



Varian Medical Systems, Inc.  
% Peter J. Coronado  
Sr. Director, Regulatory Affairs  
3100 Hansen Way,  
PALO ALTO CA 94304

September 12, 2023

Re: K231317

Trade/Device Name: TrueBeam, TrueBeam STx, Edge, VitalBeam  
Regulation Number: 21 CFR 892.5050  
Regulation Name: Medical Charged-Particle Radiation Therapy System  
Regulatory Class: Class II  
Product Code: IYE  
Dated: August 11, 2023  
Received: August 14, 2023

Dear Peter J. Coronado:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database located at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm> identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part

801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803) for devices or postmarketing safety reporting (21 CFR 4, Subpart B) for combination products (see <https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products>); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems>.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance>) and CDRH Learn (<https://www.fda.gov/training-and-continuing-education/cdrh-learn>). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice>) for more information or contact DICE by email ([DICE@fda.hhs.gov](mailto:DICE@fda.hhs.gov)) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

 **Xin He -S** for

Lora D. Weidner, Ph.D.  
Assistant Director  
Radiation Therapy Team  
DHT8C: Division of Radiological Imaging  
and Radiation Therapy Devices  
OHT8: Office of Radiological Health  
Office of Product Evaluation and Quality  
Center for Devices and Radiological Health

Enclosure

## Indications for Use

510(k) Number (if known)

K231317

Device Name

TrueBeam, TrueBeam STx and Edge Radiotherapy Delivery System;  
VitalBeam

Indications for Use (Describe)

TrueBeam-TrueBeam STx-Edge:

The TrueBeam™, TrueBeam STx and Edge™ Systems are intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation therapy is indicated for adults and pediatric patients. The TrueBeam, TrueBeam STx, and Edge Systems may be used in the delivery of radiation for treatment that includes: brain and spine tumors (such as glioma, meningioma, craniopharyngioma, pituitary tumors, spinal cord tumors, hemangioblastoma, orbital tumors, ocular tumors, optic nerve tumors, and skull based tumors), head and neck tumors (such as unknown primary of the head and neck, oral cavity, hypopharynx, larynx, oropharynx, nasopharynx, sinonasal, salivary gland, and thyroid cancer), thoracic tumors (such as lung cancer, esophageal cancer, thymic tumors, and mesothelioma), gynecologic tumors (such as ovarian, cervical, endometrial, vulvar, and vaginal), gastrointestinal tumors (such as gastric, pancreatic, hepatobiliary, colon, rectal, and anal carcinoma), genitourinary tumors (such as prostate, bladder, testicular, and kidney), breast tumors, sarcomas, lymphoid tumors (such as Hodgkin's and non-Hodgkin's lymphoma), skin cancers (such as squamous cell, basal cell, and melanoma), benign diseases (such as schwannoma, arteriovenous malformation, cavernous malformation, trigeminal neuralgia, chordoma, glomus tumors, and hemangiomas), metastasis (including all parts of the body such as brain, bone, liver, lung, kidney, and skin) and pediatric tumors (such as glioma, ependymoma, pituitary tumors, hemangioblastoma, craniopharyngioma, meningioma, metastasis, medulloblastoma, nasopharyngeal tumors, arteriovenous malformation, cavernous malformation, and skull base tumors), and medically refractory essential tremor (indicated for adults only).

VitalBeam:

VitalBeam: VitalBeam® is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation therapy is indicated for adults and pediatric patients. VitalBeam may be used in the delivery of radiation for treatment that includes: brain and spine tumors (such as glioma, meningioma, craniopharyngioma, pituitary tumors, spinal cord tumors, hemangioblastoma, orbital tumors, ocular tumors, optic nerve tumors, and skull based tumors), head and neck tumors (such as unknown primary of the head and neck, oral cavity, hypopharynx, larynx, oropharynx, nasopharynx, sinonasal, salivary gland, and thyroid cancer), thoracic tumors (such as lung cancer, esophageal cancer, thymic tumors, and mesothelioma), gynecologic tumors (such as ovarian, cervical, endometrial, vulvar, and vaginal), gastrointestinal tumors (such as gastric, pancreatic, hepatobiliary, colon, rectal, and anal carcinoma), genitourinary tumors (such as prostate, bladder, testicular, and kidney), breast tumors, sarcomas, lymphoid tumors (such as Hodgkin's and non-Hodgkin's lymphoma), skin cancers (such as squamous cell, basal cell, and melanoma), benign diseases (such as schwannoma, arteriovenous malformation, cavernous malformation, trigeminal neuralgia, chordoma, glomus tumors, and hemangiomas), metastasis (including all parts of the body such as brain, bone, liver, lung, kidney, and skin) and pediatric tumors (such as glioma, ependymoma, pituitary tumors, hemangioblastoma, craniopharyngioma, meningioma, metastasis, medulloblastoma, nasopharyngeal tumors, arteriovenous malformation, cavernous malformation, and skull base tumors).

Type of Use (Select one or both, as applicable)

Prescription Use (Part 21 CFR 801 Subpart D)

Over-The-Counter Use (21 CFR 801 Subpart C)

**CONTINUE ON A SEPARATE PAGE IF NEEDED.**

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# 510(k) SUMMARY

K231317

The following information is provided as required by 21 CFR 807.92.

## SUBMITTER

**Name and Address:** Varian Medical Systems  
3100 Hansen Way, m/s E110  
Palo Alto, CA 94304

**Contact Person:** Peter J. Coronado  
Sr. Director, Regulatory Affairs  
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[submissions.support@varian.com](mailto:submissions.support@varian.com)

**Date Prepared:** 05 May 2023

## DEVICE

**Subject Device Name:** TrueBeam™ /TrueBeam STx™/Edge™/VitalBeam  
**Common/Usual Name:** Linear accelerator radiation therapy system  
**Product Code and Classification:** Medical charged-particle radiation therapy system  
IYE | 21 CFR 892.5050 | Class II

## PREDICATE DEVICE

**Predicate Device Name:** TrueBeam™ /TrueBeam STx™/Edge™/VitalBeam (K213977)  
**Reference Device(s):** No reference devices were used in this submission.

## DEVICE DESCRIPTION

The TrueBeam and VitalBeam Radiotherapy System is a medical linear accelerator that delivered therapeutic radiation to patient in accordance with the physician's prescription.

The system consists of two major components – a photon, electron and diagnostic kV X-ray radiation beam producing component that is installed in a radiation-shielded vault and a control console area located outside the treatment room.

## INTENDED USE

**TrueBeam-TrueBeam STx-Edge:** The TrueBeam™ radiotherapy delivery system is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation treatment is indicated.

**VitalBeam:** The VitalBeam system is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation treatment is indicated.

## INDICATIONS FOR USE

### **TrueBeam-TrueBeam STx-Edge:**

The TrueBeam™, TrueBeam STx and Edge™ Systems are intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation therapy is indicated for adults and pediatric patients.

The TrueBeam, TrueBeam STx, and Edge Systems may be used in the delivery of radiation for treatment that includes: brain and spine tumors (such as glioma, meningioma, craniopharyngioma, pituitary tumors, spinal cord tumors, hemangioblastoma, orbital tumors, ocular tumors, optic nerve tumors, and skull based tumors), head and neck tumors (such as unknown primary of the head and neck, oral cavity, hypopharynx, larynx, oropharynx, nasopharynx, sinonasal, salivary gland, and thyroid cancer), thoracic tumors (such as lung cancer, esophageal cancer, thymic tumors, and mesothelioma), gynecologic tumors (such as ovarian, cervical, endometrial, vulvar, and vaginal), gastrointestinal tumors (such as gastric, pancreatic, hepatobiliary, colon, rectal, and anal carcinoma), genitourinary tumors (such as prostate, bladder, testicular, and kidney), breast tumors, sarcomas, lymphoid tumors (such as Hodgkin's and non-Hodgkin's lymphoma), skin cancers (such as squamous cell, basal cell, and melanoma), benign diseases (such as schwannoma, arteriovenous malformation, cavernous malformation, trigeminal neuralgia, chordoma, glomus tumors, and hemangiomas), metastasis (including all parts of the body such as brain, bone, liver, lung, kidney, and skin) and pediatric tumors (such as glioma, ependymoma, pituitary tumors, hemangioblastoma, craniopharyngioma, meningioma, metastasis, medulloblastoma, nasopharyngeal tumors, arteriovenous malformation, cavernous malformation, and skull base tumors), and medically refractory essential tremor (indicated for adults only).

### **VitalBeam:**

VitalBeam® is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation therapy is indicated for adults and pediatric patients.

VitalBeam may be used in the delivery of radiation for treatment that includes: brain and spine tumors (such as glioma, meningioma, craniopharyngioma, pituitary tumors, spinal cord tumors, hemangioblastoma, orbital tumors, ocular tumors, optic nerve tumors, and skull based tumors), head and neck tumors (such as unknown primary of the head and neck, oral cavity, hypopharynx, larynx, oropharynx, nasopharynx, sinonasal, salivary gland, and thyroid cancer), thoracic tumors (such as lung cancer, esophageal cancer, thymic tumors, and mesothelioma), gynecologic tumors (such as ovarian, cervical, endometrial, vulvar, and vaginal), gastrointestinal tumors (such as gastric, pancreatic, hepatobiliary, colon, rectal, and anal carcinoma), genitourinary tumors (such as prostate, bladder, testicular, and kidney), breast tumors, sarcomas, lymphoid tumors (such as Hodgkin's and non-Hodgkin's lymphoma), skin cancers (such as squamous cell, basal cell, and melanoma), benign diseases (such as schwannoma, arteriovenous malformation, cavernous malformation, trigeminal neuralgia, chordoma, glomus tumors, and hemangiomas), metastasis (including all parts of the body such as brain, bone, liver, lung, kidney, and skin) and pediatric tumors (such as glioma, ependymoma, pituitary tumors,

hemangioblastoma, craniopharyngioma, meningioma, metastasis, medulloblastoma, nasopharyngeal tumors, arteriovenous malformation, cavernous malformation, and skull base tumors).

### SIGNIFICANT DIFFERENCES

The significant changes in the subject device compared to the predicate device are as follows:

- Extended field of view CBCT reconstruction
- Templated-based fiducial detection algorithm for Auto Beam Hold
- 1.5 RPM gantry speed for imaging
- Metal artifact reduction

### SUMMARY OF TECHNOLOGICAL CHARACTERISTICS

Both subject device and the predicate device contain the same technological characteristics and functional scientific technology to deliver radiation therapy and stereotactic radiosurgery by authorized medical practitioners. A subset of technological characteristics and features of the current device is different to the predicate. These differences are all enhancements of the predicate. The Intended Use and indications for use are unchanged. There are no changes in the principle of operation of the device. The biocompatibility of patient-contacting components remains the same as the predicate device. The results of the verification, validation and safety standards testing demonstrates that there are no changes to the safety profile of the device.

The feature comparison chart below shows the difference between predicate and subject device. The features in **blue** text in table below are new to the subject device.

Feature	Predicate Device TrueBeam and VitalBeam v3.0 (K213977)	Subject Device TrueBeam-TrueBeam STx-Edge and VitalBeam v4.0
<b>Intended Use:</b>  The TrueBeam® system is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation treatment is indicated.  The VitalBeam system is intended to provide stereotactic radiosurgery and precision radiotherapy for lesions, tumors, and conditions anywhere in the body where radiation treatment is indicated.	Yes	Yes
<b>Software Operating System</b>	Windows 10	Windows 10
<b>Treatment Techniques</b>		
<ul style="list-style-type: none"> <li>• Basic integral treatment techniques include static photon, static aperture photon arc, and dynamic conformal arc.</li> <li>• Additional treatment techniques include static electron and electron arc, IMRT/IMRS, RapidArc and VMAT, Total Body treatments (photon and electron).</li> <li>• All photon treatment delivery techniques can be delivered under respiratory gating conditions.</li> <li>• Fully automated treatment delivery</li> </ul>	Yes	Yes
<b>Dynamic collimator for IMRT and VMAT</b>	No	Yes
<b>Mixed static and dynamic gantry-modulated fields</b>	No	Yes
Unicode	Yes	Yes
Jaw tracking, Trajectory logs, RDSR & Smart connect	Yes	Yes

Automated Dynamic Beam (aka ADB /4Pi / Hyperarc)	Yes	Yes
Enlarged Bounding Box (w/in HyperArcTM)	Yes	Yes
Treatment Energy used 6-16 MV (BJR-17), 6-22 MeV	Yes	Yes
Treatment Energy used 4-25MV (BJR 17), 6-22 MeV	Yes	Yes
6x FFF (High Intensity Mode)	Yes	Yes
10x FFF (High Intensity Mode)	Yes	Yes
Varied Dose rate throughout arc travel - Dose rate RT: Up to 600 MU/min High dose rate: Up to 2400 MU/min	Yes	Yes
Varied gantry rotation speed throughout arc travel	Yes	Yes
Arc treatment Control points between two and 500; segments allowed with zero dose; allowed respiratory gating	Yes	Yes
Isocenter $\leq 1.5$ mm for all three rotational axes	Yes	Yes
Single Isocenter Multiplan	Yes	Yes
LaserGuard II Gantry Collision Detection System	Yes	Yes
<b>Couch</b>		
<b>Treatment Couch Motions</b>		
<ul style="list-style-type: none"> <li>• Small, corrective motions and large planned or targeted motions for couch longitudinal, lateral, vertical &amp; rotational axes (4DoF).</li> <li>• Dynamic motion axes now include gantry, collimator (jaws, MLC, collimator rotation), couch translation and rotation for patient set up and treatment delivery.</li> <li>• Local (in treatment room) couch motion control for manual positioning and automated positioning to plan values.</li> <li>• Tx Plans pre-treatment QA (incl. exceeding pre-defined dose limits)</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>• Delta Couch automated patient alignment shifts (Delta Couch Shift).</li> <li>• (Varian Treatment Couch) – Linear Encoder</li> </ul>	Yes	Yes
Qfix kVue One Couch Top: s/w support only + MPC support	Yes	Yes
Perfect Pitch – automated corrective motion for pitch and roll axes (6 degrees of freedom)	Yes	Yes
Treatment application recognizes common isocenter within and across plans then applies couch corrections to the common isocenter.	Yes	Yes
<b>Integrated Treatment and Imaging Console</b>		
External beam: X-ray & ELECTRON plus PHOTON beam for SRS/SRT delivery	Yes	Yes
Electron Energies: 7MeV & 11MeV	Yes	Yes
Coplanar, Non-coplanar, Arc fields	Yes	Yes
Beam shaping f(x): Dynamic wedges, Asymmetric collimators	Yes	Yes
Conical Collimator Verification (Varian ICVI)	Yes	Yes
Recognized patient-specific accessories: Electron Beam Collimators, Poured Blocks, Compensators, Physical wedges	Yes	Yes
Patient ID (bar code label) verification & Custom accessory verification (VVS compatibility) <ul style="list-style-type: none"> <li>• Patient selection from queue provided by the schedule</li> <li>• Selected patient plan retrieval from info system</li> <li>• Electronically send Plan setup data to linac</li> </ul>	Yes	Yes



VVS – CV (Varian Verification System, conical Cone Verification) compatibility	Yes	Yes
Set up verification & beam prevention if setup does not match Tx plan	Yes	Yes
Manual bolus verification	Yes	Yes
Override treatment parameters based on user rights and permit current session delivery only	Yes	Yes
HET console electronically sends Plan setup data to the HET system supervisor	Yes	Yes
Access to MLC shape editing	Yes	Yes
Graphical display/editing of field parameters	Yes	Yes
Auto sequencing of fields for the selected patient	Yes	Yes
<ul style="list-style-type: none"> <li>Record treatment delivery results</li> <li>Send History to InfoSys archive in patient record</li> </ul>	Yes	Yes
Interfaces: <ul style="list-style-type: none"> <li>DICOM RT/3.0 data and image import/export capability;</li> <li>ADI v2.0 and v3.0</li> </ul>	Yes	Yes
ADI 3.0 (6DOF wit Brainlab Interoperability)	Yes	Yes
Motion Management Interface	Yes	Yes
<b>Multi-leaf Collimator</b>		
<b>120-Leaf MLC</b> <u>Maximum field sizes for 120 MLC:</u> Static field size: 40cm x 40cm. Static aperture field size: 30cm x 40cm IMRT field size: 34 cm x 40 cm	Yes	Yes
<b>HD120 MLC</b> <u>Maximum field sizes for HD120 MLC:</u> Static field size (MLC retracted): 40cm x 40 cm Static aperture field size: 30cm x 22cm IMRT field size: 34 cm x 22 cm	Yes	Yes
<b>Imaging Techniques</b>		
MV Photon Imager Component	Yes	Yes
Reference Image Feature (Structure, Field Edges, Digital graticule)	Yes	Yes
Portal Image Matching: (Matching Common Features, Match Field Edges Plot, Matched Structures and Field Edges, Related Images, Double Exposure, ROI, couch shift values, respiratory-gated image acquisition, marker matching and portal dosimetry image acquisition.)	Yes	Yes
Low X imaging energy for high contrast portal imaging	Yes	Yes
kV Photon Imager Component	Yes	Yes
Integrated Component: MV Imager w/photon imaging: 43 x 43 imager	Yes	Yes
<b>Larger kV imager 43x43</b>	<b>No</b>	<b>Yes</b>
<b>Metal artifact reduction</b>	<b>No</b>	<b>Yes</b>
<b>Extended FoV CBCT reconstruction</b>	<b>No</b>	<b>Yes</b>
<b>Templated-based fiducial detection algorithm for Auto Beam Hold</b>	<b>No</b>	<b>Yes</b>
<b>Proximity detection:</b> Touch guards on kV source, kV detector, positioning units with addition of supplemental capacitive collision detection system (kV CCDS) on kV source	Yes	Yes
<b>Type of digital image produced:</b>		

<ul style="list-style-type: none"> <li>Digital radiographs, fluoroscopic image frames, cone-beam CT image projections, respiratory-gated radiographs, respiration-synchronized fluoroscopic image frames</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Offline 4D CBCT image projections</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Offline Multi-scan CBCT images</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>2D-3D Match</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Gated CBCT</li> <li>Online 4D CBCT and Extended CBCT</li> <li>Short Arc CBCT</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Iterative CBCT (iCBCT)</li> <li>Automatic Exposure Control (AEC)</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>Iterative CBCT (iCBCT - includes pelvis large and image gently)</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li>iCBCT improvements (Improvement to the iCBCT algorithm, for when the patient's outer contour is changing during a CT scan.)</li> </ul>	Yes	Yes
<ul style="list-style-type: none"> <li><b>CBCT Mode editor</b></li> </ul>	No	Yes
<ul style="list-style-type: none"> <li>Marker-less 4D CBCT binning</li> </ul>	Yes	Yes
Movie Encoding Service	Yes	Yes
<b>Basis of image comparison:</b> Soft tissue, bony anatomy, fiducial markers, digital representation of treatment aperture	Yes	Yes
<b>Image comparison techniques:</b> 2D-2D and 3D-3D image matching under fully automatic conditions using mutual information, or semi-automatic matching conditions with use of both automated image and manual matching, or fully manual matching conditions	Yes	Yes
<b>Image comparison with:</b> Soft tissue, bony anatomy, fiducial markers, digital representation of treatment aperture		
Auto Beam hold Improvements	Yes	Yes
Marking Pixel Detection	Yes	Yes
Imaging only session (plan is only available for imaging) and unplanned treatment mode (emergency treatment up to 5 fractions)	Yes	Yes
<b>1.5 RPM gantry for imaging</b>	No	Yes
<b>Respiratory Gating</b>		
Respiratory Gating Component	Yes	Yes
Single gating camera & visual coaching device (VCD)	Yes	Yes
<b>MPC</b>		
MPC Collimator Device Check	Yes	Yes
Machine Performance Check of ICVI (MPC)	Yes	Yes
<b>Developer Mode</b>		
Dual Energy kV Imaging (XI) (Developer mode research use)	Yes	Yes
<b>Systems</b>		
Isocentric Parameterization	Yes	Yes
<b>Other</b>		
4 Rack Unit Workstation inheriting 4 computers	Yes	Yes
Encoder Diagnostics	Yes	Yes
kV source arm drive train (gearbox) (s/w support only)	Yes	Yes

**PERFORMANCE DATA**

Hardware and software verification and validation testing was conducted according to the FDA Quality System Regulation (21 CFR §820), ISO 13485 quality Management System standard, ISO 14971 Risk Management Standard and the other FDA recognized consensus standards listed below.

Test results showed conformance to applicable requirements specifications and assured hazard safeguards functioned properly.

Software verification and validation testing were conducted, and documentation was provided as recommended by FDA’s Guidance for Industry and FDA Staff, “Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices.”

The software for this device was considered as a “major” level of concern since a failure or latent flaw in the software could directly result in serious injury or death to the patient or operator.

There was no change to patient-contact materials biocompatibility in this medical device. Therefore, no change occurred in conformance to ANSI/AAMI/ISO 10993-1 “Biological Evaluation of Medical Devices – Part 1”.

Human factors validation study was conducted according to the standard IEC 62366 to verify that TrueBeam, TrueBeam STx, Edge and VitalBeam v4.0 performs well as intended for the intended users, uses, and use environments.

Electrical safety and electromagnetic compatibility (EMC) testing were conducted on this medical device. The system complies with the IEC 606011 standards for safety and the IEC 60601-1-2 standard for EMC.

## STANDARDS

Varian TrueBeam, TrueBeam STx, Edge and VitalBeam confirms to the following FDA recognized standards. For full details refer to Summary Use of Voluntary Consensus Standards document in section 9 of this 510(k) submission.

IEC 60601-1:2005+A1:2012	IEC 60601-2-68:2014	ISO 10993-1:2018
IEC 62366-1:2015+A1:2020	IEC 62304:2006+A1:2015	ISO 15223-1:2021
IEC 60601-1-6:2010+A1:2013	IEC 61217:2011	EN ISO 14971:2019
IEC 60601-1-2:2014	IEC 60976:2007	EN ISO 13485:2016
IEC 60601-1-3:2008/A1:2013	IEC 62274:2005	EN ISO 20417:2021
IEC 60601-2-1:2020	AAMI RT2:2017	ISO 15223-1:2021

## CLINICAL TESTING

No animal or clinical tests are being submitted to establish substantial equivalence with the predicate device.

## CONCLUSION

TrueBeam, TrueBeam STx, Edge and VitalBeam 4.0 is substantially equivalent to the TrueBeam, TrueBeam STx, Edge and VitalBeam 3.0 predicate device. The intended use and indications for use are the same. The

major technological characteristics are substantially equivalent to the predicate device, and the differences do not raise new questions of safety and effectiveness. The results of verification and validation as well as conformance to relevant safety standards demonstrate that TrueBeam, TrueBeam STx, Edge and VitalBeam meets the safety and performance criteria and is substantially equivalent to the predicate device.