Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
1.	Siegel RL, Miller KD, Jemal A. Cancer statistics, 2015. *CA Cancer J Clin.* 2015;65(1):5-29.	Review/Other-Tx	N/A	To provide the expected numbers of new cancer cases and deaths in 2015 nationally and for each state, as well as a comprehensive overview of cancer incidence, mortality, and survival rates and trends using the most current population-based data. The article also estimates the total number of deaths averted nationally during the past 2 decades and by state in 2011 as a result of the continual decline in cancer death rates and present actual number of deaths reported in 2011 by age for the 10 leading causes of death and for the 5 leading causes of cancer death.	Cancer death rates have been continuously declining for the past 2 decades. Overall, the risk of dying from cancer decreased by 22% between 1991 and 2011. Regionally, progress has been most rapid for residents of the Northeast, among whom death rates have declined by 25% to 30%, and slowest in the South, where rates declined by about 15%. Further reductions in cancer death rates can be accelerated by applying existing cancer control knowledge across all segments of the population, with an emphasis on those in the lowest socioeconomic bracket and other disadvantaged populations.	4
2.	SEER Cancer Statistics Factsheets: Cervix Uteri Cancer. National Cancer Institute. Bethesda, MD. 2015; Available at: http://seer.cancer.gov/statfacts/html/cervix .html. Accessed September 30, 2015.	Review/Other-Tx	N/A	To present the incidence, mortality, prevalence, and survival statistics of cancer from 1975 through 2012.	N/A	4
3.	Petterson F, ed. 21st annual report on the result of treatment in gynecological cancer. *Int J Gynecol Obstet.* 1991;36(suppl 1):27-130.	Review/Other-Dx	N/A	A report on the result of treatment in gynecological cancer.	515,125 cases of carcinoma of the uterine cervix treated in the years 1913 to 1986 have been reported to the Editorial Office of the Annual Report. Treatment results from 1950 to 1986 are reported and stage changes in stage distribution are reviewed. Stage I continuously increases from 23.0% in the period 1950-1954 to 38.8% among cases treated in 1982-1986. During the same period the stage II cases decrease from 38.0% to 29.8% and stage III cases from 32.7% to 26.0%. The proportion taken by stage IV cases is more or less unchanged.	4
4.	Rylander E. Cervical intraepithelial neoplasia. In: Kavanaugh JJ, ed. *Cancer in women.* Malden, Mass.: Blackwell Science; 1998:251-258.	Review/Other-Dx	N/A	Book chapter.	N/A	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
5.	Polterauer S, Hefler L, Seebacher V, et al. The impact of lymph node density on survival of cervical cancer patients. *Br J Cancer.* 2010;103(5):613-616.	Observational-Tx	88 patients	To evaluate the prognostic value of lymph node density in patients with lymph node-positive cervical cancer.	A significant correlation between lymph node density and Federation of Gynecology and Obstetrics (FIGO) stage ($P=0.03$), but not patients' age ($P=0.2$), histological grade ($P=0.8$), and histological type ($P=0.5$), was observed. In a univariate survival analysis, lymph node density ($P=0.01$; $P=0.01$), FIGO stage ($P=0.01$; $P=0.008$), and histological grade ($P=0.03$; $P=0.04$) were associated with DFS and OS, respectively. Patients with lymph node density >10% had impaired DFS and OS rates compared with patients with lymph node density ≤10%. In a multivariate regression model, lymph node density ($P=0.01$; $P<0.05$) and FIGO stage ($P=0.002$; $P=0.002$) were independent predictors of DFS and OS, respectively.	2
6.	Soutter WP, Hanoch J, D'Arcy T, Dina R, McIndoe GA, DeSouza NM. Pretreatment tumour volume measurement on high-resolution magnetic resonance imaging as a predictor of survival in cervical cancer. *Bjog.* 2004;111(7):741-747.	Observational-Dx	106 consecutive women	To evaluate pretreatment tumor volume as a predictor of survival in patients with cervical cancer using both endovaginal and external coil MRI.	In 89 of these women, the tumor was stage I and 88/106 were treated principally by surgery. The median tumor volume was 4.75 cm(3) (upper and lower quartiles 22 and 0.6). The median length of follow-up of surviving patients was 223 weeks (quartiles 158 and 274 weeks). MRI assessment of tumor volume using both an endovaginal and an external coil approach provides an accurate prediction of prognosis in cervical cancer and defines a population of women at high risk of recurrence and death. The predictive value of this investigation is superior to the clinical and histological parameters previously used. Also, it is tumor burden rather than stromal invasion that defines prognosis.	3
7.	Pecorelli S. Revised FIGO staging for carcinoma of the vulva, cervix, and endometrium. *Int J Gynaecol Obstet.* 2009;105(2):103-104.	Review/Other-Dx	N/A	Article on revised FIGO staging for carcinoma of the vulva, cervix, and endometrium.	N/A	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
8.	Pecorelli S, Odicino F. Cervical cancer staging. *Cancer J.* 2003;9(5):390-394.	Review/Other-Dx	N/A	Review staging system for cervical cancer.	Cervical cancer remains a clinically staged malignancy according to the FIGO staging system. Surgical-pathologic staging would not be feasible for advanced-stage disease or in early-stage patients treated primarily with radiation, especially in nations that do not routinely offer surgical extirpation due to different or limited health care resources. However, surgical and pathological data are important for precise analysis of survival and prognostic risk factors.	4
9.	Amendola MA, Hricak H, Mitchell DG, et al. Utilization of diagnostic studies in the pretreatment evaluation of invasive cervical cancer in the United States: results of intergroup protocol ACRIN 6651/GOG 183. *J Clin Oncol.* 2005;23(30):7454-7459.	Observational-Dx	197 patients	Prospective interdisciplinary clinical trial to examine the current utilization of diagnostic tests in the pretreatment workup of invasive cervical cancer. It compares the results with those of prior patterns-of-care studies to identify changes that might have occurred or trends that might have continued over the past 15 years.	Use of cystoscopy (8.1%) and sigmoidoscopy or proctoscopy (8.6%) was significantly lower than in 1988 to 1989 (*P*<.0001 in each instance). Intravenous urography was used in only 1% of patients as compared with 42% in 1988 to 1989 and 91% in 1983. No patient included in the data analysis had barium enema or lymphangiography. Only 26.9% of patients had examination under anesthesia for FIGO clinical staging. A large discrepancy exist between the diagnostic tests recommended by FIGO and the actual tests used for cervical cancer staging, suggesting a need to reassess the relevance of the FIGO guidelines to current clinical practice in the United States.	3
10.	Kaur H, Silverman PM, Iyer RB, Verschraegen CF, Eifel PJ, Charnsangavej C. Diagnosis, staging, and surveillance of cervical carcinoma. *AJR Am J Roentgenol.* 2003;180(6):1621-1631.	Review/Other-Dx	N/A	Review diagnosis, staging, and surveillance of cervical carcinoma.	MRI is the single most effective modality for detection of primary tumor and local spread. MRI is also the best modality for showing recurrent disease and monitoring therapeutic response. Addition of dynamic MRI improves specificity and provides prognostic information.	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
11. Viswanathan AN, Dimopoulos J, Kirisits C, Berger D, Potter R. Computed tomography versus magnetic resonance imaging-based contouring in cervical cancer brachytherapy: results of a prospective trial and preliminary guidelines for standardized contours. *Int J Radiat Oncol Biol Phys.* 2007;68(2):491-498.	Observational-Dx	10 patients	Prospective enrollment of patients to compare the contours and dose-volume histograms of the tumor and organs at risk with CT vs MRI in cervical cancer brachytherapy. The dose received by at least 90% of the volume (D(90)), the minimal target dose (D(100)), the volume treated to the prescription dose or greater for tumor for the high-risk and intermediate-risk clinical target volume and the dose to 0.1 cm^3, 1 cm^3, and 2 cm^3 for the organs at risk were evaluated. A standardized approach to contouring on CT was developed, implemented (high-risk-clinical target volume and intermediate-risk-clinical target volume), and compared with the MRI contours.	Tumor height, thickness, and total volume measurements, as determined by either CT or CT (standardized) were not significantly different compared with the MRI volumes. In contrast, the width measurements differed in high-risk-clinical target volume ($P=0.05$) and intermediate-risk-clinical target volume ($P=0.01$). For the high-risk-clinical target volume, this resulted in statistically significant differences in the volume treated to the prescription dose or greater (MRI, 96% vs CT (standardized) 86%, $P=0.01$), D(100) (MRI, 5.4 vs CT (standardized), 3.4, $P<.01$), and D(90) (MRI, 8.7 vs CT (standardized), 6.7, $P<0.01$). Correspondingly, the intermediate-risk-clinical target volume dose-volume histograms values on MRI vs CT (standardized), differed in the D(100) (MRI, 3.0 vs CT (standardized), 2.2, $P=0.01$) and D(90) (MRI, 5.6 vs CT (standardized), 4.6, $P=0.02$). The MRI and CT dose-volume histograms values of the dose to 0.1 cm^3, 1 cm^3, and 2 cm^3 for the organs at risk were similar. CT-based or MRI-based scans at brachytherapy are adequate for organs at risk dose-volume histograms analysis. However, CT tumor contours can significantly overestimate the tumor width, resulting in significant differences in the D(90), D(100), and volume treated to the prescription dose or greater for the high-risk-clinical target volume compared with that using MRI. MRI remains the standard for clinical target volume definition.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
12.	Yildirim Y, Sehirali S, Avci ME, et al. Integrated PET/CT for the evaluation of para-aortic nodal metastasis in locally advanced cervical cancer patients with negative conventional CT findings. *Gynecol Oncol.* 2008;108(1):154-159.	Observational-Dx	16 patients	Prospective study to evaluate the usefulness of integrated FDG-PET/CT for the detection of para-aortic nodal status and to test whether PET/CT change management strategy in locally advanced cervical cancer patients with negative conventional CT findings.	Accuracy, sensitivity, specificity, PPV and NPV of the PET/CT were 75%, 50%, 83.3%, 50% and 83.3%, respectively. The treatment was modified in 4/16 (25%) patients; 4 patients received extended field radiotherapy in combination with cisplatin chemotherapy instead of standard pelvic field radiotherapy in combination with cisplatin chemotherapy. Results suggest that PET/CT is an effective imaging technique in the evaluation of locally advanced cervical cancer with negative CT findings. It may help planning the management especially selecting radiation field. However, larger controlled studies are needed to recommend PET/CT as an alternative to pre-treatment surgical staging.	2
13.	Hricak H, Gatsonis C, Chi DS, et al. Role of imaging in pretreatment evaluation of early invasive cervical cancer: results of the intergroup study American College of Radiology Imaging Network 6651-Gynecologic Oncology Group 183. *J Clin Oncol.* 2005;23(36):9329-9337.	Observational-Dx	208 consecutive patients	To compare MRI and CT with each other and to FIGO clinical staging in the pretreatment evaluation of early invasive cervical cancer, using surgicopathologic findings as the reference standard.	Complete data were available for 172 patients; surgicopathologic findings were consistent with FIGO stages IA to IIA in 76% and stage ≥IIB in 21%. For the detection of advanced stage (≥IIB), sensitivity was poor for FIGO clinical staging (29%), CT (42%), and MRI (53%); specificity was 99% for FIGO clinical staging, 82% for CT, and 74% for MRI; and NPV was 84% for FIGO clinical staging, 84% for CT, and 85% for MRI. MRI (AUC, 0.88) was significantly better than CT (AUC, 0.73) for detecting cervical tumors (P=.014). For 85% of patients, FIGO clinical staging forms were submitted after MRI and/or CT was performed.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
14. Fischerova D, Cibula D, Stenhova H, et al. Transrectal ultrasound and magnetic resonance imaging in staging of early cervical cancer. *Int J Gynecol Cancer.* 2008;18(4):766-772.	Observational-Dx	120 consecutive patients	To determine the sensitivity, specificity, and accuracy of TRUS in comparison to MRI in the evaluation of tumor volume, early parametrial infiltration, and identification of residual tumor in early-stage cervical cancer.	Accuracy for detecting tumor in 95 patients was 93.7% for TRUS and 83.2% for MRI (P≤0.006). In small tumors (≤1 cm (3)), the accuracy of tumor detection by TRUS was 90.5% and 81.1% by MRI (P≤0.049). The accuracy of parametrial infiltration detection by TRUS and MRI was 98.9% and 94.7%, respectively (P≤0.219). The accuracy was not influenced by body mass index values. Results showed the accuracy of TRUS as being comparable to the more commonly used MRI in staging of early-stage cervical cancer. TRUS and the pathology-derived volumes correlated tightly; accuracy of TRUS was superior to MRI, especially in detection of residual tumors following conization.	2
15. Epstein E, Testa A, Gaurilcikas A, et al. Early-stage cervical cancer: tumor delineation by magnetic resonance imaging and ultrasound - a European multicenter trial. *Gynecol Oncol.* 2013;128(3):449-453.	Observational-Dx	209 women	To compare the diagnostic accuracy of US and MRI in the preoperative assessment of early-stage cervical cancer using pathologic findings as the reference standard.	Complete data were available for 182 patients. The agreement between US and pathology was excellent for detecting tumors, correctly classifying bulky tumors (>4cm), and detecting deep stromal invasion (kappa values 0.84, 0.82, and 0.81 respectively); and good for classifying small tumors (<2cm) and detecting parametrial invasion (kappa values 0.78 and 0.75, respectively). The agreement between MRI and histology was good for classifying tumors as <2cm, or >4cm, and detecting deep stromal invasion (kappa values 0.71, 0.76, and 0.77, respectively). It was moderately accurate in tumor detection, and in assessing parametrial invasion (kappa values 0.52 and 0.45, respectively). The agreement between histology and US was significantly better in assessing residual tumor (*P*<0.001) and parametrial invasion (*P*<0.001) than the results obtained by MRI. Imaging methods were not significantly influenced by previous cone biopsy.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
16. Kim SH, Choi BI, Han JK, et al. Preoperative staging of uterine cervical carcinoma: comparison of CT and MRI in 99 patients. *J Comput Assist Tomogr.* 1993;17(4):633-640.	Observational-Dx	99 patients	To compare CT and MRI at 0.5 T in the preoperative staging of uterine cervical cancer in a large series of patients. Both CT and MRI findings were compared using surgical-pathologic findings as gold standards.	MRI was superior to CT in tumor detection (sensitivity 75% vs 51%, $P<0.005$), in parametrial evaluation (accuracy 87% vs 80%, $P<0.005$), in overall tumor staging (accuracy 77% vs 69%, $P<0.025$), and in pelvic lymph node evaluation (accuracy 88% vs 83%, $P<0.01$). MRI had an accuracy of 76% in assessment of the thickness of cervical stromal invasion. MRI was superior to CT in preoperative staging of uterine cervical carcinoma and MRI should be used instead of CT for preoperative staging of this disease.	2
17. Subak LL, Hricak H, Powell CB, Azizi L, Stern JL. Cervical carcinoma: computed tomography and magnetic resonance imaging for preoperative staging. *Obstet Gynecol.* 1995;86(1):43-50.	Observational-Dx	79 women had MRI (n=71) and/or CT (n=37); 29 had both MRI and CT	Retrospective study. Women with untreated cervical cancer had MRI and/or CT prior to surgery in order to assess the accuracy of CT and MRI in the evaluation of invasive cervical cancer.	MRI was 88% accurate evaluating the presence of stromal invasion and 78% accurate for depth of stromal invasion. CT could not evaluate tumor size or stromal invasion because it could not distinguish cancer from the surrounding normal cervical tissue. In evaluating stage of disease, MRI had an accuracy of 90%, compared with 65% for CT ($P<.005$). MRI was more accurate than CT (94% vs 76%, $P<.005$) in assessing parametrial invasion. Both modalities were comparable in evaluating lymph node metastases (86% each). In determining operative candidates (stage I and minimal IIA), MRI was 94% accurate, compared with 76% for CT ($P<.005$). Compared with CT, MRI offered significantly improved evaluation of tumor size, stromal invasion, and local and regional extent of disease in pretreatment imaging for cervical cancer.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
18. Hricak H, Gatsonis C, Coakley FV, et al. Early invasive cervical cancer: CT and MR imaging in preoperative evaluation - ACRIN/GOG comparative study of diagnostic performance and interobserver variability. *Radiology.* 2007;245(2):491-498.	Observational-Dx	156 women: CT (n=146) and/or MRI (n=152); CT – 4 reviewers MR – 4 reviewers	To retrospectively compare diagnostic performance and interobserver variability for CT and MRI in the pretreatment evaluation of early invasive cervical cancer. Surgical pathologic findings used as the reference standard.	For CT and MRI, respectively, multirater kappa values were 0.26 and 0.44 for staging, 0.16 and 0.32 for tumor visualization, and 0.04 and 0.11 for detection of parametrial invasion; for advanced stage cancer (≥IIB), sensitivities were 0.14–0.38 and 0.40–0.57, PPVs were 0.38–1.00 and 0.32–0.39, specificities were 0.84–1.00 and 0.77–0.80, and NPVs were 0.81–0.84 and 0.83–0.87. MRI was significantly better than CT for tumor visualization ($P<.001$) and detection of parametrial invasion ($P=.047$). Reader agreement was higher for MRI than for CT but was low for both. MRI was significantly better than CT for tumor visualization and detection of parametrial invasion. The modalities were similar for staging, sharing low sensitivity and PPV but relatively high NPV and specificity.	2
19. Mitchell DG, Snyder B, Coakley F, et al. Early invasive cervical cancer: tumor delineation by magnetic resonance imaging, computed tomography, and clinical examination, verified by pathologic results, in the ACRIN 6651/GOG 183 Intergroup Study. *J Clin Oncol.* 2006;24(36):5687-5694.	Observational-Dx	208 patients	To compare the ability of MRI, CT and clinical FIGO staging to delineate early cervical cancer and measure tumor size. Each imaging study was interpreted prospectively by 1 onsite radiologist and retrospectively by 4 independent offsite radiologists, who were all blinded to surgical, histopathologic, and other imaging findings. Surgical pathology was the standard of reference.	Neither MRI nor CT was accurate for evaluating cervical stroma. For uterine body involvement, the area under the ROC curve was higher for MRI than for CT for both prospective (0.80 vs 0.66, respectively; $P=.01$) and retrospective (0.68 vs 0.57, respectively; $P=.02$) readings. Retrospective readers could measure diameter by CT in 35% to 73% of patients and by MRI in 79% to 94% of patients. Prospective readers had the highest Spearman correlation coefficient with pathologic measurement for MRI (r(s) = 0.54), followed by CT (r(s) = 0.45) and clinical examination (r(s) = 0.37; $P<.0001$ for all). Spearman correlation of multiobserver diameter measurements for MRI (r(s) = 0.58; $P<.0001$) was double that for CT (r(s) = 0.27; $P=.03$) MRI better than CT and clinical exam for measuring tumor size. Neither good for assessing cervical stroma.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
20. Bellomi M, Bonomo G, Landoni F, et al. Accuracy of computed tomography and magnetic resonance imaging in the detection of lymph node involvement in cervix carcinoma. *Eur Radiol.* 2005;15(12):2469-2474.	Observational-Dx	62 patients	Retrospective blinded study to assess the accuracy of CT and MRI in the detection of lymph node involvement in cervix carcinoma.	MRI: sensitivity 72.9% and specificity 93.1%. CT: sensitivity 64.6% and specificity 93.9%. The expert radiologist reviewing the films obtained better results. Inter-observer variability in the lower quadrants was high for each imaging technique (kappa for CT: 0.71; kappa for MRI: 0.84). Both imaging techniques showed similar screening accuracy in identifying nodal metastases. The radiologist's experience is important in determining the performance of the imaging technique. CT and MRI are only moderately sensitive for detection of nodal metastases and the clinical impact of their results in patient's management is limited.	2
21. Choi HJ, Ju W, Myung SK, Kim Y. Diagnostic performance of computer tomography, magnetic resonance imaging, and positron emission tomography or positron emission tomography/computer tomography for detection of metastatic lymph nodes in patients with cervical cancer: meta-analysis. *Cancer Sci.* 2010;101(6):1471-1479.	Meta-analysis	41 articles	Meta-analysis was performed to compare diagnostic performances of CT, MRI, and PET or PET/CT, for detection of metastatic lymph nodes in patients with cervical cancer.	In a patient-based data analysis, PET or PET/CT showed the highest pooled sensitivity (82%) and specificity (95%), while CT showed 50% and 92%; and MRI, 56% and 91%, respectively. The AUC (0.9641) and Q* (0.9106) of PET or PET/CT were significantly higher than those of MRI (AUC = 0.8270; Q* = 0.7599), both $P<0.001$. In region- or node-based data analysis, sensitivities of CT (52%) and PET or PET/CT (54%) were higher than that of MRI (38%), $P<0.02$ and $P<0.001$, respectively, while specificities of MRI (97%) and PET or PET/CT (97%) were higher than that of CT (92%), both $P<0.001$. The AUC and Q* showed no significant difference among CT, MRI, and PET or PET/CT. PET or PET/CT had an overall higher diagnostic performance than did CT or MRI in detecting metastatic lymph nodes in patients with cervical cancer.	M

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
22. Pannu HK, Fishman EK. Evaluation of cervical cancer by computed tomography: current status. *Cancer.* 2003;98(9 Suppl):2039-2043.	Review/Other-Dx	N/A	To review the current status of CT in the evaluation of cervical cancer. Limitations of single-detector row CT scanners were compared with the capabilities of new CT technology.	CT can aid in the staging and follow-up of patients with advanced cervical cancer. Thin slices and multiplanar imaging of the pelvis are feasible with CT because of recent advances in technology. Sagittal and coronal images can be generated to evaluate the size and extent of tumor and to assess for local extension. Studies are needed to determine the value of these additional capabilities in the management of cervical cancer.	4
23. Choi SH, Kim SH, Choi HJ, Park BK, Lee HJ. Preoperative magnetic resonance imaging staging of uterine cervical carcinoma: results of prospective study. *J Comput Assist Tomogr.* 2004;28(5):620-627.	Observational-Dx	115 patients	Prospective study to determine the accuracy of the preoperative staging of uterine cervical cancer by MRI.	The accuracy of preoperative tumor staging by MRI in the 115 patients was 77%. In terms of the evaluation of parametrial status, this study had an accuracy of 94% and a sensitivity of 38%. The accuracy and sensitivity of MRI for vaginal invasion were 81% and 87%, respectively. In terms of lymph node metastasis, this study had an accuracy of 97% and a sensitivity of 36%. MRI has high accuracy in the preoperative staging of uterine cervical cancer.	3
24. Narayan K, McKenzie A, Fisher R, Susil B, Jobling T, Bernshaw D. Estimation of tumor volume in cervical cancer by magnetic resonance imaging. *Am J Clin Oncol.* 2003;26(5):e163-168.	Observational-Dx	32 patients	Retrospective study to investigate the efficacy of tumor volume estimation in cervical cancer by MRI. Preoperative MRI images were compared with corresponding linear measurements made on fresh histopathology specimens.	Pathologic tumor diameter correlated well with the corresponding diameter in T2-weighted MRI. Tumor volume as measured by MRI was an accurate representation of the local extent of the disease and can be used as an objective measure of cervical cancer at the primary site. Substituting MRI-derived volume in place of clinical tumor diameter in the FIGO staging system will help refine its prognostic significance in patients with both operable and nonoperable cervical cancer.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
25.	deSouza NM, Dina R, McIndoe GA, Soutter WP. Cervical cancer: value of an endovaginal coil magnetic resonance imaging technique in detecting small volume disease and assessing parametrial extension. *Gynecol Oncol.* 2006;102(1):80-85.	Observational-Dx	119 patients	Retrospective study to determine the value of endovaginal MRI in detecting small volume disease and assessing parametrial extension in uterine cervical cancer by comparing the findings with those at radical hysterectomy in order to establish its role in guiding the surgical decision-making process preoperatively.	Sensitivity and specificity for detecting tumor by endovaginal MRI in the 119 patients were 96.9% and 59.0%, respectively. 36% of tumors were ≤1 cm(3) in volume. For these, sensitivity and specificity for tumor detection were 87% and 65% respectively. For evaluation of parametrial status, sensitivity was 80%, and specificity was 91.3%. A cut-off MRI tumor volume of 5.2 cm(3) predicted histologically confirmed lymph node metastases with a sensitivity of 78.6% and specificity of 72.5%. Endovaginal MRI has high sensitivity in the preoperative staging of uterine cervical cancer even for tumors ≤1 cm(3). It is an invaluable technique in planning fertility-conserving or radical surgical treatment of early stage cervical cancer.	3
26.	Charles-Edwards E, Morgan V, Attygalle AD, et al. Endovaginal magnetic resonance imaging of stage 1A/1B cervical cancer with A T2- and diffusion-weighted magnetic resonance technique: effect of lesion size and previous cone biopsy on tumor detectability. *Gynecol Oncol.* 2011;120(3):368-373.	Observational-Dx	113 patients	To evaluate the effects of previous cone biopsy and lesion size on detectability of stage 1a/1b cervical cancer using endovaginal T2- and DWI MRI.	Sensitivity and specificity for detecting tumor in those without (100%; 100%, respectively) and with (80%; 78.9%, respectively) prior cone biopsy/LLETZ were significantly different (*P*<0.001). Following cone biopsy/LLETZ, MRI tumor volume of 83 mm3 detected tumor with 80% sensitivity, 94.7% specificity; a 5.3 mm maximal histological dimension was detected on MRI with 100% sensitivity, 100% specificity. Tumor ADCs were significantly lower (*P*<0.001) than paired normal epithelial tissue (median, 988x10(-6) mm2/s vs 1564x10(-6) mm2/s) but neither tumor nor epithelial ADCs differed significantly between patients with or without prior cone biopsy/LLETZ (*P*=0.48 and 0.15, respectively).	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
27. Bipat S, Glas AS, van der Velden J, Zwinderman AH, Bossuyt PM, Stoker J. Computed tomography and magnetic resonance imaging in staging of uterine cervical carcinoma: a systematic review. *Gynecol Oncol.* 2003;91(1):59-66.	Review/Other-Dx	57 articles	To systematically review the available evidence on the diagnostic performance of CT and MRI in staging of cervical carcinoma.	Sensitivity estimates for parametrial invasion were 74% (95% CI: 68%–79%) for MRI and 55% (95% CI: 44%–66%) for CT, and for lymph node involvement, 60% (95% CI: 52%–68%) and 43% (95% CI: 37%–57%), respectively. MRI and CT had comparable specificities for parametrial invasion and lymph node involvement. For bladder invasion and rectum invasion the sensitivities for MRI were respectively 75% (95% CI: 66%–83%) and 71% (95% CI: 53%–83%), higher compared with CT. The specificity in evaluating bladder invasion for MRI was significantly higher compared with CT: 91% (95% CI: 83%–95%) for MRI and 73% (95% CI: 52%–87%) for CT. The specificities for rectum invasion were comparable. Differences in patient sample size, publication year, methodological criteria, and MRI techniques had no effect on the summary estimates.	4
28. Ho CM, Chien TY, Jeng CM, Tsang YM, Shih BY, Chang SC. Staging of cervical cancer: comparison between magnetic resonance imaging, computed tomography and pelvic examination under anesthesia. *J Formos Med Assoc.* 1992;91(10):982-990.	Observational-Dx	20 patients	To compare MRI with CT and examination under anesthesia in staging cervical carcinoma, with special emphasis on parametrial status.	The overall accuracy rate of MRI in staging carcinoma of the cervix was 75%, compared with 32% for CT staging and 55% for clinical staging. The accuracy rate of these modalities for parametrial status was 90% for MRI, 55% for CT and 82.5% for examination under anesthesia. MRI accurately excluded all 20 patients with pelvic side wall, bladder and rectal involvement.	1

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
29.	Hori M, Kim T, Murakami T, et al. Uterine cervical carcinoma: preoperative staging with 3.0-T MR imaging--comparison with 1.5-T MR imaging. *Radiology.* 2009;251(1):96-104.	Observational-Dx	31 consecutive patients; 2 independent reviewers	To prospectively evaluate the efficacy of 3.0-T MRI in the preoperative staging of cervical carcinoma compared with that at 1.5-T imaging, with surgery and pathologic analysis as the reference standards.	Mean tumor signal-to-noise ratios, mean cervical stroma signal-to-noise ratios, and mean tumor-to-cervical stroma contrast-to-noise ratios at 3.0-T imaging were significantly higher than those at 1.5-T imaging (P=9.1 x 10(-6), P=1.8 x 10(-6), and P=.008, respectively). Image homogeneity at 3.0-T imaging was significantly inferior to that at 1.5-T imaging (P=.005). There were no significant differences in terms of the degree of susceptibility artifacts. Interobserver agreement between the 2 radiologists for local-regional staging was good or excellent (kappa = 0.65-0.89). Sensitivity, specificity, and AUC for radiologist 1 in the evaluation of parametrial invasion were (a) 75% for both 3.0- and 1.5-T imaging, (b) 70% for both 3.0- and 1.5-T imaging, and (c) 0.82 for 3.0-T imaging and 0.85 for 1.5-T imaging, respectively. Corresponding values for vaginal invasion were (a) 67% for both 3.0-T and 1.5-T imaging, (b) 68% for 3.0-T imaging and 72% for 1.5-T imaging, and (c) 0.62 for 3.0-T imaging and 0.67 for 1.5-T imaging, respectively. Corresponding values for lymph node metastases were (a) 57% for both 3.0-T and 1.5-T imaging, (b) 83% for 3.0-T imaging and 88% for 1.5-T imaging, and (c) 0.72 for 3.0-T imaging and 0.78 for 1.5-T imaging, respectively. Neither radiologist noted significant differences between values obtained with 3.0-T imaging and those obtained with 1.5-T imaging (P>.5 for all comparison pairs). 3.0-T MRI was characterized by high diagnostic accuracy in the presurgical evaluation of patients with cervical carcinoma, although 3.0-T imaging was not significantly superior to 1.5-T imaging.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
30. Payne GS, Schmidt M, Morgan VA, et al. Evaluation of magnetic resonance diffusion and spectroscopy measurements as predictive biomarkers in stage 1 cervical cancer. *Gynecol Oncol.* 2010;116(2):246-252.	Observational-Dx	62 patients	To establish whether ADC and total choline were significantly different between cervical tumors with different histological characteristics (type, degree of differentiation, presence or absence of lymphovascular invasion, lymph-node involvement) in order to establish their role as predictive biomarkers.	There was a statistically significant difference between the ADC of tumor regions (1117+/-183x10(-6) mm(2)/s) and of selected normal regions (1724+/-198x10(-6) mm(2)/s; *P*<0.001), and between tumors that were well/moderately differentiated (1196+/-181x10(-6) mm(2)/s) compared with those that were poorly differentiated (1038+/-153x10(-6) mm(2)/s; *P*=0.016). There was no significant difference between the ADCs of the tumors when separated by other characteristics (tumor type, lymphovascular invasion, lymph-node metastases), or between measured total choline in any of the groups. ADCs are lower in cancer compared to normal cervical tissue, with degree of tumor differentiation contributing to this difference.	2
31. Charles-Edwards EM, Messiou C, Morgan VA, et al. Diffusion-weighted imaging in cervical cancer with an endovaginal technique: potential value for improving tumor detection in stage Ia and Ib1 disease. *Radiology.* 2008;249(2):541-550.	Observational-Dx	59 patients	To establish ADCs of invasive cervical carcinoma compared with nontumor cervical epithelium and determine sensitivity and specificity of DWI MRI used in conjunction with T2-weighted MRI to help detect invasive cervical carcinoma in patients with stage Ia and Ib1 disease.	In group 1, ADCs from cervical carcinoma (757 x 10(-6) mm(2)/sec +/- 110) and adjacent epithelium (1331 x 10(-6) mm(2)/sec +/- 159) or CIN (1291 x 10(-6) mm(2)/sec +/- 156) were significantly different (*P*<.0001). In group 2, respective sensitivity and specificity to help detect invasive cervical carcinoma on T2-weighted images were 55.6% and 75% for observer 1 and 66.7% and 41.7% for observer 2, and 88.9% and 66.7% for observer 1 and 77.8% and 58.3% for observer 2 when ADC maps with a threshold level of 1100 x 10(-6) mm(2)/sec were added. Interobserver agreement was fair (kappa = 0.37) for T2-weighted images alone and good (kappa = 0.80) with ADC included.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
32. Akita A, Shinmoto H, Hayashi S, et al. Comparison of T2-weighted and contrast-enhanced T1-weighted MR imaging at 1.5 T for assessing the local extent of cervical carcinoma. *Eur Radiol.* 2011;21(9):1850-1857.	Observational-Dx	40 patients	To compare 2 MR sequences at 1.5 T-T2-weighted and contrast-enhanced T1-weighted images by using macroscopic sections to determine which image type enables the most accurate assessment of cervical carcinoma.	31/40 patients underwent hysterectomies and 9/40 underwent trachelectomies. In 36 patients, lesions were identified on at least 1 sequence. The tumors at stage 1B or higher were detected in 94.7% on contrast-enhanced T1-weighted images and in 76.3% on T2-weighted images ($P<0.05$). Tumor margins appeared significantly more distinct on contrast-enhanced T1-weighted images than on T2-weighted images ($P<0.001$). The contrast-to-noise ratios obtained using contrast-enhanced T1-weighted images were significantly higher ($P<0.001$) than those obtained using T2-weighted images.	3
33. Sala E, Wakely S, Senior E, Lomas D. MRI of malignant neoplasms of the uterine corpus and cervix. *AJR Am J Roentgenol.* 2007;188(6):1577-1587.	Review/Other-Dx	N/A	To review the role of MRI in the imaging of malignant neoplasms of the uterine corpus and cervix, describing its role in staging, treatment planning, and follow-up.	MRI is not officially incorporated in the FIGO staging system, but is already widely accepted as the most reliable imaging technique for the diagnosis, staging, treatment planning, and follow-up of both endometrial and cervical cancer. MRI protocols need to be optimized to obtain the best results and avoid pitfalls.	4
34. Lin G, Ho KC, Wang JJ, et al. Detection of lymph node metastasis in cervical and uterine cancers by diffusion-weighted magnetic resonance imaging at 3T. *J Magn Reson Imaging.* 2008;28(1):128-135.	Observational-Dx	50 patients	To evaluate DWI for detection of pelvic lymph node metastasis in patients with cervical and uterine cancers. Histopathologic results used as reference standard.	The relative ADC values between tumor and nodes were significantly lower in metastatic than in benign nodes (0.06 vs 0.21 x 10(-3) mm(2)/s, $P<0.001$; cutoff value 0.10 x 10(-3) mm(2)/s). Compared to conventional MRI, the method combining size and relative ADC values resulted in better sensitivity (25% vs 83%) and similar specificity (98% vs 99%). The smallest metastatic lymph node detected by this method measured 5 mm on its short axis. The combination of size and relative ADC values was useful in detecting pelvic lymph node metastasis in patients with cervical and uterine cancers.	2

**Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE**

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
35.	Liu Y, Liu H, Bai X, et al. Differentiation of metastatic from non-metastatic lymph nodes in patients with uterine cervical cancer using diffusion-weighted imaging. *Gynecol Oncol.* 2011;122(1):19-24.	Observational-Dx	42 patients	To determine the diagnostic value of DWI in the differentiation of metastatic lymph nodes from nonmetastatic lymph nodes in uterine cervical cancer.	There were statistically significant differences between metastatic and non-metastatic lymph nodes in the short-axis diameter, long-axis diameter, mean ADC, minimum ADC, mean rADC and minimum rADC ($P < 0.001$). The Az of the minimum ADC (0.990) was greater than that of the other ADC-based criteria (0.974, 0.939, 0.976 for mean ADC, mean rADC and minimum rADC, respectively) and all size-based criteria (0.878 for short-axis diameter and 0.858 for long-axis diameter) ($P < 0.05$). Using the minimum ADC criteria ($</= 0.881 \times 10(-)(3)$ mm(2)/s), the sensitivity and specificity for differentiating metastatic from non-metastatic lymph nodes were 95.7% and 96.5%, respectively.	2
36.	Chung HH, Kang KW, Cho JY, et al. Role of magnetic resonance imaging and positron emission tomography/computed tomography in preoperative lymph node detection of uterine cervical cancer. *Am J Obstet Gynecol.* 2010;203(2):156 e151-155.	Observational-Dx	83 patients; 28 had pelvic lymph node metastasis: MRI – 2 reviewers; PET/CT – 1 reviewer	Retrospective study to compare MRI with PET/CT in the preoperative detection of lymph node metastases in patients with uterine cervical cancer.	Sensitivity, specificity, and accuracy for detecting lymph node metastasis were 64.3%, 69.1%, and 67.5% for MRI, and 28.6%, 83.6%, and 65.1% for PET/CT, respectively. The AUC for the MRI and PET/CT were 0.667 and 0.561, respectively (*P*=.013). MRI showed significantly higher sensitivity for detecting metastatic lymph nodes than PET/CT (*P*=.006). MRI was more sensitive than PET/CT for detecting metastatic lymph node in patients with cervical cancer.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

	Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
37.	Klerkx WM, Veldhuis WB, Spijkerboer AM, et al. The value of 3.0Tesla diffusion-weighted MRI for pelvic nodal staging in patients with early stage cervical cancer. *Eur J Cancer.* 2012;48(18):3414-3421.	Observational-Dx	68 patients	To investigate the diagnostic accuracy of 3.0-T DWI MRI in addition to conventional MRI for the detection of lymphadenopathy in patients with early stage cervical cancer compared to histopathological evaluation of the systematically removed pelvic lymph nodes as reference standard.	9 patients had 15 positive pelvic nodes at histopathological examination. The sensitivity and specificity of lymphatic metastasis detection by predefined conventional MRI characteristics was 33% (95% CI: 3–64) and 83% (95% CI: 74–93) on patient level, and 33% (95% CI: 7–60) and 97% (95% CI: 95–99) on regional level respectively for observer 1. For observer 2 the sensitivity was 33% (95% CI: 3–64) and the specificity 93% (95% CI: 87–100) on patient level, and 25% (95% CI: 1–50) and 98% (95% CI: 97–100) on regional level, respectively. The kappa-value for reproducibility of metastasis detection on regional level was 0.50. The short axis diameter showed the highest diagnostic accuracy (AUC=0.81 95% CI: 0.70–0.91); ADC did not improve diagnostic accuracy (AUC=0.83 95% CI: 0.73–0.93).	2
38.	Narayan K. Arguments for a magnetic resonance imaging-assisted FIGO staging system for cervical cancer. *Int J Gynecol Cancer.* 2005;15(4):573-582.	Review/Other-Dx	N/A	To present arguments for MRI-assisted FIGO staging system for cervical cancer.	MRI-assisted FIGO staging system for cervical cancer could be used for selecting patients appropriately for a given treatment package.	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
39. Choi HJ, Roh JW, Seo SS, et al. Comparison of the accuracy of magnetic resonance imaging and positron emission tomography/computed tomography in the presurgical detection of lymph node metastases in patients with uterine cervical carcinoma: a prospective study. *Cancer.* 2006;106(4):914-922.	Observational-Dx	22 patients: 1st group (n=7) – stage IB1 disease (tumor size ≤4 cm) and stage IIA disease; 2nd group (n=15) – stage IB2 or ≥stage IIB disease	Prospective study to determine the accuracy of MRI and PET/CT for detecting lymph node metastases in patients with uterine cervical carcinoma compared with thin-section histopathologic results from systemic lymphadenectomy.	With MRI, the sensitivity, specificity, and accuracy rates for detecting metastatic lymph nodes in each lymph node group were 30.3% (10/33 lymph node groups), 92.6% (112/121 lymph node groups), and 72.7% (122/154 lymph node groups), respectively; with PET/CT, those rates were 57.6% (19/33 lymph node groups), 92.6% (112/121 lymph node groups), and 85.1% (131/154 lymph node groups), respectively. Statistical analysis showed that PET/CT was more sensitive than MRI (P=0.026) but that there were no statistical differences noted with regard to specificity (P=1.000) or accuracy (P=0.180). Power analysis demonstrated that a sample size of 685 lymph node groups (98 patients) would be necessary to demonstrate that PET/CT was more accurate than MRI (alpha = 0.05; beta = 0.80). PET/CT was more sensitive than MRI for detecting lymph node metastases in patients with uterine cervical carcinoma.	2
40. Kim SH, Lee HJ, Kim YW. Correlation between tumor size and surveillance of lymph node metastasis for IB and IIA cervical cancer by magnetic resonance images. *Eur J Radiol.* 2012;81(8):1945-1950.	Observational-Dx	200 patients	To assess the feasibility of preoperative MRI based measurement of tumor size with regard to lymph node metastasis in early uterine cervical cancer.	Of the 200 patients, 45 (22.3%) had lymph node metastasis. There was no statistical difference between patients-based and region-specific analysis. The patients with tumor size with >4 cm revealed higher diagnostic accuracy of MRI in detecting lymph node metastasis (85.4% vs 50.6%, P=0.023) and rate of lymph node recurrence (20.0% vs 6.4%, P=0.031) in than those with size with ≤4 cm, the differences were statistically significant. Discriminant analysis of lymph node size for the differentiation of metastasis from nonmetastasis resulted in cut-off values (11.8 mm; size with >4 cm vs 8.3 mm; size with ≤4 cm) and diagnostic accuracy (84.0% of size with >4 cm vs 72.0% of size with ≤4 cm).	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
41. Kim SK, Choi HJ, Park SY, et al. Additional value of MR/PET fusion compared with PET/CT in the detection of lymph node metastases in cervical cancer patients. *Eur J Cancer.* 2009;45(12):2103-2109.	Observational-Dx	79 patients; 2 reviewers	To retrospectively evaluate the additional diagnostic value of MR/PET fusion compared with PET/CT in the detection of metastatic lymph nodes in cervical cancer patients. Histopathological evaluation of lymph nodes was diagnostic standard.	Sensitivity and specificity of PET/CT and fused MR/PET were 44.1%, 93.9% and 54.2%, 92.7% respectively. The ROC analysis demonstrated a higher diagnostic performance of fused MR/PET compared to PET/CT alone for detecting lymph node metastases (P=0.0259). Study findings demonstrate the additional diagnostic value of fused MR/PET images compared with PET/CT in the detection of metastatic lymph nodes in patients with uterine cervical cancer.	3
42. Kim WY, Chang SJ, Chang KH, Yoo SC, Lee EJ, Ryu HS. Reliability of magnetic resonance imaging for bladder or rectum invasion in cervical cancer. *J Reprod Med.* 2011;56(11-12):485-490.	Observational-Dx	257 patients	To find out whether a negative finding on MRI can rule out bladder or rectum mucosal invasion safely without cystoscopy or sigmoidoscopy.	A total of 257 patients were enrolled in this study. 16 patients had at least suspicious bladder invasion, and 1 patient had definite rectal invasion on MRI. Of these 17 patients, 6 patients had actual bladder mucosa invasion, and 1 patient had rectal mucosa invasion. The remaining 240 had negative MRI, cystoscopy and sigmoidoscopy findings. The MRI sensitivity, specificity, PPV, NPV and accuracy of bladder or rectum mucosal invasion were 100%, 96.0%, 41.25%, 100% and 96.1%, respectively.	3
43. Lecuru F, Mathevet P, Querleu D, et al. Bilateral negative sentinel nodes accurately predict absence of lymph node metastasis in early cervical cancer: results of the SENTICOL study. *J Clin Oncol.* 2011;29(13):1686-1691.	Observational-Dx	145 patients	To assess the sensitivity and NPV of sentinel lymph node biopsy.	145 patients were enrolled, and 139 were included in a modified intention-to-diagnose analysis. Intraoperative radioisotope-blue dye mapping detected at least 1 sentinel lymph node in 136 patients (97.8%; 95% CI, 93.8% to 99.6%), 23 of whom had true-positive results and 2 who had false-negative results, yielding 92.0% sensitivity (23/25; 95% CI, 74.0% to 99.0%) and 98.2% NPV (111/113; 95% CI, 74.0% to 99.0%) for node metastasis detection. No false-negative results were observed in the 104 patients (76.5%) in whom sentinel lymph node were identified bilaterally.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
44. Grigsby PW. The prognostic value of PET and PET/CT in cervical cancer. *Cancer Imaging.* 2008;8:146-155.	Review/Other-Dx	N/A	Review the prognostic value of PET and PET/CT.	CT has been the most widely used imaging method for assessment of nodal involvement and detection of distant metastatic disease. PET has become an established imaging tool for cervical cancer. The functional information about regional glucose metabolism provided by FDG-PET provides for greater sensitivity and specificity in most cancer imaging applications by comparison with CT and other anatomic imaging methods. PET is superior to conventional imaging modalities for evaluating patients with cervical cancer.	4
45. Havrilesky LJ, Kulasingam SL, Matchar DB, Myers ER. FDG-PET for management of cervical and ovarian cancer. *Gynecol Oncol.* 2005;97(1):183-191.	Review/Other-Dx	25 studies (15 cervical cancer, 10 ovarian cancer)	To assess the diagnostic performance of PET using FDG-PET in comparison to conventional imaging modalities in the assessment of patients with cervical and ovarian cancer.	For cervical cancer, pooled sensitivity and specificity of PET for aortic node metastasis are 0.84 (95% CI, 0.68–0.94) and 0.95 (0.89–0.98). Pooled sensitivity and specificity for detection of pelvic node metastasis are: PET, 0.79 (0.65–0.90) and 0.99 (0.96–0.99); MRI, 0.72 (0.53–0.87) and 0.96 (0.92–0.98). Pooled sensitivity for CT is 0.47 (0.21–0.73) (pooled specificity not available). Pooled sensitivity and specificity of PET for recurrent cervical cancer with clinical suspicion are 0.96 (0.87–0.99) and 0.81 (0.58–0.94). For ovarian cancer, pooled sensitivity and specificity to detect recurrence with clinical suspicion are: PET, 0.90 (0.82–0.95) and 0.86 (0.67–0.96); conventional imaging, 0.68 (0.49–0.83) and 0.58 (0.33–0.80); CA-125, 0.81 (0.62–0.92) and 0.83 (0.58–0.96). When conventional imaging and CA-125 are negative, pooled sensitivity and specificity of PET are 0.54 (0.39–0.69) and 0.73 (0.56–0.87), respectively. When CA-125 is rising and conventional imaging is negative, the pooled sensitivity and specificity of PET are 0.96 (0.88–0.99) and 0.80 (0.44–0.97. Good evidence to suggest PET is useful for pretreatment detection of lymph node metastases. Fair evidence that PET is useful in detecting recurrent disease.	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
46. Perez-Medina T, Pereira A, Mucientes J, et al. Prospective evaluation of 18-fluoro-2-deoxy-D-glucose positron emission tomography for the discrimination of paraaortic nodal spread in patients with locally advanced cervical carcinoma. *Int J Gynecol Cancer.* 2013;23(1):170-175.	Observational-Dx	52 patients	To evaluate the accuracy of FDG-PET for detecting para-aortic lymph node spread in patients with locally advanced cervical carcinoma.	A total of 52 patients with locally advanced cervical carcinoma fulfilled the inclusion criteria. All of them underwent a laparoscopic infrarenal para-aortic lymphadenectomy. 18 patients (34.6%) had pathologically proven para-aortic lymph node metastases. Among them, 4 (12.5%) had negative FDG-PET (false negatives). Furthermore, 2 positive FDG-PET patients were not affected after histologic analysis (11.1% false positives). No complications occurred in our series. Sensitivity, specificity, and PPV and NPV of the FDG-PET were 77.7, 94.1, 87.5, and 88.9, respectively, for the detection of para-aortic lymph node metastases.	2
47. Hope AJ, Saha P, Grigsby PW. FDG-PET in carcinoma of the uterine cervix with endometrial extension. *Cancer.* 2006;106(1):196-200.	Observational-Dx	58 patients	To determine whether pretreatment pathologic evidence of endometrial invasion correlated with FDG-PET findings and outcomes in patients with carcinoma of the uterine cervix. Patients were prospectively registered.	37 (64%) patients had pathologic evidence of endometrial invasion. Pelvic lymph node metastases were 3 times more frequent in patients with evidence of endometrial invasion compared with those without endometrial invasion (70% vs 23%, $P<0.001$). Patients with endometrial invasion also had a significantly increased risk of para-aortic and supraclavicular lymph node metastases at presentation (30% vs 0% $P=0.006$). Endometrial invasion was associated with a decreased 2-year DFS (78% vs 58%, $P=0.046$) and OS (92% vs 65%, $P=0.047$). Endometrial extension in cervical cancer correlated strongly with risk of FDG-PET detected lymph node metastases in this study's population and was associated with a poor prognosis.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
48. Park W, Park YJ, Huh SJ, et al. The usefulness of MRI and PET imaging for the detection of parametrial involvement and lymph node metastasis in patients with cervical cancer. *Jpn J Clin Oncol.* 2005;35(5):260-264.	Observational-Dx	36 patients	Retrospective study to assess usefulness of MRI and PET for detection of parametrial spread and lymph node metastasis in patients with cervical cancer.	Accuracy of FIGO and MRI staging was 67% and 84.4%, respectively. Accuracy for detecting pelvic lymph node metastasis was better for PET than for MRI (78% vs 67%, respectively). All FDG uptake lymph nodes were confirmed as metastatic lymph nodes by pathological evaluation; this included 5 lymph nodes <1 cm in diameter. MRI provides an improved evaluation of local tumor extension, but PET is more useful for the evaluation of pelvic lymph nodes than MRI; however, PET still misses microscopic disease. Further studies are necessary to evaluate the usefulness of PET/CT for the accuracy of the disease extension and the cost-effectiveness of MRI, PET or PET/CT in patients with cervical cancer.	3
49. Small W, Jr., Vern TZ, Rademaker A, et al. A prospective trial comparing lymphangiogram, cross-sectional imaging, and positron emission tomography scan in the detection of lymph node metastasis in locally advanced cervical cancer. *Am J Clin Oncol.* 2010;33(1):89-93.	Observational-Dx	20 patients	To evaluate the use of lymphangiogram, CT/MRI, and PET imaging of lymph node metastasis in patients receiving definitive chemoradiotherapy for cervical cancer.	Agreement between imaging was most consistent in the common iliacs (P<0.001) and least in the para-aortic region (P<0.41). DFS at 1 year was statistically associated with positive PET imaging (25%) vs negative PET imaging (86%) (P<0.033) in the common iliac lymph node region. No other single lymph node region in any modality was statistically associated with DFS. 1-year DFS in patients with any positive areas on PET imaging was 50% compared with 90% in patients with negative PET imaging (P<0.02). 7 patients were noted to have no metastasis in any region by all 3 of the imaging modalities; the 1-year DFS in these 7 patients was 100% compared with 59% in the 13 patients with any positive nodal area (P<0.05).	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
50. Grigsby PW, Siegel BA, Dehdashti F. Lymph node staging by positron emission tomography in patients with carcinoma of the cervix. *J Clin Oncol.* 2001;19(17):3745-3749.	Observational-Dx	101 consecutive patients	To retrospectively compare the results of CT and FDG-PET for lymph node staging in patients with carcinoma of the cervix and to evaluate the relationship of the imaging findings to prognosis.	CT demonstrated abnormally enlarged pelvic lymph nodes in 20 (20%) and para-aortic lymph nodes in 7 (7%) of the 101 patients. PET demonstrated abnormal FDG uptake in pelvic lymph nodes in 67 (67%), in para-aortic lymph nodes in 21 (21%), and in supraclavicular lymph node in 8(8%). The 2-year progression-free survival, based solely on para-aortic lymph node status, was 64% in CT-negative and PET-negative patients, 18% in CT-negative and PET-positive patients, and 14% in CT-positive and PET-positive patients (*P*<.0001). A multivariate analysis demonstrated that the most significant prognostic factor for progression-free survival was the presence of positive para-aortic lymph nodes as detected by PET imaging (*P*=.025). Study demonstrates that FDG-PET detects abnormal lymph node regions more often than does CT and that the findings on PET are a better predictor of survival than those of CT in patients with carcinoma of the cervix.	3
51. Lin WC, Hung YC, Yeh LS, Kao CH, Yen RF, Shen YY. Usefulness of (18)F-fluorodeoxyglucose positron emission tomography to detect para-aortic lymph nodal metastasis in advanced cervical cancer with negative computed tomography findings. *Gynecol Oncol.* 2003;89(1):73-76.	Observational-Dx	50 women	Prospective study to evaluate FDG-PET in detecting para-aortic lymph nodal metastasis in patients with locally advanced cervical carcinoma when CT findings were negative.	FDG-PET imaging had a sensitivity of 85.7%, a specificity of 94.4%, and an accuracy of 92%. When abdominal CT findings are negative, the use of FDG-PET can accurately detect para-aortic lymph nodal metastasis in patients with advanced cervical cancer.	3
52. Allen D, Narayan K. Managing advanced-stage cervical cancer. *Best Pract Res Clin Obstet Gynaecol.* 2005;19(4):591-609.	Review/Other-Dx	N/A	Review current staging methods and definition of advanced cervical cancer.	Use of combined chemoradiation enhances survival in advanced-stage cervical cancer. Further assessment of the role of MRI and PET in treatment planning is needed.	4
53. Bentivegna E, Uzan C, Gouy S, et al. Correlation between [18f]fluorodeoxyglucose positron-emission tomography scan and histology of pelvic nodes in early-stage cervical cancer. *Anticancer Res.* 2010;30(3):1029-1032.	Observational-Dx	16 patients	To study the histological results of pelvic lymphadenectomy in patients treated for early-stage cervical cancer (<4 cm) who had no nodal uptake on FDG-PET/CT.	Surgery was performed laparoscopically and by laparotomic approach in 13 and 3 cases, respectively. 2 patients had histologically proven pelvic involvement. The false-negative rate and NPV of PET-CT imaging for pelvic nodal involvement were 13% and 87%, respectively.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
54. Signorelli M, Guerra L, Montanelli L, et al. Preoperative staging of cervical cancer: is 18-FDG-PET/CT really effective in patients with early stage disease? *Gynecol Oncol.* 2011;123(2):236-240.	Observational-Dx	159 women	To determine the diagnostic accuracy of FDG-PET/CT in the detection of nodal metastases.	159 women were enrolled. 65% had squamous histotype and 51% had grade 3 disease. Median number of nodes dissected was 29 (range 11–61). 28/159 women (18%) showed nodal metastases. Overall patient-based sensitivity, specificity, positive and NPV of FDG-PET/CT for detection of nodal disease were 32.1%, 96.9%, 69.2% and 87.0% respectively. Among the 97 (61%) women included in group 1, 8 had nodal metastases (8.2%) and 2 was discovered through FDG-PET/CT (25%), while 20/62 women of the group 2 (32.3%) had nodal involvement, of which 7 (35%) was detected by FDG-PET/CT.	2
55. Selman TJ, Mann C, Zamora J, Appleyard TL, Khan K. Diagnostic accuracy of tests for lymph node status in primary cervical cancer: a systematic review and meta-analysis. *CMAJ.* 2008;178(7):855-862.	Meta-analysis	72 studies: 5,042 women	To systematically review the diagnostic accuracy literature on sentinel node biopsy, PET, MRI and CT to evaluate the accuracy of each index test in determining lymph node status in patients with cervical cancer.	The pooled positive likelihood ratios (and 95% CI) were 15.3 (7.9–29.6) for PET, 6.4 (4.9–8.3) for MRI and 4.3 (3.0–6.2) for CT. The pooled negative likelihood ratios (and 95% CIs) were 0.27 (0.11–0.66) for PET, 0.50 (0.39–0.64) for MRI and 0.58 (0.48–0.70) for CT. Using a 27% pretest probability of lymph node metastasis among all cases (regardless of stage), we found that a positive sentinel node biopsy result increased post-test probability to 94% (95% CI: 90%–96%), whereas a positive finding on PET increased it to 85% (75%–92%).	M

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
56. Kidd EA, El Naqa I, Siegel BA, Dehdashti F, Grigsby PW. FDG-PET-based prognostic nomograms for locally advanced cervical cancer. *Gynecol Oncol.* 2012;127(1):136-140.	Observational-Dx	234 patients	To evaluate the combined use of 3 prognostic factors (cervical tumor SUV_{max}, tumor volume, and highest level of lymph node involvement) assessed on pretreatment FDG-PET for predicting recurrence-free survival, disease-specific survival, and OS.	53% of patients had FDG-avid lymph node on PET; the highest level of nodal involvement was pelvic in 84, para-aortic in 41, and supraclavicular in 10. The average cervix tumor SUV_{max} was 12.4 (range, 2.1–50.4) and PET tumor volume average was 66.4 cm3 (range, 3.0–535.7 cm3). The median follow-up was 40.7 months for patients alive at last follow-up. PET lymph node status had the greatest influence on outcome. The c-statistics for the 3 nomograms were 0.741 for recurrence-free survival, 0.739 for disease-specific survival, and 0.658 for OS. The PET-based nomograms performed better than FIGO stage with c-statistics of 0.605, 0.600 and 0.559 for recurrence-free survival, disease-specific survival and OS, respectively.	4
57. Lee YY, Choi CH, Kim CJ, et al. The prognostic significance of the SUVmax (maximum standardized uptake value for F-18 fluorodeoxyglucose) of the cervical tumor in PET imaging for early cervical cancer: preliminary results. *Gynecol Oncol.* 2009;115(1):65-68.	Observational-Dx	44 patients	Prospective study to evaluate the prognostic significance of the cervical tumor uptake of FDG measured as the SUV_{max} by PET in patients with early cervical cancer treated with surgery with or without adjuvant therapy.	According to the tumor stage, the mean SUV_{max} significantly differed among groups (P=0.013). The SUV_{max} was significantly higher in patients with deep stromal invasion (≥1 cm, P=0.0208), lymph-vascular space invasion (P=0.0429) and a pathologically confirmed large tumor size of >4 cm (P=0.0074) when compared to controls. Patients with a high SUV_{max} (≥13.4) had a significantly reduced DFS rate compared to patients with a low SUV_{max} (P=0.021). In addition, the SUV_{max} (≥13.4) was a significant independent predictor of recurrence of cervical cancer after treatment with surgery (+/-adjuvant therapy) (P=0.0207). Patients with early cervical cancer showing a high SUV_{max} (≥13.4) of the cervical tumor should be considered at increased risk for disease recurrence after surgery and may need more aggressive multimodal treatment.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
58. Nakamura K, Okumura Y, Kodama J, Hongo A, Kanazawa S, Hiramatsu Y. The predictive value of measurement of SUVmax and SCC-antigen in patients with pretreatment of primary squamous cell carcinoma of cervix. *Gynecol Oncol.* 2010;119(1):81-86.	Observational-Dx	52 patients	To examine the predictive value of measurement of SUV_{max} and serum squamous cell carcinoma antigen in patients with pretreatment of primary squamous cell carcinoma of cervix.	The high SUV_{max} of the primary tumor ($\geq$15.6) plus lymph node metastasis (a short-axis diameter of over 10 mm with a SUV_{max} $\geq$3.5) were significant predictors for poor prognosis when compared with the low SUV_{max} of the primary tumor (<15.6) or the high SUV_{max} of the primary tumor plus negative lymph node metastasis (a short-axis diameter of under 10 mm or SUV_{max} <3.5) (OS rate; *P*=0.0211). Findings indicate that the high SUV_{max} of the primary tumor plus lymph node metastasis with pretreatment of primary SCC of cervix may be associated with a poor prognosis.	3
59. Yilmaz M, Adli M, Celen Z, Zincirkeser S, Dirier A. FDG PET-CT in cervical cancer: relationship between primary tumor FDG uptake and metastatic potential. *Nucl Med Commun.* 2010;31(6):526-531.	Observational-Dx	43 patients: low SUV group -21 patients with SUV_{max} <13.5; high SUV group - 22 patients with SUV_{max} $\geq$13.5	To retrospectively evaluate the relationships between primary tumor FDG uptake measured as the maximum SUV_{max} and local extension, and nodal or distant metastasis in patients with cervical cancer on pretreatment FDG-PET/CT.	Average SUV_{max} was 9.6+/-2.6 and 19.9+/-4.9 in the low and high SUV groups, respectively. In the low SUV group, 6 patients (29%) had a local extension, 8 (38%) had pelvic and/or para-aortic lymph node metastasis and 1 had distant organ metastasis (4.7%). In the high SUV group, 10 patients (45%) had a local extension, 16 (73%) had pelvic and/or para-aortic lymph node metastasis, and 2 (9%) had distant organ metastases. There was a significant difference in the lymph node metastasis rate between the 2 groups (*P*<0.05), but differences in local extension and distant organ metastasis were not statistically significant (*P*>0.05). In addition, there was a moderate correlation between SUV_{max} and clinical tumor stages (r=0.40, *P*=0.0075). Higher primary tumor FDG uptake predicts higher nodal metastatic potential in cervical cancer patients. Patients with higher SUV_{max} in cervical tumor may need a close follow-up because of their higher metastatic potential.	4

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
60. Xue F, Lin LL, Dehdashti F, Miller TR, Siegel BA, Grigsby PW. F-18 fluorodeoxyglucose uptake in primary cervical cancer as an indicator of prognosis after radiation therapy. *Gynecol Oncol.* 2006;101(1):147-151.	Observational-Dx	96 consecutive patients	Retrospective blinded study to evaluate the prognostic significance of tumor metabolic activity on pretreatment PET using the FDG-PET in patients with carcinoma of the cervix undergoing radiotherapy with or without concurrent chemotherapy.	5-year DFS in patients with SUV_{max} <10.2 and ≥10.2 were 71% and 52% (P=0.0289) respectively, while OS were 72% and 69% (P=0.4), respectively. On multivariate analysis, lymph node metastasis on FDG-PET was found to be predictive of DFS (P<0.0001). Both the SUV for FDG and FIGO stage I disease were found to be marginally predictive of DFS (P=0.055 and P=0.058, respectively). FDG uptake within primary cervical cancer, as measured by SUV, is predictive of DFS in patients undergoing radiotherapy for cervical cancer. High FDG uptake may be useful in identifying patients who may require more aggressive initial therapy.	4
61. Yoo J, Choi JY, Moon SH, et al. Prognostic significance of volume-based metabolic parameters in uterine cervical cancer determined using 18F-fluorodeoxyglucose positron emission tomography. *Int J Gynecol Cancer.* 2012;22(7):1226-1233.	Observational-Dx	73 female patients	To compare the prognostic value of volume-based metabolic parameters determined using FDG-PET (with other prognostic parameters in uterine cervical cancer.	Recurrence or disease progression occurred in 23 patients (31.5%). In univariate analysis, patient age (cutoff, 57 years, P<0.05), FIGO stage (P<0.07), primary tumor size (cutoff, 6.7 cm; P<0.05), lymph node status on PET (P<0.005), treatment method (P<0.01), metabolic tumor volume (cutoff, 82 cm; P<0.001), and total lesion glycolysis (cutoff, 7600; P<0.005) were significant predictors of recurrence or progression. In multivariate analysis, both lymph node status on PET (HR, 1.042 [negative vs intrapelvic metastasis only], 7.008 [negative vs extrapelvic metastasis]; P<0.001) and total lesion glycolysis (cutoff, 7600; HR, 2.981; P<0.05) were independent prognostic factors for predicting recurrence.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
62. Liu FY, Yen TC, Chen MY, et al. Detection of hematogenous bone metastasis in cervical cancer: 18F-fluorodeoxyglucose-positron emission tomography versus computed tomography and magnetic resonance imaging. *Cancer.* 2009;115(23):5470-5480.	Observational-Dx	Group CT/PET – 233 imaging pairs in 190 patients; Group MR/PET – 245 imaging pairs in 228 patients	Retrospective study in which the authors evaluated the diagnostic performances of CT, MRI, and FDG-PET in detecting hematogenous bone metastasis in patients with cervical cancer. For CT and MRI studies, the imaging findings were interpreted by 2 radiologists. For PET studies, the imaging findings were interpreted by 2 nuclear physicians.	PET was more sensitive than CT (P=.004) and more specific than MRI (P=.04). The diagnostic performance of PET was significantly superior to the performance CT (AUC, 0.964 vs 0.662; P<.001) and MRI (AUC, 0.966 vs 0.833; P=.033). Both FIGO stage and the extent of lymph node metastases were associated with hematogenous bone metastasis in univariate analysis. However, the extent of lymph node metastases was the only significant risk factor in multivariate analysis (P=.025). The current study demonstrated the superiority of FDG-PET over CT and MRI for detecting hematogenous bone metastasis in patients with advanced cervical cancer. Hematogenous bone metastasis in cervical cancer was associated with the extent of lymph node metastases rather than with FIGO stage.	3
63. Ozulker T, Kucukoz Uzun A, Ozulker F, Ozpacac T. Comparison of (18)F-FDG-PET/CT with (99m)Tc-MDP bone scintigraphy for the detection of bone metastases in cancer patients. *Nucl Med Commun.* 2010;31(6):597-603.	Observational-Dx	70 patients	Retrospective study to assess the efficacy of FDG-PET/CT scan in detecting bone metastases in cancer patients and to compare the results with bone scan findings.	FDG-PET/CT imaging detected bone involvement in 68/70 patients with a sensitivity of 97.1%. While bone scan showed the presence of metastases in 60 patients (85.7%). PET/CT detected 666/721 metastatic lesions correctly (92.3%), whereas bone scan detected 506 lesions totally (70.1%). PET/CT revealed organ metastases in 24 patients and in 7 patients with unknown primary; PET/CT also depicted primary tumor. FDG-PET/CT is more sensitive than bone scan in detecting bone metastasis in patients with neoplastic diseases. FDG-PET/CT has the advantage of detecting unknown primary cancers and visceral metastases besides bone metastases.	2

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
64. Koliopoulos G, Sotiriadis A, Kyrgiou M, Martin-Hirsch P, Makrydimas G, Paraskevaidis E. Conservative surgical methods for FIGO stage IA2 squamous cervical carcinoma and their role in preserving women's fertility. *Gynecol Oncol.* 2004;93(2):469-473.	Review/Other-Dx	N/A	To present the published data on conservative surgical methods for FIGO stage IA2 squamous cervical carcinoma methods (radical vaginal, abdominal or laparoscopic trachelectomy and laparoscopic pelvic lymphadenectomy, deep cold-knife excision and lymphadenectomy, ovarian transposition and radiotherapy) and their clinical role in preserving women's fertility.	The recurrence rates after radical trachelectomy range from 0% to 8% and are comparable to reported results from series of patients treated with radical hysterectomy. There are over 35 reported live births out of approximately 210 women who had this operation. However, the rates of second trimester losses and preterm deliveries due to cervical weakness are high. Data from the other methods are limited. Vaginal radical trachelectomy is currently the fertility-sparing procedure with the most available data supporting its use. Although these results are encouraging, there is lack of level I evidence (ie, randomized controlled trials) comparing safety and survival rates between conservative and radical methods. Therefore, these techniques should be used by fully trained operators, with the understanding that this is not the standard treatment at present.	4
65. Lakhman Y, Akin O, Park KJ, et al. Stage IB1 cervical cancer: role of preoperative MR imaging in selection of patients for fertility-sparing radical trachelectomy. *Radiology.* 2013;269(1):149-158.	Observational-Dx	62 patients	To determine whether MRI evaluation of key morphologic tumor characteristics can improve patient selection for radical trachelectomy.	Sensitivity and specificity of tumor detection were, respectively, 87% and 100% (reader 1) and 76% and 95% (reader 2). 6/6 patients with negative cone biopsy margins and no tumor at postconization MRI were without tumor at trachelectomy pathologic analysis. Mean differences between MRI and histologic tumor sizes were 0.7 mm (range, -15 to 11 mm) for reader 1 and 2.2 mm (range, -9 to 15 mm) for reader 2. Sensitivities for deep cervical stromal invasion were 75% (reader 1) and 50% (reader 2). For each reader, 9/9 (100%) patients with tumor 5 mm or less from the internal os and 3/5 (60%) patients with tumor 6–9 mm from the internal os at MRI needed radical hysterectomy. For both readers, tumor size of ≥2 cm (*P*<.001) and deep cervical stromal invasion (*P*≤.003) at MRI were associated with increased chance of radical hysterectomy.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
66. Reznek RH, Sahdev A. MR imaging in cervical cancer: seeing is believing. The 2004 Mackenzie Davidson Memorial Lecture. *Br J Radiol.* 2005;78 Spec No 2:S73-85.	Review/Other-Dx	N/A	Lecture on MRI in cervical cancer.	N/A	4
67. Loft A, Berthelsen AK, Roed H, et al. The diagnostic value of PET/CT scanning in patients with cervical cancer: a prospective study. *Gynecol Oncol.* 2007;106(1):29-34.	Observational-Dx	120 patients	To investigate the clinical value of PET/CT as a supplement to FIGO staging in patients with cervical cancer stage ≥1B.	27 patients underwent radical surgery; 4 of these had PET/CT scans revealing pathological foci in the pelvis. 3 (11%) were true positive; 1 was false positive. 22 patients had true negative PET/CT scans concerning pelvic lymph nodes. One patient had a false negative node. For these patients, we found the PPV to be 75%, NPV 96%, sensitivity 75%, specificity 96%. Regarding para-aortic nodal disease in the total population of 119 patients, 15 patients had true positive scans. The number of true negatives was 103, resulting in PPV 94%, NPV 100%, and sensitivity 100%, and specificity 99%. PET/CT scans showed distant metastases in 19 patients, 10 were true positive and 9 were false positive. The remaining 100 patients were considered true negative for distant metastases and for these patients, we found PPV 63%, NPV 100%, sensitivity 100% and specificity 94%.	3

Pretreatment Planning of Invasive Cancer of the Cervix
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
68. Sironi S, Buda A, Picchio M, et al. Lymph node metastasis in patients with clinical early-stage cervical cancer: detection with integrated FDG PET/CT. *Radiology.* 2006;238(1):272-279.	Observational-Dx	47 women	To prospectively determine the accuracy of combination PET/CT in lymph node staging in patients with early-stage cervical cancer, with histopathologic results as the reference standard.	15 (32%) patients had metastatic lymph nodes at histopathologic examination, and 32 (68%) had no histopathologically confirmed nodal metastasis. Of the total 1081 lymph nodes histopathologically sampled, 18 were found to be positive for malignant cells. The overall node-based sensitivity, specificity, PPV, NPV, and accuracy of PET/CT were 72% (13/18), 99.7% (1060/1063), 81% (13/16), 99.5% (1060/1065), and 99.3% (1073/1081), respectively. Corresponding values for PET/CT-based diagnosis of lymph nodes >0.5 cm in diameter were 100% (13/13), 99.6% (675/678), 81% (13/16), 100% (675/675), and 99.6% (688/691), respectively. The overall patient-based sensitivity, specificity, PPV, NPV, and accuracy of PET/CT were 73% (11/15), 97% (31/32), 92% (11/12), 89% (31/35), and 89% (42/47), respectively.	2
69. Grigsby PW. PET/CT imaging to guide cervical cancer therapy. *Future Oncol.* 2009;5(7):953-958.	Review/Other-Dx	N/A	To review use of PET/CT imaging in the management of patients with carcinoma of the uterine cervix.	PET imaging defines the extent of the disease at diagnosis. It aids in selecting therapy, such as surgery, radiation therapy, chemotherapy or combinations thereof. For radiotherapy, the metabolically active disease can be specifically targeted with radiotherapy planning. Once therapy is complete, FDG-PET is utilized to evaluate the metabolic response to therapy. The 3-month post-therapy PET scan has been demonstrated to be highly predictive of long-term survival outcome. Surveillance after completion of therapy and evaluation of clinically suspected recurrent disease are also uses of FDG-PET in patients with cervical cancer.	4

Evidence Table Key

Abbreviations Key

Study Quality Category Definitions

- *Category 1* The study is well-designed and accounts for common biases.

- *Category 2* The study is moderately well-designed and accounts for most common biases.

- *Category 3* There are important study design limitations.

- *Category 4* The study is not useful as primary evidence. The article may not be a clinical study or the study design is invalid, or conclusions are based on expert consensus. For example:

  a) the study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description);
  b) the study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence;
  c) the study is an expert opinion or consensus document.

- M = Meta-analysis

Dx = Diagnostic

Tx = Treatment

ADC = Apparent diffusion coefficient

AUC = Areas under the receiver operating characteristic curve

CI = Confidence interval

CT = Computed tomography

DFS = Disease-free survival

DWI = Diffusion-weighted imaging

FDG-PET = Fluorine-18-2-fluoro-2-deoxy-D-glucose-positron emission tomography

HR = Hazard ratio

MRI = Magnetic resonance imaging

NPV = Negative predictive value

OS = Overall survival

PPV = Positive predictive value

ROC = Receiver-operator characteristic

SUV = Standardized uptake value

SUV_{max} = Maximum standardized uptake value

TRUS = Transrectal ultrasound

US = Ultrasound