

**Right Upper Quadrant Pain  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Gill PT, Dillon E, Leahy AL, Reeder A, Peel AL. Ultrasonography, HIDA scintigraphy or both in the diagnosis of acute cholecystitis? <i>Br J Surg</i> 1985; 72(4):267-268.	9	47	To compare US to scintigraphy in the diagnosis of acute cholecystitis (AC).	Slightly better specificity with scintigraphy. Similar sensitivity of US and scintigraphy for AC.	2
2. Schofield PF, Hulton NR, Baildam AD. Is it acute cholecystitis? <i>Ann R Coll Surg Engl</i> 1986; 68(1):14-16.	10	100	Prospective study to determine if physical exam can diagnose AC in patients with acute upper right quadrant pain.	Considerable diagnostic error. 25 patients were found to have a different diagnosis on subsequent investigation and in a further 11 patients, no definite diagnosis could be established.	2
3. Hanbidge AE, Buckler PM, O'Malley ME, Wilson SR. From the RSNA refresher courses: imaging evaluation for acute pain in the right upper quadrant. <i>Radiographics</i> 2004; 24(4):1117-1135.	12	N/A	To review imaging features of AC.	No results.	4
4. Trowbridge RL, Rutkowski NK, Shojania KG. Does this patient have acute cholecystitis? <i>JAMA</i> 2003; 289(1):80-86.	11	17 studies	To determine role of clinical or laboratory testing in identifying patients who require diagnostic imaging tests to rule in or rule out the diagnosis of AC.	No clinical criteria had high or low likelihood ratio for AC except Murphy sign (positive LR 2.8) and right upper quadrant tenderness (positive LR 0.4).	2
5. Laing FC, Federle MP, Jeffrey RB, Brown TW. Ultrasonic evaluation of patients with acute right upper quadrant pain. <i>Radiology</i> 1981; 140(2):449-455.	9	52	US in acute right upper quadrant pain.	Sonographic Murphy sign (SMS) plus stones was most sensitive for AC; 33% had no stones or SMS and were normal.	3
6. Bree RL. Further observations on the usefulness of the sonographic Murphy sign in the evaluation of suspected acute cholecystitis. <i>J Clin Ultrasound</i> 1995; 23(3):169-172.	10	200	To determine accuracy of SMS in AC.	Sensitivity of SMS 86%, specificity 35%, PPV 43%, NPV 82%. Combination of stones and SMS specificity of 77%. SMS has many false positives.	2
7. Ralls PW, Colletti PM, Halls JM, Siemsen JK. Prospective evaluation of 99mTc-IDA cholescintigraphy and gray-scale ultrasound in the diagnosis of acute cholecystitis. <i>Radiology</i> 1982; 144(2):369-371.	10	91	To assess sensitivity, specificity and accuracy of US and scintigraphy for AC.	US; sensitivity 86%, specificity 90%, accuracy 88%. Scintigraphy; sensitivity. 86%, specificity 84%, accuracy 85%.	2
8. Samuels BI, Freitas JE, Bree RL, Schwab RE, Heller ST. A comparison of radionuclide hepatobiliary imaging and real-time ultrasound for the detection of acute cholecystitis. <i>Radiology</i> 1983; 147(1):207-210.	9	194	To compare scintigraphy and US in detection of AC.	Radionuclide scintigraphy sensitivity 97%, specificity 93% PPV 77%. US sensitivity 97%, specificity 64%, PPV 40%. Presence of stones was positive; strict pathologic criteria.	2

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9. Alobaidi M, Gupta R, Jafri SZ, Fink-Bennet DM. Current trends in imaging evaluation of acute cholecystitis. <i>Emerg Radiol</i> 2004; 10(5):256-258.	9	117	To compare roles of US to hepatobiliary 99mTc-iminodiacetic acid (HIDA) in the diagnosis of AC.	Patients had combinations of US, HIDA, both or no imaging. The best results were HIDA imaging with sensitivity of 91% and US has sensitivity of 62%.	2
10. Kalimi R, Gecelter GR, Caplin D, et al. Diagnosis of acute cholecystitis: sensitivity of sonography, cholescintigraphy, and combined sonography-cholescintigraphy. <i>J Am Coll Surg</i> 2001; 193(6):609-613.	9	132	Retrospective study of patients with AC who had US, HIDA or both.	Sensitivity of US 48%. Sensitivity of HIDA 86%. Sensitivity of US plus HIDA 90%. Recommend HIDA as first test.	2
11. Ralls PW, Colletti PM, Lapin SA, et al. Real-time sonography in suspected acute cholecystitis. Prospective evaluation of primary and secondary signs. <i>Radiology</i> 1985; 155(3):767-771.	10	497	To determine accuracy of US for AC.	Stones accurate and sensitive but less specific. SMS and wall thickening less accurate and specific but more sensitive.	1
12. Simeone JF, Brink JA, Mueller PR, et al. The sonographic diagnosis of acute gangrenous cholecystitis: importance of the Murphy sign. <i>AJR</i> 1989; 152(2):289-290.	10	18	To determine importance of the SMS in gangrenous cholecystitis.	6 of 18 had positive SMS with very abnormal gall bladders. Possibly due to loss of innervations.	3
13. Costi R, Sarli L, Caruso G, et al. Preoperative ultrasonographic assessment of the number and size of gallbladder stones: is it a useful predictor of asymptomatic choledochal lithiasis? <i>J Ultrasound Med</i> 2002; 21(9):971-976.	10	300	To determine whether preoperative US assessment of the number and size of gallbladder stones can identify patients at increased risk of having asymptomatic common bile duct stones.	Positive cases are stones $\geq 5$ mm. Negative cases, are stones $>5$ mm. Asymptomatic CBD stones found in 9.5% of positive and 2.3% of negative. US is able to accurately show gallbladder stones.	1
14. Coppola R, Riccioni ME, Ciletti S, et al. Selective use of endoscopic retrograde cholangiopancreatography to facilitate laparoscopic cholecystectomy without cholangiography. A review of 1139 consecutive cases. <i>Surg Endosc</i> 2001; 15(10):1213-1216.	10	1,139	To review cases to determine if preoperative endoscopic retrograde cholangiopancreatography (ERCP) obviate the need for intraoperative cholangiography in laparoscopic cholecystectomy patients.	Using ERCP as the gold standard and using preoperative risk criteria for stones, only 0.6% of patients were found to have residual stones in follow-up period.	2
15. Raduns K, McGahan JP, Beal S. Cholecystokinin sonography: lack of utility in diagnosis of acute acalculous cholecystitis. <i>Radiology</i> 1990; 175(2):463-466.	10	15	To determine accuracy of cholecystokinin sonography in acute acalculous cholecystitis.	Poor specificity of cholecystokinin sonography for acute acalculous cholecystitis.	3

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16. Bennett GL, Rusinek H, Lisi V, et al. CT findings in acute gangrenous cholecystitis. <i>AJR</i> 2002; 178(2):275-281,	10	75	To determine value of CT for gangrenous cholecystitis.	Best criteria for gangrenous cholecystitis were air in wall or lumen, intraluminal membranes, irregular or absent wall, and abscess. Absence of wall enhancement, pericholecystic fluid and gall bladder distention. Overall accuracy of CT 87%.	2

## Evidence Table Key

### Study Type Key

*Numbers 1-7 are for studies of therapies while numbers 8-15 are used to describe studies of diagnostics.*

1. Randomized Controlled Trial — Treatment
2. Controlled Trial
3. Observation Study
  - a. Cohort
  - b. Cross-sectional
  - c. Case-control
4. Clinical Series
5. Case reviews
6. Anecdotes
7. Reviews
  
8. Randomized Controlled Trial — Diagnostic
9. Comparative Assessment
10. Clinical Assessment
11. Quantitative Review
12. Qualitative Review
13. Descriptive Study
14. Case Report
15. Other (Described in text)

### Strength of Evidence Key

- Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.
- Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.
- Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.
- Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.