Supplementary

Table S1 Overview of quality assessment of literature

Subject of assessment	Number of studies
Total abstracts reviewed	352
Total full articles retrieved	115
Total studies included	84
Used training/testing set	82
Did not use or mention training/testing set	2
Inclusion of separate validation/hold-out/cross validation sample	68
Inclusion of only one measure of performance	37
Algorithms compared across accuracy only	9
Algorithms compared across AUC only	25
Algorithms compared across sensitivity/specificity only	3
Did not mention image quality	45
Lack of image quality assessment	11
Evaluated and excluded images	22
Evaluated but included poor quality images	6

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Table S2 Studies included in this meta-analysis

1. Akselrod-Ballin A, Chorev M, Shoshan Y, *et al.* Predicting Breast Cancer by Applying Deep Learning to Linked Health Records and Mammograms. Radiology. 2019;292(2):331-342. doi:10.1148:radiol.2019182622
2. Aldoj N, Lukas S, Dewey M, Penzkofer T. Semi-automatic classification of prostate cancer on multi-parametric MR imaging using a multi-channel 3D convolutional neural network. Eur Radiol. 202030(2):1243-1253.
3. Antonelli M, Johnston EW, Dikaios N, *et al.* Machine learning classifiers can predict Gleason pattern 4 prostate cancer with greater accuracy than experienced radiologists Eur Radiol. 201929(9)-4754-4764
4. Ariji Y, Fukuda M, Kise Y, *et al.* Contrast-enhanced computed tomography image assessment of cervical lymph node metastasis in patients with oral cancer by using a deep learning system of artificial intelligence.
5. Ashraf AB, Gavenonis SC, Daye D, Mies C, Rosen MA, Kontos D. A multichannel Markov random field framework for tumor segmentation with an application to classification of gene expression-based breast cancer recurrence risk. IEEE Trans Med Imaging. 2013.
6. Becker AS, Marcon M, Ghafoor S, Wurnig MC, Frauenfelder T, Boss A. Deep Learning in Mammography: Diagnostic Accuracy of a Multipurpose Image Analysis Software in the Detection of Breast Cancer. Invest Radiol. 2017
7. Becker AS, Mueller M, Stoffel E, Marcon M, Ghafoor S, Boss A. Classification of breast cancer in ultrasound imaging using a generic deep learning analysis software- a pilot study. Br J Radiol. 2018;91(1083)-20170576. doi-10.1259:bjr.20170576
8. Beig N, Khorrami M, Alilou M, *et al.* Perinodular and Intranodular Radiomic Features on Lung CT Images Distinguish Adenocarcinomas from Granulomas. Radiology. 2019;290(3)-783-792. doi-10.1148:radiol.2018180910
9. Bickelhaupt S, Paech D, Kickingereder P, *et al.* Prediction of malignancy by a radiomic signature from contrast agent-free diffusion MRI in suspicious breast lesions found on screening mammography. J Magn Reson Imaging. 2017
10. Bonekamp D, Kohl S, Wiesenfarth M, *et al.* Radiomic Machine Learning for Characterization of Prostate Lesions with MRI- Comparison to ADC Values. Radiology. 2018;289(1)-128-137. doi-10.1148:radiol.2018173064
11. Buda M, Wildman-Tobriner B, Hoang JK, *et al.* Management of Thyroid Nodules Seen on US Images: Deep Learning May Match Performance of Radiologists. Radiology. 2019;292(3):695-701. doi:10.1148:radiol.2019181343
12. Byra M, Galperin M, Ojeda-Fournier H, *et al.* Breast mass classification in sonography with transfer learning using a deep convolutional neural network and color conversion. Med Phys. 2019;46(2):746-755. doi:10.1002:mp.13361
13. Cha MJ, Chung MJ, Lee JH, Lee KS. Performance of Deep Learning Model in Detecting Operable Lung Cancer With Chest Radiographs. J Thorac Imaging. 2019;34(2)-86-91. doi-10.1097
14. Chen K, Nie Y, Park S, *et al.* Development and Validation of Machine Learning-based Model for the Prediction of Malignancy in Multiple Pulmonary Nodules: Analysis from Multicentric Cohorts. Clin Cancer Res. 2021;27(8):2255-2265. doi:10.1158/1078-0432.CCR-20-4007
15. Choi JS, Han BK, Ko ES, *et al.* Effect of a Deep Learning Framework-Based Computer-Aided Diagnosis System on the Diagnostic Performance of Radiologists in Differentiating between Malignant and Benign Masses on Breast Ultrasonography. Korean J Radio
16. Corral JE, Hussein S, Kandel P, Bolan CW, Bagci U, Wallace MB. Deep Learning to Classify Intraductal Papillary Mucinous Neoplasms Using Magnetic Resonance Imaging. Pancreas. 2019;48(6):805-810. doi:10.1097:MPA.0000000000001327
17. Daimiel Naranjo I, Gibbs P, Reiner JS, *et al.* Breast Lesion Classification with Multiparametric Breast MRI Using Radiomics and Machine Learning: A Comparison with Radiologists' Performance. Cancers (Basel). 2022;14(7):1743. Published 2022 Mar 29. doi:10.3390/cancers14071743
18. Elmohr MM, Fuentes D, Habra MA, *et al.* Machine learning-based texture analysis for differentiation of large adrenal cortical tumours on CT. Clin Radiol. 2019;74(10):818.e1-818.e7. doi:10.1016:j.crad.2019.06.021.pdf
19. Fujioka T, Kubota K, Mori M, *et al.* Distinction between benign and malignant breast masses at breast ultrasound using deep learning method with convolutional neural network. Jpn J Radiol. 2019;37(6):466-472. doi:10.1007:s11604-019-00831-5
20. Gatos I, Tsantis S, Spiliopoulos S, *et al.* Temporal stability assessment in shear wave elasticity images validated by deep learning neural network for chronic liver disease fibrosis stage assessment. Med Phys. 2019;46(5).pdf
21. Gong J, Liu J, Hao W, Nie S, Wang S, Peng W. Computer-aided diagnosis of ground-glass opacity pulmonary nodules using radiomic features analysis. Phys Med Biol. 2019;64(13):135015. Published 2019 Jul 5. doi:10.1088:1361-6560:ab2757.pdf
22. Hamm CA, Wang CJ, Savic LJ, *et al.* Deep learning for liver tumor diagnosis part I- development of a convolutional neural network classifier for multi-phasic MRI. Eur Radiol. 2019;29(7)-3338-3347. doi-10.1007:s00330-019-06205-9
23. Jiang H, Liu X, Chen J, *et al.* Man or machine? Prospective comparison of the version 2018 EASL, LI-RADS criteria and a radiomics model to diagnose hepatocellular carcinoma. Cancer Imaging. 2019;19(1)84. Published 2019 Dec 5
24. Jun Y, Eo T, Kim T, *et al.* Deep-learned 3D black-blood imaging using automatic labelling technique and 3D convolutional neural networks for detecting metastatic brain tumors. Sci Rep. 2018;8(1)-9450. Published 2018 Jun 21. doi-10.1038:s41598-01.
25. Juntu J, Sijbers J, De Backer S, Rajan J, Van Dyck D. Machine learning study of several classifiers trained with texture analysis features to differentiate benign from malignant soft-tissue tumors in T1-MRI images. J Magn Reson Imaging. 2010;31(3
26. Kniep HC, Madesta F, Schneider T, *et al.* Radiomics of Brain MRI- Utility in Prediction of Metastatic Tumor Type. Radiology. 2019;290(2)-479-487. doi-10.1148:radiol.2018180946
27. Kooi T, Litjens G, van Ginneken B, *et al.* Large scale deep learning for computer aided detection of mammographic lesions. Med Image Anal. 2017;35:303-312. doi:10.1016:j.media.2016.07.007
28. Land WH, Margolis D, Gottlieb R, Krupinski EA, Yang JY. Improving CT prediction of treatment response in patients with metastatic colorectal carcinoma using statistical learning theory. BMC Genomics. 2010;11 Suppl 3(Suppl 3)-S15. Published 20
29. Lee E, Ha H, Kim HJ, *et al.* Differentiation of thyroid nodules on US using features learned and extracted from various convolutional neural networks. Sci Rep. 2019;9(1)-19854. Published 2019 Dec 27. doi-10.1038:s41598-019-56395-x.
30. Lee HJ, Nguyen AT, Ki SY, *et al.* Classification of MR-Detected Additional Lesions in Patients With Breast Cancer Using a Combination of Radiomics Analysis and Machine Learning. Front Oncol. 2021;11:744460. Published 2021 Dec 2. doi:10.3389/fonc.2021.744460
31. Li L, Liu Z, Huang H, Lin M, Luo D. Evaluating the performance of a deep learning-based computer-aided diagnosis (DL-CAD) system for detecting and characterizing lung nodules Comparison with the performance of double reading by radiologists.
32. Li Y, Jian J, Pickhardt PJ, *et al.* MRI-Based Machine Learning for Differentiating Borderline From Malignant Epithelial Ovarian Tumors: A Multicenter Study [published online ahead of print, 2020 Feb 11]. J Magn Reson Imaging. 2020
33. Lu Y, Liu L, Luan S, Xiong J, Geng D, Yin B. The diagnostic value of texture analysis in predicting WHO grades of meningiomas based on ADC maps: an attempt using decision tree and decision forest. Eur Radiol. 2019
34. Luo Y, Chen X, Chen J, *et al.* Preoperative Prediction of Pancreatic Neuroendocrine Neoplasms Grading Based on Enhanced Computed Tomography Imaging- Validation of Deep Learning with a Convolutional Neural Network. Neuroendocrinology. 20
35. Ma X, Hadjiiski LM, Wei J, *et al.* U-Net based deep learning bladder segmentation in CT urography. Med Phys. 2019;46(4)-1752-1765. doi-10.1002:mp.13438
36. Ma X, Wei J, Zhou C, *et al.* Automated pectoral muscle identification on MLO-view mammograms- Comparison of deep neural network to conventional computer vision. Med Phys. 2019;46(5)-2103-2114. doi-10.1002:mp.13451
37. Ma, J., He, N., Yoon, J. H., Ha, R., Li, J., Ma, W., Meng, T., Lu, L., Schwartz, L. H., Wu, Y., Ye, Z., Wu, P., Zhao, B., & Xie, C. (2021). Distinguishing benign and malignant lesions on contrast-enhanced breast cone-beam CT with deep learning neural architecture search. European journal of radiology, 142, 109878. https://doi.org/10.1016/j.ejrad.2021.109878
38. Malek M, Gity M, Alidoosti A, *et al.* A machine learning approach for distinguishing uterine sarcoma from leiomyomas based on perfusion weighted MRI parameters. Eur J Radiol. 2019;110:203-211. doi:10.1016:j.ejrad.2018.11.009
39. Mao N, Yin P, Wang Q, *et al.* Added Value of Radiomics on Mammography for Breast Cancer Diagnosis: A Feasibility Study. J Am Coll Radiol. 2019;16(4 Pt A):485-491. doi:10.1016:j.jacr.2018.09.041
40. Michael E, Ma H, Li H, Qi S. An Optimized Framework for Breast Cancer Classification Using Machine Learning. Biomed Res Int. 2022;2022:8482022. Published 2022 Feb 18. doi:10.1155/2022/8482022
41. Molloi S, Ding H, Feig S. Breast density evaluation using spectral mammography, radiologist reader assessment, and segmentation techniques- a retrospective study based on left and right breast comparison. Acad Radiol. 2015;22(8)-1052-1059.
42. Nakagawa M, Nakaura T, Namimoto T, *et al.* A multiparametric MRI-based machine learning to distinguish between uterine sarcoma and benign leiomyoma: comparison with 18F-FDG PET:CT. Clin Radiol. 2019;74(2):167.e1-167.e7. doi:10.1016:j.crad.2018.10.010
43. Nakagawa M, Nakaura T, Namimoto T, *et al.* Machine learning based on multi-parametric magnetic resonance imaging to differentiate glioblastoma multiforme from primary cerebral nervous system lymphoma. Eur J Radiol. 2018
44. Nakagawa M, Nakaura T, Namimoto T, *et al.* Machine Learning to Differentiate T2-Weighted Hyperintense Uterine Leiomyomas from Uterine Sarcomas by Utilizing Multiparametric Magnetic Resonance Quantitative Imaging Features. Acad Radiol. 2019
45. Nam JG, Park S, Hwang EJ, *et al.* Development and Validation of Deep Learning-based Automatic Detection Algorithm for Malignant Pulmonary Nodules on Chest Radiographs. Radiology
46. Nikpanah M, Xu Z, Jin D, *et al.* A deep-learning based artificial intelligence (AI) approach for differentiation of clear cell renal cell carcinoma from oncocytoma on multi-phasic MRI. Clin Imaging. 2021;77:291-298. doi:10.1016/j.clinimag.2021.06.016
47. Nishio M, Nishizawa M, Sugiyama O, *et al.* Computer-aided diagnosis of lung nodule using gradient tree boosting and Bayesian optimization. PLoS One
48. O'Connell AM, Bartolotta TV, Orlando A, Jung SH, Baek J, Parker KJ. Diagnostic Performance of an Artificial Intelligence System in Breast Ultrasound. J Ultrasound Med. 2022;41(1):97-105. doi:10.1002/jum.15684
49. Patel BK, Ranjbar S, Wu T, *et al.* Computer-aided diagnosis of contrast-enhanced spectral mammography: A feasibility study. Eur J Radiol. 2018;98:207-213. doi:10.1016:j.ejrad.2017.11.024
50. Payabvash S, Aboian M, Tihan T, Cha S. Machine Learning Decision Tree Models for Differentiation of Posterior Fossa Tumors Using Diffusion Histogram Analysis and Structural MRI Findings. Front Oncol. 2020;10-71. Published 2020 Feb 7. doi-10.3389
51. Prior FW, Fouke SJ, Benzinger T, *et al.* Predicting a multi-parametric probability map of active tumor extent using random forests. Conf Proc IEEE Eng Med Biol Soc. 2013;2013:6478-6481. doi:10.1109:EMBC.2013.6611038.
52. Rajpurkar P, Irvin J, Ball RL, Zhu K, Yang B, Mehta H, Duan T, Ding D, Bagul A, Langlotz CP, Patel BN, Yeom KW, Shpanskaya K, Blankenberg FG, Seekins J, Amrhein TJ, Mong DA, Halabi SS, Zucker EJ, Ng AY, Lungren MP. Deep learning for chest radiograph diagnosis: A retrospective comparison of the CheXNeXt algorithm to practicing radiologists. PLoS Med. 2018 Nov 20;15(11):e1002686. doi: 10.1371/journal.pmed.1002686. PMID: 30457988; PMCID: PMC6245676.
53. Ren T, Cattell R, Duanmu H, Huang P, Li H, Vanguri R, Liu MZ, Jambawalikar S, Ha R, Wang F, Cohen J, Bernstein C, Bangiyev L, Duong TQ. Convolutional Neural Network Detection of Axillary Lymph Node Metastasis Using Standard Clinical Breast MRI. Clin Breast Cancer. 2020 Jun;20(3):e301-e308. doi: 10.1016/j.clbc.2019.11.009. Epub 2019 Dec 5. PMID: 32139272.
54. Reyad YA, Berbar MA, Hussain M. Comparison of statistical, LBP, and multi-resolution analysis features for breast mass classification. J Med Syst. 2014 Sep;38(9):100. doi: 10.1007/s10916-014-0100-7. Epub 2014 Jul 19. PMID: 25037713.
55. Romeo V, Cuocolo R, Apolito R, *et al.* Clinical value of radiomics and machine learning in breast ultrasound: a multicenter study for differential diagnosis of benign and malignant lesions. Eur Radiol. 2021;31(12):9511-9519. doi:10.1007/s00330-021-08009-2
56. Romeo V, Maurea S, Cuocolo R, Petretta M, Mainenti PP, Verde F, Coppola M, Dell'Aversana S, Brunetti A. Characterization of Adrenal Lesions on Unenhanced MRI Using Texture Analysis: A Machine-Learning Approach. J Magn Reson Imaging. 2018 Jul;48(1):198-204. doi: 10.1002/jmri.25954. Epub 2018 Jan 17. PMID: 29341325.
57. Saha A, Grimm LJ, Ghate SV, Kim CE, Soo MS, Yoon SC, Mazurowski MA. Machine learning-based prediction of future breast cancer using algorithmically measured background parenchymal enhancement on high-risk screening MRI. J Magn Reson Imaging. 2019 Aug;50(2):456-464. doi: 10.1002/jmri.26636. Epub 2019 Jan 16. PMID: 30648316; PMCID: PMC6625842.
58. Schaffter T, Buist DSM, Lee CI, Nikulin Y, Ribli D, Guan Y, Lotter W, Jie Z, Du H, Wang S, Feng J, Feng M, Kim HE, Albiol F, Albiol A, Morrell S, Wojna Z, Ahsen ME, Asif U, Jimeno Yepes A, Yohanandan S, Rabinovici-Cohen S, Yi D, Hoff B, Yu T, Chaibub Neto E, Rubin DL, Lindholm P, Margolies LR, McBride RB, Rothstein JH, Sieh W, Ben-Ari R, Harrer S, Trister A, Friend S, Norman T, Sahiner B, Strand F, Guinney J, Stolovitzky G; and the DM DREAM Consortium, Mackey L, Cahoon J, Shen L, Sohn JH, Trivedi H, Shen Y, Buturovic L, Pereira JC, Cardoso JS, Castro E, Kalleberg KT, Pelka O, Nedjar I, Geras KJ, Nensa F, Goan E, Koitka S, Caballero L, Cox DD, Krishnaswamy P, Pandey G, Friedrich CM, Perrin D, Fookes C, Shi B, Cardoso Negrie G, Kawczynski M, Cho K, Khoo CS, Lo JY, Sorensen AG, Jung H. Evaluation of Combined Artificial Intelligence and Radiologist Assessment to Interpret Screening Mammograms. JAMA Netw Open. 2020 Mar 2;3(3):e200265. doi: 10.1001/jamanetworkopen.2020.0265. Erratum in: JAMA Netw Open. 2020 Mar 2;3(3):e204429. PMID: 32119094; PMCID: PMC7052735.
59. Shin I, Kim YJ, Han K, Lee E, Kim HJ, Shin JH, Moon HJ, Youk JH, Kim KG, Kwak JY. Application of machine learning to ultrasound images to differentiate follicular neoplasms of the thyroid gland. Ultrasonography. 2020 Jul;39(3):257-265. doi: 10.14366/usg.19069. Epub 2020 Feb 29. PMID: 32299197; PMCID: PMC7315296.
60. Stanzione A, Cuocolo R, Del Grosso R, Nardiello A, Romeo V, Travaglino A, Raffone A, Bifulco G, Zullo F, Insabato L, Maurea S, Mainenti PP. Deep Myometrial Infiltration of Endometrial Cancer on MRI: A Radiomics-Powered Machine Learning Pilot Study. Acad Radiol. 2021 May;28(5):737-744. doi: 10.1016/j.acra.2020.02.028. Epub 2020 Mar 28. PMID: 32229081.
61. Suh HB, Choi YS, Bae S, Ahn SS, Chang JH, Kang SG, Kim EH, Kim SH, Lee SK. Primary central nervous system lymphoma and atypical glioblastoma: Differentiation using radiomics approach. Eur Radiol. 2018 Sep;28(9):3832-3839. doi: 10.1007/s00330-018-5368-4. Epub 2018 Apr 6. PMID: 29626238.
62. Sun C, Zhang Y, Chang Q, Liu T, Zhang S, Wang X, Guo Q, Yao J, Sun W, Niu L. Evaluation of a deep learning-based computer-aided diagnosis system for distinguishing benign from malignant thyroid nodules in ultrasound images. Med Phys. 2020 Sep;47(9):3952-3960. doi: 10.1002/mp.14301. Epub 2020 Jun 25. PMID: 32473030.
63. Sun W, Zheng B, Qian W. Automatic feature learning using multichannel ROI based on deep structured algorithms for computerized lung cancer diagnosis. Comput Biol Med. 2017 Oct 1;89:530-539. doi: 10.1016/j.compbiomed.2017.04.006. Epub 2017 Apr 13. PMID: 28473055.
64. Sun XY, Feng QX, Xu X, Zhang J, Zhu FP, Yang YH, Zhang YD. Radiologic-Radiomic Machine Learning Models for Differentiation of Benign and Malignant Solid Renal Masses: Comparison With Expert-Level Radiologists. AJR Am J Roentgenol. 2020 Jan;214(1):W44-W54. doi: 10.2214/AJR.19.21617. Epub 2019 Sep 25. PMID: 31553660.
65. Trivizakis E, Ioannidis GS, Melissianos VD, Papadakis GZ, Tsatsakis A, Spandidos DA, Marias K. A novel deep learning architecture outperforming 'off-the-shelf' transfer learning and feature-based methods in the automated assessment of mammographic breast density. Oncol Rep. 2019 Nov;42(5):2009-2015. doi: 10.3892/or.2019.7312. Epub 2019 Sep 12. PMID: 31545461; PMCID: PMC6787954.
66. Uhlig J, Biggemann L, Nietert MM, *et al.* Discriminating malignant and benign clinical T1 renal masses on computed tomography A pragmatic radiomics and machine learning approach. Medicine (Baltimore). 202099(16)e19725.pdf
67. Urushibara A, Saida T, Mori K, *et al.* The efficacy of deep learning models in the diagnosis of endometrial cancer using MRI: a comparison with radiologists. BMC Med Imaging. 2022;22(1):80. Published 2022 Apr 30. doi:10.1186/s12880-022-00808-3
68. Urushibara, A., Saida, T., Mori, K., Ishiguro, T., Sakai, M., Masuoka, S., Satoh, T., & Masumoto, T. (2021). Diagnosing uterine cervical cancer on a single T2-weighted image: Comparison between deep learning versus radiologists. European journal of radiology, 135, 109471. https://doi.org/10.1016/j.ejrad.2020.109471
69. von Schacky CE, Wilhelm NJ, Schäfer VS, *et al.* Development and evaluation of machine learning models based on X-ray radiomics for the classification and differentiation of malignant and benign bone tumors [published online ahead of print, 2022 Apr 9]. Eur Radiol. 2022;10.1007/s00330-022-08764-w. doi:10.1007/s00330-022-08764-w
70. Vos M, Starmans MPA, Timbergen MJM, van der Voort SR, Padmos GA, Kessels W, Niessen WJ, van Leenders GJLH, Grünhagen DJ, Sleijfer S, Verhoef C, Klein S, Visser JJ. Radiomics approach to distinguish between well differentiated liposarcomas and lipomas on MRI. Br J Surg. 2019 Dec;106(13):1800-1809. doi: 10.1002/bjs.11410. PMID: 31747074; PMCID: PMC6899528.
71. Wang R, Cai Y, Lee IK, Hu R, Purkayastha S, Pan I, Yi T, Tran TML, Lu S, Liu T, Chang K, Huang RY, Zhang PJ, Zhang Z, Xiao E, Wu J, Bai HX. Evaluation of a convolutional neural network for ovarian tumor differentiation based on magnetic resonance imaging. Eur Radiol. 2021 Jul;31(7):4960-4971. doi: 10.1007/s00330-020-07266-x
72. Wang T, Gong J, Li Q, Chu C, Shen W, Peng W, Gu Y, Li W. A combined radiomics and clinical variables model for prediction of malignancy in T2 hyperintense uterine mesenchymal tumors on MRI. Eur Radiol. 2021 Aug;31(8):6125-6135. doi: 10.1007/s00330-020-07678-9.
73. Wang Y, Choi EJ, Choi Y, Zhang H, Jin GY, Ko SB. Breast Cancer Classification in Automated Breast Ultrasound Using Multiview Convolutional Neural Network with Transfer Learning. Ultrasound Med Biol. 2020 May;46(5):1119-1132. doi: 10.1016/j.ultrasmedbio.2020.01.001. Epub 2020 Feb 12. PMID: 32059918.
74. Wei L, Yang Y, Nishikawa RM, Jiang Y. A study on several machine-learning methods for classification of malignant and benign clustered microcalcifications. IEEE Trans Med Imaging. 2005 Mar;24(3):371-80. doi: 10.1109/tmi.2004.842457. PMID: 15754987.
75. Wu E, Hadjiiski LM, Samala RK, Chan HP, Cha KH, Richter C, Cohan RH, Caoili EM, Paramagul C, Alva A, Weizer AZ. Deep Learning Approach for Assessment of Bladder Cancer Treatment Response. Tomography. 2019 Mar;5(1):201-208. doi: 10.18383/j.tom.2018.00036. PMID: 30854458; PMCID: PMC6403041.
76. Wu M, Krishna S, Thornhill RE, Flood TA, McInnes MDF, Schieda N. Transition zone prostate cancer: Logistic regression and machine-learning models of quantitative ADC, shape and texture features are highly accurate for diagnosis. J Magn Reson Imaging. 2019 Sep;50(3):940-950. doi: 10.1002/jmri.26674. Epub 2019 Jan 30. PMID: 30701625.
77. Yala A, Lehman C, Schuster T, Portnoi T, Barzilay R. A Deep Learning Mammography-based Model for Improved Breast Cancer Risk Prediction. Radiology. 2019 Jul;292(1):60-66. doi: 10.1148/radiol.2019182716. Epub 2019 May 7. PMID: 31063083.
78. Yanagawa M, Niioka H, Hata A, Kikuchi N, Honda O, Kurakami H, Morii E, Noguchi M, Watanabe Y, Miyake J, Tomiyama N. Application of deep learning (3-dimensional convolutional neural network) for the prediction of pathological invasiveness in lung adenocarcinoma: A preliminary study. Medicine (Baltimore). 2019 Jun;98(25):e16119. doi: 10.1097/MD.0000000000016119. PMID: 31232960; PMCID: PMC6636940.
79. Zhang XP, Wang ZL, Tang L, Sun YS, Cao K, Gao Y. Support vector machine model for diagnosis of lymph node metastasis in gastric cancer with multidetector computed tomography: a preliminary study. BMC Cancer. 2011 Jan 11;11:10. doi: 10.1186/1471-2407-11-10. PMID: 21223564; PMCID: PMC3025970
80. Zhao CK, Ren TT, Yin YF, *et al.* A Comparative Analysis of Two Machine Learning-Based Diagnostic Patterns with Thyroid Imaging Reporting and Data System for Thyroid Nodules: Diagnostic Performance and Unnecessary Biopsy Rate. Thyroid. 2021;31(3):470-481. doi:10.1089/thy.2020.0305
81. Zhao HB, Liu C, Ye J, *et al.* A comparison between deep learning convolutional neural networks and radiologists in the differentiation of benign and malignant thyroid nodules on CT images. Endokrynol Pol. 2021;72(3):217-225. doi:10.5603/EP.a2021.0015
82. Zhao SS, Feng XL, Hu YC, Han Y, Tian Q, Sun YZ, Zhang J, Ge XW, Cheng SC, Li XL, Mao L, Shen SN, Yan LF, Cui GB, Wang W. Better efficacy in differentiating WHO grade II from III oligodendrogliomas with machine-learning than radiologist's reading from conventional T1 contrast-enhanced and fluid attenuated inversion recovery images. BMC Neurol. 2020 Feb 7;20(1):48. doi: 10.1186/s12883-020-1613-y. PMID: 32033580; PMCID: PMC7007642.
83. Zhao X, Zhou Y, Zhang Y, *et al.* Radiomics Based on Contrast-Enhanced MRI in Differentiation Between Fat-Poor Angiomyolipoma and Hepatocellular Carcinoma in Noncirrhotic Liver: A Multicenter Analysis. Front Oncol. 2021;11:744756. Published 2021 Oct 13. doi:10.3389/fonc.2021.744756
84. Zhou ZG, Liu F, Jiao LC, Wang ZL, Zhang XP, Wang XD, Luo XZ. An evidential reasoning based model for diagnosis of lymph node metastasis in gastric cancer. BMC Med Inform Decis Mak. 2013 Nov 6;13:123. doi: 10.1186/1472-6947-13-123. PMID: 24195733; PMCID: PMC3827004