

THINK BIG, SCALE SMART



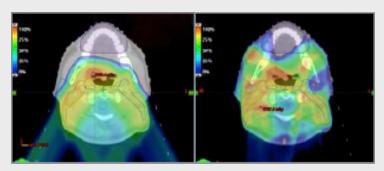
Proton therapy

A true success in cancer care

Proton therapy is used today to treat many cancers and is particularly appropriate in situations where treatment options are limited or conventional radiotherapy presents an unacceptable risk to the patient.

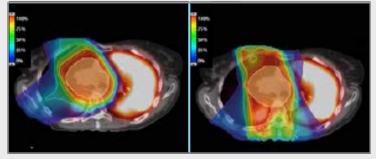
These situations include and are not limited to eye and brain cancers, tumors close to the brain stem, spinal cord or other vital organs, head and neck cancers, recurring cancers and pediatric cancers.

Proton therapy VS X-ray radiation



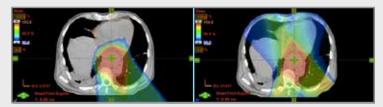
Head and neck

Images with courtesy of Dr Alexander Lin, University of Pennsylvania School of Medicine



Lung

Images with courtesy of Stephen Bowen, PhD, University of Washington



Esophagus

Images with courtesy of Dr John Plastaras, University of Pennsylvania School of Medicine

For a general overview of the clinical aspects of proton therapy, refer to the following books:

- "Proton and charged particle radiotherapy"
- by Thomas F. Delaney, Hanne M. Kooy "Proton Therapy", Series: Radiation Medicine Rounds Volume 1 Issue 3 by James M. Metz and Charles R. Thomas, Jr.

IBA | PROTEUS*ONE

PROTEUS®ONE

THINK BIG, SCALE SMART

PROTEUS®ONE is the only true compact single-room proton therapy solution with PBS and CBCT that can be integrated easily into many kinds of healthcare settings.

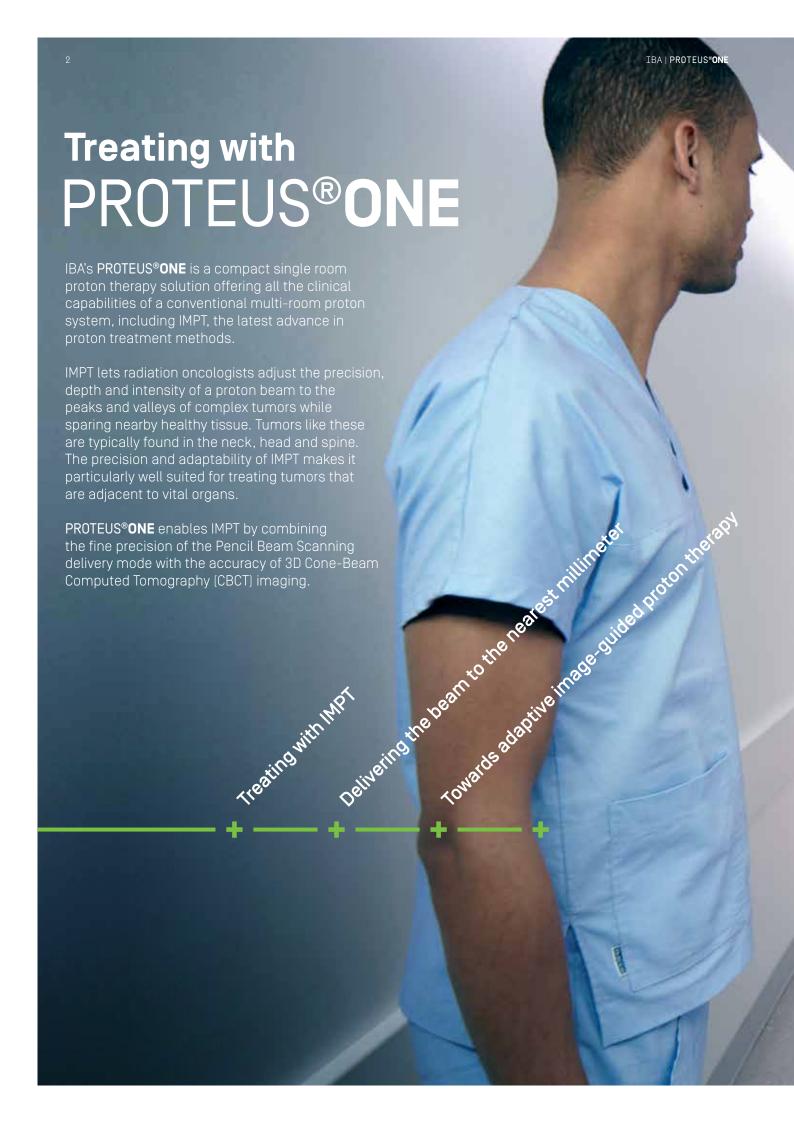
Much smaller and more affordable than conventional multi-room proton systems, but with the same clinical applications, PROTEUS®ONE makes proton therapy more accessible to clinical institutions worldwide and to their cancer patients.

Benefiting from IBA's unrivalled experience in proton therapy, PROTEUS®ONE delivers the latest advance in proton radiation therapy, Intensity Modulated Proton Therapy (IMPT). IMPT combines the precise dose delivery of Pencil Beam Scanning (PBS) with the dimensionally accurate imaging of 3D Cone Beam Computed Tomography (CBCT), enabling physicians to truly track where protons will be targeting tumor cells.

PROTEUS®ONE was inspired by everyday clinical practice. Its patient-centered design was developed in collaboration with Philips Healthcare to foster a soothing patient environment while enhancing the medical staff work experience and efficiency.

The powerful combination of a smaller system size, clinical capabilities and patient-centered design is why PROTEUS®ONE is being adopted by more advanced institutions around the world.







IBA | PROTEUS®**ONE**

Treating with Intensity Modulated Proton Therapy

PROTEUS®ONE delivers the proton beam to the target using the Pencil Beam Scanning (PBS) modality.

Thanks to its advanced technical and clinical capabilities, PBS enables a clinician's delivery of Intensity Modulated Proton Therapy to cancer patients. IMPT precisely targets the tumor while controlling the intensity and spatial distribution of the dose with fine precision.

With PROTEUS®ONE IMPT capabilities, you will have the ability to precisely model the dose on the target tumor, reaching high levels of conformality and dose uniformity, especially for complex tumors, with fewer treatment beams than IMRT.



What is Pencil Beam Scanning?

PBS is a proton beam delivery mode supporting IMPT. In PBS, the proton beam paints the target volume, one layer at a time, voxel by voxel, to precisely match the shape of the tumor.

IMPT treats a small section of the tumor at a time, adjusting the proton beam dose and depth to wider and narrower contours of the tumor, section by section.

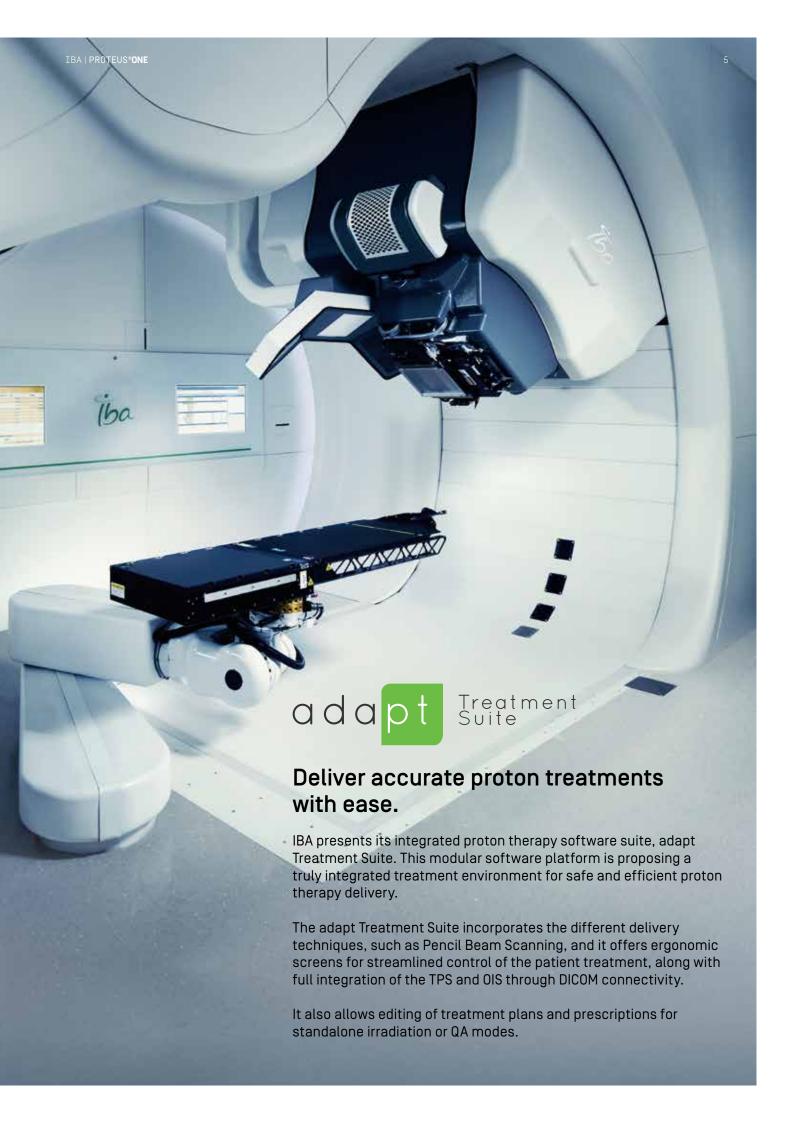
Combined with the appropriate imaging devices and treatment strategies, IMPT is capable of treating moving tumors.

The key advantages of PBS:

- It sculpts the dose with very high levels of conformality, even in complex-shaped tumors, thanks to its fine precision.
- It enables Intensity Modulated Proton Therapy (IMPT).
- It makes treatment planning easier, while eliminating the need for individualized aperture and compensator devices.
- It decreases the neutron dose to the patient during treatment compared to other proton delivery techniques (Double Scattering and Uniform Scanning).

At the Willis-Knighton Cancer Center in Shreveport, LA, we wanted to offer the latest form of proton therapy, pencil beam scanning, while taking advantage of advances in image guidance and remaining within the budget of our hospital system. We needed assurances that our partner had experience in designing, installing, and maintaining a proton therapy facility but also had the financial strength to invest in research and development for the future. IBA has continually demonstrated innovation in the field of proton therapy and they were chosen for their unique ability to meet our department needs.

Lane R Rosen MD



Delivering the beam to the nearest millimeter

PROTEUS®ONE brings together the most advanced techniques of patient positioning for proton therapy treatments. It enables your treatment procedures to optimize proton beam precision in dose, depth and shape. Developed over the years by IBA and our clinical partners, our proton beam technology has proven successful in delivering the proton beam with fine precision.

Robotic Patient Positioning System

Properly positioning the patient with the utmost care while ensuring the precise delivery of proton fractions is a key to clinical effectiveness.

The Robotic Patient Positioning System incorporated into PROTEUS®ONE is a safe, robust and accurate device equipped with interchangeable treatment tabletops. Its smooth, deliberate motion positions the patient so that the target is precisely placed for receiving the treatment beam. Adjustments to the patient's position are automatically transferred from the Image-guided Proton Therapy system to the positioning controller.

IBA's Robotic Patient Positioning System offers:

- **Treatment flexibility:** Patient positioner with 6 degrees of freedom (horizontal, lateral, vertical, rotation, pitch and roll movements are possible).
- Treatment precision: High positioning accuracy and reproducibility.
- Patient comfort: Increased smoothness and reliability.





8 IBA|PROTEUS®**one**

Towards adaptive Image-Guided Proton Therapy

IBA's **PROTEUS®ONE** incorporates the latest imaging technologies so clinicians can deliver Image-Guided Proton Therapy (IGPT) to cancer patients.

IGPT relies on high-resolution and high-sensitivity X-Ray digital imaging systems that provide low-dose stereoscopic and 3D imaging in various geometrical arrangements.

The advanced imaging technologies integrated in PROTEUS®ONE ensure quick and accurate patient position verification by comparison with diagnostic CT images, taken during the treatment planning process.

Stereoscopic Patient imaging

Oblique stereoscopic X-Ray imaging allow accurate patient position verification and monitoring.

adapt insight is the IBA imaging platform. It is part of IBA's integrated proton therapy software suite, adapt Treatment Suite. It incorporates image-guidance features such as 3D CBCT and stereoscopic X-Ray imaging for highly accurate patient treatment, as well as tight integration with adapt deliver. An open architecture and programmable workflow configurability build a solid foundation for the development of future proton specific image-guided solutions.



IBA | PROTEUS*ONE

3D Cone-Beam CT Image-Guided Proton Therapy (IGPT)

3D volumetric X-Ray imaging, Cone-Beam Computed Tomography (CBCT), can be directly acquired in the treatment room at isocenter. It can then be compared with treatment planning CT for patient position verification and anatomical modification assessment.

Advanced acquisition software, shading correction, accelerated inline and offline image reconstruction algorithms support high-speed, high-resolution, uniform and low-dose CBCT.

CBCT offers soft-tissue contrast, providing much more information than a conventional stereoscopic alignment system, and allowing more accurate patient treatment through anatomical modification

assessment, the first step towards adaptive radiation therapy.

With the advanced imaging technologies integrated into PROTEUS®ONE, clinical users can now apply similar advanced positioning and Quality Assurance protocols as those used in their Image-Guided Radiation Therapy (IGRT) practice.

IBA's PROTEUS®ONE brings the advantages of:

- **Acquiring** CBCT image in room and at isocenter.
- **Ensuring** accurate patient positioning during treatment.
- **Enabling** the detection of anatomic modifications within the patient along the radiological path.







12 IBA | PROTEUS®**ONE**

Optimized staff experience

Open treatment enclosure

PROTEUS®ONE is designed with an open treatment enclosure. It allows the physicians and nurses to have easy access to the patient during positioning and imaging. This facilitates patient care and comfort, and improves positioning procedures especially during non-coplanar treatments.

Gantry Rolling Floor

Thanks to the highly functional design of our Gantry Rolling Floor, the patient remains accessible to the treatment staff as the gantry rotates around the isocenter. The Gantry Rolling Floor ensures staff safety during clinical operations, allowing them to focus on their core tasks and tend to patient wellbeing.

In-room imaging control

PROTEUS®ONE permits radiation therapists and clinicians to access and control patient imaging from inside the treatment room. This permits improved patient care, greater ease of use and efficient patient positioning.



IBA|PROTEUS*ONE 13

Turning healthcare into human care

While focusing on clinical efficiency and interoperability, PROTEUS®ONE also incorporates environmental features to help keep patients relaxed and comfortable during imaging and treatment.

Based on insights from proton patients, healthcare staff and experts, Philips Healthcare and IBA integrated a solution that improves the overall patient and staff experience; turning a cold, impersonal environment into one that comforts and reassures.

Philips received the "International Red Dot Award: Product design 2014" for the Ambient Experience associated to the **PROTEUS®ONE**.



Acknowledged as the best quality and ground-breaking design, Ambient Experience helps enhance the overall experience for oncology patients and staff.



Benefits of Ambient Experience

For the patients and families:

Reduced anxiety and increased comfort. Higher patient satisfaction.

For the staff:

Increased working comfort.
Better patient interaction.
Higher job effectiveness with improved staff experience and satisfaction.

For the hospital management:

Improved workflow and throughput.
Improved patient satisfaction leading to word-of-mouth endorsement.
Attracting and retaining highly trained clinical staff and reducing overhead costs.

Philips Ambient Experience in figures*

- 76% increase in staff satisfaction
- 4% overall decrease in procedure duration
- 6% overall patient increase
- * Philips installed base survey "What do our customers say", 100 customers interviewed, 27 countries (excl.NA) in September 2011.

In partnership with

PHILIPS





IBA|PROTEUS*ONE

When size matters

In many areas, size matters. This is particularly true in a high-tech medical facility where every square foot is invaluable. There is a common misconception that proton therapy requires a large — and costly — facility in which to operate. As a consequence, too many facility executives look at the space and capital they have available and quickly deem a proton center to be impossible.

The IBA team has worked relentlessly to prove this belief to be false.

The result is **PROTEUS®ONE**: a proton therapy solution with a footprint limited to the size of two typical linac vaults.

Compact acceleration with minimal neutron dose

Acceleration of the proton beam in PROTEUS®ONE is performed by IBA's specially designed Superconducting Synchro-Cyclotron. This technology reduces the accelerator weight and energy consumption by a factor of four.

In order to ensure the safest treatment at all times, the scanning controller performs 1 million measurements per second, allowing **60,000 safety decisions per second**.

Our compact accelerator is mounted outside of the treatment room which dramatically reduces neutron exposure.

On average, it releases **7 times less neutron dose to the whole body*** compared to a Gantry Mounted Accelerator**.

* Stichelbaut F, Closset M, Jongen Y "Secondary Neutron doses in a compact proton therapy system", Pubmed 24591728, Radiat Prot Dosimetry, 2014.

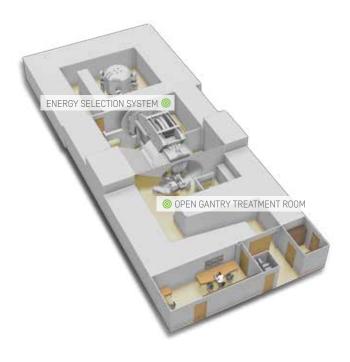
Complete treatment freedom for improved patient and staff experience

IBA offers the first compact gantry on the market that extends the treatment angle to 360°. In doing so, your clinicians benefit from complete treatment freedom and uncompromised treatment options. The open treatment enclosure allows physicians and nurses to have easy access to the patient in treatment position. This facilitates patient care and comfort, and improves positioning procedures especially during non-coplanar treatments.

The IBA Open Compact Gantry provides the perfect equilibrium associating the strength, reliability and speed in a compact and patient-friendly treatment solution.

The IBA Open Compact Gantry Treatment Room combines a compact gantry design with the following advantages:

- Optimized access and comfort for patients and staff.
- Accurate patient positioning systems.
- Reduced cost and shorter installation time.



^{**} Based on Monte Carlo Simulation.

16 IBA | PROTEUS®**ONE**

Leading institutions have already chosen IBA. Join them to develop the future of cancer care together.

Stay focused on patient care, we can run the system for you

Our experience installing proton systems at more than half of the clinical proton therapy centers worldwide has led us to understand the worries and clinical complexities that arise when treating cancer. Our commitment is to ensure your clinical success by providing reliable systems with the highest availability possible — over 98% uptime. The dependability and reliability of IBA proton systems means you can schedule patient treatments — and necessary clinical staff — with confidence.

To date, being part of the IBA proton therapy client network and benefiting from our technical expertise has helped centers around the world to treat over 60,000 cancer patients worldwide.

Your team can focus on the clinical aspects of cancer care while IBA's team keeps your proton therapy system running at top performance and meets the highest safety and reliability standards.

Operation and Maintenance Services in a nutshell

With the largest team of proton experts around the world, you can have access to our qualified field support team at any time, day and night.

In addition to personalized support, other key services are provided:

- 24/7 remote support service, online or over the phone, is an important component to keep your equipment's high uptime.
- A team of IBA trained specialists will operate the system onsite to ensure the highest level of availability for clinical treatment.
- In case of emergency, we can deliver spare parts the same day via our extensive spare parts worldwide network, with hubs in America, Asia and Europe.
- Because technology changes quickly, IBA develops both update and upgrade packages tailored to your center's configuration and training programs to increase your team's efficiency.

NEW service features include:

- Remote Service Connections to proton therapy accelerator systems;
- Worldwide Computerized Maintenance Management Systems.

We are very pleased to be working with IBA. The UZ Leuven mission is to deliver the highest quality and most innovative patient care with unrelenting attention to clinical excellence, patient care and patient safety. It was therefore a natural decision for us to equip our hospital with a proton therapy solution as it is the most targeted treatment in the fight against cancer. Following a comprehensive public tender, we have chosen IBA because it provided the proton therapy solution that best fitted our needs.

Marc Decramer

Chief Executive Officer of UZ Leuven



IBA | PROTEUS®ONE

IBA has designed and installed the majority of clinically operating Proton Therapy centers in the world.

North America network



NORTHWESTERN MEDICINE CHICAGO PROTON CENTER





HAMPTON UNIVERSITY PROTON THERAPY INSTITUTE Hampton, VA, USA



MASSACHUSETTS GENERAL HOSPITAL BURR PROTON THERAPY CENTER

Boston, MA, USA Treating since 2001



WILLIS-KNIGHTON CANCER CENTER

Shreveport, LA, USA Treating since 2014



PROCURE PROTON THERAPY CENTER IN OKLAHOMA CITY

Oklahoma City, OK, USA Treating since 2009



THE PROTON THERAPY CENTER LLC (TPTC) PROVISION HEALTHCARE

Knoxville, TN, USA Treating since 2014



SCCA PROTON THERAPY A PROCURE CENTER

Seattle, WA, USA



PROCURE PROTON THERAPY CENTER

Somerset, NJ, USA



MIAMI CANCER INSTITUTE BAPTIST HEALTH SOUTH **FLORIDA**

Miami, FL, USA Treating since 2017



TEXAS CENTER FOR PROTON THERAPY

Dallas, TX, USA



BEAUMONT HEALTH SYSTEM

Roval Oak, MI, USA Treating since 2017



INOVA SCHAR CANCER INSTITUTE

Fairfax, VA, USA



UNIVERSITY OF FLORIDA HEALTH PROTON THERAPY INSTITUTE

Jacksonville, FL, USA Treating since 2006 / Opening in 2019



UNIVERSITY OF PENNSYLVANIA **HEALTH SYSTEM ROBERTS** PROTON THERAPY CENTER

Philadelphia, PA, USA

South America network



INSTITUTO DE ONCOLOGIA ANGEL ROFFO HOSPITAL

Buenos Aires, Argentina



PROTEUS®PLUS

PROTEUS®ONE

This map has been updated in August 2017. For last version of the map visit us online at: iba-worlwide.com

IBA|PROTEUS*ONE 19

Europe network



UNIVERSITAIR ZIEKENHUIS LEUVEN Leuven, Belgium Opening in 2019



AZIENDA PROVINCIALE PER I SERVIZI SANITARI (APSS)

Trento, Italy
Treating since 2014



CENTRE ANTOINE LACASSAGNE

Nice, France Treating since 2018



WESTDEUTSCHES PROTONEN-THERAPIEZENTRUM ESSEN

(WPE) Essen, Germany Treating since 2013



PROTON PARTNERS INTERNATIONAL

United Kingdom
The Rutherford Cancer
Centres (Newport, Reading,
Northumberland & two other
undisclosed locations)
Opening in 2018



PROTON THERAPY CENTER CZECH S.R.O.

Prague, Czech Republic Treating since 2012



SKANDIONKLINIKEN

Uppsala, Sweden Treating since 2015



CENTRE DE PROTONTHÉRAPIE DE l'INSTITUT CURIE

Paris (Orsay), France Treating since 2009



FEDERAL HIGH-TECH MEDICAL CENTER

Dimitrovgrad, Russia, Europe



CHILDREN'S CANCER HOSPITAL FOUNDATION

Cairo, Egypt Opening in 2020



BRONOWICE CYCLOTRON CENTER

Kraków, Poland Treating since 2016



CYCLHAD (CYCLOTRON FOR HADRON THERAPY)

Caen, France Opening in 2018



UNIVERSITATKLINIKUM CARL GUSTAV CARUS

Dresden, Germany Treating since 2014



UNIVERSITAIR MEDISCH CENTRUM GRONINGEN

(UMCG) Groningen, The Netherlands



QUIRÓNSALUD PROTON THERAPY CENTER

Madrid, Spain Opening in 2019

Asia network



APOLLO PROTON THERAPY CENTER

Chennai, India



NARITA MEMORIAL HOSPITAL

Toyohashi-shi, Japan Opening in 2018



NATIONAL CANCER CENTER

Ilsan, Korea Treating since 2007



TMUH - TAIPEI MEDICAL UNIVERSITY HOSP.

Taipei, Taiwan



WANJIE PROTON THERAPY CENTER

Zibo, China Treating since 2004



BEIJING PROTON MEDICAL CENTER

Beijing, China Opening in 2018



GULF INTERNATIONAL CANCER CENTER (PPI)

Abu Dhabi, UAE Opening in 2020



TATA MEMORIAL CENTRE

Mumbai, India Opening 2020



KOJINKAI HOKKAIDO OHNO MEMORIAL HOSPITAL

Sapporo, Japan Opening in 2018



CCH - CHANGHUA CHRISTIAN HOSP.

Changhua, Taiwan Opening in 2021



GUANGDONG HENGJU MEDICAL TECHNOLOGIES CO. LIMITED

Guangzhou, China Opening in 2018



ZHUOZHOU PROTON THERAPY CENTER

Hebei, China Opening in 2018



QINGDAO ZHONG JIA LIAN HE HEALTHCARE MANAGEMENT COMPANY I IMITED

Qingdao, China Opening in 2019 20 IBA | PROTEUS*ONE

Contact us

IBA USA Headquarters

Phone +1 571-449-4992 Email: IBA_INC_NA@iba-group.com

IBA International Headquarters

Phone: + 32 10 475 811

Email: global.marketing@iba-group.com

IBA Asia Headquarters

Phone: +86 10 8080 9288 Email: BEI_All@iba-group.com

IBA International Headquarters Email: global.marketing@iba-group.com www.iba-proteusone.com









While all care has been taken to ensure that the information contained in this publication is correct, we accept no responsibility for any inaccuracy and reserve the right to modify this information.

Technical specifications are based on standard operating conditions and may be subject to variations.

Pictures and illustrations are not contractual.

PROTEUS®ONE is the brand name of a configuration of the Proteus 235 in the US and Europe and a certified product in Japan.

AdaPT insight is the brand name of the I2C Image guided therapy device integrated to the IBA Proton Therapy solutions.

IBA, a Belgian company, is listed on the pan-European stock exchange EURONEXT and its annual reports can be downloaded on the website: www.iba-worldwide.com

Published by IBA S.A., Chemin du Cyclotron, 3 1348 Louvain-la-Neuve, Belgium.

This brochure is printed on ECF woodfree uncoated paper. It was produced with plants that comply with ISO 14001, the environmental management standard.









IBA: The best in proton therapy today and tomorrow

Together with our clinical partners, we brought proton therapy to clinical cancer care.

Ever since we started more than 30 years ago, our collaborations, our visionary roadmap and progressively unrivalled experience have enabled us to continue to innovate. Care givers now benefit from leading proton therapy technologies.

Today, our true continuum of Image-Guided Intensity Modulated Proton Therapy solutions can easily be integrated in most healthcare settings to make it available to all patients who need it.

Backed by IBA's unique service offer [financing, workflow optimization, education], our single-room PROTEUS®ONE, all our solutions and robust processes (installation, operations and upgrades) are developed in collaboration with our end-users.

Tomorrow, our unique and open culture of sharing will further strengthen the clinical and patient communities we have always cared for. Working collectively, we will achieve our goal which is to offer cancer patients access to effective treatments with decreased side effects and better quality of life.

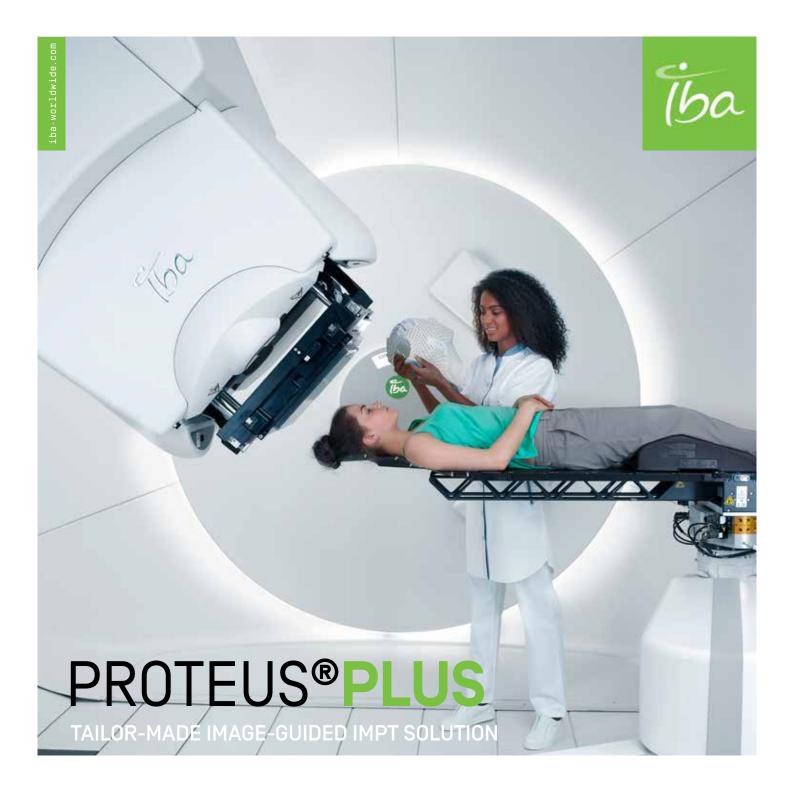
Request more information: pone@iba-group.com

Visit us online at:

www.iba-protontherapy.com







EXCELLENCE IN PROTON THERAPY



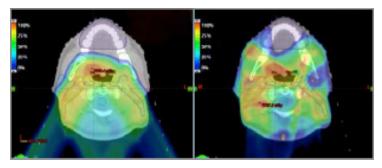
Proton Therapy

A true success in cancer care

Proton therapy is used today to treat many cancers and is particularly appropriate in situations where treatment options are limited or conventional radiotherapy presents an unacceptable risk to the patient.

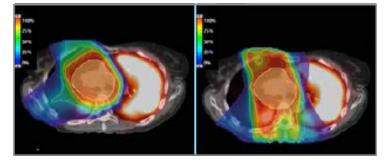
These situations include, but are not limited to, benign and malignant tumor of the eye and brain, tumors close to the brain stem, spinal cord or other vital organs, head and neck cancers, recurrent cancers and pediatric cancers.

Proton therapy VS X-ray radiation



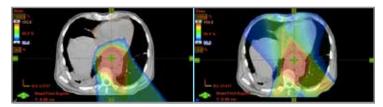
Head and neck

Images with courtesy of Dr Alexander Lin, University of Pennsylvania School of Medicine



Lung

Images with courtesy of Stephen Bowen, PhD, University of Washington



Esophagus

Images with courtesy of Dr John Plastaras, University of Pennsylvania School of Medicine

For a general overview of the clinical aspects of proton therapy, refer to the following books:

- "Proton and charged particle radiotherapy" by Thomas F.
 Delaney, Hanne M. Kooy
 "Proton Therapy", Series: Radiation Medicine Rounds Volume
- 1 Issue 3 by James M. Metz and Charles R. Thomas, Jr.

IBA|PROTEUS®PLUS

PROTEUS® PLUS EXCELLENCE IN PROTON THERAPY

PROTEUS®PLUS is a unique proton therapy solution for leading cancer centers striving to meet the treatment needs of a large and growing patient base, while further advancing your clinical reputation in cancer care, regionally and nationally.

Its cutting-edge features can be configured into a tailored solution to meet your research, clinical and business objectives.

PROTEUS®PLUS is inspired by clinical excellence with specific attention paid to patient experience. Its versatility powers your institution to rise to the challenges of treating a broad array of complex cancer conditions and to expand your research potential to advance cancer care.

Concretely, PROTEUS® PLUS arms your team with the latest advances in precise, image-guided and intensity modulated proton beam delivery. It enables you to offer new treatment options to patients and investigate new protocols and retreatment opportunities. From an administration perspective, its optimized workflow will allow you to maximize the use of the system to offer proton therapy to the largest number of patients possible, while its upgradability will ensure you stay on the leading edge.

PROTEUS®PLUS is the perfect solution to differentiate your institution and sharpen its competitive edge.

PROTEUS®PLUS is a made-to-measure platform that forges the future of radiation therapy. It will put your institution on course to excellence in cancer treatment.





4 IBA|PROTEUS®PLUS

Treating with Intensity Modulated Proton Therapy

PROTEUS®PLUS delivers a proton beam to the target using the Pencil Beam Scanning (PBS) modality.

Thanks to its advanced technical and clinical capabilities, PBS enables delivery of Intensity Modulated Proton Therapy to cancer patients. IMPT targets the tumor while controlling the intensity and spatial distribution of the dose with fine precision.

With PROTEUS®PLUS IMPT capabilities, you will have the ability to precisely shape the dose according to the target tumor, reaching high levels of conformity and dose uniformity, especially for complex tumors, requiring fewer treatment beams than IMRT.



What is Pencil Beam Scanning?

PBS is a proton beam delivery mode supporting IMPT. In PBS, the proton beam paints the target volume, one layer at a time, voxel by voxel, to precisely match the shape of the tumor.

IMPT treats a small section of the tumor at a time, adjusting the proton beam dose and depth to wider and narrower contours of the tumor, section by section.

Combined with the appropriate imaging devices and treatment strategies, IMPT is capable of treating moving tumors.

The key advantages of PBS:

- It sculpts the dose with very high levels of conformality, even in complex-shaped tumors, thanks to its fine precision.
- It enables Intensity Modulated Proton Therapy (IMPT).
- It makes treatment planning easier, while eliminating the need for individualized aperture and compensator devices.
- It decreases the neutron dose to the patient during treatment compared to other proton delivery techniques [Double Scattering and Uniform Scanning].





Deliver accurate proton treatments with ease.

IBA presents its integrated proton therapy software, adapt Treatment Suite. This modular software platform supports a truly integrated treatment environment for safe and efficient proton therapy delivery.

The adapt Treatment Suite incorporates the different delivery techniques, such as Pencil Beam Scanning. It offers ergonomic screens for streamlined control of the patient treatment, along with full integration of the TPS and OIS through DICOM connectivity.

It also enables editing of treatment plans and prescriptions for standalone irradiation or QA modes.

Motion Management

PROTEUS®PLUS brings together the most advanced techniques in motion management. It enables your clinical staff to effectively treat tumors in motion by using the most appropriate mitigation technique for the patient.



Motion Management Solutions

Proper motion management solutions will enable users of Pencil Beam Scanning to treat further indications, including those previously challenged by organ motion.

Developed over years by IBA and our clinical partners, IBA offers various advanced features for motion management.

Gating

Up to four different gating solutions can be connected on the IBA system through the Universal Beam Triggering Interface (UBTI). At the time of treatment and depending on the indication, the clinical staff will select the most appropriate gated solution.

Repainting

Instead of delivering the dose in one shot, the system delivers the dose through several scans. This not only increases the probability of hitting the target, it also fades out dose difference between hot spots and cold spots through statistical blurring.

Fast PBS delivery

The faster the dose delivery, the more the dose can be delivered while the target remains within the "beam allowed" window. The current IBA solution enables very fast PBS delivery and IBA continues to work on improving the robustness and speed of the PBS modality.

Multiple PBS spot sizes

The ability to access multiple PBS spot sizes to reduce the influence of motion and maintain the most conformal treatment plan.

These techniques can be used individually or in combination, to best fit clinical needs.



8 IBA|PROTEUS®PLUS

Towards adaptive Image-Guided Proton Therapy

IBA's PROTEUS®PLUS incorporates the latest imaging technologies so clinicians can deliver Image-Guided Proton Therapy (IGPT) to cancer patients and adapt the treatment plan as necessary.

The advanced IGPT technologies integrated in PROTEUS®PLUS ensure quick and accurate patient position verification by comparison with diagnostic CT imaged during the treatment planning process.

Going beyond the accurate positioning of the patient, integration with in-room CT* imaging enables PROTEUS®PLUS to incorporate plan verification into the treatment process towards adaptive proton therapy

Stereoscopic Orthogonal Patient Imaging

True orthogonal Beam's Eye View stereoscopic X-Ray imaging enables accurate patient position verification and monitoring.

adapt insight is the IBA imaging platform. It incorporates image-guidance features such as 3D CBCT and stereoscopic X-Ray imaging for highly accurate patient treatment, as well as tight integration with adapt deliver. An open architecture and programmable workflow configurability builds a solid foundation for the development of future proton specific image-guided solutions.

*available in Europe and may be subject to some technical review by competent authorities.



IBA|PROTEUS®PLUS

3D Cone-Beam CT Image-Guided Proton Therapy (IGPT)

3D volumetric X-Ray imaging and Cone-Beam Computed Tomography (CBCT), can be directly acquired in the treatment room at isocenter. It can then be compared with treatment planning CT for patient position verification and anatomical modification assessment.

Advanced acquisition software, shading correction, accelerated inline and offline image reconstruction algorithms support high-speed, high-resolution, uniform and low-dose CBCT.

CBCT offers soft-tissue contrast, providing much more information than a conventional stereoscopic alignment system. It enables more accurate patient treatment through anatomical modification assessment, the first step towards adaptive radiation therapy.

In-Room CT imaging*

While fully confident that the integrated CBCT is enough for your imaging requirements for patient positioning,

PROTEUS®PLUS supports the integration of a CT imaging system on floor rails directly with the treatment room.

Currently, this layout is fully operational in one PROTEUS®PLUS facility. With our clinical partners, we are working towards the ultimate goal: online proton adaptive therapy to unleash the full potential of protons to optimize treatment outcomes.

With the advanced imaging technologies integrated into PROTEUS®PLUS, clinical users can now apply similar advanced positioning and Quality Assurance protocols as those used in their Image-Guided Radiation Therapy (IGRT) practice.

IBA's PROTEUS®PLUS brings the advantages of:

- **Acquiring** CBCT image in room and at isocenter.
- Acquiring CT image* in room.
- **Ensuring** accurate patient positioning during treatment.
- **Enabling** the detection of anatomical modifications for treatment plan adaption







Optimized staff experience

Full Treatment access

PROTEUS® PLUS is designed with full treatment access. It allows the physicians and therapists to have easy access to the patient during positioning and imaging. This facilitates patient care and comfort, and improves positioning procedures especially during non-coplanar treatments.

Gantry Rolling Floor

Thanks to the highly functional design of our Gantry Rolling Floor, the patient remains accessible to the treatment staff as the gantry rotates around the isocenter. The Gantry Rolling Floor ensures staff safety during clinical operations, allowing them to focus on their core tasks and attend to patient wellbeing.

In-room imaging control

PROTEUS®PLUS permits radiation therapists and clinicians to access and control patient imaging from inside the treatment room. This permits improved patient care, greater ease of use and efficient patient positioning.



Turning healthcare into human care

While focusing on clinical efficiency and interoperability, PROTEUS®PLUS also incorporates environmental features to help keep patients relaxed and comfortable during imaging and treatment.

Based on insights from proton patients, healthcare staff and experts, Philips Healthcare and IBA integrated a solution with dynamic lighting, projection and sound; turning a cold, impersonal environment into one that comforts and reassures.

Acknowledged as the best in quality and groundbreaking design, Ambient Experience helps enhance the overall experience for oncology patients and staff.



Benefits of Ambient Experience

■ For the patients and families: Reduced stress and increased comfort. Higher patient satisfaction.

For the staff:

Increased working comfort.
Better patient interaction.
Higher job effectiveness with improved staff experience and satisfaction.

For the hospital management:

Improved workflow and throughput.
Improved patient satisfaction leading to word-of-mouth endorsement.
Attracting and retaining highly trained clinical staff and reducing overhead costs.

Philips Ambient Experience in figures*

- 76% increase in staff satisfaction
- 4% overall decrease in procedure duration
- 6% overall patient increase
- * Philips installed base survey "What do our customers say?",100 customers interviewed, 27 countries (excl.NA) in September 2011.



In partnership with





2001

First patient treated at MGH, Boston

2008

First treatment by Pencil Beam Scanning at MGH, Boston 2014

First clinical use of Cone Beam CT at UPENN, Philadelphia



2015

First clinical use of Inroom CT at APSS, Trento 2016

Use of Prompt Gamma Camera within research program in collaboration with OncoRay in Dresden and with UPENN in Philadephia 2017

Introduction of large field of view Cone Beam CT and wireless Hand Pendant

Leading institutions have already chosen IBA. Join them to develop the future of cancer care together.

Stay focused on patient care, we can run the system for you

Our experience installing proton systems at more than half of the clinical proton therapy centers worldwide has led us to understand the worries and clinical complexities that arise when treating cancer. Our commitment is to ensure your clinical success by providing reliable systems with the highest availability possible — over 98% uptime. The dependability and reliability of IBA proton systems means you can schedule patient treatments — and necessary clinical staff — with confidence.

To date, being part of the IBA proton therapy client network and benefiting from our technical expertise has helped centers around the world to treat over 60,000 cancer patients worldwide.

Your team can focus on the clinical aspects of cancer care, while IBA's team keeps your proton therapy system running at top performance and meets the highest safety and reliability standards.

Operation and Maintenance Services in a nutshell

With the largest team of proton experts around the world, you can have access to our qualified field support team at any time, day and night.

In addition to personalized support, other key services are provided:

- **24/7 remote support service**, online or over the phone. This is an important component to maintain your equipment's high uptime.
- A team of **IBA trained specialists** will operate the system onsite to ensure the highest level of availability for clinical treatment.
- In case of emergency, we can deliver spare parts the same day via our extensive spare parts worldwide network with hubs in America, Asia and Europe.
- Because technology changes quickly, IBA develops both update and upgrade packages tailored to your center's configuration and training programs to increase your team's efficiency.

NEW service features include:

- Remote Service Connections to proton therapy accelerator systems;
- Worldwide Computerized Maintenance Management Systems.

We have been able to treat more than 6,500 patients just in 10 years and we have been at capacity since we were open. Over this time period, there have been only six days that we have lost to treatment. So the operation and equipment have been fantastic from the highest levels to the IBA people on the ground. There is an obvious, deep commitment to patient care.

Nancy Mendenhall Medical Director at UFPTI, Jacksonville, Florida, USA



Since 2014 we have been collaborating with IBA on the clinical implementation of the prompt gamma slit camera, a technology used for proton range verification. I like this joint project very much, not only because it is exciting, cutting-edge research; but also because there is a well developed team spirit, built on trust, competence and reliability. This cooperation is driven by our common goal to enhance the precision of clinical proton therapy, rather than the pursuit of formal milestones.

Dr. Christian RichterResearch Group Leader
Oncoray – National Center for Radiation Research in Oncology
Dresden, GERMANY

IBA has designed and installed the majority of clinically operating Proton Therapy centers in the world.

North America network



NORTHWESTERN MEDICINE CHICAGO PROTON CENTER

Warrenville, IL, USA Treating since 2010



HAMPTON UNIVERSITY PROTON THERAPY INSTITUTE

Hampton, VA, USA Treating since 2010



MASSACHUSETTS GENERAL HOSPITAL BURR PROTON THERAPY CENTER

For last version of the map visit us online at:

iba-worlwide.com

Boston, MA, USA Treating since 2001



WILLIS-KNIGHTON CANCER CENTER

Shreveport, LA, USA Treating since 2014



PROCURE PROTON THERAPY CENTER IN OKLAHOMA CITY

Oklahoma City, OK, USA Treating since 2009



THE PROTON THERAPY CENTER LLC (TPTC) PROVISION HEALTHCARE

Knoxville, TN, USA



SCCA PROTON THERAPY A PROCURE CENTER

Seattle, WA, USA



PROCURE PROTON THERAPY CENTER

Somerset, NJ, USA



MIAMI CANCER INSTITUTE BAPTIST HEALTH SOUTH FLORIDA

Miami, FL, USA



TEXAS CENTER FOR PROTON THERAPY

Dallas, TX, USA



BEAUMONT HEALTH SYSTEM

Royal Oak, MI, USA



INOVA SCHAR CANCER INSTITUTE

Fairfax, VA, USA



UNIVERSITY OF FLORIDA HEALTH PROTON THERAPY INSTITUTE

Jacksonville, FL, USA Treating since 2006 / Opening in 2019



UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM ROBERTS PROTON THERAPY CENTER

Philadelphia, PA, USA



Europe network



UNIVERSITAIR ZIEKENHUIS LEUVEN Leuven, Belgium Opening in 2019



AZIENDA PROVINCIALE PER I SERVIZI SANITARI (APSS)

Trento, Italy
Treating since 2014



CENTRE ANTOINE LACASSAGNE

Nice, France
Treating since 2016



WESTDEUTSCHES PROTONEN-THERAPIEZENTRUM ESSEN

(WPE) Essen, Germany Treating since 2013



PROTON PARTNERS INTERNATIONAL

The Rutherford Cancer Centres (Newport, Reading, Northumberland & two other undisclosed locations)



PROTON THERAPY CENTER CZECH S.R.O.

Prague, Czech Republic



SKANDIONKLINIKEN Uppsala Sweden

Uppsala, Sweden Treating since 2015



CENTRE DE PROTONTHÉRAPIE DE l'INSTITUT CURIE

Paris (Orsay), France Treating since 2009



FEDERAL HIGH-TECH MEDICAL CENTER

Dimitrovgrad, Russia, Europe



CHILDREN'S CANCER HOSPITAL FOUNDATION Cairo, Egypt

RODHS

BRONOWICE CYCLOTRON CENTER

Kraków, Poland



CYCLHAD (CYCLOTRON FOR HADRON THERAPY)

Caen, France Opening in 2018



UNIVERSITATKLINIKUM CARL GUSTAV CARUS

Dresden, Germany



UNIVERSITAIR MEDISCH CENTRUM GRONINGEN

(UMCG) Groningen, The Netherlands



QUIRÓNSALUD PROTON THERAPY CENTER

Madrid, Spain Opening in 2019

Asia network



APOLLO PROTON THERAPY CENTER

Chennai, India



NARITA MEMORIAL HOSPITAL

Toyohashi-shi, Japan Opening in 2018



NATIONAL CANCER CENTER

Ilsan, Korea Treating since 2007



TMUH - TAIPEI MEDICAL UNIVERSITY HOSP.

Taipei, Taiwan



WANJIE PROTON THERAPY CENTER

Zibo, China Treating since 2004



BEIJING PROTON MEDICAL CENTER

Beijing, China Opening in 2018



CANCER CENTER (PPI)
Abu Dhabi, UAE

Opening in 2020



TATA MEMORIAL CENTRE Mumbai, India



KOJINKAI HOKKAIDO OHNO MEMORIAL HOSPITAL

Kushiro, Japan Opening in 2018



CCH - CHANGHUA CHRISTIAN HOSP.

Changhua, Taiwan



GUANGDONG HENGJU MEDICAL

TECHNOLOGIES CO. LIMITED
Guangzhou, China



ZHUOZHOU PROTON THERAPY CENTER

Hebei, China Opening in 2018



QINGDAO ZHONG JIA LIAN HE HEALTHCARE MANAGEMENT COMPANY LIMITED

Qingdao, China Opening in 2019

Contact us

IBA USA Headquarters

Phone +1 571-449-4990

Email: IBA_INC_NA@iba-group.com

IBA International Headquarters

Phone: + 32 10 475 811

Email: global.marketing@iba-group.com

IBA Asia Headquarters

Phone: +86 10 8080 9288 Email: BEI_All@iba-group.com









IBA International Headquarters Email: global.marketing@iba-group.com Visit us online at: www.iba-proteusplus.com

While all care has been taken to ensure that the information contained in this publication is correct, we accept no responsibility for any inaccuracy and reserve the right to modify this information.

Technical specifications are based on standard operating conditions and may be subject to variations.

Pictures and illustrations are not contractual.

PROTEUS® PLUS is the brand name of the Proteus 235 FDA Cleared and CE marked product.

Adapt insight is the brand name of the I2C Image guided therapy device integrated to the IBA Proton Therapy solutions.

IBA, a Belgian company, is listed on the pan-European stock exchange EURONEXT and its annual reports can be downloaded on the website: www.iba-worldwide.com

Published by IBA S.A., Chemin du Cyclotron, 3 1348 Louvain-la-Neuve, Belgium.

This brochure is printed on ECF woodfree uncoated paper. It was produced with plants that comply with ISO 14001, the environmental management standard.









IBA: The best in proton therapy today and tomorrow

Together with our clinical partners, we brought proton therapy to clinical cancer care.

Ever since we started more than 30 years ago, our collaborations, our visionary roadmap and progressively unrivalled experience have enabled us to continue to innovate. Care givers now benefit from leading proton therapy technologies.

Today, our true continuum of Image-Guided Intensity Modulated Proton Therapy solutions can easily be integrated in most healthcare settings to make it available to all patients who need it.

Backed by IBA's unique service offer [financing, workflow optimization, education], our tailor made PROTEUS®PLUS, all our solutions and robust processes [installation, operations and upgrades] are developed in collaboration with our end-users.

Tomorrow, our unique and open culture of sharing will further strengthen the clinical and patient communities we have always cared for. Working collectively, we will achieve our goal which is to offer cancer patients access to effective treatments with decreased side effects and better quality of life.

Request more information: pplus@iba-group.com

Visit us online at:

www.iba-protontherapy.com



