Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Mindelzun RE, Jeffrey RB. Unenhanced helical CT for evaluating acute abdominal pain: a little more cost, a lot more information. *Radiology* 1997; 205(1):43-45.	12	N/A	Review data on cost effectiveness and diagnostic accuracy of unenhanced helical CT in acute abdominal pain.	Helical CT provides clinically relevant information at a reasonable cost.	4
2. MacKersie AB, Lane MJ, Gerhardt RT, et al. Nontraumatic acute abdominal pain: unenhanced helical CT compared with three-view acute abdominal series. *Radiology* 2005; 237(1):114-122.	9	91	Prospective, blinded study to compare the diagnostic accuracy of unenhanced CT with a three-view acute abdominal series in patients with acute non-traumatic abdominal pain.	• CT yielded sensitivity, specificity, and accuracy of 96.0%, 95.1%, and 95.6%, respectively. • Acute abdominal series interpretations yielded sensitivity, specificity, and accuracy of 30.0%, 87.8%, and 56.0%, respectively. • CT is the imaging procedure of choice.	1
3. Siewert B, Raptopoulos V, Mueller MF, Rosen MP, Steer M. Impact of CT on diagnosis and management of acute abdomen in patients initially treated without surgery. *AJR* 1997; 168(1):173-178.	10	91	Retrospective analysis of clinical data and CT reports to evaluate the effect of CT on the diagnosis and management of acute abdominal pain in patients who did not undergo surgery and to determine what population of patients would profit most from CT examination.	CT had sensitivity 90% vs 76% for clinical evaluation alone. Management was changed after CT in 25 patients. CT is recommended for patients with acute abdomen, regardless of the duration of signs and symptoms.	2
4. Taourel P, Baron MP, Pradel J, Fabre JM, Seneterre E, Bruel JM. Acute abdomen of unknown origin: impact of CT on diagnosis and management. *Gastrointest Radiol* 1992; 17(4):287-291.	10	40	Prospective study to determine the impact of CT on diagnosis and management of patients with acute abdominal pain.	CT scan made the syndrome's diagnosis in 95% of cases and it permitted the detection of a lesion in 57.5% of cases.	2
5. Rosen MP, Sands DZ, Longmaid HE, 3rd, Reynolds KF, Wagner M, Raptopoulos V. Impact of abdominal CT on the management of patients presenting to the emergency department with acute abdominal pain. *AJR* 2000; 174(5):1391-1396.	10	57	Prospective study to document the impact of CT on non-traumatic abdominal pain in the ER.	Physician's level of certainty increased by 1.5 points on a 5-point scale. 24% reduction in hospital admissions as a result of CT.	2
6. Roth C, Tello R, Sutherland K, Ptak T. Prediction rule for etiology of vague abdominal pain in the emergency room: utility for imaging triage. *Invest Radiol* 2002; 37(10):552-556.	13	164	Cross sectional study to determine the predictive value of clinical parameters in patients with nonspecific abdominal pain undergoing CT evaluation of the abdomen and pelvis in the emergency room. Results CT studies were correlated with clinical data and discharge diagnosis to assess their PPV using ordinal logistic regression.	An elevated white blood cell is strong evidence of the presence of an inflammatory process. Alternative diagnoses should be considered in the context of a normal white blood cell, without strong clinical suspicion, especially in women.	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
7. Lane MJ, Liu DM, Huynh MD, Jeffrey RB, Jr., Mindelzun RE, Katz DS. Suspected acute appendicitis: nonenhanced helical CT in 300 consecutive patients. *Radiology* 1999; 213(2):341-346.	10	300 consecutive patients	Prospective study to determine the accuracy of non-contrast helical CT in suspect appendicitis.	Sensitivity 96%, specificity of 99%, accuracy of 97%.	1
8. Son HJ, Lee SJ, Lee JH, et al. Clinical diagnosis of primary epiploic appendagitis: differentiation from acute diverticulitis. *J Clin Gastroenterol* 2002; 34(4):435-438.	13	26	Retrospectively review clinical and radiologic characteristics of 8 patients with primary epiploic appendagitis (PEA) and compare with 18 patients with acute diverticulitis.	When patients with very localized lower abdominal pain and tenderness do not have associated symptoms or laboratory abnormalities, a high index of suspicion for PEA is warranted.	3
9. Gore RM, Miller FH, Pereles FS, Yaghmai V, Berlin JW. Helical CT in the evaluation of the acute abdomen. *AJR* 2000; 174(4):901-913.	12	N/A	Review practical aspects of optimizing helical CT and emphasize the CT features of acute abdominal disorders.	Helical CT has potential to impact positively the outcome, length of stay, and overall health care expenditures of patients with acute abdomen.	4
10. Urban BA, Fishman EK. Tailored helical CT evaluation of acute abdomen. *Radiographics* 2000; 20(3):725-749.	12	N/A	Review article discusses value of tailoring CT protocols to clinical diagnosis in acute abdomen.	Helical CT is a rapid and efficient means of evaluating patients with acute abdominal pain. Attention to proper technique and protocol is essential for optimizing the CT examination and maximizing diagnostic accuracy.	4
11. Vardareli E, Kebapci M, Saricam T, Pasaoglu O, Acikalin M. Tuberculous peritonitis of the wet ascitic type: clinical features and diagnostic value of image-guided peritoneal biopsy. *Dig Liver Dis* 2004; 36(3):199-204.	9	19	Retrospective study to analyze the clinical, laboratory, US and CT findings of patients with peritoneal tuberculosis and diagnostic value of image-guided peritoneal biopsy.	The most common US and CT findings were: ascites, septation in the ascites, peritoneal thickening, mesenteric and omental involvement. Diagnosis was made by image-guided percutaneous peritoneal biopsy in 18/19 patients. Peritoneal tuberculosis should be considered in the differential diagnosis of exudative ascites. Image-guided percutaneous peritoneal biopsy is sufficient, safe and inexpensive.	3
12. O'Malley ME, Wilson SR. US of gastrointestinal tract abnormalities with CT correlation. *Radiographics* 2003; 23(1):59-72.	12	N/A	Review US of gastrointestinal tract abnormalities with CT used for correlation.	US often detects abnormal bowel in patients with acute abdominal pain. US imaging often allows for specific diagnosis based on the degree and distribution of bowel wall thickening and associated changes in the mesentery.	4

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
13. Varras M, Polyzos D, Perouli E, Noti P, Pantazis I, Akrivis C. Tubo-ovarian abscesses: spectrum of sonographic findings with surgical and pathological correlations. *Clin Exp Obstet Gynecol* 2003; 30(2-3):117-121.	13	25	Retrospective study to identify the different sonographic markers on gray scale and color Doppler US in tubo-ovarian abscesses.	The US findings of tubo-ovarian abscesses are non specific. The presence of a mass at the anatomic position of the ovary or at the cul-de-sac and clinical and laboratory findings are helpful for a correct diagnosis. The color Doppler flow can further characterize the nature of the pelvic mass by detecting a significant rich blood flow in most cases of tubo-ovarian abscesses.	3
14. Roebuck DJ, Metreweli C. Radiation risk in CT for acute abdominal pain. *Radiology* 1998; 209(1):287-288.	15	N/A	Review radiation risk in CT for acute abdominal pain.	In young adults, probability of causing a fatal cancer from doing a CT of abdomen and pelvis is 1 in 2,000.	4
15. Birchard KR, Brown MA, Hyslop WB, Firat Z, Semelka RC. MRI of acute abdominal and pelvic pain in pregnant patients. *AJR* 2005; 184(2):452-458.	10	29	Prospective study to demonstrate the usefulness of MRI in the evaluation of pregnant women with acute abdominal pain.	Twelve of the 29 patients had normal examinations. MRI correctly identified the abnormalities in 16/17 patients with abnormal examinations. Gadolinium contrast was given to 7 patients when the untenanted MRI was indeterminate. Safety and accuracy of MRI makes it useful in the evaluation of pregnant patients.	2
16. Nishino M, Hayakawa K, Iwasaku K, Takasu K. Magnetic resonance imaging findings in gynecologic emergencies. *J Comput Assist Tomogr* 2003; 27(4):564-570.	12	NA	To review the MRI findings in common gynecological emergencies.	MRI can be useful in the diagnosis of many gynecological emergencies.	4
17. Pedrosa I, Levine D, Eyvazzadeh AD, Siewert B, Ngo L, Rofsky NM. MR imaging evaluation of acute appendicitis in pregnancy. *Radiology* 2006; 238(3):891-899.	10	51 consecutive patients 3 reviewers	Retrospectively assess the diagnostic performance of MRI in pregnant patients with suspected acute appendicitis. An US preceded the noncontrast MRI in all cases. The US was either inconclusive or additional information was needed.	MRI was positive for appendicitis in 4 and inconclusive in 3 of the 51 patients. Potential alternate diagnosis was given in the remainder of the patients. The sensitivity and specificity for MRI was 100% and 93.6%.	2
18. Lazarus E, Mayo-Smith WW, Mainiero MB, Spencer PK. CT in the evaluation of nontraumatic abdominal pain in pregnant women. *Radiology* 2007; 244(3):784-790.	9	78 pregnant women 80 consecutive CT scans	To retrospectively determine the sensitivity and specificity of CT in the evaluation of pregnant patients with non-traumatic abdominal pain and retrospectively compare findings at CT and US in patients who had both examinations. Surgery or clinical follow-up was reference standard.	An abnormal CT was found in 29 (36%) of the patients. There were multiple causes including 13 patients with of appendicitis. For diagnosis of appendicitis, sensitivity of CT was 92% (12/13 examinations), specificity was 99% (66/67), and NPV was 99% (66/67). In 46 patients with a normal US, CT was abnormal in 14. The average fetal radiation dose was 16 mGr (1.6 rad).	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
19. Frager D, Medwid SW, Baer JW, Mollinelli B, Friedman M. CT of small-bowel obstruction: value in establishing the diagnosis and determining the degree and cause. *AJR* 1994; 162(1):37-41.	9	85 patients evaluated on 90 occasions	To determine whether CT is superior to clinical-radiographic evaluation in prospectively establishing the diagnosis, severity, and cause in cases of suspected obstruction of the small bowel. Gold standard was surgical findings in 61 cases and clinical course in 29 cases.	For combined clinical-radiographic findings, the diagnosis was complete obstruction in 21/46 cases (sensitivity 46%). When CT was used, the diagnosis was established in all 46 cases (sensitivity 100%). CT determined location and cause in most (85%) while clinical did in none.	1
20. Maglinte DD, Reyes BL, Harmon BH, et al. Reliability and role of plain film radiography and CT in the diagnosis of small-bowel obstruction. *AJR* 1996; 167(6):1451-1455.	9	78	Blinded, retrospective study to compare reliability of radiographs vs CT in diagnosis of different degrees of severity of small-bowel obstruction. Findings at enteroclysis and clinical outcomes were used as standards of reference.	• Radiographs: sensitivity 69%, specificity 57%, accuracy 67%. • CT: sensitivity 64%, specificity 79%, accuracy 67%. • High grade obstruction: CT sensitivity 86%, radiographs sensitivity 82%. • Low grade obstruction: CT sensitivity 56%, radiographs sensitivity 50%. • Radiography and CT had similar accuracies. Radiography should remain the initial method of imaging patients with suspected small-bowel obstruction.	2
21. Megibow AJ, Balthazar EJ, Cho KC, Medwid SW, Birnbaum BA, Noz ME. Bowel obstruction: evaluation with CT. *Radiology* 1991; 180(2):313-318.	10	84	Retrospective evaluation of patients with bowel obstruction using CT.	CT is useful in patients with history of abdominal malignancy and those without operation with signs of infection, bowel infection or palpable abdominal mass.	2
22. Balthazar EJ, Birnbaum BA, Megibow AJ, Gordon RB, Whelan CA, Hulnick DH. Closed-loop and strangulating intestinal obstruction: CT signs. *Radiology* 1992; 185(3):769-775.	10	19 consecutive patients with closed-loop obstruction 2 observers	Findings at examination with CT were retrospectively correlated with the surgical and pathologic findings to determine the sensitivity of CT to closed loop and strangulating obstruction.	Signs of closed-loop obstruction in 15 patients were associated with configuration of the incarcerated loop of small bowel, abnormalities detected at the site of obstruction, or both. CT signs of strangulation, seen in 10/16 patients with ischemic or infarcted bowel, were associated with the appearance of the bowel wall (thickening, high attenuation, and the target sign), abnormalities in the attached mesentery, or both. In mechanical obstruction of the small bowel, detection of ischemic changes in the bowel wall or mesentery with CT indicates strangulation. Absence of CT findings of ischemia or infarction does not rule out strangulation.	3

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
23. Jaffe TA, Martin LC, Thomas J, Adamson AR, DeLong DM, Paulson EK. Small-bowel obstruction: coronal reformations from isotropic voxels at 16-section multi-detector row CT. *Radiology* 2006; 238(1):135-142.	10	100 consecutive patients 3 readers	Retrospective, blinded study to assess the added value of coronal reformations of the abdomen and pelvis using MDCT in the diagnosis of small bowel obstruction.	The combination of coronal reconstruction with transverse CT imaging adds confidence to the diagnosis and exclusion of small bowel obstruction. Mean sensitivity and specificity of CT scout alone, transverse CT alone, and transverse plus coronal CT were 88% and 86%, 87% and 87%, and 87% and 90%, respectively.	2
24. Lund EC, Han SY, Holley HC, Berland LL. Intestinal ischemia: comparison of plain radiographic and computed tomographic findings. *Radiographics* 1988; 8(6):1083-1108.	9	14	Retrospective analysis of radiographs and CT scans of the abdomen in patients with proved intestinal ischemia or infarction.	• Frequent radiographic findings: Gaseous bowel distention, thumbprinting and pneumatosis. • Frequent CT findings: Intestinal distention, thickening of the bowel wall, engorgement of mesenteric vessels, and pneumatosis. • CT offers major advantages for evaluating patients suspected of having intestinal ischemia or infarction.	3
25. Taourel PG, Deneuville M, Pradel JA, Regent D, Bruel JM. Acute mesenteric ischemia: diagnosis with contrast-enhanced CT. *Radiology* 1996; 199(3):632-636.	10	39 consecutive patients 24 controls 2 reviewers	Retrospective, blinded study to determine accuracy of dynamic enhanced CT for mesenteric ischemia compared to controls.	CT had sensitivity 64%, specificity 92%, and accuracy 75%. Dynamic enhanced CT is recommended in the diagnosis of and determination of prognosis in acute mesenteric ischemia.	2
26. Wiesner W, Khurana B, Ji H, Ros PR. CT of acute bowel ischemia. *Radiology* 2003; 226(3):635-650.	12	N/A	To review recent advances in understanding of acute bowel ischemia and define role of MDCT.	The CT diagnosis of acute bowel ischemia may be difficult if specific vascular and bowel wall abnormalities are not present. However, the sensitivity is 82%. MDCT has become the imaging procedure of choice.	4
27. Klein HM, Lensing R, Klosterhalfen B, Tons C, Gunther RW. Diagnostic imaging of mesenteric infarction. *Radiology* 1995; 197(1):79-82.	9	54	Comparative study to determine the value of diagnostic imaging in the management of mesenteric infarction.	Radiography and US allowed correct diagnoses in 5/18 cases (28%). Only one of 14 fluoroscopic examinations contributed to diagnosis. 14/16 angiography (sensitivity, 87.5%) and 18/22 CT (82%) were correct. The difference in sensitivity between CT and angiography was not significant (P>.05).	3
28. Jeffrey RB, Federle MP, Wall S. Value of computed tomography in detecting occult gastrointestinal perforation. *J Comput Assist Tomogr* 1983; 7(5):825-827.	14	5	To determine value of CT in detecting occult gastrointestinal perforation.	The site of perforation was apparent on CT in four patients.	4
29. Gore RM, Balthazar EJ, Ghahremani GG, Miller FH. CT features of ulcerative colitis and Crohn's disease. *AJR* 1996; 167(1):3-15.	12	N/A	To review the value and current applications of CT for patients with inflammatory bowel disease (IBD).	CT is the premier imaging procedure for evaluating the mural and extraintestinal manifestations of IBD.	4

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
30. Jacobs JE, Birnbaum BA. CT of inflammatory disease of the colon. *Semin Ultrasound CT MR* 1995; 16(2):91-101.	12	N/A	To review role of CT for diagnosing inflammatory disease of the colon.	CT is important for evaluating patients with colonic inflammation.	4
31. Maconi G, Sampietro GM, Parente F, et al. Contrast radiology, computed tomography and ultrasonography in detecting internal fistulas and intra-abdominal abscesses in Crohn's disease: a prospective comparative study. *Am J Gastroenterol* 2003; 98(7):1545-1555.	9	625 consecutive patients	Prospective, comparative study of US, contrast radiography and CT in the detection of intestinal fistulas and abscesses complication Crohn's disease.	Comparable accuracy of US and radiographic studies in detecting internal fistulae (85.2% vs 84.8%), with sensitivity of 71.4% for US and 69.6% for radiographic studies, and specificity of 95.8% for both. In severe cases of Crohn's disease with clinical suspicion of septic complications accuracy of US, barium studies, and CT was 88.5%, 80.3%, and 77%, respectively. The presence of abscesses was correctly detected in 90.9% of cases by means of US and in 86.4% by CT, although accuracy was higher for CT (91.8%) than for US (86.9%) because of false positive results in US studies. Comparable accuracy was found for CT and US. The combination of barium studies and US can reliable detect most internal fistulae and abscesses.	1
32. Fukuya T, Hawes DR, Lu CC, Barloon TJ. CT of abdominal abscess with fistulous communication to the gastrointestinal tract. *J Comput Assist Tomogr* 1991; 15(3):445-449.	13	24 cases	To review CT cases of abdominal abscess with fistulous communication to the GI tract.	An air-fluid level may indicate the presence of a fistulous communication to the GI tract.	3
33. Fishman EK, Kavuru M, Jones B, et al. Pseudomembranous colitis: CT evaluation of 26 cases. *Radiology* 1991; 180(1):57-60.	13	26	Review CT appearances of patients with Pseudomembranous colitis (PMC).	CT appearance of PMC is not highly specific.	3
34. Arndt JW, Grootscholten MI, van Hogezand RA, Griffioen G, Lamers CB, Pauwels EK. Inflammatory bowel disease activity assessment using technetium-99m-HMPAO leukocytes. *Dig Dis Sci* 1997; 42(2):387-393.	9	136 patients with Crohn's disease 29 controls	Retrospective study to determine accuracy for active disease in ulcerative colitis and Crohn's of [99mTc] hexamethyl-propylamine-oxime (HMPAO) scans vs activity index and clinical assessment.	114 positive and 22 negative [99mTc] HMPAO leukocyte scintigrams. Sensitivities for active disease at 1 and 3 hours were 98% and 98% and specificities were 100% and 83%, respectively. [99mTC] HMPAO leukocyte scintigraphy is superior to the activity index and the clinical assessment of active inflammation. Scintigraphy allows assessment of the existence, extent, and intensity of active inflammation with high accuracy.	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
35. Giaffer MH, Tindale WB, Holdsworth D. Value of technetium-99m HMPAO-labelled leucocyte scintigraphy as an initial screening test in patients suspected of having inflammatory bowel disease. *Eur J Gastroenterol Hepatol* 1996; 8(12):1195-1200.	10	64	To evaluate the value of Tc-99m HMPAO-labelled leucocyte scintigraphy as a screening test in patients with IBD.	Bowel scanning using ^{111}In or Tc-99m HMPAO is useful. Because of radiation dose, image quality and availability Tc-99m may be preferred to ^{111}In.	2
36. Lin WY, Kao CH, Lin HT, Wang YL, Wang SJ, Liu TJ. 99Tcm-HMPAO-labelled white blood cell scans to detect acute appendicitis in older patients with an atypical clinical presentation. *Nucl Med Commun* 1997; 18(1):75-78.	10	49	Assess clinical efficacy of Tc-99m-HMPAO white cell scanning in appendicitis among older patients presenting with equivocal clinical features.	White blood cell scans had sensitivity 92%, specificity 91.7%, accuracy 91.8%, PPV 92%, NPV 91.7%. Tc-99m-HMPAO-labelled white blood cell scans provide a rapid and highly accurate method for diagnosing appendicitis in older patients with equivocal clinical findings.	3
37. Kolkman JJ, Falke TH, Roos JC, et al. Computed tomography and granulocyte scintigraphy in active inflammatory bowel disease. Comparison with endoscopy and operative findings. *Dig Dis Sci* 1996; 41(4):641-650.	9	32	Prospective, blinded study to determine accuracy of CT and granulocyte scintigraphy (GS) in active IBD. Findings on operation or endoscopy were gold standard.	• Crohn's disease (17 patients): CT detected bowel pathology (sensitivity 71%, specificity 98%), abscesses (sensitivity and specificity 100%), and fistulas (sensitivity 80%, specificity 100%). • Crohn's disease: GS had sensitivity of 79% and specificity of 98% for detection of inflammatory activity. • Ulcerative colitis: GS predicted proximal extension of bowel involvement better than CT. • Crohn's disease: CT is superior to GS for localization of both active and fibrostenotic bowel disease, and in detection of the abscesses and fistulas.	2
38. Kirkpatrick ID, Greenberg HM. Gastrointestinal complications in the neutropenic patient: characterization and differentiation with abdominal CT. *Radiology* 2003; 226(3):668-674.	13	76	Retrospective review to characterize CT findings of gastrointestinal complications of neutropenic patients and identify CT features that can differentiate these complications.	CT findings such as bowel wall thickness, pneumotosis, wall nodulaity and mucosal enhancement can used to differentiate the complications in neutropenic patients.	2
39. Bernabeu-Wittel M, Villanueva JL, Pachon J, et al. Etiology, clinical features and outcome of splenic microabscesses in HIV-infected patients with prolonged fever. *Eur J Clin Microbiol Infect Dis* 1999; 18(5):324-329.	13	32 consecutive patients	Prospective study to determine the etiology and clinical features and outcome of HIV-infected patients with prolonged fever and multiple splenic microabscesses in which high resolution (7.5 Mhz) US revealed multiple splenic microabscesses.	Splenic microabscesses may be a frequent condition in HIV-infected patients with prolonged fever. High-resolution US is a useful technique for their detection and follow-up.	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
40. Wyatt SH, Fishman EK. The acute abdomen in individuals with AIDS. *Radiol Clin North Am* 1994; 32(5):1023-1043.	12	N/A	Review acute abdominal disease in AIDS patients.	CT is the preferred modality for characterization of AIDS related abdominal disease.	4
41. Kuhlman JE, Fishman EK. Acute abdomen in AIDS: CT diagnosis and triage. *Radiographics* 1990; 10(4):621-634.	13	80	Retrospective analysis of CT scans, medical records, and conventional radiographic studies of patients with AIDS and symptoms of acute abdominal pain.	CT is effective for diagnosis and triage.	3
42. Merine DS, Fishman EK, Jones B, Nussbaum AR, Simmons T. Right lower quadrant pain in the immunocompromised patient: CT findings in 10 cases. *AJR* 1987; 149(6):1177-1179.	14	10	Examine CT findings in immunosuppressed patients with right lower quadrant pain.	CT is helpful in the evaluation of persistent right lower quadrant pain.	4
43. Wu CM, Davis F, Fishman EK. Radiologic evaluation of the acute abdomen in the patient with acquired immunodeficiency syndrome (AIDS): the role of CT scanning. *Semin Ultrasound CT MR* 1998; 19(2):190-199.	12	N/A	Review article discusses unique features of CT in AIDS patients with acute abdomen.	CT has the ability to image the entire abdomen and pelvis and thus play an important role in the prompt and accurate diagnosis and treatment of AIDS patients.	4
44. Kumar R, Basu S, Torigian D, Anand V, Zhuang H, Alavi A. Role of modern imaging techniques for diagnosis of infection in the era of 18F-fluorodeoxyglucose positron emission tomography. *Clin Microbiol Rev* 2008; 21(1):209-224.	12	N/A	Review the current medical literature on the use of FDG-PET imaging in a setting of suspected infection or inflammation in the management of patients with suspected or confirmed infection.	FDG-PET imaging clearly plays an important role in the detection, diagnosis and monitoring of patients with infection.	4
45. Porter JA, Loughry CW, Cook AJ. Use of the computerized tomographic scan in the diagnosis and treatment of abscesses. *Am J Surg* 1985; 150(2):257-262.	10	89	Retrospective study to evaluate the use of CT in the diagnosis of abscesses in a group of hospitalized patients (study did not mention whether they were postoperative or not).	CT had a very high sensitivity (93%) and specificity (98%) accuracy (96 %) in detecting abdominal abscesses. CT is recommended in the diagnosis of abscesses.	2
46. Barkhausen J, Stoblen F, Dominguez-Fernandez E, Henseke P, Muller RD. Impact of CT in patients with sepsis of unknown origin. *Acta Radiol* 1999; 40(5):552-555.	10	63 consecutive patients 45 abdominal and 38 chest exams	Evaluate abdominal and chest examinations to determine the diagnostic relevance of CT in patients with sepsis of unknown origin.	CT is useful for the evaluation of patients with fever or sepsis without a known source. Following CT, 19% of patients could be immediately referred for percutaneous drainage or surgery.	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
47. Ambrosetti P, Robert J, Witzig JA, et al. Incidence, outcome, and proposed management of isolated abscesses complicating acute left-sided colonic diverticulitis. A prospective study of 140 patients. *Dis Colon Rectum* 1992; 35(11):1072-1076.	10	140 consecutive patients	Prospective study to patients to evaluate the usefulness of CT in isolated abscesses complicating diverticulitis.	Out of 140 consecutive patients, 22 had abscesses that were all demonstrated by CT.	2
48. Crass RA, Meyer AA, Jeffrey RB, et al. Pancreatic abscess: impact of computerized tomography on early diagnosis and surgery. *Am J Surg* 1985; 150(1):127-131.	10	21	Evaluate the impact of CT on the early diagnosis and surgery of pancreatic abscesses.	21 patients had pancreatic abscesses. CT was of value in localizing the site of de novo or recurrent pancreatic abscess and in detecting postoperative complications.	3
49. Labs JD, Sarr MG, Fishman EK, Siegelman SS, Cameron JL. Complications of acute diverticulitis of the colon: improved early diagnosis with computerized tomography. *Am J Surg* 1988; 155(2):331-336.	10	42	Evaluate the diagnostic role of CT in patients suspected clinically of having a complication of acute diverticulitis (abscess, colovesical fistula, or both). Diverticular abscesses were confirmed at operation in 10 patients.	Ability to detect abscess in these patients with CT was 100% (10/10). CT is the most sensitive and specific test for diagnosing complications of acute diverticulitis.	3
50. Rotman N, Chevret S, Pezet D, et al. Prognostic value of early computed tomographic scans in severe acute pancreatitis. French Association for Surgical Research. *J Am Coll Surg* 1994; 179(5):538-544.	15	228	Prospective, multicenter study to evaluate the prognostic value of early CT scan in a homogenous group of patients with a first attack of severe acute pancreatitis.	CT findings showing an increase in mortality rate were non-enhancement of the neck of the pancreas (P=0.04) and extrapancreatic collections within the left (P=0.001) and right (P=0.02) pararenal posterior spaces. The risk of abscess increased when there was non-visualization of the splenic vein (P=0.0001), in the presence of extrapancreatic collections in the right pararenal posterior space (P=0.03) and when the extrapancreatic collections were heterogenous (P=0.003). Study shows that the location of extrapancreatic collections and nonvisualization of the splenic and portal veins on CT scans were not previously recognized prognostic factors of complicated outcome in patients with severe acute pancreatitis.	2
51. Tack D, Bohy P, Perlot I, et al. Suspected acute colon diverticulitis: imaging with low-dose unenhanced multi-detector row CT. *Radiology* 2005; 237(1):189-196.	9	110 consecutive patients 4 readers	To prospectively compare the sensitivity and specificity of unenhanced low-dose MDCT with contrast material-enhanced standard-dose MDCT in patients suspected of having acute diverticulitis.	There was a 75%-90% dose reduction compared to the standard radiation dose. The sensitivity and specificity in patients with suspected diverticulitis were similar regardless of dose.	1

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
52. Heavey LR, Glazer GM, Francis IR, Fugenschuh D, Jasinski R. Abscesses with enteric communication: a potential pitfall in computed tomography. *J Comput Assist Tomogr* 1987; 11(3):470-473.	10	17	Retrospectively review clinical and radiologic records of patients with proven abdominal abscesses with enteric communication to evaluate the role of CT.	CT was able to diagnose abscesses in only 11/17 patients with enteric communications. Radiograph was suggestive of an abscess in 48% of patients.	3
53. Lenchik L, Dovgan DJ, Kier R. CT of the iliopsoas compartment: value in differentiating tumor, abscess, and hematoma. *AJR* 1994; 162(1):83-86.	10	44	Retrospectively review CT scans of patients who had abnormalities of the iliopsoas compartment (15 neoplasms, 21 abscesses, and 8 hematomas) to determine whether CT can differentiate abscess from other iliopsoas disorders.	Most reliable CT features: • Irregular margins: 67% sensitive, 52% specific, and 57% accurate for neoplasms; • Low attenuation: 100% sensitive, 43% specific, and 70% accurate for abscesses; • Diffuse involvement of the entire muscle 88% sensitive, 78% specific, and 80% accurate for hematomas. • Results show that the efficacy of CT, when scans are interpreted without knowledge of the clinical history, is poor for differentiating iliopsoas neoplasms, abscesses, and hematomas.	3
54. Dobrin PB, Gully PH, Greenlee HB, et al. Radiologic diagnosis of an intra-abdominal abscess. Do multiple tests help? *Arch Surg* 1986; 121(1):41-46.	9	94	Review charts of patients to evaluate roles of CT, US and gallium in ruling out intra-abdominal abscesses.	The sensitivities and specificities were as follows: CT (88%, 93%), US (75%, 91%) and gallium scans (73%, 81%). Authors conclude that CT scan was the only test necessary, as additional tests did not add significantly.	3
55. Field TC, Pickleman J. Intra-abdominal abscess unassociated with prior operation. *Arch Surg* 1985; 120(7):821-824.	9	65	Evaluate diagnosis of patients treated for intra-abdominal abscesses unassociated with prior operation.	Radiologic tests proved quite accurate in confirming diagnosis. Abdominal radiographs were abnormal in 25/44 patients, as were US in 33 (89%) of 37 patients, CT in 13 (100%) of 13 patients, and gallium scans in 5 (100%) of 5 patients.	3
56. Lundstedt C, Hederstrom E, Brismar J, Holmin T, Strand SE. Prospective investigation of radiologic methods in the diagnosis of intra-abdominal abscesses. *Acta Radiol Diagn (Stockh)* 1986; 27(1):49-54.	9	40	Prospective study to evaluate the use various imaging tests (conventional abdominal radiography, US, CT and ^{111}In-labelled leucocyte scintigraphy) in the evaluation of intra-abdominal abscesses. All patients (40) had all tests.	Sensitivities and specificities as follows: Radiographs (45%, 95%), scintigraphy (65%, 55%), US (82%, 78%), CT (78%, 85%)) CT was the single most reliable test but the combination of US and ^{111}In-labelled leucocyte scintigraphy show all lesions.	2
57. Soulen MC, Fishman EK, Goldman SM, Gatewood OM. Bacterial renal infection: role of CT. *Radiology* 1989; 171(3):703-707.	9	62 patients CT-53 CT/US-25	Retrospective review of patients with a final discharge diagnosis of acute renal infection to determine role of CT.	US failed to detect 60% of cases of acute bacterial nephritis and 47% of intra-renal and extra-renal abscesses and that CT was more sensitive for the detection of acute renal inflammatory disease.	3

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
58. Baba AA, McKillop JH, Cuthbert GF, Neilson W, Gray HW, Anderson JR. Indium 111 leucocyte scintigraphy in abdominal sepsis. Do the results affect management? *Eur J Nucl Med* 1990; 16(4-6):307-309.	10	45	Retrospective review of patients presenting with suspected intra-abdominal sepsis to examine the value of ^{111}In-autologous leucocyte scintigraphy.	Sensitivity of 95%, specificity of 91%. 34 of those studies were felt to help patient management by either being positive or negative.	3
59. Goldman M, Ambrose NS, Drolc Z, Hawker RJ, McCollum C. Indium-111-labelled leucocytes in the diagnosis of abdominal abscess. *Br J Surg* 1987; 74(3):184-186.	10	100 consecutive patients	To evaluate the accuracy of ^{111}In-labelled leucocytes to diagnose abscess. 34 post-surgical, 34 IBD, and 30 miscellaneous patients were studied.	Sensitivity 93%, Specificity 100% of the 30 abscesses. ^{111}In-labelled leucocyte imaging provides a rapid, safe and precise method for detecting intra-abdominal abscess even in the presence of IBD.	2
60. Jasinski RW, Glazer GM, Francis IR, Harkness RL. CT and ultrasound in abscess detection at specific anatomic sites: a study of 198 patients. *Comput Radiol* 1987; 11(1):41-47.	9	198	Retrospective study to examine use CT and US for abscess detection.	CT was significantly more sensitive than US for the detection of abdominal abscesses. It was noted that both CT and US had difficulties in diagnosing abscesses with enteric communications. Study concluded that nuclear medicine should be considered in any patients with a negative CT and suspected abscess.	2
61. Lantto EH. Leucocytes labelled with 99mTc-HMPAO in the detection of abdominal abscesses. *Eur J Surg* 1991; 157(8):469-472.	10	69 patients 74 exams	Retrospective study to evaluate the use of Tc-99m-HMPAO-labelled-leucocyte scintigraphy to detect abdominal abscesses.	There were 29 abscesses in 28/69 patients. The sensitivity, specificity, accuracy for detecting the abscesses was 90%, 91%, 91% respectively.	3
62. Lantto EH, Lantto TJ, Vorne M. Fast diagnosis of abdominal infections and inflammations with technetium-99m-HMPAO labeled leukocytes. *J Nucl Med* 1991; 32(11):2029-2034.	10	80 patients 87 investigations	Prospective study to evaluate diagnostic accuracy of abdominal infections with Tc-99m-HMPAO -leukocyte images (2 minute, 0.5 minutes, 2 hours and 4 hours).	• 2-minute scans: sensitivity, specificity and accuracy were 74%, 85% and 77%. • 0.5-minute scans: sensitivity, specificity and accuracy were 88%, 81% and 86%. • 2-hour scans; sensitivity, specificity and accuracy were 5%, 85% and 92%. • 4-hour scans: sensitivity, specificity and accuracy were 96%, 92% and 95%. • Imaging within 2 hours from injection has a high diagnostic value and activity accumulates in areas of infection and inflammation faster than in the intestinal background.	2

Acute Abdominal Pain and Fever or Suspected Abdominal Abscess
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
63. Tsai SC, Chao TH, Lin WY, Wang SJ. Abdominal abscesses in patients having surgery: an application of Ga-67 scintigraphic and computed tomographic scanning. *Clin Nucl Med* 2001; 26(9):761-764.	9	34	Comparative study to evaluate CT and Ga-67 in the detection of intra-abdominal abscesses among patients with persistent fever following colorectal surgery.	• CT scans: accuracy, sensitivity, and specificity rates were 97.1%, 93.7%, and 100%, respectively. • Ga-67 scans: accuracy, sensitivity, and specificity rates were 91.2%, 100%, and 95.2%, respectively. • CT and Ga-67 offer complimentary information.	2
64. Haggett PJ, Moore NR, Shearman JD, Travis SP, Jewell DP, Mortensen NJ. Pelvic and perineal complications of Crohn's disease: assessment using magnetic resonance imaging. *Gut* 1995; 36(3):407-410.	10	25	Evaluate the ability of MRI to demonstrate pelvic and perineal complications of Crohn's disease.	16 patients were shown to have fistulas or abscesses diagnosed by MRI with only one false negative study.	3
65. Field S, Guy PJ, Upsdell SM, Scourfield AE. The erect abdominal radiograph in the acute abdomen: should its routine use be abandoned? *Br Med J (Clin Res Ed)* 1985; 290(6486):1934-1936.	9	102 consecutive patients	Prospective analysis of the value of erect and supine abdominal radiographs and erect chest radiographs in patients with acute abdominal symptoms.	In five cases the erect abdominal radiograph was thought to have contributed useful or additional information, although in four of these cases abnormal features were visible in the supine film. In 3/5 cases important but subtle information was missed by junior surgeons. In 5/102 patient's information obtained from the erect abdominal radiograph was potentially misleading. The small yield of positive information, potentially misleading features, and lack of effect on surgical management suggest that the routine use of the erect abdominal radiograph in the acute abdomen should be abandoned.	2
66. Paling MR, Gouse JC. Efficacy of abdominal computed tomography in evaluation of possible abdominal abscess. *J Comput Tomogr* 1986; 10(2):111-114.	10	130	Retrospective analysis to evaluate the use of abdominal CT for the clinical suspicion of abscess. Of the 130 patients, 45 were postoperative.	It was difficult to get sensitivities and specificities from this study. The authors' conclusions were that CT was worthwhile for postoperative patients but in patients with a low clinical suspicion without previous surgery that an isotope examination or US study would be preferred.	3
67. American College of Radiology. *Manual on Contrast Media*. Available at: http://www.acr.org/SecondaryMainMenuCategories/quality_safety/contrast_manual.aspx	15	N/A	Guidance document on contrast media to assist radiologists in recognizing and managing risks associated with the use of contrast media.	N/A	3

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.