

SUPPLEMENTARY TABLE 1: SUMMARY OF 283 CDSS STUDIES WITH ML AND DL METHODOLOGIES

<u>AUTHORS</u>	<u>YEAR</u>	<u>JOURNAL</u>	<u>TYPES OF AI METHODOLOGY</u>		<u>SPECIALTY</u>	<u>CDSS APPLICATION</u>	<u>Prediction Performance (CA/AUC)</u>	<u>EFFECT ON PROCESS</u>	<u>PATIENT OUTCOME</u>
Alyahya MS, Hijazi HH, Alshraideh HA, Al-Nasser AD	2017	Inform Health Soc Care	ML	DTs model	Multidisciplinary	Association between the length of stay and potentially avoidable readmissions	78.52%/-	NO	NO
Amaral JLM, Lopes AJ, Veiga J, Faria ACD, and Melo PL	2017	Comput Methods Programs Biomed	ML	k-NN , RF, AdaBoost	Pulmonary	Detection of airway obstruction in asthma	90%/91%	YES	NO
Bian J, Morid MA, Jonnalagadda S, Luo G, Del Fiol G	2017	J Biomed Inform	ML and Bayesian		Multidisciplinary	Automatic identification of high impact PubMed articles	-/-	NO	NO
Brown AD, Marotta TR	2017	J Am Med Inform Assoc	ML	SVM, GBM, RFM	Radiology	MRI protocol selection	95%/-	NO	NO
Brown AD, Marotta TR	2017	Acad Radiol	ML and NLP	RF, SVM, or k-NN	Radiology	Automate MRI Brain Protocol Selection and Prioritization	88.2%/-	NO	NO
Buchlak QD, Yanamadala V, Leveque JC, Edwards A, Nold K, Sethi R	2017	J Clin Neurosci	ML	LRA	Surgery	Predicting 30-day complication risk in adult spinal deformity surgery	75%/71.2%	NO	NO
Che Z, Purushotham S, Khemani R, Liu Y	2017	AMIA Annu Symp Proc	DL	Multilayer NN	Critical Care	ICU outcome prediction	-/78.98%	NO	NO
Choi E, Schuetz A, Stewart WF, Sun J	2017	J Am Med Inform Assoc	DL and ML	RNN, MLP, SVM, k-NN	Cardiology	Heart failure onset	-/88.3%	NO	NO
Connolly B, Cohen KB, Santel D, Bayram U, Pestian J	2017	BMC Bioinformatics	ML and Bayesian	SVM, k-means classifier	Multidisciplinary	A novel method for calibrating ML scores to probabilities in clinical decision support	-/-	NO	NO
Davis SE, Lasko TA, Chen G, Siew ED, Matheny ME	2017	J Am Med Inform Assoc	ANN, ML, Bayesian		Critical Care	Whether a patient will develop acute kidney injury during a hospital admission	-/76%	NO	NO
Desautels T, Calvert J, Hoffman J, Mao Q, Jay M, Fletcher G, Barton C, Chettipally U, Kerem Y, Das R.	2017	Biomed Inform Insights	ML	Ensemble of decision tress	Multidisciplinary	Patient-derived health data with outcomes of interest, such as in-hospital mortality	-/76%	NO	NO
Devarakonda MV, Mehta N, Tsou CH, Liang JJ, Nowacki AS, Jelovsek JE.	2017	Int J Med Inform	ML and NLP	IBM Watson	Multidisciplinary	Automatic problem list generation	79.9%/-	NO	NO
Esteva A, Kuprel B, Novoa RA Ko J, Swetter SM, Blau HM, Thrun S	2017	Nature	ANN	CNN	Dermatology	Dermatology-level classification of skin cancer	72.1%/91%	NO	NO
Farhan W, Wang Z, Huang Y, Wang S, Wang F, Jiang X.	2017	JMIR Med Inform	ML	SVM, linear regression, and DTs	Multidisciplinary	A sequential predictive model for medical events based on this new representation	-/79%	NO	NO
Ferroni P, Zanzotto FM, Scarpato N, Riondino S, Nanni U, Roselli M, Guadagni F	2017	Med Decis Making	ML	SVM, random optimization model	Oncology	Venous thromboembolism (VTE) risk predictors for cancer outpatients	-/-	NO	NO
Forkan AR, Khalil I	2017	Comput Methods Programs Biomed	ML	Weka Software	Multidisciplinary	A clinical decision support system for vital sign predictions	77.7%/-	NO	NO

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Garcia-Chimeno Y, Garcia-Zapirain B, Gomez-Beldarrain M, Fernandez-Ruanova B, Garcia-Monco JC	2017	BMC Medical Info and Deci Making	ML and Bayesian	RF, SVM	Neurology	Migraine classification	95%/-	NO	NO
Halpern Y, Horng S, Choi Y, Sontag D	2017	J Am Med Inform Assoc	ML	LRA	Multidisciplinary	Algorithm with phenotype definitions	-/97%	NO	NO
Hassanpour S, Bay G, Langlotz CP	2017	J Digit Imaging	ML and NLP	x	Radiology	Characterization of Change and Significance for Clinical Findings in Radiology Reports	99.2%/-	NO	NO
Hassanpour S, Langlotz CP, Amrhein TJ, Befera NT, Lungren MP.	2017	Artif Intell Med	ML and NLP	SVM	Radiology	Knee MRI report classifier	90.2%/-	NO	NO
Horng S, Sontag DA, Halpern Y, Jernite Y, Shapiro NI, Nathanson LA	2017	PLoS One	ML	SVM	Critical Care	Identify patients with suspected sepsis	-/86%	YES	NO
Huang MW, Chen CW, Lin WC, Ke SW, Tsai CF	2017	PLoS One	ML	SVM	Oncology	Breast cancer diagnosis	99.5%/-	NO	NO
Imbus JR, Randle RW, Pitt SC, Sippel RS, Schneider DF	2017	J Surg Res	ML	Weka 3.8.0	Surgery	Predict multigland parathyroid disease	94.1%/98.4%	NO	NO
Jalali A, Bender D, Rehman M, Nadkanri V, Nataraj C	2017	Conf Proc IEEE Eng Med Biol	ANN	x	Critical Care	Outcome prediction in intensive care unit	42%/-	NO	NO
Kam HJ, Kim HY	2017	Comput Biol Med	DNN	x	Critical Care	Early detection of sepsis	-/92.9%	NO	NO
Karaca Y, Zhang YD, Cattani C, Ayan U	2017	CNS Neurol Disord Drug Target	ML	x	Multidisciplinary	The differential diagnosis of multiple sclerosis	-/-	NO	NO
Kessler RC, Hwang I, Hoffmire CA, McCarthy JF, Petukhova MV, Rosellini AJ, Sampson NA, Schneider AL, Bradley PA, Katz IR, Thompson C,	2017	Int J Methods Psychiatr Res	ML	LRA	Multidisciplinary	Suicide risk prediction model in the VA hospital	-/-	NO	NO
Khastavaneh H, Ebrahimpour-Komleh H	2017	J Biomed Phys Eng	ANN	Massive training	Neurology	Automatic segmentation of multiple sclerosis lesion on MRI.	-/-	NO	NO
Kim SJ, Cho KJ, Oh S	2017	PLoS	ML	DT, RF, SVM, k-NN	Ophthalmology	Diagnosis of glaucoma.	98%/97.9%	NO	NO
Kyrgiou M, Pouliakis A, Panayiotides JG, Margari N, Bountris P, Valasoulis, Paraskevaidi M, Bilirakis E, Nasioutziki M, Loufopoulos A, Haritou M, Koutsouris DD, Karakitsos P, Paraskevaidis E	2017	Gynecol Oncol	ANN	MLP	Primary Care	Personalized management of women with cervical abnormalities	93%/-	NO	NO
Li X, Liu H, Yang J, Xie G, Xu M, Yang Y	2017	Stud Health Technol Inform	ML and Bayesian	Linear models, DT	Cardiology	Predict STEMI Mortality	-/85%	NO	NO
Li X, Liu H, Du X, Zhang P, Hu G, Xie G, Guo S, Xu M, Xie X	2017	AMIA Annu Symp Proc	ML and Bayesian	DT, generalized linear model	Cardiology	Predicting ischemic stroke and thromboembolism in atrial fibrillation	-/74%	NO	NO

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Li Q, Chan MF	2017	Ann N Y Acad Sci	ANN	MATLAB	Oncology	Accurate and effective applicability in the dosimetry	-/-	NO	NO
Libânio D, Dinis-Ribeiro M, Pimentel-Nunes P, Dias CC, Rodrigues PP	2017	Endosc Int Open	ML and Bayesian	LRA	Surgery	Predicting outcomes of gastric endoscopic submucosal dissection	-/80%	NO	NO
Lin FP, Pokorny A, Teng C, Dear R, Epstein RJ	2017	BMC Cancer	ML and Bayesian	SVM, MLR, k-NN, J48, alternating DT	Oncology	Decision-making for adjuvant breast cancer drug therapies	-/97.7%	NO	NO
Lingren T, Thaker V, Brady C, Namjou B, Kennebeck S, Bickel J, Patibandla N, Ni Y, Van Driest SL, Chen L, Roach A, Cobb B, Kirby J, Denny J, Bailey-Davis L, Williams MS, Marsolo K, Solti I, Holm IA, Harley J, Kohane IS, Savova G, Crimmins N	2017	Appl Clin Inform	ML and Bayesian	SVM	Pediatric	Accurately identify children with severe early onset childhood obesity	89.5%/-	NO	NO
Menti E, Lanera C, Lorenzoni G, Giachino DF, Marchi M, Gregori D, Berchiolla P	2017	AMIA Annu Symp Proc	ML and Bayesian	x	Multidisciplinary	Predict extra-intestinal manifestation	89%/-	NO	NO
Monsalve-Torra A, Ruiz-Fernandez D, Marin-Alonso O, Soriano-Payá A, Camacho-Mackenzie J, Carreño-Jaimes M	2017	J Biomed Inform	ANN	MLP	Surgery	Predicting in hospital mortality, open repair of abdominal aortic aneurysm	95%/-	NO	NO
Paydar K, Niakan Kalhori SR, Akbarian M, Sheikhtaheri A	2017	Int J Med Inform	ANN	x	Ob/Gyn	Prediction of pregnancy outcome in pregnant women with SLE	90.9%/-	NO	NO
Pearce CM, McLeod A, Patrick J, Boyle D, Shearer M, Eustace P, Pearce MC	2017	JMIR Res Protoc	ML	SVM	Primary Care	Generate a relative risk of patients presenting to an emergency department	-/-	NO	NO
Pranav Rajpurkar, Jeremy Irvin, Kaylie Zhu, Brandon Yang, Hershel Mehta, Tony Duan, Daisy Ding, Aarti Bagul, Curtis Langlotz, Katie Shpanskaya, Matthew P. Lungren, Andrew Y. Ng	2017	arXiv.org	ANN	CNN	Radiology	Radiologist-level pneumonia detection on chest x-rays	-/93.7%	NO	NO
Schiff GD, Volk LA, Volodarskaya M, Williams DH, Walsh L, Myers SG, Bates DW, Rozenblum R	2017	AM Med Inform Assoc	ML	MedAware	Multidisciplinary	Screening for medication errors	-/-	NO	NO
Spathis D, Vlamos P	2017	Health Informatics J	ML	RF	Pulmonary	Diagnosing asthma and chronic obstructive pulmonary disease	97.7%/-	NO	NO
Sudha M	2017	J Med Syst	ANN	x	Multidisciplinary	Breast cancer diagnosis, infertility diagnosis, heart disease diagnosis	97.6%/-	NO	NO
Szlosek DA, Ferrett J	2017	EGEMS	ML and NLP	SVM, DT Classifier, k-NNs classifier	Multidisciplinary	Accurately evaluate a clinical decision support rule through an EMR system	-/-	NO	NO

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Ting DSW, Cheung CY, Lim G, Tan GSW, Quang ND, Gan A, Hamzah H, Garcia-Franco, and 21 additional authors	2017	JAMA	DL	CNN	Ophthalmology	Screening for diabetic retinopathy and related eye disease.	-/98.3%	NO	NO
Trivedi H, Mesterhazy J, Laguna B, Vu T, Sohn JH	2017	J Digit Imaging	DL and ML	IBM Watson	Radiology	Need for IV contrast in musculoskeletal MRI	83.2%/-	NO	NO
Tseng HH, Luo Y, Cui S, Chien JT, Ten Haken RK, Naqa IE	2017	Med Phys	DRL	GAN, Deep Q-network	RadOnc	Automated radiation adaptation protocol	-/-	NO	NO
Valdes G, Simone CB 2nd, Chen J, Lin A, Yom SS, Pattison AJ, Carpenter CM, Solberg TD	2017	Radiother Oncol	ML	Classifier	Oncology	Radiotherapy treatment planning	-/-	NO	NO
Zhang B, He X, Ouyang F, Gu D, Dong Y, Zhang L, Mo X, Huang W, Tian J, Zhang	2017	Cancer Lett	ANN, ML, Bayesian	LR, SVM, AdaBoost, RF, k-NN, linear discriminate analysis	Oncology	Prognostic biomarker of advanced nasopharyngeal carcinoma.	-/84.6%	NO	NO
Zhang X, Yan LF, Hu YC, Li G, Yang Y, Han Y, Sun YZ, Liu ZC, Tian Q, Han ZY, Liu LD, Hu BQ, Qiu ZY, Wang W, Cui GB	2017	Oncotarget	ANN, ML, Bayesian	25 models tested	Oncology	Glioma grading system.	96.1%/-	NO	NO
Beaudoin M, Kabanza F, Nault V, Valiquette L	2016	Artif Intell Med	ML	x	Drug	Antimicrobial stewardship programs	-/-	YES	NO
Buzaev IV, Plechev VV, Nikolaeva IE, Galimova RM	2016	Chronic Dis Transl Med	NN	x	Surgery	Treatment choice between CABG and percutaneous coronary intervention	-/-	NO	NO
Gulshan V, Peng L, Coram M, Stumpe MC, Wu D, Narayanaswamy A, Venugopalan S, and 8 additional authors	2016	JAMA	DL	CNN	Ophthalmology	Detection of diabetic retinopathy	-/99.1%	NO	NO
Hassanpour S, Langlotz CP	2016	Artif Intell Med	ML and NLP	x	Radiology	Annotate radiology reports and extract report contents	-/-	NO	NO
Isma'eel HA, Cremer PC, Khalaf S, Almedawar MM, Elhajj IH, Sakr GE, Jaber WA.	2016	Int J Cardiovasc Imaging	ANN	x	Cardiology	Risk stratification for patients with suspected acute coronary syndromes.	-/-	NO	NO
Lee BJ, Kim JY	2016	IEE J Biomed Health Inform	ML and Bayesian	LRA	Primary Care	Identification of Type 2 diabetes risk factors	-/73.5%	NO	NO
Low YS, Gallego B, Shah NH	2016	J Comp Eff Res	ML	RF, LR	Multidisciplinary	Quick and accurate evidence for clinical decision support at the point of care	-/-	NO	NO
Lungu A, Swift AJ, Capener D, Kiely D, Hose R, Wild JM	2016	Pulm Circ	ML	DT	Pulmonary	Diagnosis of pulmonary hypertension	92%/-	YES	NO
Luo Y, Szolovits P, Dighe AS, Baron JM	2016	Am J Clin Pathol	ML	x	Laboratory	Predict lab results	-/97%	NO	NO

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McRae MP, Simmons G, Wong J, McDevitt JT	2016	Acc Chem Res	ML	machine and statistical learning	Cardiology	Heart attack and heart failure patients	-/-	NO	NO
Montazeri M, Montazeri M, Montazeri M, Beigzadeh A	2016	Technol Health Care	ANN and ML	RF, k-NN, AdaBoost, SVM, RBF network, MLP	Oncology	Breast cancer survival prediction.	96%/96%	NO	NO
Pestian JP, Grupp-Phelan J, Bretonnel Cohen K, Meyers G, Richey LA, Matykiewicz P, Sorter MT	2016	Suicide Life Threat Behavior	ML and NLP		ED	Examine the Language of Suicidal Adolescents in the Emergency Department	-/-	YES	NO
Pizarro RA, Cheng X, Barnett A, Lemaitre H, Verchinski BA, Goldman AL, Xiao and 5 additional authors	2016	Front Neuroinform	ML	SVM	Radiology	Automatic quality assessment of structural MRI	80%/-	NO	NO
Ruiz-Fernández D, Monsalve Torra A, Soriano-Payá A, Marín-Alonso	2016	Comput Methods Programs Bio	ANN and ML	MLP, DT	Surgery	Classifying the risk of congenital heart surgery	99%/-	NO	NO
Shan J, Alam SK, Garra B, Zhang Y, Ahmed T	2016	Ultrasound Med Biol	ANN and ML	DT, RF, SVM	Radiology	Computer aided diagnosis for breast ultrasound.	78.5%/83%	NO	NO
Soguero-Ruiz C, Hindberg K, Mora-Jiménez I, Rojo-Álvarez JL, Skråvseth SO, Godtliebsen F, Mortensen K, Revhaug A, Lindsetmo RO, Augestad KM, Jenssen R.	2016	J Biomed Inform	ML	SVM	Oncology	Predicting colorectal surgical complications using heterogeneous clinical data	92%/83%	NO	NO
Taylor RA, Pare JR, Venkatesh AK, Mowafi H, Melnick ER, Fleischman W, Hall MK	2016	Acad Emerg Med	ML	RF, CART, LR model	ED	Prediction of in-house mortality in emergency department patients with sepsis	-/86%	NO	NO
Valdes G, Solberg TD, Heskel M, Ungar L, Simone CB	2016	Phys Med Biol	ML	DT, RUSBoost	Oncology	Predict radiation pneumonitis in cancer patients treated with radiation therapy	-/-	NO	NO
Wang G, Lam KM, Deng Z, Choi KS	2016	Comput Biol Med	ANN, ML, Bayesian	Back propagation, RBF, extreme learning machine, SVM, k-NN	Surgery	Prediction of mortality after radical cystectomy for bladder cancer	80%/-	NO	NO
Wiharto W, Kusnanto H, Herianto H	2016	Healthc Inform Res	ML	DT	Cardiology	Diagnosis of coronary heart disease	-/84.2%	NO	NO
Al-Kadi OS	2015	Comput Med Imaging Graph	ML and Bayesian	SVM, k-NN	Pathology	Classification of histologic brain tumor	94.1%/-	NO	NO
Amaral JL, Lopes AJ, Faria AC, Melo PL	2015	Comput Methods Programs Biomed	ML	k-NN, RF, SVM	Pulmonary	Categorize the airway obstruction severity in chronic obstructive pulmonary disease	--/91%	YES	NO
Barbieri C, Molina M, Ponce P, Tothova M, Cattinelli I, Ion Titapiccolo J, and 7 additional authors	2015	Kidney Int	ANN	MLP	Surgery	Predicting the response to anemia treatment in patients undergoing dialysis	-/-	NO	NO

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Dai W, Brisimi TS, Adams WG, Mela T, Saligrama V, Paschalidis ICH	2015	Int J Med Inform	ML and Bayesian	SVM, AdaBoost, LR	Cardiology	Prediction of hospitalization due to heart disease	82%/-	NO	NO
Dugan TM, Mukhopadhyay S, Carroll A, Downs S	2015	Appl Clin Inform	ML and Bayesian	Random Tree, RF, J48, ID3	Pediatric	Predict childhood obesity	85%/-	NO	NO
Hoffman H, Lee SI, Garst JH, Lu DS, Li CH, Nagasawa DT, Ghalehsari N, Jahanforouz N, Razaghy M, Espinal M, Ghavamrezaii A, Paak BH, Wu I, Sarrafzadeh M, Lu DC	2015	J Clin Neurosci	ML	SVM, multivariate linear regression	Surgery	Predict functional outcome after surgery for cervical spondylitic myelopathy.	-/-	YES	NO
Jenny MA, Hertwig R, Ackermann S, Messmer AS, Karakoumis J, Nickel CH,, Bingisser R	2015	Acad Emerg Med	ANN, ML, Bayesian	17 learning models	Primary Care	Predictability of mortality, acute morbidity, and presence of acute infectious disease	82%/67%	YES	NO
Jiménez-Serrano S, Tortajada S, García-Gómez JM	2015	Telemed J E Health	ML and Bayesian	x	Ob/Gyn	Mobile health prediction of postpartum depression	-/-	NO	NO
V. Krishnaiah, G. Narsimha, N. Subhash Chandra	2015	Proceedings of the 49th Annual Conv of the Computer Society of India	ML	fuzzy k-NN	Cardiology	Heart disease prediction.	-/-	NO	NO
Kuusisto F, Dutra I, Elezaby M, Mendonça EA, Shavlik J, Burnside ES	2015	AMIA Jt Summits Transl Sci Proc	ML and Bayesian	x	Oncology	Estimating the probability of malignancy, a non-definitive breast core needle biopsy	-/-	NO	NO
Lagani V, Chiarugi F, Manousos D, Verma V, Fursse J, Marias K, Tsamardinos I	2015	J Diabetes Complications	ML and Bayesian	Regression algorithm, RF, SVM	Primary Care	Long-term risk assessment of diabetes-related complications	-/-	NO	NO
Launay CP, Rivière H, Kabeshova A, Beauchet O	2015	Eur J Intern Med	ANN	MLP	ED	Predicting prolonged length of hospital stay in older emergency department users.	-/-	YES	NO
Mamiya H, Schwartzman K, Verma A, Jauvin C, Behr M, Buckeridge D	2015	J Biomed Inform	ML	LR model	Primary Care	Predicting recent transmission of tuberculosis from patient attributes	-/65%	NO	NO
Marateb HR, Goudarzi S	2015	J Res Med Sci	ML	Fuzzy ruled-based, K-means clustering, multivariate LR	Cardiology	A non-invasive method for coronary artery disease	84%/-	NO	NO
Moradi E, Pepe A, Gaser C, Huttunen H, Tohka J	2015	Neuroimage	ML	RF	Radiology	Early MRI-based Alzheimer's conversion prediction	-/90.2%	NO	NO
Nguyen T, Nahavandi S, Creighton D, Khosravi A	2015	FEBS Lett	ML	Genetic algorithm	Oncology	Mass spectrometry cancer data classification	-/100%	NO	NO
Ogunyemi O, Kermah D	2015	AMIA Annu Symp Proc	ML	x	Ophthalmology	Detecting diabetic retinopathy	-/72%	NO	NO

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Pouliakis A, Karakitsou E, Chrelias C, Pappas A, Panayiotides I, Valasoulis, Kyrgiou M, Paraskevaidis E, Karakitsos P	2015	Biomed Res Int	ML	CART	Primary Care	Triage of women for referral to colposcopy and risk for cervical neoplasia	92%/-	NO	NO
Ranjith G, Parvathy R, Vikas V, Chandrasekharan K, Nair S	2015	Neuroradiol J	ANN and ML	MLP, SVM, RF, locally weighted learning	Radiology	Classification of gliomas	-/91%	NO	NO
Ravindran S, Jambek AB, Muthusamy H, Neoh SC	2015	Comput Math Methods Med	ML	Genetic algorithm, extreme learning machine	Ob/Gyn	Assessment of fetal well-being	98.8%/-	NO	NO
Roysden N, Wright A	2015	AMIA Annu Symp Proc	ML and NLP	RF	Psychiatry	Detect patients who may benefit from referral, for cost management	-/88%	NO	NO
Manjeevan Seera, Chee Peng Lim, Wei Shiung Liew, Einly Lim, Chu Kiong Loo	2015	Expert Systems with Applications	ML	9 models tested	Cardiology	Classification of electrocardiogram and auscultatory blood pressure signals	-/-	NO	NO
Sen I, Saraclar M, Kahya YP	2015	IEEE Trans Biomed Eng	ML	SVM, gaussian mixture model, hidden Markov	Pulmonary	Diagnostic classification of pulmonary sounds	85%/-	NO	NO
Shamir RR, Dolber T, Noecker AM, Walter BL, McIntyre CC	2015	Brain Stimul	ML and Bayesian	SVM, Naïve Bayes, and RF	Neurology	Optimizing combined stimulation and medication therapies for Parkinson's Disease	86%/-	NO	NO
Tsolaki E, Svolos P, Kousi E, Kapsalaki E, Fezoulidis I, Fountas K, Theodorou K, Kappas C, Tsougos I	2015	Int J Comput Assist Radiol Surg	ML	SVM	Radiology	Brain tumor classification and grading of brain tumors	89%/-	NO	NO
Tsoukalas A, Albertson T, Tagkopoulos I	2015	JMIR Med Inform	ML and Bayesian	x	Critical Care	Probabilistic machine learning approach to decision support for patients with sepsis	82%/70%	NO	NO
Wise ES, Hocking KM, Brophy CM	2015	J Vasc Surg	ANN and ML	Multiple LR	Surgery	Prediction of in-house mortality after ruptured abdominal aortic aneurysm repair	-/85%	NO	NO
Çelik G, Baykan ÖK, Kara Y, Tireli H	2014	J Stroke Cerebrovasc Dis	ANN and ML	MLP, multivariate discriminant analysis, LRA	Neurology	Predicting 10-day mortality in patients with stroke	87.8%/-	NO	NO
Choi SB, Kim WJ, Yoo TK, Park JS, Chung JW, Lee YH, Kang ES, Kim DW	2014	Comput Math Methods Med	ANN and ML	SVM	Primary Care	Screening for prediabetes	-/73.1%	NO	NO
Dheeba J, Albert Singh N, Tamil Selvi S	2014	J Biomed Inform	NN	Particle swarm optimized wavelet NN	Radiology	Computer assisted detection of breast cancer on mammogram	-/96.8%	NO	NO
Escandell-Montero P, Chermisi M, Martínez-Martínez JM, Gómez-Sanchis J, and 7 additional authors	2014	Artif Intell Med	ML	Markov decision, reinforcement learning	Surgery	Optimization of anemia treatment in hemodialysis patients	-/-	NO	NO
Soumadip Ghosh, Sujoy Mondal, Bhaskar Ghosh	2014	First Int Conf Automation (ACES)	ANN and ML	SVM, MLP	Pathology	Breast cancer detection	96%/-	NO	NO

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Guidi G, Pettenati MC, Melillo P, Iadanza E	2014	IEEE J Biomed Health Inform	ANN and ML	SVM, RF, regression tree	Cardiology	Heart failure patient assistance	87.6%/-	NO	NO
Gultepe E, Green JP, Nguyen H, Adams J, Albertson T, Tagkopoulos I	2014	J Am Med Inform Assoc	ML and Bayesian	SVM, gaussian mixture model, hidden Markov models	Critical Care	Identify patients at high risk for hyperlactatemia	73%/73%	NO	NO
Installé AJ, Van den Bosch T, De Moor B, Timmerman D	2014	JMIR Med Inform	ML	Weka Software	Multidisciplinary	Clinical diagnostic model research extracts diagnostic models from patient data	-/-	NO	NO
Keltch B, Lin Y, Bayrak C	2014	J Med Syst	ANN, ML, Bayesian	DT, LR	Radiology	AI techniques for prediction of liver fibrosis in hepatitis patients	-/-	NO	NO
Ying Kong, Hui-Juan Lu	2014	International Conference on Human Centered Computing	ANN	x	Radiology	Micro-calcification clusters in early breast cancer X-ray	-/-	NO	NO
Kuruville J, Gunavathi K	2014	Comput Methods Programs Biomed	ANN	x	Radiology	Lung cancer classification on CT images	93.3%/-	NO	NO
Li X, Chen X, Yan Y, Wei W, Wang ZJ	2014	Sensors (Basel)	ML	SVM	Neurology	Classification of EEG signal	89.2%/-	NO	NO
Liu NT, Holcomb JB, Wade CE, Batchinsky AI, Cancio LC, Darrah MI, Salinas J	2014	Med Biol Eng Comput	ANN	MLP	Critical Care	Predict the need for life-saving intervention in trauma patients	89%/-	NO	NO
Mani S, Ozdas A, Aliferis C, Varol HA, Chen Q, Carnevale R, Chen Y, Romano-Keeler J, Nian H, Weitkamp JH	2014	J Am Med Inform Assoc	ML and Bayesian	SVM, k-NN, CART, RF, LRA	Critical Care	Early detection of late-onset neonatal sepsis	-/78%	NO	NO
Martínez-Martínez JM, Escandell-Montero P, Barbieri C, Soria-Olivas E, Mari F, and 8 additional authors	2014	Comput Methods Programs Biomed	ANN and ML	SVM, regression tree, linear model	Surgery	Predicting hemoglobin level in hemodialysis patients	-/-	NO	NO
Monkaresi H, Calvo RA, Yan H	2014	IEEE J Biomed Health Inform	ML	x	Cardiology	Improving contactless heart rate monitoring using a webcam	-/-	NO	NO
Prosperi MC, Marinho S, Simpson A, Custovic A, Buchan IE	2014	BMC Med Genomics	ML	LR, RF	Pulmonary	Predicting phenotypes of asthma and eczema	-/84%	NO	NO
Søreide K, Thorsen K, Søreide JA	2014	Eur J Trauma Emerg Surg	ANN	x	Surgery	Predicting outcomes in patients with perforated gastroduodenal ulcers	-/90%	NO	NO
Stanculescu I, Williams CK, Freer Y	2014	IEEE J Biomed Health Inform	ML	hidden Markov model	Critical Care	Early detection of neonatal sepsis	-/80%	NO	NO

SUPPLEMENTARY TABLE 1: CONTINUED

<u>AUTHORS</u>	<u>YEAR</u>	<u>JOURNAL</u>	<u>TYPES OF AI METHODOLOGY</u>		<u>SPECIALTY</u>	<u>CDSS APPLICATION</u>	<u>Prediction Performance (CA/AUC)</u>	<u>EFFECT ON PROCESS</u>	<u>PATIENT OUTCOME</u>
Steele SR, Bilchik A, Johnson EK, Nissan A, Peoples GE, Eberhardt JS, Kalina P, Petersen B, Brücher B, Protic M, Avital I, Stojadinovic A	2014	Am Surg	ML and Bayesian	x	Oncology	Time-dependent estimates of recurrence and survival in colon cancer	-/90%	NO	NO
T Thomas M, De Brabanter K, Suykens JA, De Moor B	2014	BMC Bioinformatics	ML	SVM	Oncology	Predicting breast cancer using a microarray expression and clinical parameters	-/84%	NO	NO
Woo JI, Yang JG, Lee YH, Kang UG	2014	Healthc Inform Res	ML and NLP	x	Multidisciplinary	Healthcare decision support system for administration of chronic diseases	-/-	NO	NO
Wu ST, Juhn YJ, Sohn S, Liu H	2014	J Am Med Inform Assoc	ML and NLP	x	Pulmonary	Patient-level temporal aggregation for text-based asthma status ascertainment	85.7%/-	NO	NO
Zachariah N, Kothari S, Ramamurthy S, Osunkoya AO, Wang MD	2014	Conf Proc IEEE Eng Med Biol Soc	ML	x	Pathology	Histopathological image classifier optimization	-/-	NO	NO
Amaral JL, Lopes AJ, Jansen JM, Faria AC, Melo PL	2013	Comput Methods Programs Biomed	ANN and ML	Logistic linear regression, k-NN, SVM	Pulmonary	An improved method of early diagnosis of smoking-induced respiratory changes	89%/91%	YES	NO
Ayer T, Chen Q, Burnside ES	2013	Comput Math Methods Med	ANN	x	Radiology	Mammography interpretation	88%/91%	NO	NO
Cuevas Tello JC, Hernández-Ramírez D, García-Sepúlveda CA	2013	Comput Biol Med	ML	SVM	Multidisciplinary	SVM algorithms in the search of KIR gene associations with disease	-/73.5%	NO	NO
Douali N, Abdennour M, Sasso M, Miette V, Tordjman J, Bedossa P, Veyrie N, Poitou C, Aron-Wisniewsky	2013	Stud health Technol Inform	ML	LR, fuzzy logic,	Surgery	Noninvasive diagnosis of nonalcoholic steatohepatitis disease	91.9%/91.7%	YES	NO
Fong S, Zhang Y, Fiaidhi J, Mohammed O, Mohammed S.	2013	Biomed Res Int	ANN, ML, Bayesian	x	Primary Care	Blood glucose prediction in diabetes therapy	87.4%/84.7%	NO	NO
Gross DP, Zhang J, Steenstra I, Barnsley S, Haws C, Amell T, McIntosh G, Cooper J, Zaiane O	2013	J Occup Rehabil	ML and Bayesian	DT, RIPPER	Primary Care	Selecting appropriate rehabilitation interventions for injured workers	-/94%	NO	NO
Gultepe E, Green JP, Nguyen H, Adams J, Albertson T, Tagkopoulos I	2013	J Am Med Inform Assoc	ML and Bayesian	SVM, gaussian mixture model, hidden Markov models	Critical Care	Identify patients at high risk for sepsis	99%/100%	NO	NO
Hiesh MH, Lam Andy YY, Shen CP, Chen W, Lin FS, Sung HY, Lin JW, Chiu MJ, Lai F	2013	Conf Proc IEEE Eng Med Biol Soc	ML	Genetic algorithm, SVM	Psychiatry	Classification of schizophrenia	88.2%	YES	NO
Hsu JC, Chen YF, Chung WS, Tan TH, Chen T, Chiang JY	2013	Biomed Eng Online	ML	SVM	Critical Care	Clinical decision support system for ventilator weaning		YES	YES

SUPPLEMENTARY TABLE 1: CONTINUED

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Klann JG, Anand V, Downs SM	2013	J Am Med Inform Assoc	ML and Bayesian	x	Pediatric	Patient-tailored prioritization for a pediatric care	-/65%	NO	NO
Liu J, Tang ZH, Zeng F, Li Z, Zhou L	2013	BMC Med Inform Dec Mak	ANN	x	Cardiology	Prediction model for cardiovascular autonomic dysfunction	-/95%	NO	NO
Mani S, Chen Y, Li X, Arlinghaus L, Chakravarthy AB, Abramson V, Bhav SR, Levy MA, Xu H, Yankeelov TE.	2013	J Am Med Inform Assoc.	ML and Bayesian	LR	Oncology	Predicting the response of breast cancer to neoadjuvant chemotherapy	86%/86%	NO	NO
Ocak H	2013	J Med Syst	ML	SVM, genetic algorithm	Ob/Gyn	Evaluation of fetal well-being	100%/-	NO	NO
Punam Suresh Pawar, Dharmaraj Patil	2013	International Conference on Comm Systems	ANN	Back propagation, RBF network	Pathology	Breast cancer detection	98%/-	NO	NO
Spelt L, Nilsson J, Andersson R, Andersson B	2013	Eur J Surg Oncol	ANN	x	Oncology	Prediction of survival following liver resection for colorectal cancer metastasis	72%/-	NO	NO
Sun T, Zhang R, Wang J, Li X, Guo X	2013	PLoS One	ML	SVM	Radiology	Computer aided diagnosis for early stage lung cancer	97%/94%	NO	NO
Tang ZH, Liu J, Zeng F, Li Z, Yu X, Zhou L.	2013	PLoS One	ANN and ML	LRA	Cardiology	Prediction model for cardiovascular autonomic dysfunction	-/76.2%	NO	NO
Ajay Urmaliya, Jyoti Singhai	2013	IEEE Second International Conference on Image Info Processing	ML	SVM	Pathology	Breast cancer diagnosis	-/-	NO	NO
Yilmaz E, Kılıkçer C	2013	Comput Math Methods Med	ML	SVM	Ob/Gyn	Determination of fetal state from cardiotocogram	91.6%/-	NO	NO
Yurtkuran A, Tok M, Emel E	2013	Comput Math Methods Med	ANN	MLP	Surgery	Femoral peripheral arterial disease treatment	-/94.5%	NO	NO
Muhamad Hariz B. Muhamad Adnan, Wahidah Husain, Nur'Aini Abdul Rashid	2012	International Conference on Computer & Info Science	ML and Bayesian	x	Pediatric	Childhood obesity prediction	91.9%/-	NO	NO
Amaral JL, Lopes AJ, Jansen JM, Faria AC, Melo PL	2012	Comput Methods Programs Biomed	ANN, ML, Bayesian	k-NN, DT, SVM	Pulmonary	Automatic identification of chronic obstructive pulmonary disease	-/95%	NO	NO
Dheeba J, Selvi ST	2012	J Med Syst	ANN	x	Radiology	Classification of microcalcification in mammograms	-/97.6%	NO	NO
Er O, Tanrikulu AC, Abakay A, Temurtas F	2012	Computers & Electrical Engineering	ANN and Bayesian	x	Pulmonary	Diagnosis of Mesothelioma's disease	96.3%/-	NO	NO

SUPPLEMENTARY TABLE 1: CONTINUED

AUTHORS	YEAR	JOURNAL	TYPES OF AI METHODOLOGY		SPECIALTY	CDSS APPLICATION	Prediction Performance (CA/AUC)	EFFECT ON PROCESS	PATIENT OUTCOME
Wan-Ting Hung, King-Teh Lee, Shih-Chin Wang, Wen-Hsien Ho, Su-Ching Chang, Jhi-Joung Wang, Ding-Ping Sun, Hao-Hsien Lee, Chong-Chi Chiu, Hon-Yi Shi	2012	Third Int Conference on Innovations in Bio-Inspired Computing and Applications	ANN and ML	LR model	Surgery	Predicting 5-year mortality after surgery for hepatocellular carcinoma	92%/82%	NO	NO
Karakitsos P, Chrelias C, Pouliakis A, Koliopoulos G, Spathis A, Kyrgiou M, and 6 additional authors	2012	J Biomed Biotechnol	ANN	x	Ob/Gyn	Identification of women for referral to colposcopy	96.%/-	NO	NO
Karan O, Bayraktar C, Gumuskaya H, Karlik B	2012	Expert Systems w Applications	ANN	MLP	Primary Care	Diagnosing diabetes on small mobile devices.	-/-	NO	NO
Li CP, Zhi XY, Ma J, Cui Z, Zhu ZL, Zhang C, Hu LP	2012	Chin Med J (Engl)	ANN and ML	MLP, DT, LR, CART	Neurology	Predicting peripheral neuropathy in type 2 diabetes	-/88.6%	NO	NO
Liu M, Dong X	2012	International Conference on Systems and Informatics	ANN	x	Oncology	Diagnosis of breast tumors	-/-	NO	NO
Saritas I	2012	J Med Syst	ANN	x	Radiology	Prediction of breast cancer	90.5%/-	NO	NO
Suganthi M, Madheswaran M	2012	J Med Syst	ANN and ML	Genetic algorithm	Radiology	Breast cancer diagnosis using mammogram	99.5%	NO	NO
Xiao H	2012	International Conference on BioMedical Eng and Informatics	ANN and ML	SVM, genetic algorithm, DT, k-NN, probabilistic NN	Neurology	Diagnosis of Parkinson's disease	99%/-	NO	NO
Zhang L, Li QY, Duan YY, Yan GZ, Yang YL, Yang RJ	2012	BMC Med Inform Decis Mak	ANN	x	Radiology	Non-invasive grading evaluation of hepatic fibrosis by duplex US	88.3%/-	NO	NO
Kabari LG, Bakpo FS	2011	2nd Inter Conf Adaptive Science & Technology	ANN	x	Dermatology	Diagnosis of skin disease	90%/-	NO	NO
Chan KY, Ling SH, Dillon TS, Nguyen HT	2011	Expert Systems w Applications	ANN	x	Primary Care	Diagnosing hypoglycemic episodes	-/-	NO	NO
Dietzel M, Baltzer PA, Dietzel A, Zoubi R, Gröschel T, Burmeister HP, Bogdan, Kaiser WA	2011	Eur J Radiol	ANN	MLP	Radiology	Differential diagnosis of breast lesion on MR-Mammography	-/88.8%	NO	NO
Dutra I, Nassif H, Page D, Shavlik J, Strigel RM, Wu Y, Elezaby ME, Burnside E	2011	AIA Annu Symp Proc	ML and Bayesian	Weka-Tan	Radiology	Improve the accuracy of breast biopsy	-/-	NO	NO
Hirose H, Takayama T, Hozawa S, Hibi T, Saito I	2011	Comput Biol Med	ANN	x	Primary Care	Prediction of metabolic syndrome	-/-	YES	NO

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Hsieh CH, Lu RH, Lee NH, Chiu WT, Hsu MH, Li YC	2011	Surgery	ANN and ML	RF, SVM	Surgery	Diagnosis of acute appendicitis	-/98%	NO	NO
Janghorbani A, Arasteh A, Moradi MH	2011	19th Iranian Conference on Electrical Eng	ML	LR, SVM, genetic algorithm	Critical Care	Prediction of acute hypotension episodes	84%/88%	NO	NO
Jelinek HF, Rocha A, Carvalho T, Goldenstein S, Wainer J	2011	Conf Proc IEEE Eng Med Biol Soc	ML	SVM	Ophthalmology	Identification of retinal pathology	80%/-	NO	NO
Khalilia M, Chakraborty S, Popescu M	2011	BMC Med Inform Decis Mak	ML	RF, SVM	Multidisciplinary	Predicting disease risks	-/91.9%	NO	NO
Krupa N, Ali M, Zahedi E, Ahmed S, Hassan FM	2011	Biomed Eng Online	ML	SVM	Ob/Gyn	Antepartum fetal heart rate extraction and classification	86%/-	NO	NO
Mahdi A, Razali A, Alwakil A	2011	Broad Research in Artificial Intelligence and Neuroscience	ML and Bayesian	k-NN	Primary Care	Disease diagnosis.	91%/91.8%	NO	NO
Rocha T, Paredes S, de Carvalho P, Henriques J	2011	Comput Biol Med	ANN	x	Cardiology	Prediction of acute hypotensive episodes	94%/-	NO	NO
Shirvan RA, Tahami E	2011	18th Iranian Conference of Biomedical Engineering	ML	k-NN, genetic algorithm	Neurology	Voice analysis for detecting Parkinson's disease	98.2%/-	YES	NO
Szkoła J, Pancerz K, Warchoń J.	2011	Comput Intell Neurosci	ANN	RNN	Surgery	Laryngopathies detection	-/-	NO	NO
Tang H, Poynton MR, Hurdle JF, Baird BC, Koford JK, Goldfarb-Rumyantzev AS	2011	ASAIO J	ANN and ML	classification tree, LR	Surgery	Predicting 3-yr-year kidney graft survival in recipients with SLE	-/74%	NO	NO
Tenório JM, Hummel AD, Cohrs FM, Sdepanian VL, Pisa IT, de Fátima Marin H	2011	Int J Med Inform	ANN, ML, Bayesian	k nearest neighbor, SVM, DT	Surgery	Celiac disease diagnosis	80%/84%	NO	NO
Varlitzidou A, Pouliakis A, Stamataki M, Meristoudis C, Margari N, Peros G, Panayiotides JG, Karakitsos P	2011	Anal Quant Cytol Histol	ANN	x	Pathology	Discrimination of thyroid lesions	-/-	NO	NO
Yadav G, Kumar Y, Sahoo G	2011	Indian J Med Sci	ML	SVM, tree and statistical classifiers	Neurology	Prediction of Parkinson's disease	-/-	NO	NO
Zacharaki EI, Kanas VG, Davatzikos C	2011	Int J Comput Assist Radiol Surg	ML and Bayesian	DT, k-NN, VFI, SVM	Radiology	MRI-based classification of brain neoplasms	96.9%/-	NO	NO
Amaral JL, Faria AC, Lopes AJ, Jansen JM, Melo PL	2010	Conf Proc IEEE Eng Med Biol Soc	ANN	x	Pulmonary	Automatic identification of chronic obstructive pulmonary disease	-/90%	NO	NO

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Jafari S, Arabalibeik H, Agin K	2010	5th Int Symp on Health Informatics and Bioinformatics	ANN	MLP	Pulmonary	Classification of normal and abnormal respiration patterns	97.6%/-	YES	NO
Caocci G, Baccoli R, Vacca A, Mastronuzzi A, Bertaina A, Piras E, Littera R, Locatelli F, Carcassi C, La Nasa G.	2010	Exp Hematol	ANN and ML	LR	Surgery	Predicting acute graft versus host	-/-	NO	NO
Er O, Yumusak N, Temurtas F	2010	Expert Systems w Applications	ANN	x	Pulmonary	Diagnosis of chest disease	92.6%/-	NO	NO
Er O, Temurtas F, Tanrikulu AC	2010	J Med Syst	ANN	MLP	Primary Care	Tuberculosis disease detection	94%/-	NO	NO
Gholami B, Haddad WM, Tannenbaum AR	2010	IEEE Trans Biomed Eng	ML	SVM	Pediatric	Pain intensity assessment	-/-	NO	NO
Jayasurya K, Fung G, Yu S, Dehing-Oberije C, De Ruysscher D, Hope A, De Neve W, Lievens Y, Lambin P	2010	Med Phys	ML and Bayesian	SVM	Oncology	Prediction of two-year survival in lung cancer patients	-/77%	NO	NO
Aditya Khosla, Yu Cao, Cliff Chiung-Yu Lin, Hsu-Kuang Chiu, Junling Hu, Honglak Lee	2010	Proceedings of the 16th ACM SIGKDD	ML	SVM	Neurology	Stroke prediction	-/77%	NO	NO
Pace F, Riegler G, de Leone A, Pace M, Cestari R, Dominici P, Grossi E	2010	Eur J Gastroenterol Hepatol	ANN	x	Primary Care	Differentiate erosive from nonerosive reflux disease patients	-/66.5%	NO	NO
Pasomsub E, Sukasem C, Sungkanuparph S, Kijisirikul B, Chantratita W	2010	Jpn J Infect Dis	ANN	x	Drug	Drug resistance prediction	92%/-	NO	NO
Sahin D, Ubeyli ED, Ilbay G, Sahin M, Yasar AB	2010	J Med Syst	ML	SVM	Pulmonary	Diagnosis of airway obstruction or restrictive spirometric pattern	97.3%/-	NO	NO
Salas-Gonzalez D1, Górriz JM, Ramírez J, López M, Alvarez I, Segovia F, Chaves R, Puntonet CG	2010	Phys Med Biol	ML	SVM, classification tree	Neurology	Computer-aided diagnosis of Alzheimer's disease	95%/-	NO	NO
Siristatidis CS, Chrelias C, Pouliakis A, Katsimanis E, Kassanos D	2010	Med Sci Monit	ANN	x	Ob/Gyn	Gynaecological disease	-/-	NO	NO
Tang CH, Middleton PM, Savkin AV, Chan GS, Bishop S, Lovell NH	2010	Physiol Meas	ML	SVM	Critical Care	Non-invasive classification of severe sepsis	84.6%/-	NO	NO
Van Calster B, Valentin L, Van Holsbeke C, Testa AC, Bourne T, Van Huffel S, Timmerman D	2010	BMC Med Res Methodol	ML	LR, SVM	Oncology	Diagnosis of ovarian tumors.	96%/-	NO	NO
Wang SL, Wu F, Wang BH	2010	Adv Exp Med Biol	ML	SVM	Critical Care	Prediction of severe sepsis	-/-	NO	NO
Wu D, Warwick K, Ma Z, Gasson MN, Burgess JG, Pan S, Aziz TZ	2010	Int J Neural Syst	ANN	RBF	Neurology	Prediction of Parkinson's disease tremor	Retrospective Data Set	NO	NO

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Zhou X, Chen S, Liu B, Zhang R, Wang Y, Li P, Guo Y, Zhang H, Gao Z, Yan X	2010	Artif Intell Med	ML and Bayesian	SVM, DT	Multidisciplinary	Individualized empirical knowledge to large-scale evidence-based medicine.	86.4%/-	NO	NO
Daemen A, Gevaert O, Ojeda F, Debucquoy A, Suykens JA, Sempoux C, Machiels JP, Haustermans K, De Moor B.	2009	Genome Med	ML	SVM	Oncology	Genome wide data integration for cancer clinical decision support	98.7%/-	NO	NO
Das R, Turkoglu I, Sengur A	2009	Expert Systems w Applications	ANN	x	Cardiology	Diagnosis of heart disease	89%/-	NO	NO
Das R, Turkoglu I, Sengur A	2009	Comput Methods Programs Biom	ANN	x	Cardiology	Diagnosis of valvular heart disease	97.4%/-	NO	NO
Er O, Sertkaya C, Temurtas F, Tanrikulu AC	2009	J Med Syst	ANN	x	Pulmonary	Chronic obstructive pulmonary and pneumonia disease diagnosis	-/-	NO	NO
Gorthi A, Firtion C, Vepa J	2009	Conf Proc IEEE Eng Med Biol Soc	ML	DT	Ob/Gyn	Automated risk assessment tool for pregnancy care	82.5%/-	NO	NO
Janevski A, Kamalakaran S, Banerjee N, Varadan V, Dimitrova N	2009	BMC Bioinformatics	ML	SVM, Genetic algorithm	Oncology	Breast cancer biomarker signature discovery, evaluation and assessment	-/-	NO	NO
Llorca J, Dierssen-Sotos T, Gómez-Acebo I, Gonzalez-Castro A, Miñambres E	2009	J Heart Lung Transplant	ANN and ML	LR	Surgery	Prediction of mortality after lung transplantation	79%/-	NO	NO
Mehrabi S, Maghsoudloo M, Arabalibeik H, Noormand R, Nozari Y	2009	Expert Systems w Applications	ANN	MLP, RBF	Multidisciplinary	Congestive heart failure and chronic obstructive pulmonary disease	92.4%/-	NO	NO
Narasingarao MR, Manda R, Sridhar GR, Madhu K, Rao AA	2009	J Assoc Physicians India	ANN	MLP	Primary Care	Assess wellbeing in diabetes	-/-	NO	NO
Subashini TS, Ramalingam V, Palanivel S	2009	Expert Systems w Applications	ANN and ML	Radial basis network, SVM	Pathology	Histologic cancer diagnosis.	96%/-	NO	NO
Temurtas F	2009	Expert Systems w Applications	ANN and Bayesian	x	Surgery	Diagnosis of thyroid disease	94.8%/-	NO	NO
Temurtas H, Yumusak N, Temurtas F	2009	Expert Systems w Applications	ANN	MLP, probabilistic NN	Primary Care	Diabetes disease diagnosis.	82.3%/-	NO	NO
Tortajada S, García-Gomez JM, Vicente J, Sanjuán J, de Frutos R, and 10 additional authors	2009	Methods Inf Med	ANN	MLP	Ob/Gyn	Prediction of postpartum depression	84%/84%	NO	NO
Wang J, Li M, Hu YT, Zhu Y	2009	BMC Health Serv Res	ANN and ML	DT	Oncology	Hospital charge prediction model for gastric cancer patients	-/98.3%	NO	NO
Asl BM, Setarehdan SK, Mohebbi M	2008	Artif Intell Med	ML	SVM	Cardiology	Arrhythmia classification	100%/-	NO	NO
Er O, Temurtas F	2008	J Med Syst	ANN	MLP	Pulmonary	Diagnosis of chronic obstructive pulmonary disease	-/-	NO	NO

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Ge G, Wong GW	2008	BMC Bioinformatics	ML	DT	Oncology	Classification of premalignant pancreatic mass-spectrometry data	75%/-	NO	NO
Ghoshal UC, Das A	2008	Hepatol Int	ANN	x	Surgery	Models for prediction of mortality from cirrhosis	91%/78%	NO	NO
Kurt I, Ture M, Kuru AT	2008	Expert Systems w Applications	ANN and ML	LRA, CART, MLP, RBF, self-organizing feature map	Cardiology	Predicting coronary artery disease	-/78%	NO	NO
Lahner E, Intraligi M, Buscema M, Centanni M, Vannella L, Grossi E, Annibale B	2008	World J Gastroenterol	ANN	x	Surgery	Predicting the presence of thyroid disease in atrophic body gastritis	75.8%/-	NO	NO
Manoharan SC, Veezhinathan M, and Ramakrishnan S	2008	MEASUREMENT SCIENCE REVIEW	ANN	Radial basis	Pulmonary	Classification of spirometric pulmonary function data	100%/-	YES	NO
Serpen G, Tekkedil DK, Orra M	2008	Comput Biol Med	ANN	x	Pulmonary	Pulmonary embolism diagnosis	73.3%/-	NO	NO
Zhang G, Yan P, Zhao H, Zhang X	2008	International Conference on BioMedical Eng Informatics	ANN	Back propagation	Radiology	A computer aided diagnosis system in mammography.	83.3%/-	NO	NO
Bassi P, Sacco E, De Marco V, Aragona M, Volpe A	2007	BJU Int	ANN and ML	LRA	Oncology	Prognosis of patients undergoing radical cystectomy for bladder cancer	-/-	NO	NO
Coppini G, Miniati M, Paterni M, Monti S, Ferdeghini EM	2007	Med Eng Phys	ANN	x	Pulmonary	Diagnosis of emphysema in COPD patients	90%/-	NO	NO
Guru N, Dahiya A, Rajpal N	2007	Delhi Business Review	ANN	MLP	Cardiology	Heart disease diagnosis.	-/-	NO	NO
Polat K, Gunes S	2007	Digital Signal Processing	ML	SVM	Oncology	Breast cancer diagnosis	98.5%/-	NO	NO
Quchani SA, Tahami E	2007	3rd Int Conference on Biomedical Engineering	ANN	MLP, RNN	Primary Care	Blood glucose prediction in diabetes therapy	-/-	NO	NO
Shavdia D	2007	MIT Theses	ML	Multivariate regression model	Critical Care	Providing early warnings for septic shock	94%/-	NO	NO
Bilgin G, Altun O	2006	Applied Electronics	ANN	Probabilistic NN, RBF, general regression NN	Cardiology	Cardiac problem diagnosis	81%/-	NO	NO
Eggers KM, Ellenius J, Dellborg M, Groth T, Oldgren J, Swahn E, Lindahl B	2006	Int J Cardiol	ANN	x	Cardiology	Early diagnosis of acute myocardial infarction	87%/-	NO	NO
Krajnak M, Xue J	2006	Conf Proc IEEE Eng Med Biol Soc	ML	Genetic algorithm	Surgery	Patient status monitoring in the operating room	-/77%	NO	NO

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Payá AS, Fernández DR, Méndez DG, Hernández CAM	2006	1st Bio-Inspired Models of Network, Information and Computing Systems	ANN	MLP	Urology	Helping to diagnosis disease in urology	85%/-	NO	NO
Yan H, Jiang Y, Zheng J, Peng C, Li Q	2006	Expert Systems w Applications	ANN	MLP	Cardiology	Heart disease diagnosis.	90%/-	NO	NO
Zhou X, Xu J, Zhao Y	2006	Australas Phys Eng Sci Med	ML	DT, LR model	Psychiatry	Anticipating the psychological distress in patients with Alzheimer's disease	81.9%/-	NO	NO
Barua M, Nazeran H, Nava P, Diong B, Goldman M	2005	Conf Proc IEEE Eng Med Biol Soc	ANN	x	Pulmonary	Classification of lung function in asthmatic children	98.6%/-	NO	NO
Chu F, Wang L	2005	Int J Neural Syst	ML	SVM	Oncology	Cancer classification with microarray data	-/-	NO	NO
Hoshi K, Kawakami J, Kumagai M, Kasahara S, Nishimura N, Nakamura H, Sato K	2005	Chem Pharm Bull (Tokyo)	ANN and Bayesian	x	Surgery	Thyroid function diagnosis	96.7%/-	NO	NO
Jaimes F, Farbiarz J, Alvarez D, Martínez C	2005	Crit Care	ANN and ML	LR	ED	Prediction of mortality in patients with suspected sepsis in the emergency room	87%/-	NO	NO
Lahner E, Grossi E, Intraligi M, Buscema M, Corleto VD, Delle Fave G, Annibale B	2005	World J Gastroenterol	ANN	x	Surgery	Recognition of patients with suspected atrophic body gastritis	97.7%/-	NO	NO
Li YJ, Fan FY	2005	Conf Proc IEEE Eng Med Biol Soc	ANN	x	Psychiatry	Classification of schizophrenia	60%/-	NO	NO
Timmerman D, Testa AC, Bourne T, Ferrazzi E, Ameye L, Konstantinovic ML, Van Calster B, Collins WP, Vergote I, Van Huffel S, Valentin L	2005	J Clin Oncol	ML	LR model	Surgery	Distinguishing between benign and malignant adnexal mass	-/94%	NO	NO
Ergün U, Barýpçý N, Ozan AT, Serhatlýođlu S, Ođur E, Hardalaç F, Güler I	2004	J Med Syst	ANN	MLP, RBF	Neurology	Classification of MCA stenosis in diabetes	94%/93%	NO	NO
Heckerling PS, Gerber BS, Tape TG, Wigton RS	2004	Methods Inf Med	ANN	x	Pulmonary	Predict community-acquired pneumonia	-/95.4%	NO	NO
Lee SM, Kang JO, Suh YM	2004	J Korean Med Sci	ANN and ML	DT	Oncology	Hospital charge prediction model for colorectal cancer patients	-/-	NO	NO
Walsh P, Cunningham P, Rothenberg SJ, O'Doherty S, Hoey H, Healy R	2004	Eur J Emerg Med	ANN	x	Pediatric	Predict disposition and length of stay in children presenting with bronchiolitis	90%/-	NO	NO

SUPPLEMENTARY TABLE 1: CONTINUED

<u>AUTHORS</u>	<u>YEAR</u>	<u>JOURNAL</u>	<u>TYPES OF AI METHODOLOGY</u>		<u>SPECIALTY</u>	<u>CDSS APPLICATION</u>	<u>Prediction Performance (CA/AUC)</u>	<u>EFFECT ON PROCESS</u>	<u>PATIENT OUTCOME</u>
Wei JS, Greer BT, Westermann F, Steinberg SM, Son CG, Chen QR, Whiteford CC and 7 additional authors	2004	Cancer Research	ANN	x	Oncology	Prediction of clinical outcome using gene expression profile	98%/-	NO	NO
Brier ME, Ray PC, Klein JB	2003	Nephrol Dial Transplant	ANN and ML	LRA	Surgery	Prediction of delayed renal allograft function	64%/-	NO	NO
Chang RF, Wu WJ, Moon WK, Chou YH, Chen DR	2003	Acad Radiol	ML	SVM	Radiology	Diagnosis of breast tumors on US images	85.6%/-	NO	NO
Ji W, Naguib RN, Ghoneim MA	2003	IEEE Trans Inf Technol Biomed	ANN	x	Oncology	Outcome prediction in bladder cancer	-/-	NO	NO
Peng S, Xu Q, Ling XB, Peng X, Du W, Chen L	2003	FEBS Lett	ML	SVM, genetic algorithm	Oncology	Molecular classification of cancer types	87.5%/-	NO	NO
Brause R, Hamker F, Paetz J	2002	Computational Intelligence Techniques	ANN	RBF	Critical Care	Septic shock diagnosis	67.8%/-	NO	NO
Goldbaum MH, Sample PA, Chan K, Williams J, Lee TW, Blumenthal E, Girkin CA, Zangwill LM, Bowd C, Sejnowski T, Weinreb RN	2002	Invest Ophthalmol Vis Sci	ANN and ML	MLP, SVM, mixture of gaussian	Ophthalmology	Diagnosing glaucoma from standard automated perimetry	-/92%	NO	NO
Nguyen T, Malley R, Inkelis S, Kuppermann N	2002	J Clin Epidemiol	ANN and ML	LRA	Pediatric	Prediction model for adverse outcome in pediatric meningococcal disease	-/83%	NO	NO
Ozyilmaz L, Yildirim T	2002	Proc of the 9th Inter Conf on Neural Info Processing	ANN	MLP	Surgery	Diagnosis of thyroid disease	98%/-	NO	NO
Shipp MA, Ross KN, Tamayo P, Weng AP, Kutok JL, Aguiar RC, Gaasenbeek M, and 13 Additional authors	2002	Nat Med	ML	x	Oncology	Predict outcome in diffuse large B-cell lymphoma	91%/-	NO	NO
Clermont G, Angus DC, DiRusso SM, Griffin M, Linde-Zwirble WT	2001	Crit Care Med	ANN and ML	LR model	Critical Care	Predicting hospital mortality for patients in the ICU	-/85%	NO	NO
Khan J, Wei JS, Ringnér M, Saal LH, Ladanyi M, Westermann F, Berthold F, and 4 additional authors	2001	Nat Med	ANN	x	Oncology	Diagnostic prediction of cancers using gene expression profile	-/-	NO	NO
Lewenstein K	2001	Med Biol Eng Comput	ANN	RBF	Cardiology	Diagnosis of coronary heart disease based on ECG and exercise test	97%/-	NO	NO
Petrosian AA, Prokhorov DV, Lajaran-Nanson W, Schiffer RB	2001	Clin Neurophysiol	ANN	RNN	Neurology	Early recognition of Alzheimer's disease in EEG	89%/-	NO	NO
Hayashi Y, Setiono R, Yoshida K	2000	Artif Intell Med	ANN	x	Surgery	Diagnosis of hepatobiliary disorders	85.6%/-	NO	NO
Mobley BA, Schechter E, Moore WE, McKee PA, Eichner JE	2000	Artif Intell Med	ANN	x	Cardiology	Prediction of coronary artery stenosis	89%/-	NO	NO

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Nakamura K, Yoshida H, Engelmann R, MacMahon H, Katsuragawa S, Ishida T, Ashizawa K, Doi K.	2000	Radiology	ANN	x	Radiology	Likelihood of malignancy in solitary pulmonary nodules	-/85.4%	NO	NO
Lundin M, Lundin J, Burke HB, Toikkanen S, Pylkkänen L, Joensuu H	1999	Oncology	ANN	x	Oncology	Survival prediction in breast cancer	-/91%	NO	NO
Timmerman D, Bourne TH, Taylor A, Collins WP, Verrelst H, Vandenberghe K, Vergote I	1999	Am J Obstet Gynecol	ML	LR model	Oncology	Discrimination between malignant and benign adnexal masses	-/96%	NO	NO
Zheng B, Chang YH, Wang XH, Good WF	1999	Inter Joint Con on Neural Networks. Proceedings	ANN and Bayesian	x	Radiology	Computer assisted diagnosis scheme for mammography	86%/-	NO	NO
Bright P, Miller MR, Franklyn JA, Sheppard MC	1998	Am J Respir Crit Care Med	ANN	x	Pulmonary	Detecting upper airway obstruction by goiter	92%/-	NO	NO
Pantazopoulos D, Karakitsos P, Iokim-Liossi A, Pouliakis A, Botsoli-Stergiou, Dimopoulos C	1998	J Urol	ANN	x	Oncology	Discrimination of benign from malignant lower urinary tract lesion	95%/-	NO	NO
Ellenius J, Groth T, Lindahl B, Wallentin L	1997	Clin Chem	ANN	x	Cardiology	Early assessment of patients with suspected acute myocardial infarction	-/-	NO	NO
Hedén B, Ohlin H, Rittner R, Edenbrandt L	1997	Circulation	ANN	x	Cardiology	Acute myocardial infarction detection in the ECG	-/-	NO	NO
Karakitsos P, Stergiou EB, Pouliakis A, Tzivras M, Archimandritis A, Liossi A, Kyrkou K	1997	Anal Quant Cytol Histol	ANN	x	Pathology	Distinguishing between benign and malignant gastric cells	97%/-	NO	NO
Kaufmann SJ, Eastaugh JL, Snowden S, Smye SW, Sharma V	1997	Hum Reprod	ANN	x	Ob/Gyn	Predicting the outcome of in-vitro fertilization	59%/-	NO	NO
Kennedy RL, Harrison RF, Burton AM, Fraser HS, Hamer WG, MacArthur D, McCallum R, Steedman DJ	1997	Comput Methods Programs Biom	ANN	x	Cardiology	Diagnosis of acute myocardial infarction	91.8%/-	NO	NO
Kentala E, Pyykkö I, Auramo Y, Juhola M	1997	Acta Otolaryngol Suppl	ANN	x	Primary Care	Diagnosing vertigo	-/-	N/A	N/A
Lippmann RP, Shahian DM	1997	Ann Thorac Surg	ANN	x	Surgery	Coronary artery bypass risk prediction	-/76%	NO	NO
Baxt WG	1996	Ann Intern Med	ANN	x	Cardiology	Diagnosing acute myocardial infarction	96%/-	YES	NO
Dybowski R, Weller P, Chang R, Gant V	1996	Lancet	ANN and ML	x	Critical Care	Prediction of outcome in critically ill patients	-/86%	NO	NO
Gardner GG, Keating D, Williamson TH, Elliott AT	1996	Br J Ophthalmol	ANN	x	Ophthalmology	Automatic detection of diabetic retinopathy	-/93%	NO	NO

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Kocur CM, Rogers SK, Myers LR, Burns T, Kabrisky M, Hoffmeister JW, Bauer KW, Steppe JM	1996	IEEE Engineering in Medicine and Biology	ANN	MLP	Radiology	Breast cancer diagnosis	88%-	NO	NO
Novak B, Bigec M	1996	9th IEEE Symposium on Computer-Based Medical Systems	ANN	Radial basis network	Pediatric	Childhood obesity prediction	-/-	NO	NO
Pedersen SM, Jørgensen JS, Pedersen JB	1996	Clin Chem	ANN	x	Cardiology	Diagnosing acute myocardial infarction	99%/-	NO	NO
Sahiner B, Chan HP, Petrick N, Wei D, Helvie MA, Adler DD, Goodsitt MM	1996	IEEE Trans Med Imaging	ANN	CNN	Radiology	Classification of mass and normal breast tissue	-/87%	NO	NO
Kischell ER, Kehtarnavaz N, Hillman GR, Levin H, Lilly M, Kent TA	1995	Neuroradiology	ANN	x	Radiology	Classification of brain compartments and head injury lesions	-/-	NO	NO
Lapuerta P, Azen SP, LaBree L	1995	Comput Biomed Res	ANN	x	Cardiology	Predicting the risk of coronary artery disease	66%/-	NO	NO
Novak B, Bigec M	1995	IEEE	ANN	Radial basis network	Pediatric	Childhood obesity prediction	-/-	NO	NO
Shen Z, Clarke M, Jones R, Alberti T	1995	Neural Comput & Applic	ANN	MLP	Cardiology	Detection of coronary heart disease.	73%/98%	NO	NO
Hu YH, Tompkins WJ, Urrusti JL, Afonso VX	1993	J Electrocardiol	ANN	x	Cardiology	ECG signal detection and classification	-/-	NO	NO
Tsai DY, Fujita H, Horita K, Endo T, Kido C, Ishigaki T	1993	Intern Joint Conf on Neural Networks	ANN	MLP	Radiology	Classification of breast tumors in mammograms	75%/-	NO	NO
Xue Q, Hu Yh, Tompkins WJ	1992	IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING,	ANN	x	Cardiology	QRS detection from ECG.	99.5%/-	NO	NO
Baxt WG	1991	Ann Intern Med	ANN	x	Cardiology	Diagnosis of myocardial infarction	-/-	YES	NO
Furlong JW, Dupuy ME, Heinsimer JA	1991	Am J Clin Pathol	ANN	x	Cardiology	Analysis of serial cardiac enzyme data for AMI prediction	92%/-	NO	NO

Abbreviations: artificial neural network (ANN), classification and regression tree (CART), convolutional neural network (CNN), decision tree (DT), k-nearest neighbor (k-NN), linear regression analysis (LRA), multilayer perceptron (MLP), radial basis function (RBF), random forest (RF), recurrent neural network (RNN), support vector machine (SVM), classification accuracy (CA), area under curve (AUC)