Contents

Recommendation: Severity of Illness Scoring Tools

Scoring Systems as Predictors of Mortality in Adults

Scoring system	Results	No. studies; No. participants	GRADE certainty of evidence
APACHE II	OR, Per point: 1.07 95% CI: 1.00, 1.15	6 observational studies[6-11]; 1,668 participants	⊕◯◯◯ VERY LOW
	Hazard ratio (HR), Per point: 1.16 95% CI: 1.07, 1.26	1 observational study[12]; 103 participants	⊕⊕⊕◯ MODERATE
	OR, Score cutoff: Not pooled Score 8+ OR: 12.30 Score 12+ OR: 2.11 Score 19+ OR: 2.86 Score 21+ OR: 9.50	4 observational studies[13-16]; 811 participants	⊕⊕◯◯ LOW
	RR, Score cutoff 12+: 31.60 95% CI: 1.80, 554.83	1 observational study[17]; 117 participants	⊕⊕◯◯ LOW
SAPS II	OR, Per point: 1.06 95% CI: 1.03, 1.08	3 observational studies[18-20]; 1,897 participants	⊕⊕⊕◯ MODERATE
	OR, Score cutoff 47/48+: 5.00 95% CI: 2.89, 8.65	2 observational studies[21,22]; 464 participants	⊕⊕⊕◯ MODERATE
SOFA	OR, Per point: 1.30 95% CI: 1.21, 1.41	4 observational studies[19,23-25]; 872 participants	⊕⊕⊕◯ MODERATE

	HR, Per point: 1.29 95% CI: 1.20, 1.39	2 observational studies[26,27]; 787 participants	⊕⊕⊕◯ MODERATE
	OR, Score cutoff: Not pooled Score 3+ OR: 12.14 Score 4+ OR: 1.20 Score 7+ OR: 8.14	3 observational studies[16,22,28]; 653 participants	⊕⊕⊕◯ MODERATE
	HR, Score cutoff 3+: 6.14 95% CI: 1.40, 26.93	1 observational study[29]; 205 participants	⊕⊕◯◯ LOW
ASA	OR, Per point: 1.76 95% CI: 0.92, 3.40	3 observational studies[24,25,30]; 3,129 participants	⊕⊕◯◯ LOW
	OR, Score cutoff: Not pooled Score 3+ OR: 2.75 Score 4 OR: 5.75 Score 4 OR: 7.86	3 observational studies[10,31,32]; 507 participants	⊕⊕⊕◯ MODERATE
	RR, Score cutoff 3+: 21.5 95% CI: 3.10, 149.12	1 observational study[17]; 117 participants	⊕⊕⊕◯ MODERATE
WSES	OR, Per point: 1.78 95% CI: 1.73, 1.84	2 observational studies[5,33]; 4,633 participants	⊕⊕◯◯ LOW

Recommendation: Diagnostic Imaging for Suspected Acute Appendicitis (Adults)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Appendicitis in Adults

Imaging	Population	No. studies; No. patients	Sensitivity median (range)	No. studies; No. patients	Specificity median (range)
Initial US- definitive results only*	Adults with suspected appendicitis	7 observational studies[18,24,46,49,54,58,71]; 792 patients	0.99 (0.87-1.00) (Supplementary Figure 2)	7 observational studies[18,24,46,49,54,58,71]; 792 patients	0.95 (0.54-1.00) (Supplementary Figure 2)
Initial US- all results, including equivocal	Adults with suspected appendicitis	12 observational studies[18,24,27,31,33,35,45,46,54,58,59,71]; 2,454 patients	0.68 (0.44-0.88) (Supplementary Figure 2)	12 observational studies[18,24,27,31,33,35,45,46,54,58,59,71]; 2,454 patients	0.96 (0.25-1.00) (Supplementary Figure 2)
Initial CT*	Adults with suspected appendicitis	28 observational studies[9,12,16,18,21,22,25,30,34,36-40,43,46,47,51-53,57,59,60,63,68,72-74]; 12,077 patients	0.97 (0.83-1.00) (Supplementary Figure 3)	27 observational studies[9,12,16,18,21,22,25,34,36-39,43,46,47,51-53,57,59,60,63,68,72-74,76]; 12,047 patients	0.94 (0.64-1.00) (Supplementary Figure 3)
Initial MRI	Adults with suspected appendicitis	5 observational studies[14,19,26,28,45]; 527 patients	0.96 (0.85-0.97) (Supplementary Figure 4)	5 observational studies[14,19,26,28,45]; 527 patients	0.97 (0.89-1.00) (Supplementary Figure 4)
Subsequent US- definitive results only	Adults with suspected appendicitis	1 observational study[77]; 190 patients	0.98 (Supplementary Figure 5)	1 observational study[77]; 190 patients	0.97 (Supplementary Figure 5)
Subsequent US- all results,	Adults with suspected	2 observational studies[65,77]; 364 patients	0.84 (0.77-0.90) (Supplemen	2 observational studies[65,77]; 364 patients	0.91 (0.83-0.98) (Supplemen

including equivocal	appendicitis		tary Figure 5)		tary Figure 5)
Subsequent CT	Adults with suspected appendicitis	9 observational studies[12,18,32,41,46,50,54,66,75]; 1,329 patients	0.97 (0.80-1.00) (Supplementary Figure 6)	9 observational studies[12,18,32,41,46,50,54,66,75]; 1,329 patients	0.97 (0.84-1.00) (Supplementary Figure 6)
Subsequent MRI	Adults with suspected appendicitis	No studies found		No studies found	

*One additional study[78] performed a head-to-head comparison of US and CT in adults presenting to the ED with abdominal pain. For the 284 diagnosed with appendicitis, US (definitive results only) and CT yielded sensitivities of 76% and 94%, respectively, and specificities of 95% and 95%, respectively.

Recommendation: Diagnostic Imaging for Suspected Acute Appendicitis (Children)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Appendicitis in Children

Imaging	Population	No. studies; No. patients	Sensitivity median (range)	No. studies; No. patients	Specificity median (range)
Initial US- definitive results only	Children with suspected appendicitis	15 observational studies[5,9,12,15,17,25,28,36, 37,39,47,50,55,57,59,61]; 11,825 patients	0.99 (0.84-1.00) (Supplementary Figure 7)	15 observational studies[5,9,12,15,17,25,28,36,37,39,47,50,55,57,59,61]; 11,825 patients	0.96 (0.71-0.98) (Supplementary Figure 7)
Initial US- all results, including equivocal	Children with suspected appendicitis	22 observational studies[5,7,9,10,12,15,22,25,28,36,37,39,41,44,46,47,49,50,55-57,59]; 16,252 patients	0.82 (0.56-1.00) (Supplementary Figure 7)	22 observational studies[5,7,9,10,12,15,22,25,28,36,37,39,41,44,46,47,49,50,55-57,59]; 16,252 patients	0.94 (0.17-0.99) (Supplementary Figure 7)
Initial CT	Children with suspected appendicitis	3 observational studies[6,49,60]; 393 patients	0.96 (0.91-0.98) (Supplementary Figure 8	3 observational studies[6,49,60]; 393 patients	0.96 (0.87-1.00) (Supplementary Figure 8
Initial MRI	Children with suspected appendicitis	11 observational studies[11,18,25,27,30,33,35,42,43,48,56,61]; 2,799 patients	0.98 (0.92-1.00) (Supplementary Figure 9)	11 observational studies[11,18,25,27,30,33,35,42,43,48,56,61]; 2,799 patients	0.97 (0.89-1.00) (Supplementary Figure 9)
Subsequent US- definitive results only	Children with suspected appendicitis	2 observational studies[5,51]; 39 patients	1.00 (1.00-1.00) (Supplementary Figure 10)	2 observational studies[4,50]; 39 patients	0.96 (0.91-1.00) (Supplementary Figure 10)
Subsequent US- all results, including equivocal	Children with suspected appendicitis	3 observational studies [5, 51, 52]; 148 patients	0.83 (0.71-0.98) (Supplementary Figure 10)	3 observational studies [5, 51, 52]; 148 patients	0.96 (0.96-1.00) (Supplementary Figure 10)
Subsequent CT	Children with suspected appendicitis	6 observational studies [19, 26, 34, 52, 54, 59, 61]; 908 patients	0.98 (0.86-1.00) (Supplementary Figure 11)	6 observational studies [19, 26, 34, 52, 54, 59, 61]; 908 patients	0.98 (0.94-1.00) (Supplementary Figure 11)

Subsequent MRI	Children with suspected appendicitis	14 observational studies [8, 13, 14, 16, 17, 19, 23, 24, 26, 32, 38, 40, 56, 58]; 1,971 patients	0.95 (0.84-1.00) (Supplementary Figure 12)	14 observational studies [8, 13, 14, 16, 17, 19, 23, 24, 26, 32, 38, 40, 56, 58]; 1,971 patients	0.97 (0.88-1.00) (Supplementary Figure 12)

*For all studies, change in antimicrobial therapy means a change to a different antimicrobial based on culture susceptibility results.

Recommendation: Diagnostic Imaging for Suspected Acute Appendicitis (Pregnant People)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Appendicitis in Pregnant People

Imaging	Population	No. studies; No. patients	Sensitivity median (range)	No. studies; No. patients	Specificity median (range)
Initial US-definitive results only	Pregnant people with suspected appendicitis	2 observational studies[18,19]; 11 patients	1.00 (1.00-1.00) (Supplementary Figure 13)	2 observational studies[18,19]; 11 patients	0.92 (0.83-1.00) (Supplementary Figure 13)
Initial US-all results, including equivocal	Pregnant people with suspected appendicitis	3 observational studies[7,18,19]; 579 patients	0.26 (0.18-0.29) (Supplementary Figure 13)	3 observational studies[7,18,19]; 579 patients	1.00 (0.99-1.00) (Supplementary Figure 13)
Initial MRI	Pregnant people with suspected appendicitis	11 observational studies[6,8,11,12,14,22,24,26,28,29,31]; 1,512 patients	0.93 (0.18-1.00) (Supplementary Figure 14)	11 observational studies[6,8,11,12,14,22,24,26,28,29,31]; 1,512 patients	0.96 (0.54-1.00) (Supplementary Figure 14)
Subsequent US	Pregnant people with suspected appendicitis	No studies found		No studies found	
Subsequent MRI	Pregnant people with suspected appendicitis	7 observational studies[7,8,13,18,20,21,25]; 479 patients	1.00 (1.00-1.00) (Supplementary Figure 15)	7 observational studies[7,8,13,18,20,21,25]; 479 patients	0.98 (0.94-1.00) (Supplementary Figure 15)

Recommendation: Diagnostic Imaging for Suspected Acute Cholecystitis or Acute Cholangitis (Adults)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Cholecystitis

Imaging modality	Population	Sensitivity/Specificity	No. studies; No. patients
Initial US	Adults with suspected acute cholecystitis	Median sensitivity (range): 0.73 (0.32-0.83) Median specificity (range): 0.83 (0.46-0.88)	6 observational studies[2-7]; 2,197 patients
Initial CT	Adults with suspected acute cholecystitis	Sensitivity (95% CI): 0.73 (0.50, 0.89) Specificity (95% CI): 0.94 (0.71, 1.00)	1 observational study[5]; 39 patients
Initial HIDA	Adults with suspected acute cholecystitis	Median sensitivity (range): 0.89 (0.85, 0.92) Median specificity (range): 0.67 (0.34, 0.86)	3 observational studies[2,3,5]; 630 patients

Recommendation: Diagnostic Imaging for Suspected Acute Diverticulitis (Adults)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Diverticulitis

Imaging modality	Population	Sensitivity/Specificity	No. studies; No. patients
Initial CT	Adults with suspected diverticulitis	Median (range) sensitivity: 0.96 (0.92-0.99) Median (range) specificity: 0.99 (0.97-1.00)	2 observational studies[4,8]; 1,397 patients
Initial CT	Adults with abdominal pain (indirect evidence)	Median (range) sensitivity: 0.90 (0.81-0.95) Median (range) specificity: 0.99 (0.93-0.99)	3 observational studies[3,6,7]; 1,152 patients
Initial MRI	Adults with suspected diverticulitis	Sensitivity (95% CI): 0.94 (0.82, 0.99) Specificity (95% CI): 0.88 (0.47, 1.00)	1 observational study[2]; 55 patients
Initial US	Adults with abdominal pain (indirect evidence)	Median (range) sensitivity: 0.61 (0.61-1.00) Median (range) specificity: 0.99 (0.99-1.00)	3 observational studies[5-7]; 1,584 patients
Subsequent CT	Adults with abdominal pain (indirect evidence)	Sensitivity (95% CI): 1.00 (0.72, 1.00) Specificity (95% CI): 1.00 (0.95, 1.00)	1 observational study[6]; 82 patients

Recommendation: Diagnostic Imaging for Suspected Acute Intra-Abdominal Abscess (Adults)

Summary of Evidence for Imaging Modalities Compared to Pathology for Diagnosing Acute Intra-Abdominal Abscess in Adults

Imaging modality	Population	Median sensitivity and specificity	No. studies; No. patients
Initial CT	Adults with suspected appendiceal abscess	Sensitivity: 1.00 [95% CI: 0.59, 1.00] Specificity: Not estimable	1 observational study[2]; 7 patients
Initial CT	Adults with suspected postoperative abscess	Sensitivity: 1.00 [95% CI: 0.48, 1.00] Specificity: 1.00 [95% CI: 0.95, 1.00]	1 observational study[3]; 73 patients
Initial US	Adolescents/Adults with known Crohn's disease and suspected abscess (indirect evidence)	Median (range) sensitivity: 0.95 (0.90-1.00) Median (range) specificity: 0.98 (0.97-0.99)	2 observational studies[4,5]; 73 patients
Initial Contrast-Enhanced US	Adolescents/Adults with known Crohn's disease and suspected abscess (indirect evidence)	Sensitivity: 0.97 [95% CI: 0.85, 1.00] Specificity: 1.00 [95% CI: 0.84, 1.00]	1 observational study[6]; 57 patients
Initial MRE	Adolescents/Adults with known Crohn's disease and suspected abscess (indirect evidence)	Median (range) sensitivity: 0.85 (0.80-0.89) Median (range) specificity: 0.94 (0.90-0.98)	2 observational studies[7,8]; 110 patients

Recommendation: Blood Cultures for Known or Suspected Intra-Abdominal Infection (Adults and Children)

Summary of Evidence for Positive Blood Cultures as Predictors of Mortality and Meaningful Change in Therapy

Outcome	Population	Result	No. studies; No. blood cultures	GRADE certainty of evidence
In-hospital mortality	Adults with blood cultures obtained for any reason (where suspected intra-abdominal infection is a subset)	Modeling in-hospital mortality for patients receiving blood cultures: All studies combined: For every 100 patients receiving blood cultures, ~23 of those are true positive for bacteremia. Of those, ~3-4 resulted in death. Proportion of patients who died in-hospital after a positive blood culture: 15.9% Freeman-Tukey Double Arcsine proportion: 0.159; 95% CI (0.00, 0.49)	3 observational studies[1-3]; 1,237 cases	⊕◯◯◯ Very low
	Adults with suspected acute cholangitis	In Otani 2022, of 310 patients with acute cholangitis receiving blood cultures, 149 returned true positive results (48%). Of these true		

		positives, 7 resulted in death (2% of total patient population; 4.6% of positive cultures).		
Meaningful change in antimicrobial therapy or management* (Adults)	Adults with blood cultures obtained for any reason (where suspected intra-abdominal infection is a subset)	Modeling meaningful change in antimicrobial therapy for patients receiving blood cultures: For every 100 patients receiving blood cultures, ~7-8 of those are true positive for bacteremia. Of those, ~4 resulted in meaningful change in therapy. Proportion of patients who had a meaningful change in antimicrobial therapy after a positive blood culture: 51.5% Freeman-Tukey Double Arcsine proportion: 0.515; 95% CI (0.041, 0.791)	4 observational studies[1,4-6]; 13,650 cases	⊕⊕⊕◯ Moderate
Meaningful change in antimicrobial therapy or management[*] (Children)		A single study in children with suspected appendicitis demonstrated a positive culture yield of 3.8% (11/288).[8] However, 10 of 11 were contaminants, resulting in 1 case of bacteremia or a true positive yield of 0.34%. No change in	1 observational study[7]; 288 cases	⊕⊕⊕◯ Moderate

		antimicrobial therapy or clinical management was documented for this patient.		

*Change in antimicrobial therapy or management was defined differently across studies but generally included the initiation of antimicrobial therapy, change to appropriate antimicrobial therapy (narrowing, broadening, or optimizing regimen), lengthening treatment, or recalling patient for further assessment.

Recommendation: Intra-Abdominal Fluid Cultures for Known or Suspected Intra-Abdominal Infection (Adults and Children)

Summary of Evidence for Obtaining Intra-Abdominal Cultures in Patients with Uncomplicated and/or Uncomplicated Intra-Abdominal Infection

Outcome	Population	Result	No. studies; No. participants with fluid cultures	GRADE certainty of evidence
Mortality	Adults with complicated intra-abdominal infection who had fluid cultures obtained	Obtaining a fluid culture in patients with complicated intra-abdominal infection was associated with improved survival. OR [95% CI]: 0.85 [0.77, 0.94]	1 observational study[1]; 16,280 participants	⊕⊕⊕◯ Moderate
Meaningful change in antimicrobial therapy*	Adults with complicated intra-abdominal infection who had fluid cultures obtained	Obtaining a fluid culture in patients with complicated intra-abdominal infection was associated with increased escalation of antimicrobial agents on day 5. OR [95% CI]: 1.56 [1.42, 1.71] For every 100 patients with uncomplicated intra-abdominal infection receiving fluid cultures, ~45 of those are positive. Of those,	1 observational study[1]; 16,280 participants	⊕⊕⊕◯ Moderate

		~7 will result in a change in therapy.		
Meaningful change in antimicrobial therapy*	Children and adults with complicated appendicitis who had fluid cultures obtained	For every 100 patients with complicated appendicitis receiving fluid cultures, ~45 of those are positive. Of those, at most 4 will result in a meaningful change in therapy. Proportion of patients with complicated appendicitis who had a meaningful change in antimicrobial therapy after a *positive* fluid culture: 9.1% Freeman-Tukey Double Arcsine proportion: 0.091; 95% CI (0.00, 0.336)	4 observational studies[2-5]; 171 participants	⊕⊕◯◯ Low
Meaningful change in antimicrobial therapy*	Children and adults with uncomplicated appendicitis who had fluid cultures obtained	For every 100 patients with uncomplicated appendicitis receiving fluid cultures, ~45 of those are positive. Of those, 0 will result in a meaningful change in therapy.	1 observational study[2]; 67 participants	⊕⊕◯◯ Low
Meaningful change in	Children and adults with complicated or	For every 100 patients with either complicated	3	⊕⊕◯◯

antimicrobial therapy*	uncomplicated appendicitis who had fluid cultures obtained	or uncomplicated appendicitis receiving fluid cultures, ~45 of those are positive. Of those, 0-1 will result in a meaningful change in therapy. Proportion of patients with either complicated or uncomplicated appendicitis who had a meaningful change in antimicrobial therapy after a positive fluid culture: 0.5% Freeman-Tukey Double Arcsine proportion: 0.005; 95% CI (0.00, 0.019)	observational studies[6-8]; 787 participants	Low