

## Acuros® XB Bibliography\*

### Foundational

Gifford KA, Horton JL, Wareing TA, Failla G, Mourtada F. Comparison of a finite-element multigroup discrete-ordinates code with Monte Carlo for radiotherapy calculations. *Phys Med Biol.* 2006;51:2253-2265. The University of Texas MD Anderson Cancer Center, Houston, TX.

Vassiliev ON, Wareing TA, Davis IM, McGhee J, Barnett D, Horton JL, Gifford K, Failla G, Titt U, Mourtada F. Feasibility of a multigroup deterministic solution method for three-dimensional radiotherapy dose calculations. *Int J Radiat Oncol Biol Phys.* 2008;72:220-227. MD Anderson Cancer Center, Houston, TX.

Vassiliev ON, Wareing TA, McGhee J, Failla G, Salehpour MR, Mourtada F. Validation of a new grid-based Boltzmann equation solver for dose calculation in radiotherapy with photon beams. *Phys Med Biol.* 2010;55:581-598. MD Anderson Cancer Center, Houston, TX.

### Physics and Commissioning

Bush K, Gagne IM, Zavgorodni S, Ansbacher W, Beckham W. Dosimetric validation of Acuros XB with Monte Carlo methods for photon dose calculations. *Med Phys.* 2011;38:2208-2221. Department of Medical Physics, British Columbia Cancer Agency-Vancouver Island Center, British Columbia, Canada.

Fogliata A, Nicolini G, Clivio A, Vanetti E, Cozzi L. Dosimetric evaluation of Acuros XB Advanced Dose Calculation algorithm in heterogeneous media. *Radiat Oncol.* 2011;6:82. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Fogliata A, Nicolini G, Clivio A, Vanetti E, Cozzi L. Accuracy of Acuros XB and AAA dose calculation for small fields with reference to RapidArc® stereotactic treatments. *Med Phys.* 2011;38:6228-6237. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Fogliata A, Nicolini G, Clivio A, Vanetti E, Mancosu P, Cozzi L. Dosimetric validation of the Acuros XB Advanced Dose Calculation algorithm: fundamental characterization in water. *Phys Med Biol.* 2011;56:1879-1904. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Han T, Mikell JK, Salehpour M, Mourtada F. Dosimetric comparison of Acuros XB deterministic radiation transport method with Monte Carlo and model-based convolution methods in heterogeneous media. *Med Phys.* 2011;38:2651-2664. The University of Texas MD Anderson Cancer Center, TX.

Alhakeem E, AlShaikh S, Rosenfeld AB, Zavgorodni S. Sci-Thur AM: Planning - 01: Experimental and Monte Carlo verification of Acuros XB calculations near low and high density heterogeneities. *Med Phys.* 2012;39:4619. University of Victoria, British Columbia, Canada; University of Wollongong, Australia; Ministry of Health, Riyadh, Kingdom of Saudi Arabia and British Columbia Cancer Agency-Vancouver Island Center, British Columbia, Canada.

Bush K, Wang L, Mok E. SU-E-T-485: Validation of Acuros XB Dose Calculations in SBRT Lung Planning with Monte Carlo Methods. *Med Phys.* 2012;39:3816-3817. Stanford University Cancer Center, Palo Alto, CA.

Han T, Mourtada F, Repchak R, Tonigan J, Mikell J, Howell R, Salehpour M, Molineu A, Followill D. SU-E-T-519: Experimental Evaluation of Deterministic Acuros XB Radiation Transport Algorithm for Heterogeneity Dose Calculation Using the Radiological Physics Center's Lung Phantom. *Med Phys.* 2012;39:3825. MD Anderson Cancer Center, Houston, TX and Christiana Care Hospital, Newark, DE.

Han T, Taylor R, LaNeave S, Howell R, Mourtada F, Salehpour M. SU-E-T-528: Appraisal of Acorus XB and Convolution Dose Algorithms in Field Junction of Breast Tangential/superclavicular Fields. *Med Phys.* 2012;39:3827. MD Anderson Cancer Center, Houston, TX and Christiana Care Hospital, Newark, DE.

Hoffmann L, Jørgensen MB, Muren LP, Petersen JB. Clinical validation of the Acuros XB photon dose calculation algorithm, a grid-based Boltzmann equation solver. *Acta Oncol.* 2012;51:376-385. Aarhus University Hospital, Aarhus, Denmark.

Kron T, Clivio A, Vanetti E, Nicolini G, Cramb J, Lonski P, Cozzi L, Fogliata A. Small field segments surrounded by large areas only shielded by a multileaf collimator: comparison of experiments and dose calculation. *Med Phys.* 2012;39:7480-7489. Peter MacCallum Cancer Centre, Melbourne, Australia.

Mißbeck M, Kneschaurek P. Comparison between Acuros XB and Brainlab Monte Carlo algorithms for photon dose calculation. *Strahlenther Onkol.* 2012;188:599-605. Technische Universität München, Munich, Germany.

Rana S, Rogers K. SU-E-T-529: Dosimetric Evaluation with Heterogeneity in Acuros XB Advanced Dose Calculation Algorithm and Anisotropic Analytical Algorithm (AAA). *Med Phys.* 2012;39:3827. Arizona Center for Cancer Care, Peoria, AZ.

Fogliata A, Clivio A, Vanetti E, Nicolini G, Belosi MF, Cozzi L. Dosimetric evaluation of photon dose calculation under jaw and MLC shielding. *Med Phys.* 2013;40:101706. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Lloyd SA, Ansbacher W. Evaluation of an analytic linear Boltzmann transport equation solver for high-density inhomogeneities. *Med Phys.* 2013;40:011707. University of Victoria, British Columbia, Canada.

Rana S, Rogers K. Dosimetric evaluation of Acuros XB dose calculation algorithm with measurements in predicting doses beyond different air gap thickness for smaller and larger field sizes. *J Med Phys.* 2013;38:9-14. Arizona Center for Cancer Care, Peoria, AZ.

Ojala J, Kapanen M, Sipilä P, Hyödynmaa S, Pitkänen M. The accuracy of Acuros XB algorithm for radiation beams traversing a metallic hip implant - comparison with measurements and Monte Carlo calculations. *J Appl Clin Med Phys.* 2014;15:4912. Tampere University Hospital, Tampere, Finland.

Ojala JJ, Kapanen MK, Hyödynmaa SJ, Wigren TK, Pitkänen MA. Performance of dose calculation algorithms from three generations in lung SBRT: comparison with full Monte Carlo-based dose distributions. *J Appl Clin Med Phys.* 2014;15:4662. Tampere University Hospital, Tampere, Finland.

Muralidhar KR, Pangam S, Srinivas P, Athar Ali M, Priya VS, Komanduri K. A phantom study on the behavior of Acuros XB algorithm in flattening filter free photon beams. *J Med Phys.* 2015;40:144-149. American Oncology Institute, Telangana, India.

Ojala JJ, Kapanen M. Quantification of dose differences between two versions of Acuros XB algorithm compared to Monte Carlo simulations--the effect on clinical patient treatment planning. *J Appl Clin Med Phys.* 2015;16:213-225. Tampere University Hospital, Tampere, Finland.

Fogliata A, Lobefalo F, Reggiori G, Stravato A, Tomatis S, Scorsetti M, Cozzi L. Evaluation of the dose calculation accuracy for small fields defined by jaw or MLC for AAA and Acuros XB algorithms. *Med Phys.* 2016;43:5685. Humanitas Research Hospital and Cancer Center, Milan, Italy.

Onizuka R, Araki F, Ohno T, Nakaguchi Y, Kai Y, Tomiyama Y, Hioki K. Accuracy of dose calculation algorithms for virtual heterogeneous phantoms and intensity-modulated radiation therapy in the head and neck. *Radiol Phys Technol.* 2016;9:77-87.

Paulu D, Alaei P. Evaluation of dose calculation accuracy of treatment planning systems at hip prosthesis interfaces. *J Appl Clin Med Phys.* 2017;18:9-15. University of Minnesota, MN.

Zavan R, McGeachy P, Madamesila J, Villarreal-Barajas JE, Khan R. Verification of Acuros XB dose algorithm using 3D printed low-density phantoms for clinical photon beams. *J Appl Clin Med Phys.* 2018;19:32-43. Tom Baker Cancer Center, Alberta, Canada and Washington University School of Medicine, MO.

Reis CQM, Nicolucci P, Fortes SS, Silva LP. Effects of heterogeneities in dose distributions under nonreference conditions: Monte Carlo simulation vs dose calculation algorithms. *Med Dosim.* 2019;44:74-82. National Institute for Cancer José Alencar Gomes da Silva, RJ, Brazil and University of Sao Paulo, SP, Brazil.

Fogliata A, Esposito E, Paganini L, Reggiori G, Tomatis S, Scorsetti M, Cozzi L. The impact of scanning data measurements on the Acuros dose calculation algorithm configuration. *Radiat Oncol.* 2020;15:169. Humanitas Clinical and Research Center, Italy.

Seniwal B, Bhatt CP, Fonseca TCF. Comparison of dosimetric accuracy of acuros XB and analytical anisotropic algorithm against Monte Carlo technique. *Biomed Phys Eng Express.* 2020;6:015035. Federal University of Minas Gerais, MG, Brazil.

Cheng ZJ, Bromley RM, Oborn B, Booth JT. Radiotherapy dose calculations in high-Z materials: comprehensive comparison between experiment, Monte Carlo, and conventional planning algorithms. *Biomed Phys Eng Express.* 2021;7. The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China; University of Sydney, Sydney, Australia; Northern Sydney Cancer Centre, Sydney, Australia; Illawarra Cancer Care Centre, Wollongong, Australia and Centre for Medical Radiation Physics, Wollongong, Australia.

Pawałowski B, Ryczkowski A, Panek R, Sobocka-Kurdyk U, Graczyk K, Piotrowski T. Accuracy of the doses computed by the Eclipse treatment planning system near and inside metal elements. *Sci Rep.* 2022;12:5974. Greater Poland Cancer Centre, Poznan, Poland; Poznan University of Technology, Poznan, Poland; Poznan University of Medical Sciences, Poznan, Poland; Nottingham University Hospitals NHS Trust, Nottingham, UK; University of Nottingham, Nottingham, UK and Calisia University, Kalisz, Poland.

## Dose Reporting Method

Han T, Mourtada F, Kisling K, Mikell J, Followill D, Howell R. Experimental validation of deterministic Acuros XB algorithm for IMRT and VMAT dose calculations with the Radiological Physics Center's head and neck phantom. *Med Phys.* 2012;39:2193-2202. The University of Texas MD Anderson Cancer Center, TX.

Han T, Followill D, Mikell J, Repchak R, Molineu A, Howell R, Salehpour M, Mourtada F. Dosimetric impact of Acuros XB deterministic radiation transport algorithm for heterogeneous dose calculation in lung cancer. *Med Phys.* 2013;40:051710. The University of Texas MD Anderson Cancer Center, TX.

Mampuya WA, Nakamura M, Hirose Y, Kitsuda K, Ishigaki T, Mizowaki T, Hiraoka M. Difference in dose-volumetric data between the analytical anisotropic algorithm, the dose-to-medium, and the dose-to-water reporting modes of the Acuros XB for lung stereotactic body radiation therapy. *J Appl Clin Med Phys.* 2016;17:341-347. Kyoto University, Kyoto, Japan.

Zifodya JM, Challens CH, Hsieh WL. From AAA to Acuros XB-clinical implications of selecting either Acuros XB dose-to-water or dose-to-medium. *Australas Phys Eng Sci Med.* 2016;39:431-439. North West Cancer Centre, Tamworth, Australia.

Yan C, Combine AG, Bednarz G, Lalonde RJ, Hu B, Dickens K, Wynn R, Pavord DC, Saiful Huq M. Clinical implementation and evaluation of the Acuros dose calculation algorithm. *J Appl Clin Med Phys.* 2017;18:195-209. UPMC Cancer Centers, PA; Loyola University Health System, IL and Health Quest, NY.

Kamaleldin M, Elsherbini NA, Elshemey WM. AAA and AXB algorithms for the treatment of nasopharyngeal carcinoma using IMRT and RapidArc techniques. *Med Dosim.* 2018;43:224-229. Cairo University, Cairo, Egypt.

Muñoz-Montplet C, Marruecos J, Buxó M, Jurado-Bruggeman D, Romera-Martínez I, Bueno M, Vilanova JC. Dosimetric impact of Acuros XB dose-to-water and dose-to-medium reporting modes on VMAT planning for head and neck cancer. *Phys Med.* 2018;55:107-115. Catalan Institute of Oncology, Girona, Spain; University of Girona, Girona, Spain; Girona Biomedical Research Institute, Girona, Spain and Institute for Radiation Protection and Nuclear Safety, France.

Delbaere A, Younes T, Vieilleveigne L. On the conversion from dose-to-medium to dose-to-water in heterogeneous phantoms with Acuros XB and Monte Carlo calculations. *Phys Med Biol.* 2019;64:195016. Claudius Regaud Institute-Toulouse University Cancer Institute, Toulouse, France.

Sayah R, Felefly T, Zouein L, El Barouky J, Khater N, Farah N, Roukoz C, El Khoury C, Azoury F, Nehme Nasr D, Nasr E. Dosimetric impact of switching from AAA to Acuros dose-to-water and dose-to-medium for RapidArc plans of nasopharyngeal carcinomas. *Cancer Radiother.* 2020;24:842-850. Hôtel-Dieu de France University Hospital, Beirut, Lebanon; Saint Joseph University, Beirut, Lebanon and Saint Louis University, MO.

Abdullah C, Farag H, El-Sheshtawy W, Aboelenein H, Guirguis OW. Clinical impact of anisotropic analytical algorithm and Acuros XB dose calculation algorithms for intensity modulated radiation therapy in lung cancer patients. *J Xray Sci Technol.* 2021;29:1019-1031. Al-Azhar University, Cairo, Egypt; Cairo University, Giza, Egypt; Sohag Oncology Institute, Egypt.

Fleming C, O'Keeffe S, McDermott R, Dunne M, McClean B, León Vintró L. The influence of Acuros XB on dose volume histogram metrics and tumour control probability modelling in locally advanced non-small cell lung cancer. *Phys Med.* 2021;81:295-301. St. Luke's Hospital, Dublin, Ireland and University College Dublin, Dublin, Ireland.

Muñoz-Montplet C, Fuentes-Raspall R, Jurado-Bruggeman D, Agramunt-Chaler S, Onsès-Segarra A, Buxó M. Dosimetric Impact of Acuros XB Dose-to-Water and Dose-to-Medium Reporting Modes on Lung Stereotactic Body Radiation Therapy and Its Dependency on Structure Composition. *Adv Radiat Oncol.* 2021;6:100722. Catalan Institute of Oncology, Girona, Spain; University of Girona, Girona, Spain and Girona Biomedical Research Institute, Girona, Spain.

Srivastava RP, Basta K, De Gerssem W, De Wagter C. A comparative analysis of Acuros XB and the analytical anisotropic algorithm for volumetric modulation arc therapy. *Rep Pract Oncol Radiother.* 2021;26:481-488. Radiotherapy Association Meuse Picardie, Mouscron, Belgium and Ghent University Hospital, Ghent, Belgium.

Gopalakrishnan Z, Bhasi S, P R, Menon SV, B S, Thayil AG, Nair RK. Dosimetric comparison of analytical anisotropic algorithm and the two dose reporting modes of Acuros XB dose calculation algorithm in volumetric modulated arc therapy of carcinoma lung and carcinoma prostate. *Med Dosim.* 2022;47:280-287. Regional Cancer Centre, Thiruvananthapuram, India and SUT Royal Hospital, Thiruvananthapuram, India.

Kumar L, Bhushan M, Kishore V, Chowdhary RL, Barik S, Sharma A, Gairola M. Dosimetric Influence of Acuros XB Dose-to-Medium and Dose-to-Water Reporting Modes on Carcinoma Cervix Using Intensity-Modulated Radiation Therapy and Volumetric RapidArc Technique. *J Med Phys.* 2022;47:10-19. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, India; Rajiv Gandhi Cancer Institute and Research Centre, New Delhi, India and Bundelkhand Institute of Engineering and Technology, Uttar Pradesh, India.

## General Treatment Planning

Fogliata A, Nicolini G, Clivio A, Vanetti E, Cozzi L. On the dosimetric impact of inhomogeneity management in the Acuros XB algorithm for breast treatment. *Radiat Oncol.* 2011;6:103. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Fogliata A, Nicolini G, Clivio A, Vanetti E, Cozzi L. Critical appraisal of Acuros XB and Anisotropic Analytic Algorithm dose calculation in advanced non-small-cell lung cancer treatments. *Int J Radiat Oncol Biol Phys.* 2012;83:1587-1595. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Kan MW, Leung LH, Yu PK. Verification and dosimetric impact of Acuros XB algorithm on intensity modulated stereotactic radiotherapy for locally persistent nasopharyngeal carcinoma. *Med Phys.* 2012;39:4705-4714. Princess Margaret Hospital, Hong Kong SAR, China.

Fogliata A, Scorsetti M, Navarria P, Catalano M, Clivio A, Cozzi L, Lobefalo F, Nicolini G, Palumbo V, Pellegrini C, Reggiori G, Roggio A, Vanetti E, Alongi F, Pentimalli S, Mancosu P. Dosimetric comparison between VMAT with different dose calculation algorithms and protons for soft-tissue sarcoma radiotherapy. *Acta Oncol.* 2013;52:545-552. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Kan MW, Leung LH, So RW, Yu PK. Experimental verification of the Acuros XB and AAA dose calculation adjacent to heterogeneous media for IMRT and RapidArc of nasopharyngeal carcinoma. *Med Phys.* 2013;40:031714. Princess Margaret Hospital, Hong Kong SAR, China.

Kan MW, Leung LH, Yu PK. Dosimetric impact of using the Acuros XB algorithm for intensity modulated radiation therapy and RapidArc planning in nasopharyngeal carcinomas. *Int J Radiat Oncol Biol Phys.* 2013;85:e73-80. Princess Margaret Hospital, Hong Kong SAR, China.

Kan MW, Leung LH, Yu PK. The performance of the progressive resolution optimizer (PRO) for RapidArc planning in targets with low-density media. *J Appl Clin Med Phys.* 2013;14:4382. Princess Margaret Hospital, Hong Kong SAR, China.

Kathirvel M, Subramanian S, Clivio A, Arun G, Fogliata A, Nicolini G, Subramani V, Swamy ST, Vanetti E, Cozzi L. Critical appraisal of the accuracy of Acuros-XB and Anisotropic Analytical Algorithm compared to measurement and calculations with the compass system in the delivery of RapidArc clinical plans. *Radiat Oncol.* 2013;8:140. Oncology Institute of Southern Switzerland, Bellinzona, Switzerland.

Kroon PS, Hol S, Essers M. Dosimetric accuracy and clinical quality of Acuros XB and AAA dose calculation algorithm for stereotactic and conventional lung volumetric modulated arc therapy plans. *Radiat Oncol.* 2013;8:149. Institute Verbeeten, Tilburg, Netherlands.

Rana S, Rogers K, Lee T, Reed D, Biggs C. Dosimetric impact of Acuros XB dose calculation algorithm in prostate cancer treatment using RapidArc. *J Cancer Res Ther.* 2013;9:430-435. Arizona Center for Cancer Care, AZ and ProCure Proton Therapy Center, OK.

Khan RF, Villarreal-Barajas E, Lau H, Liu HW. Effect of Acuros XB algorithm on monitor units for stereotactic body radiotherapy planning of lung cancer. *Med Dosim.* 2014;39:83-87. Baker Cancer Centre, AB, Canada.

Liu HW, Nugent Z, Clayton R, Dunscombe P, Lau H, Khan R. Clinical impact of using the deterministic patient dose calculation algorithm Acuros XB for lung stereotactic body radiation therapy. *Acta Oncol.* 2014;53:324-329. Tom Baker Cancer Center, AB, Canada.

Louie AV, Senan S, Dahele M, Slotman BJ, Verbakel WF. Stereotactic ablative radiation therapy for subcentimeter lung tumors: clinical, dosimetric, and image guidance considerations. *Int J Radiat Oncol Biol Phys.* 2014;90:843-849. VU University Medical Center, Amsterdam, Netherlands.

Padmanaban S, Warren S, Walsh A, Partridge M, Hawkins MA. Comparison of Acuros (AXB) and Anisotropic Analytical Algorithm (AAA) for dose calculation in treatment of oesophageal cancer: effects on modelling tumour control probability. *Radiat Oncol.* 2014;9:286. Oxford University Hospitals, Oxford, UK..

Petillion S, Swinnen A, Defraene G, Verhoeven K, Weltens C, Van den Heuvel F. The photon dose calculation algorithm used in breast radiotherapy has significant impact on the parameters of radiobiological models. *J Appl Clin Med Phys.* 2014;15:259–269. University Hospitals of Leuven, Leuven, Belgium.

Rana S, Rogers K, Pokharel S, Cheng C. Evaluation of Acuros XB algorithm based on RTOG 0813 dosimetric criteria for SBRT lung treatment with RapidArc. *J Appl Clin Med Phys.* 2014;15:4474. ProCure Proton Therapy Center, AZ.

Tsuruta Y, Nakata M, Nakamura M, Matsuo Y, Higashimura K, Monzen H, Mizowaki T, Hiraoka M. Dosimetric comparison of Acuros XB, AAA, and XVMC in stereotactic body radiotherapy for lung cancer. *Med Phys.* 2014;41:081715. Kyoto University Hospital, Kyoto, Japan.

Hirata K, Nakamura M, Yoshimura M, Mukumoto N, Nakata M, Ito H, Inokuchi H, Matsuo Y, Mizowaki T, Hiraoka M. Dosimetric evaluation of the Acuros XB algorithm for a 4 MV photon beam in head and neck intensity-modulated radiation therapy. *J Appl Clin Med Phys.* 2015;16:52–64. Kyoto University Hospital, Kyoto, Japan.

Huang B, Wu L, Lin P, Chen C. Dose calculation of Acuros XB and Anisotropic Analytical Algorithm in lung stereotactic body radiotherapy treatment with flattening filter free beams and the potential role of calculation grid size. *Radiat Oncol.* 2015;10:53. Cancer Hospital of Shantou University Medical College, Shantou, China.

Koo T, Chung JB, Eom KY, Seok JY, Kim IA, Kim JS. Dosimetric effects of the acuros XB and anisotropic analytical algorithm on volumetric modulated arc therapy planning for prostate cancer using an endorectal balloon. *Radiat Oncol.* 2015;10:48. Seoul National University College of Medicine, Seoul, Korea and Seoul National University Bundang Hospital, Seoul, Korea.

Shields LB, Bond C, Odom A, Sun DA, Spalding AC. Heterogeneity correction for intensity-modulated frameless SRS in pituitary and cavernous sinus tumors: a retrospective study. *Radiat Oncol.* 2015;10:193. The Norton Cancer Institute Radiation Center, KY.

Zhen H, Hrycushko B, Lee H, Timmerman R, Pompoš A, Stojadinovic S, Foster R, Jiang SB, Solberg T, Gu X. Dosimetric comparison of Acuros XB with collapsed cone convolution/superposition and anisotropic analytic algorithm for stereotactic ablative radiotherapy of thoracic spinal metastases. *J Appl Clin Med Phys.* 2015;16:181–192. UT Southwestern Medical Center, TX.

Krishna GS, Srinivas V, Reddy PY. Clinical implications of Eclipse analytical anisotropic algorithm and Acuros XB algorithm for the treatment of lung cancer. *J Med Phys.* 2016;41:219-223. MNJ Institute of Oncology and Regional Cancer Centre, Telangana, India and Osmania University, Telangana, India.

Ong CCH, Ang KW, Soh RCX, Tin KM, Yap JHH, Lee JCL, Bragg CM. Dosimetric comparison of peripheral NSCLC SBRT using Acuros XB and AAA calculation algorithms. *Med Dosim.* 2017;42:216-222. Faculty of Health

Sheffield Hallam University, Sheffield, UK; National Cancer Center Singapore, Singapore and Nanyang Technological University, Singapore.

Hoffmann L, Alber M, Söhn M, Elstrøm UV. Validation of the Acuros XB dose calculation algorithm versus Monte Carlo for clinical treatment plans. *Med Phys.* 2018. Aarhus University Hospital, Aarhus, Denmark and University Clinic Heidelberg, Heidelberg, Germany.

Kim KH, Chung JB, Suh TS, Kang SW, Kang SH, Eom KY, Song C, Kim IA, Kim JS. Dosimetric and radiobiological comparison in different dose calculation grid sizes between Acuros XB and anisotropic analytical algorithm for prostate VMAT. *PLoS One.* 2018;13:e0207232. Department of Biomedicine & Health The Catholic University of Korea, Seoul, Korea and Seoul National University Bundang Hospital, Seongnam, Korea.

Aland T, Walsh A, Jones M, Piccini A, Devlin A. Accuracy and efficiency of graphics processing unit (GPU) based Acuros XB dose calculation within the Varian Eclipse treatment planning system. *Med Dosim.* 2019;44:219-225. ICON Group, Queensland, Australia.

Hoshida K, Araki F, Ohno T, Tominaga H, Komatsu K, Tamura K. Monte Carlo dose verification for a single-isocenter VMAT plan in multiple brain metastases. *Med Dosim.* 2019;44:e51-e58. Kumamoto University, Kumamoto, Japan and SAGA HIMAT Foundation, Saga, Japan.

Matsuoka T, Araki F, Ohno T, Sakata J, Tominaga H. Dependence of volume dose indices on dose calculation algorithms for VMAT-SBRT plans for peripheral lung tumor. *Med Dosim.* 2019;44:284-290. Kumamoto University, Kumamoto, Japan.

Shiraishi S, Fong de Los Santos LE, Antolak JA, Olivier KR, Garces YI, Park SS, Grams MP. Phantom Verification of AAA and Acuros Dose Calculations for Lung Cancer: Do Tumor Size and Regression Matter? *Pract Radiat Oncol.* 2019;9:29-37. Mayo Clinic, Minnesota.

Tajaldeen A, Ramachandran P, Alghamdi S, Geso M. On the use of AAA and AcurosXB algorithms for three different stereotactic ablative body radiotherapy (SABR) techniques: Volumetric modulated arc therapy (VMAT), intensity modulated radiation therapy (IMRT) and 3D conformal radiotherapy (3D-CRT). *Rep Pract Oncol Radiother.* 2019;24:399-408. RMIT University, Victoria, Australia; Peter MacCallum cancer centre, Victoria, Australia and Imam Abdulrahman bin Faisal University, Saudi Arabia.

Zhang J, Jiang D, Su H, Dai Z, Dai J, Liu H, Xie C, Yu H. Dosimetric comparison of different algorithms in stereotactic body radiation therapy (SBRT) plan for non-small cell lung cancer (NSCLC)v. *Onco Targets Ther.* 2019;12:6385-6391. Zhongnan Hospital of Wuhan University, Hubei, China.

Kumar L, Kishore V, Bhushan M, Dewan A, Yadav G, Raman K, Kumar G, Ahmad I, Chufal KS, Gairola M. Impact of acuros XB algorithm in deep-inspiration breath-hold (DIBH) respiratory techniques used for the treatment of left breast cancer. *Rep Pract Oncol Radiother.* 2020;25:507-514. A.P.J Abdul Kalam Technical University, Lucknow, India; Gandhi Cancer Institute and Research Center, New Delhi, India and Bundelkhand Institute of Engineering & Technology, Jhansi, India.

Sarkar V, Paxton A, Rassiah P, Kokeny KE, Hitchcock YJ, Salter BJ. Evaluation of dose distribution differences from five algorithms implemented in three commercial treatment planning systems for lung SBRT. *J Radiosurg SBRT.* 2020;7:57-66. University of Utah, UT.

Takizawa T, Tanabe S, Utsunomiya S, Nakano H, Yamada T, Sakai H, Ohta A, Saito H, Nakano T, Abe E, Kaidu M, Aoyama H. Dosimetric comparison of analytic anisotropic algorithm and Acuros XB algorithm in VMAT plans for high-grade glioma. *Phys Med.* 2020;73:73-82. Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan.

Kumar L, Kishore V, Bhushan M, Kumar P, Chaudhary RL. Dosimetric impact of Acuros XB on cervix radiotherapy using RapidArc technique: a dosimetric study. *Rep Pract Oncol Radiother.* 2021;26:582-589. Dr. A.P.J Abdul Kalam Technical University, Lucknow, India; Rajiv Gandhi Cancer Institute and Research Center, New Delhi, India and Bundelkhand Institute of Engineering and Technology, Jhansi, India.

*\* This bibliography is a representative selection, but not necessarily exhaustive list, of literature pertaining to Varian's Acuros® XB dose calculation algorithm, with additional articles foundational to Acuros XB in the Foundational section.*

### Intended Use Summary

Varian Medical Systems' linear accelerators are intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation treatment is indicated.

### Safety Statement

Radiation treatments may cause side effects that can vary depending on the part of the body being treated. The most frequent ones are typically temporary and may include, but are not limited to, irritation to the respiratory, digestive, urinary or reproductive systems, fatigue, nausea, skin irritation, and hair loss. In some patients, they can be severe. Treatment sessions may vary in complexity and time. Radiation treatment is not appropriate for all cancers.

**varian**

[varian.com](http://varian.com)

USA, Corporate  
Headquarters and  
Manufacturer

Varian Medical Systems, Inc.  
3100 Hansen Way  
Palo Alto, CA 94304  
Tel: 650.424.5700  
800.544.4636

Headquarters Europe,  
Eastern Europe, Middle &  
Near East, India, Africa

Siemens Healthineers  
International AG  
Steinhausen, Switzerland  
Tel: 41.41.749.8844

Asia Pacific Headquarters

Varian Medical Systems  
Pacific, Inc.  
Kowloon, Hong Kong  
Tel: 852.2724.2836

Australasian Headquarters

Varian Medical Systems  
Australasia Pty Ltd.  
Sydney, Australia  
Tel: 61.2.9485.0111

Latin American Headquarter

Varian Medical Systems  
Brasil Ltda.  
São Paulo, Brazil  
Tel: 55.11.3457.2655