

Pretreatment Staging of Colorectal Cancer
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Bernini A, Deen KI, Madoff RD, Wong WD. Preoperative adjuvant radiation with chemotherapy for rectal cancer: its impact on stage of disease and the role of endorectal ultrasound. <i>Ann Surg Oncol</i> 1996; 3(2):131-135.	10	43	To assess the impact of preoperative adjuvant therapy in patients judged by endorectal US to have extramural invasion of rectal cancer and/or regional lymph node involvement.	Downstaging was seen in 23 (53%) patients with wall invasion and in 23 (72%) of 32 patients with lymph node involvement. Overall, downstaging was achieved in 30 (70%). PPVs of US after irradiation were 72% and 56% for wall penetration and lymph node status, respectively. NPVs of US after irradiation were 100% and 82%, respectively.	2
2. Niederhuber JE. Colon and rectum cancer. Patterns of spread and implications for workup. <i>Cancer</i> 1993; 71(12 Suppl):4187-4192.	12	N/A	Review the rationale for imaging colon and rectum cancer.	MRI of pelvis may be useful, and endorectal US has an important role in staging low rectum cancer. Preoperative evaluation is essential in selecting appropriate operative therapy and for sequencing surgery with available adjuvant treatments.	4
3. Shank B, Dershaw DD, Caravelli J, Barth J, Enker W. A prospective study of the accuracy of preoperative computed tomographic staging of patients with biopsy-proven rectal carcinoma. <i>Dis Colon Rectum</i> 1990; 33(4):285-290.	10	91 patients 2 observers	Prospective study to determine accuracy of preoperative CT staging of patients with rectal cancer.	Agreement between 2 staging's performed by first observer was 51%, interobserver agreement was 37%. Agreement with Dukes' staging was 33%. Study does not recommend preoperative pelvic CT for staging or for the selection of patients for treatment options.	2
4. Gerard JP, Ayzac L, Coquard R, et al. Endocavitary irradiation for early rectal carcinomas T1 (T2). A series of 101 patients treated with the Papillon's technique. <i>Int J Radiat Oncol Biol Phys</i> 1996; 34(4):775-783.	10	101 patients 36 patients had TRUS	Retrospective study to determine value of transrectal US (TRUS) in selecting rectal cancer patients for endocavitary irradiation.	Complete response was observed in all patients at the completion of treatment. Loco-regional failures were seen in 14 patients (local in 7 patients, nodal pararectal in 6 patients, and local + nodal in 1 patient). A curative salvage treatment was attempted in 13 patients and resulted in an ultimate pelvic control rate of 99 patients. Rectal preservation was possible in 92 patients. Overall and specific 5-year survival was 83.3% and 94.4%.	2
5. Balthazar EJ, Megibow AJ, Hulnick D, Naidich DP. Carcinoma of the colon: detection and preoperative staging by CT. <i>AJR</i> 1988; 150(2):301-306.	10	90	Retrospective review of preoperative CT scans to examine the detection rate and role of CT in the preoperative evaluation of patients with colon cancer.	CT showed sensitivity of 55% for local invasion, 73% for regional nodes, and 79% for liver metastases. Compared with Dukes, CT correctly staged 64% but variations in staging different groups with lower results in Dukes A, B, and C patients. CT, however, showed a sensitivity of 81% and PPV of 100% in detecting Dukes D lesions.	2

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6. Boyce GA, Sivak MV, Jr., Lavery IC, et al. Endoscopic ultrasound in the pre-operative staging of rectal carcinoma. <i>Gastrointest Endosc</i> 1992; 38(4):468-471.	10	45	Endoscopic US was performed prospectively to stage patients with rectal cancer.	Depth of invasion correct in 89%. Presence of abscess of lymph node metastases, correct in 79%. Recommends endoscopic US for local staging.	2
7. Cance WG, Cohen AM, Enker WE, Sigurdson ER. Predictive value of a negative computed tomographic scan in 100 patients with rectal carcinoma. <i>Dis Colon Rectum</i> 1991; 34(9):748-751.	10	100	To determine value of a negative CT scan in patients with rectal cancer.	CT has a 90% NPV and, therefore, a useful preoperative screen.	2
8. Harvey CJ, Amin Z, Hare CM, et al. Helical CT pneumocolon to assess colonic tumors: radiologic-pathologic correlation. <i>AJR</i> 1998; 170(6):1439-1443.	10	52	Prospective study to determine the accuracy of helical CT pneumocolon in the staging of colonic carcinomas.	Images were obtained in 47/52 patients. CT pneumocolon gave an overall staging accuracy of 79% in 38 carcinomas. Sensitivity and specificity for serosal infiltration were 100% and 33% respectively; sensitivity and specificity for lymph node involvement were 56% (9/16 carcinomas) and 95% (21/22 carcinomas), respectively.	3
9. Herzog U, von Flue M, Tondelli P, Schuppisser JP. How accurate is endorectal ultrasound in the preoperative staging of rectal cancer? <i>Dis Colon Rectum</i> 1993; 36(2):127-134.	9	125	Prospective study to assess accuracy of TRUS in preoperative staging of rectal cancer. Compared TRUS with CT.	Overall accuracy: 89% for depth of penetration. Overstaged occurred in 10%; Understaged in 0.8%. US more accurate than CT. In staging lymph nodes, accuracy was 80.2 %, sensitivity 89.4 %, specificity 73.4 %, PPV 71.2 %, and NPV 90.4 %.	2
10. Jochem RJ, Reading CC, Dozois RR, Carpenter HA, Wolff BG, Charboneau JW. Endorectal ultrasonographic staging of rectal carcinoma. <i>Mayo Clin Proc</i> 1990; 65(12):1571-1577.	10	50	Prospectively assess patients with rectal cancer using 7.0-MHz endorectal transducer to determine depth of invasion of rectal cancer.	US had accuracy of 80%, sensitivity 92%; specificity 76% for detection of invasion of the perirectal fat. US is sensitive to find nodes, but not specific.	2

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11. Kruskal JB, Kane RA, Sentovich SM, Longmaid HE. Pitfalls and sources of error in staging rectal cancer with endorectal us. <i>Radiographics</i> 1997; 17(3):609-626.	12	N/A	Pictorial essay describing pitfalls and sources of error in staging rectal cancer with endorectal US.	Technical pitfalls in US of the rectal wall include proximity of the lesion to the anal verge, improper balloon inflation, a nonperpendicular imaging plane, shadowing artifacts due to air or stool, reverberation artifacts, refraction artifacts, and a transducer gain setting that is too high. Sources of error in tumor staging with endorectal US include interpretation differences, endosonologist bias, tumor location, tumor stenosis, peritumoral inflammation, post-biopsy and postsurgical changes, post irradiation changes, hemorrhage, and pedunculated or villous tumors. Node size and appearance are not reliable indicators of lymph node involvement.	4
12. Lindmark G, Elvin A, Pahlman L, Glimelius B. The value of endosonography in preoperative staging of rectal cancer. <i>Int J Colorectal Dis</i> 1992; 7(3):162-166.	10	63	To determine value of endosonography in preoperative staging of rectal cancer. Depth of infiltration and presence of mesorectal lymph node metastases was assessed in 53 patients.	Tumor growth in the bowel wall was correctly estimated in 43 (81%) patients. Evaluation of mesorectal lymph node status was accurate in 43 (81%) patients. Endorectal US is an accurate method for preoperative assessment of tumor infiltration in the bowel wall as the risk of understaging was under 10%.	3
13. Nielsen MB, Qvitzau S, Pedersen JF, Christiansen J. Endosonography for preoperative staging of rectal tumours. <i>Acta Radiol</i> 1996; 37(5):799-803.	10	100	To evaluate the use of rectal endosonography for preoperative staging of tumor extension and lymph node involvement in rectal tumors.	Accuracy of endosonography in assessing local tumor extension was 85% (76%-91%; CI: 95%). Study confirmed use of endoluminal US in the preoperative evaluation of local tumor spread. However, endosonographic assessment of perirectal nodal involvement seems to be too unreliable to be used for the preoperative selection of patients.	2
14. Rifkin MD, Ehrlich SM, Marks G. Staging of rectal carcinoma: prospective comparison of endorectal US and CT. <i>Radiology</i> 1989; 170(2):319-322.	9	102	Prospective comparison of CT and US for staging rectal cancer.	<ul style="list-style-type: none"> • Sensitivity of US 67%, specificity 77%, PPV 73%, NPV 72%. • Sensitivity of CT 53%, specificity 53%, PPV 56%, NPV 50%. • US for nodes sensitivity 50%, specificity 92%, PPV 68%, NPV 84%. • CT for nodes sensitivity 27%, specificity 88%, PPV 46%, NPV 76%. 	2

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15. Rifkin MD, Wechsler RJ. A comparison of computed tomography and endorectal ultrasound in staging rectal cancer. <i>Int J Colorectal Dis</i> 1986; 1(4):219-223.	9	85	Prospective study to compare CT with TRUS in staging rectal cancer.	TRUS more accurate than CT in detecting the site of tumor and in detecting perirectal fat infiltration. TRUS slightly more accurate than CT in detecting level II lymph node involvement.	2
16. Rotte KH, Kluhs L, Kleinau H, Kriedemann E. Computed tomography and endosonography in the preoperative staging of rectal carcinoma. <i>Eur J Radiol</i> 1989; 9(3):187-190.	9	30	Compare CT and US for staging rectal cancer.	<ul style="list-style-type: none"> • TRUS accuracy 84%. • CT accuracy 76%. • Neither method was accurate in looking at lymph nodes. • Recommend US followed by CT if needed. 	3
17. Snady H, Merrick MA. Improving the treatment of colorectal cancer: the role of EUS. <i>Cancer Invest</i> 1998; 16(8):572-581.	12	N/A	Review role of endorectal US in patients with rectal cancer.	Endorectal US can be used preoperatively to evaluate lymph nodes with an accuracy of up to 86% (median 80%) and depth of tumor penetration through the bowel wall with an accuracy of up to 97% (median 85%) for effective clinical staging. This high staging accuracy is useful in managing colorectal cancer. Endorectal US can be used to select patients with lesions that can be treated with local excision or sphincter-sparing surgery.	4
18. Thoeni RF. Colorectal cancer: cross-sectional imaging for staging of primary tumor and detection of local recurrence. <i>AJR</i> 1991; 156(5):909-915.	12	N/A	Review cross-sectional imaging in staging of colorectal cancer and detection of local recurrence.	Debate continues over which imaging modality or combination of is most cost-effective. Recommends CT for extensive tumor; doubts use of US.	4
19. Thoeni RF. Colorectal cancer. Radiologic staging. <i>Radiol Clin North Am</i> 1997; 35(2):457-485.	12	N/A	Review the uses of cross-sectional imaging in colorectal cancer.	CT and MRI have an unacceptably low accuracy for identifying the early stages of primary colorectal cancers; their routine use for preoperative staging is not recommended. Summarizing published data on CT scan and MRI, a mean overall accuracy of approximately 70% can be established. The sensitivity for lymph node detection of malignant lymphadenopathy is only about 45%. Despite these limitations CT scan and MRI are useful for assessing patients suspected of having extensive disease.	4
20. Thompson WM, Trenkner SW. Staging colorectal carcinoma. <i>Radiol Clin North Am</i> 1994; 32(1):25-37.	12	N/A	Review preoperative staging of colorectal cancer with CT, MRI, and endorectal US.	Endorectal US may be useful in patients with rectal tumors. CT is recommended for follow-up imaging in colorectal cancer patients.	4

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21. Vogl TJ, Pegios W, Mack MG, et al. Accuracy of staging rectal tumors with contrast-enhanced transrectal MR imaging. <i>AJR</i> 1997; 168(6):1427-1434.	10	35 patients 2 observers	To evaluate the accuracy of contrast-enhanced transrectal MRI in staging rectal adenoma and carcinoma by correlating with histopathologic findings.	Transrectal surface-coil MRI provided reliable information in staging patients before surgery and in evaluating rectal adenoma and carcinoma.	2
22. Waizer A, Zitron S, Ben-Baruch D, Baniel J, Wolloch Y, Dintzman M. Comparative study for preoperative staging of rectal cancer. <i>Dis Colon Rectum</i> 1989; 32(1):53-56.	9	68	Comparison of digital exam CT and TRUS for preoperative evaluation of rectal cancer.	Digital examination 82% accurate; TRUS 76% accurate; CT 65% accurate for rectal wall invasion. Digital examination and TRUS appear to be more effective.	2
23. Zerhouni EA, Rutter C, Hamilton SR, et al. CT and MR imaging in the staging of colorectal carcinoma: report of the Radiology Diagnostic Oncology Group II. <i>Radiology</i> 1996; 200(2):443-451.	9	478	To prospectively evaluate the relative accuracy of CT and MRI in the staging of colorectal carcinoma.	For staging of local extent, CT is more accurate than MRI, particularly in the definition of penetration of the muscularis propria by rectal cancer (74% vs 58%). CT and MRI exhibited accuracies of 62% and 64% in assessment of lymph node involvement with sensitivities of 48% and 22%, respectively. The accuracy of MRI and of CT (85% for each) are better for evaluation of liver metastases; lower sensitivities (62% and 70%, respectively) than specificities (97% and 94%, respectively) were demonstrated for both modalities.	2
24. Chan TW, Kressel HY, Milestone B, et al. Rectal carcinoma: staging at MR imaging with endorectal surface coil. Work in progress. <i>Radiology</i> 1991; 181(2):461-467.	10	12	To examine the diagnostic value of MRI with endorectal coil in staging rectal cancer.	The depth of invasion is correct in 11/12 patients; nodes detected positive in 4/7 (57%). No false positives of lymph adequately.	3
25. Vogl TJ, Pegios W, Mack MG, et al. Radiological modalities in the staging of colorectal tumors: new perspectives for increasing accuracy. <i>Recent Results Cancer Res</i> 1996; 142:103-120.	10	20 patients 10 volunteers	To evaluate the diagnostic accuracy of contrast-enhanced endorectal MRI for the staging of rectal adenoma vs. rectal carcinoma in correlation to findings from biopsy and histopathology.	The endorectal MRI stage agreed with the staging results from pathological study in 16 of 20 (80%) patients. Endorectal surface coil MRI provides reliable data for the preoperative staging and evaluation of rectal lesions.	2
26. Zagoria RJ, Schlarb CA, Ott DJ, et al. Assessment of rectal tumor infiltration utilizing endorectal MR imaging and comparison with endoscopic rectal sonography. <i>J Surg Oncol</i> 1997; 64(4):312-317.	9	10	To compare accuracy of preoperative endorectal MRI with endoscopic rectal sonography in determining depth of invasion of rectal carcinomas.	Staging accuracy was 80% for endorectal MRI and 70% for endoscopic rectal sonography. Endorectal MRI and endoscopic rectal sonography have similar accuracy for assessing depth of invasion of rectal carcinoma.	3

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27. Bhattacharjya S, Bhattacharjya T, Baber S, Tibballs JM, Watkinson AF, Davidson BR. Prospective study of contrast-enhanced computed tomography, computed tomography during arteriportography, and magnetic resonance imaging for staging colorectal liver metastases for liver resection. <i>Br J Surg</i> 2004; 91(10):1361-1369.	9	120	Prospective study to compare the value of contrast-enhanced helical CT, CT during arteriportography (CTAP), and contrast-enhanced MRI for staging patients with colorectal liver metastases.	<ul style="list-style-type: none"> The sensitivity and specificity were 73.0% and 96.5% for CT, 87.1% and 89.3% for CTAP, and 81.9% and 93.2% for MRI. PPVs were 89.7%, 87.5% and 87.5% respectively. The diagnostic accuracy of spiral CT, MRI and CTAP was similar. Combining modalities did not improve accuracy. 	2
28. Caseiro-Alves F, Goncalo M, Cruz L, et al. Water enema computed tomography (WE-CT) in the local staging of low colorectal neoplasms: comparison with transrectal ultrasound. <i>Abdom Imaging</i> 1998; 23(4):370-374.	9	40 patients 18 patients had TRUS	Prospective study to determine the accuracy of CT performed with a water enema application (WE-CT) in the local staging of low colorectal neoplasms and to compare the results with those of TRUS.	<ul style="list-style-type: none"> For tumor staging: WE-CT had sensitivity of 90%, specificity of 73%, PPV of 90%, NPV of 73%, and accuracy of 85%. For TRUS, sensitivity was 73%, specificity 29%, PPV 62%, NPV 40%, and accuracy 39%. For nodal staging, results were superior when reading A was used (≥ 5 mm): WE-CT had sensitivity 84%, specificity 83%, PPV 73%, NPV 91%, and accuracy 84%. TRUS showed a sensitivity 29%, specificity 100%, PPV 100%, NPV 67%, and accuracy 71%. WE-CT is recommended. For diagnosis of peritumoral metastatic lymph nodes on WE-CT, the 5-mm diameter cutoff value is the recommended criterion. 	3
29. Farouk R, Nelson H, Radice E, Mercill S, Gunderson L. Accuracy of computed tomography in determining resectability for locally advanced primary or recurrent colorectal cancers. <i>Am J Surg</i> 1998; 175(4):283-287.	10	84	To determine the accuracy of CT in determining tumor resectability in patients with locally advanced primary (T4) or locally recurrent colorectal cancer.	At surgery, disease was confined to the pelvis in 63 patients, the abdomen in 7 and both the pelvis and abdomen in 14. CT correctly identified tumor in 87% of patients, with 89% and 80% accuracies for pelvic and abdominal disease, respectively. CT is generally reliable at identifying disease as being confined to one region, and for predicting the need for adjacent organ resection. It is less discriminating for predicting local tumor resectability.	2
30. Kronawitter U, Kemeny NE, Heelan R, Fata F, Fong Y. Evaluation of chest computed tomography in the staging of patients with potentially resectable liver metastases from colorectal carcinoma. <i>Cancer</i> 1999; 86(2):229-235.	10	202	Retrospective analysis to determine whether CT of the chest was necessary in patients with negative chest radiograph.	For routine preoperative workup, majority of lesions appearing on chest CT scans of patients with negative chest radiographs were not malignant. The positive yield of CT-guided workup was 10/202 patients (5%).	2

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31. Morrin MM, Farrell RJ, Raptopoulos V, McGee JB, Bleday R, Kruskal JB. Role of virtual computed tomographic colonography in patients with colorectal cancers and obstructing colorectal lesions. <i>Dis Colon Rectum</i> 2000; 43(3):303-311.	10	34	Prospective study to assess the ability of CT colonography (CTC) to diagnose colorectal masses, stage colorectal cancers, image the proximal colon in obstructing colorectal lesions, and evaluate the anastomoses in patients with previous colorectal surgery.	<ul style="list-style-type: none"> • CTC can accurately identify all colorectal masses but may overcall stool as masses in poorly prepared colons. • CTC has a staging accuracy of 81% for colorectal cancer and is superior to barium enema in visualizing colonic segments proximal to obstructing colorectal lesions. 	3
32. de Lange EE, Fechner RE, Edge SB, Spaulding CA. Preoperative staging of rectal carcinoma with MR imaging: surgical and histopathologic correlation. <i>Radiology</i> 1990; 176(3):623-628.	10	29	Report observations on the results of MRI in patients with rectal carcinoma who went on to surgery.	Correct diagnosis was made in 9/12 patients with stage A and B1 tumors. MRI may permit accurate determination of local extent of rectal cancer. Less accurate for pathologic lymph nodes.	3
33. Guinet C, Buy JN, Ghossain MA, et al. Comparison of magnetic resonance imaging and computed tomography in the preoperative staging of rectal cancer. <i>Arch Surg</i> 1990; 125(3):385-388.	9	19	Prospective study to compare MRI and CT in the preoperative staging of rectal cancer.	<ul style="list-style-type: none"> • CT localizations 63%. • MRI localizations 68%. • Digital examination 79%. • Neither CT nor MRI could evaluate extensive through bowel wall or into fat or lymph nodes. TNM MRI correct in 74% of carcinomas. • CT correct in 68%. 	3
34. Okizuka H, Sugimura K, Yoshizako T, Kaji Y, Wada A. Rectal carcinoma: prospective comparison of conventional and gadopentetate dimeglumine enhanced fat-suppressed MR imaging. <i>J Magn Reson Imaging</i> 1996; 6(3):465-471.	9	32	Prospective evaluation of patients to compare the usefulness of conventional MRI and gadopentetate dimeglumine enhanced fat-suppressed MRI for the depiction and staging of rectal carcinoma.	Tumor detection was excellent using gadopentetate dimeglumine enhanced fat-suppressed images. However, the accuracy of staging was not improved by obtaining such images.	2
35. Videhult P, Smedh K, Lundin P, Kraaz W. Magnetic resonance imaging for preoperative staging of rectal cancer in clinical practice: high accuracy in predicting circumferential margin with clinical benefit. <i>Colorectal Dis</i> 2007; 9(5):412-419.	10	91 patients 5 observers	Retrospective study to determine agreement between staging of rectal cancer made by MRI and histopathological examination and the influence of MRI on choice of radiotherapy and surgical procedure.	MRI predicted circumferential resection margin with high accuracy in rectal cancer. MRI could be used as a clinical guidance with high reliability.	2

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36. Purkayastha S, Tekkis PP, Athanasiou T, Tilney HS, Darzi AW, Heriot AG. Diagnostic precision of magnetic resonance imaging for preoperative prediction of the circumferential margin involvement in patients with rectal cancer. <i>Colorectal Dis</i> 2007; 9(5):402-411.	11	9 studies evaluating 529 patients	Meta-analysis comparing MRI with histology after total mesorectal excision. To evaluate the diagnostic precision of MRI for the preoperative evaluation of circumferential margin involvement in patients with rectal cancer.	MRI can accurately predict circumferential margin involvement preoperatively for rectal cancer in single units.	1
37. Tatli S, Mortelet KJ, Breen EL, Bleday R, Silverman SG. Local staging of rectal cancer using combined pelvic phased-array and endorectal coil MRI. <i>J Magn Reson Imaging</i> 2006; 23(4):534-540.	9	51	Comparison of surgical pathology staging to MRI staging to assess the accuracy of MRI for preoperative local staging of rectal cancer.	Combined endorectal and pelvic phased-array coil MRI can be used to select which patients should receive preoperative chemo radiotherapy.	3
38. Reading CC. Endorectal sonography. <i>Crit Rev Diagn Imaging</i> 1992; 33(1-2):1-28.	12	N/A	Review endorectal US in preoperative staging of rectal carcinoma.	Studies on endorectal US have reported an accuracy of between 67% and 92% in the visualization of the depth of tumor invasion in the rectal wall. This surpasses the accuracy reported for digital examination and other preoperative imaging methods such as CT and MRI.	4
39. Blend MJ, Abdel-Nabi H. New methods for the staging of colorectal cancer using noninvasive techniques. <i>Semin Surg Oncol</i> 1996; 12(4):253-263.	12	N/A	Review new methods for staging of colorectal cancer using noninvasive techniques.	There is evidence that imaging with labeled antibodies is clinically useful for detecting colorectal cancer in patients with suspected recurrence, in patients with presumed isolated resectable liver metastasis, and in those at high risk of the development of recurrence. Also reviews data from PET imaging in colorectal patients.	4
40. Goldenberg DM. New imaging techniques in gastrointestinal cancer. <i>Curr Opin Oncol</i> 1993; 5(4):697-702.	12	N/A	Review new imaging modalities in gastrointestinal cancer.	Improvements in detecting and defining local vs extended sites of cancer in various gastrointestinal organs have been made by conventional methods and by newer functional tests, including PET, receptor scintigraphy, and radioimmunodetection.	4
41. Vitola JV, Delbeke D, Sandler MP, et al. Positron emission tomography to stage suspected metastatic colorectal carcinoma to the liver. <i>Am J Surg</i> 1996; 171(1):21-26.	9	24	FDG-PET was compared to CT and CT portography for staging metastatic colorectal carcinoma.	PET imaging had a higher accuracy (93%) than CT and CT portography (both 76%). Although the sensitivity of FDG-PET (90%) was slightly lower than that of CT portography (97%), the specificity was much higher (100% vs 9%), including postsurgical sites. FDG-PET altered surgical plans in 6 (25%) of 24 patients.	3

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42. Falk PM, Gupta NC, Thorson AG, et al. Positron emission tomography for preoperative staging of colorectal carcinoma. <i>Dis Colon Rectum</i> 1994; 37(2):153-156.	9	16	To compare PET with CT for staging of colorectal cancer.	PET had PPV of 93% and NPV of 50%. CT had PPV of 100% and NPV of 27%. PET has increased sensitivity, but CT has increased specificity. Predictive accuracy is 83% for PET and 56 % for CT.	3
43. Heriot AG, Hicks RJ, Drummond EG, et al. Does positron emission tomography change management in primary rectal cancer? A prospective assessment. <i>Dis Colon Rectum</i> 2004; 47(4):451-458.	10	46	A prospective study to assess the impact of PET scanning on the management of primary rectal cancer.	PET scanning changes the stage or alters the therapy of almost a third of patients with advanced primary rectal cancer.	3
44. Gearhart SL, Frassica D, Rosen R, Choti M, Schulick R, Wahl R. Improved staging with pretreatment positron emission tomography/computed tomography in low rectal cancer. <i>Ann Surg Oncol</i> 2006; 13(3):397-404.	9	37	Comparative study to determine whether PET/CT could provide additional information in patients undergoing standard evaluation for primary rectal cancer.	PET/CT frequently yields additional staging information in patients with low rectal cancer.	3
45. Veit-Haibach P, Kuehle CA, Beyer T, et al. Diagnostic accuracy of colorectal cancer staging with whole-body PET/CT colonography. <i>JAMA</i> 2006; 296(21):2590-2600.	9	47	Prospective study to determine the staging accuracy of whole-body PET/CT colonography compared with the staging accuracies of CT followed by PET (CT + PET) and CT alone and to evaluate the effect of PET/CT colonography on therapy planning compared with conventional staging (CT of the abdomen and thorax and optical colonoscopy).	PET/CT colonography is at least equivalent to CT + PET for tumor staging in patients with colorectal cancer.	3
46. Lejeune C, Bismuth MJ, Conroy T, et al. Use of a decision analysis model to assess the cost-effectiveness of 18F-FDG PET in the management of metachronous liver metastases of colorectal cancer. <i>J Nucl Med</i> 2005; 46(12):2020-2028.	15	1 base case and decision analysis tree	Use a decision analysis model to assess the cost-effectiveness of FDG-PET in the management of metachronous liver metastases of colorectal cancer.	CT+PET was the most cost-effective strategy.	3
47. American College of Radiology. <i>Manual on Contrast Media</i> . 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.