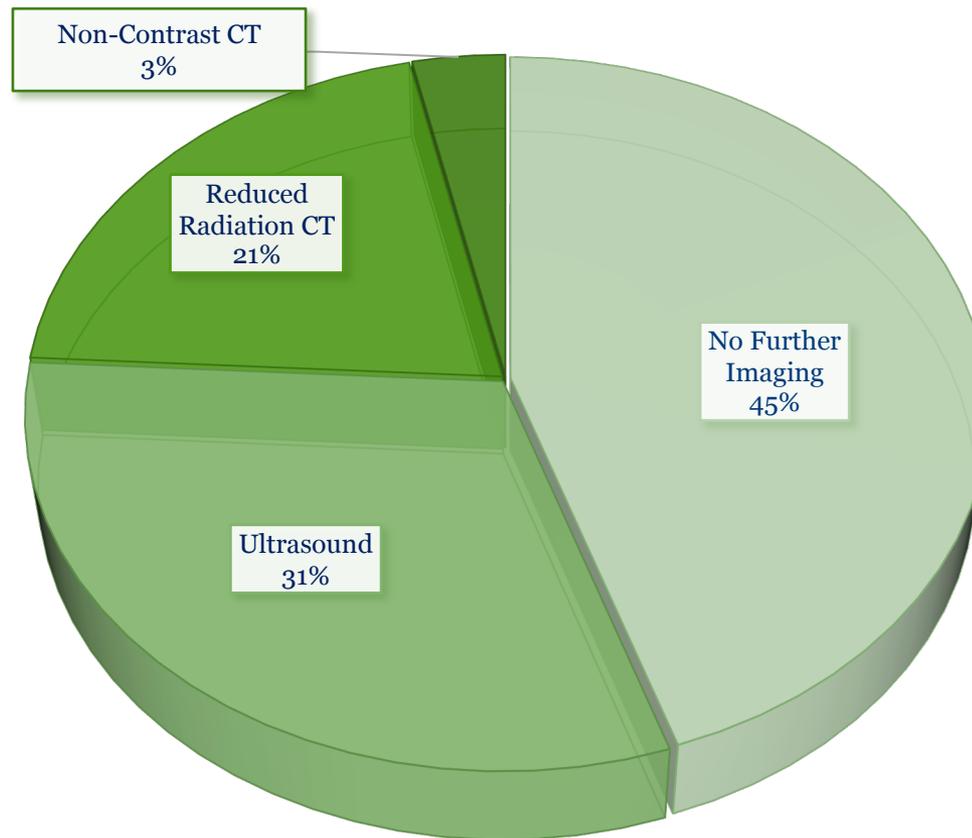
Vignettes and Consensus – 29 total

Vignettes:

- | | | |
|--|-----------|-----------------|
| 4. A <u>35 year-old male</u> with no prior history of kidney stones presents with an acute onset of flank pain over the last 3 hours. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesics. | Perfect | 9 POCUS |
| 5. A <u>55 year-old male</u> with no prior history of kidney stones presents with an acute onset of flank pain over the last 3 hour. He reports nausea with vomiting and has hematuria on urine dip. He has no abdominal tenderness. His pain is relieved after intravenous analgesics. | Excellent | 8 RDCT, 1 POCUS |

Results

Expert Panel's Imaging Recommendations for Vignettes



Take Home Points

- When can CT be avoided as the first line of imaging?
 - Patients presenting with signs and symptoms of uncomplicated stone
 - Younger patients (~35 years old) without prior history of stone
 - Middle-aged patients (~55 years old) with history of kidney stone
- In older patients (~75 years old) CT should generally be obtained
- Point-of-care ultrasound may help guide clinicians
- Pregnant and pediatric patients should have radiology performed ultrasound as the initial imaging modality

Conclusion

- Through a modified Delphi approach, perfect consensus was reached for more than half of clinical vignettes
- Consensus was achieved that CT could be avoided in 22 vignettes (75%)
- When needed, reduced radiation CT should be performed.

Thank you!

- Agency for Healthcare Research and Quality (AHRQ Grant R18HS023778)
- E-QUAL Multispecialty Renal Colic Imaging Committee members

ACEP

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