



Iba

iba-worldwide.com

**PROTECT,
ENHANCE &
SAVE LIVES**

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About IBA



WHAT DO WE DO?

We are world leaders in the design, production and marketing of innovative solutions for the diagnosis and treatment of cancer and other serious illnesses.

Around the world, thousands of hospitals use particle accelerators and dosimetry equipment designed, produced, and maintained by IBA as part of our mission to Protect, Enhance and Save Lives.

Through our four core activities, i.e., Industrial Solutions, RadioPharma Solutions, Proton Therapy and Dosimetry, we offer health care professionals solutions that allow them to take a fully-integrated approach to their patient care.

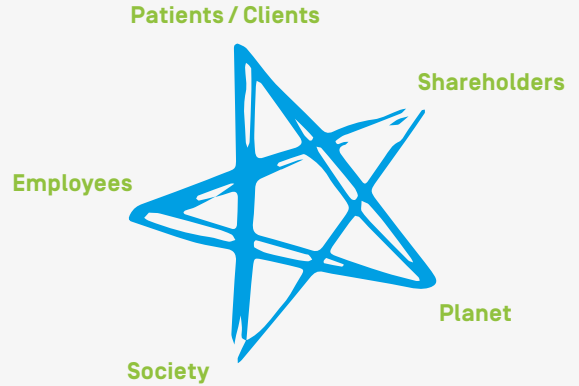


HOW DO WE WORK?

Our aim is to be a sustainable business that delivers consistent performance.

As part of the societal and environmental crisis the world is experiencing, companies have a huge responsibility which is why they need to think about how they work.

At IBA, we have adopted a sustainable and responsible management approach to achieve our performance objectives, taking all our stakeholders into account. Consequently, we ensure that our strategic and operational decisions are equally motivated by economic, societal and environmental concerns.



As a company, we are focused on increasing our market share and the return for our shareholders, improving the quality of life of our people, patients and employees, and contributing to the well-being of our society and planet.

WHY DO WE DO THIS?

To Protect, Enhance and Save Lives.

For over thirty years, our mission has been to provide for society's needs, and more specifically the needs of people who are ill, with our particle physics technology. This desire is reflected in our mission to Protect, Enhance and Save Lives.

All our activities are targeted towards the same objective of having a positive impact on patient health by providing health care professionals with the most effective and accurate solutions for diagnosis and treatment. This goal is implemented in different ways which benefit the various stakeholders involved:



Our customers and their patients:

we develop the most effective technology for our customers so they can provide the best possible diagnosis and treatment for their patients.



Our employees:

we offer them quality jobs in a stimulating, friendly environment guided by ethical values.



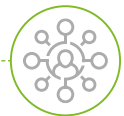
Our society:

we utilize a sustainable entrepreneurial business model that involves all our stakeholders.



Our planet:

we continually work to reduce the environmental impact of our operations.



Our shareholders:

we show that we are worthy of their trust by being a sound financial investment and acting in accordance with our values

A flexible and resilient business model.

In today's volatile and turbulent global economy, we have demonstrated flexibility, adaptability and resilience. These are fundamental for the continued success of our business activities.

The natural pace changes year to year, consistent with emerging markets such as proton therapy, can result periodically in slower sales than expected. We were able to offset this slowdown this past year through our improved performance in our RadioPharma and Industrial Solutions business units where each posted record results.

We also have adapted our strategy by strengthening our commitment to quality and innovation while paying increased attention to the need for upgrading our user's equipment with new technology.

OUR VALUES



Care

Care: we care about the well-being of our patients, our employees, our society, our planet, and our shareholders.



Dare

Dare: we dare to focus on innovative solutions that continually stretch the boundaries of technology.



Share

Share: we share our ideas and our expertise with our clients and our partners to advance the diagnosis and the treatment of cancer.



Be Fair

Be Fair: we implement our mission to Protect, Enhance and Save Lives with ethical standards and transparency to remain worthy of our stakeholders' trust.

PROTECT +
ENHANCE +
SAVE LIVES



Message from Olivier Legrain

BUILD TO LAST

IBA is an exciting and growing company. Its objective is to use particle accelerator technology for the benefit of society. In partnership with our customers, our employees are driven and motivated by the company's mission to Protect, Enhance and Save Lives of more patients everyday.

To maintain its growth throughout its history, IBA has regularly reinvented itself by innovating new applications of its technology and adapting to changing market conditions. Our 2019 theme of "Build to Last" is completely in line with this approach.

How do we do? First, by capitalizing on the renewed success in 2018 of our RadioPharma and Industrial Solutions business units. New products and markets have boosted the growth of these businesses, showing once again how important it is to capitalize on the existing synergies between divisions to strengthen our development. Another promising market in the long-term is the proton therapy market as evidenced by the increasing number of patients being treated with this technology.

In recent months, we have adapted our organization to better manage through market volatility and leaner years.

This transformation is accompanied by an increased focus on service offerings which accounted for over 45% of our revenue in 2018. The number of IBA proton therapy centers in clinical operation is set to double between 2018 and 2022. The development of our customer base offerings and the renewed commitment to customer will help increase the stability of our revenues as well as provide a significant competitive advantage in the proton therapy market.

We aim to achieve this transformation with dedication, conviction and respect for our values while also rising to the human, societal and environmental challenges of today's world.

Finally, I would like to offer my warmest thanks to all of our IBA employees for their efforts, loyalty to our mission and values, and passionate commitment to satisfy all of our stakeholders.

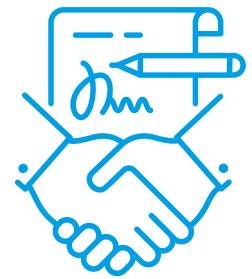
Olivier Legrain
CEO

IBA in 2018 at a glance

± **180 000**¹
PATIENTS TREATED
WITH PROTON THERAPY

5
CONTINENTS

+ **550**
ACCELERATORS
SOLD



INDUSTRIAL SOLUTIONS

Industrial Solutions mainly concentrates on developing dedicated solutions for the market for the sterilization of medical devices. Its products enable the medical industry to be less dependent on chemical products and radioactive processes.

RADIOPHARMA SOLUTIONS

RadioPharma Solutions assists hospitals and radiopharmaceutical product distribution centers by helping them design, build and operate their radiopharmacy.

Its products are used for producing isotopes vital for cancer diagnosis as well as use in cardiology and neurology fields.

[1] Cumulative figure extrapolated from PTCOG data for 2017, across all proton therapy systems around the world.

4
BUSINESS
ACTIVITIES

10%
OF TURNOVER INVESTED
IN R&D

1451
EMPLOYEES



PROTON THERAPY

Proton Therapy is considered the most advanced form of radiotherapy in cancer treatments that utilize ionizing rays.

Thanks to the unique properties of protons, the tumor can be targeted more accurately. The protons deposit the majority of their energy in a controlled zone, limiting exposure of the surrounding healthy tissues to potentially harmful radiation.

DOSIMETRY

The Dosimetry business offers hospitals a comprehensive range of monitoring tools and software, for the calibration and control of their radiotherapy and radiology equipment. This technology is crucial to ensure the prescribed dose is delivered within a precisely defined area of the patient's body. Precision and control are vital to assure patient safety and proper dose administration.



01

STERILIZATION

How do we implement our mission?

AT IBA, OUR BUSINESS PROJECT IS FOUNDED ON A STRONG STATEMENT: USING PARTICLE TECHNOLOGY FOR THE BENEFIT OF SOCIETY, TO HELP PROTECT, ENHANCE AND SAVE LIVES.

WE ACHIEVE OUR MISSION BY PROMOTING SUSTAINABLE DEVELOPMENT THROUGH A SERIES OF INNOVATIVE ACTIVITIES WITH HIGH TECHNOLOGICAL ADDED VALUE.

PROTECT, ENHANCE AND SAVE LIVES BY CONTRIBUTING TO INNOVATIVE STERILIZATION METHODS

The development of medical devices increasingly requires advanced sterilization methods to assure the safety of patients and medical staff.

In the sterilization market, we offer solutions that enable customers to sterilize medical devices, either with x-rays or with electron beams. This is an alternative to sterilization technologies using chemical or radioactive material.

2018 was a turning point in our strategy as we refocused on the technology and the market for the sterilization of medical devices. We adapted our organizational structure and mobilized the resources needed to grow this business.

To dare is one of IBA's founding values and is well represented in the spirit of innovation of our Industrial Solutions business. We currently offer the most advanced electron beam technology in the world and are well positioned as the sole supplier of this solution in the market.

➤ **Always on the cutting edge of innovation with advanced research programs**

Characteristics of the Rhodotron®

Three characteristics contribute to make the Rhodotron® the most complete accelerator on the sterilization market today and facilitate access to clean technology:

Pulsed Technology



It generates an equivalent output power with a reduced electrical energy consumption.

Modularity



It facilitates access to clean technology, and enables customers to progressively increase the energy used as it is needed.

High Energy



The accelerator's power capacity has been increased, opening the door to a whole new range of applications in the field of diagnosis and diagnosis-therapy.

THE NEW GENERATION OF RHODOTRON®

In 2018, we launched a new generation of Rhodotron®. New technology has improved the performance of these accelerators which has reduced energy consumption.

The pulsed technology, the modularity and the high energy enable Rhodotron® to meet our customers' ever-changing needs.

This strategic choice produced the exceptional results of this business in 2018, which was a record year. A growing number of customers have placed their trust in our team and technology, including the Aerial Technology Resource Center in Strasbourg, France.

Technology watch

Evolutions are the result of listening attentively to the needs of the market and our customers in terms of sterilization. IBA has a technology watch in place to close monitor changing trends, anticipate customer needs and respond with technological solutions that are entirely adapted to market demand.



Aerial is a Technology Resource Center, based in Strasbourg, France, was founded in 1985. The research center has a workforce of 25 employees. In addition to powerful analytical tools in various laboratories, the center also has several experimental irradiation facilities with electron accelerators, including the Rhodotron® which equips the center to handle a wide range of industrial requirements. Aerial is also one of 25 IAEA Collaborating Centers around the world.

“With our *feerix* (Faisceau d’Electrons Et Rayonnement Ionisants X/ebeam and x-ray ionizing radiation) project, we are supplementing our range of low and medium-energy equipment with a high-energy accelerator, namely IBA’s Rhodotron®. This new investment, which is unique in France and the only one with this configuration in the world, makes Aerial an essential partner in Research & Development and Innovation in the field of ionization. This will enable us, among others, to develop new applications to sterilize increasingly sophisticated medical devices.

feerix, which will become operational in June 2019, has all the industrial “ingredients” while maintaining the required flexibility in terms of applied research. This enables the application of protocols that were developed in the industrial field, without changes of scale. The characteristics of this equipment enable us to explore a wide range of applications. We are pleased to develop a strong partnership with IBA, which extends well beyond the mere supply of equipment”.

Alain Strasser
General Manager
Aerial

SYNERGIES ACROSS ACTIVITIES

The new generation high-energy Rhodotron® was developed in collaboration with our RadioPharma Solutions business. This technological breakthrough enables the innovative and clean production of radioisotopes for diagnostic and theranostics [a combination of diagnostics and therapy – see page 13] applications.

DYNAMITRON®: SERVICE AND UPGRADES

Another use of our Industrial Solutions business is the reticulation of polymers. In this field, we have delivered on our commitments to our Dynamitron® customer base. This technology increases the resistance of polymers by changing their molecular structure. In 2018, we elected to concentrate our efforts on service and upgrades to ensure these machines continue to remain at the cutting edge of technology.

An alternative to the SF6

The Dynamitron® customer base is IBA’s largest. In 2017, the company took the initiative to replace the SF6 in the Dynamitron®. In 2018, this culminated in the financing of a project by the European Union with its LIFE funding instrument. This project, in partnership with General Electric and the University of Manchester, aims to develop a sustainable alternative solution to the SF6 in the Dynamitron®. The partners hope to implement it in a pilot project by 2021.



The SF6 accounts for 60% of the Dynamitron®’s CO₂ emissions. Finding an alternative to the SF6 would have a tremendous positive impact on our carbon footprint.



Candice Nagel
Sustainability R&D Project Manager
IBA Industrial Solutions



02

DIAGNOSIS

PROTECT, ENHANCE AND SAVE LIVES BY CONTRIBUTING TO MORE ACCURATE DIAGNOSIS



ONCOLOGY: EARLY DETECTION SUBSTANTIALLY INCREASES THE CHANCES OF SURVIVAL

World Health Organization (WHO) figures indicate that 9.5 million people die from cancer yearly. However, patients' lives and chances of survival are significantly improved when the cancer is detected early.

3 million undiagnosed cases of childhood cancer

A modeling study published in *The Lancet Oncology*² projected cancer incidence for 200 countries worldwide and suggested that the number of undiagnosed cases of childhood cancer could account for more than half of the total in Africa, south-central Asia and the islands of the Pacific. In North America and Europe, by contrast, only 3% of cases are undiagnosed. If there is no improvement, the authors of the study estimated that more than 3 million new cases of childhood cancer will be missed between 2015 and 2030.

Cancer that is diagnosed at an earlier stage is more likely to be treated successfully (i.e. higher likelihood of survival, reduction of morbidity and lower cost of care). Cancer Research UK indicated that the average cancer survival rate for the 8 most common cancers for patients with stage 1 cancer is 90%. The survival rate plummets to just 5% when the patient is diagnosed as having stage 4 cancer.

In light of this conclusion, and in keeping with our mission to Protect, Enhance and Save Lives, our RadioPharma Solutions division is committed to make cancer diagnosis more accessible around the world by working on several levels.

First, by reducing the size of the radiopharmacy where the radiopharmaceutical tracers for cancer diagnosis are produced. The IntegraLab®ONE solution is the most compact radiopharmacy solution on the market, facilitating its installation and reducing the building cost.

Applications of radiopharmaceuticals

Oncology



Cardiology



Neurology



[2] Zachary J Ward, MPH, Jennifer M Yeh, PhD, Nickhill Bhakta, MD, A Lindsay Frazier, MD, Prof Rifat Atun, FRCP, Estimating the total incidence of global childhood cancer: a simulation-based analysis. 26 February 2019.

[https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(18\)30909-4/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30909-4/fulltext)

Next, by increasing cyclotron production capacity for the production of the isotopes in the radioactive tracers. IBA's Cyclone® KIUBE cyclotron offers the highest production capacity enabling increased diagnostic capabilities.

Finally, RadioPharma Solutions offers adjustable production solutions. The Cyclone® KIUBE produces the widest range of radioisotopes, enabling it to produce fluorodeoxyglucose (FDG, the most commonly used radiopharmaceutical for cancer diagnosis), Gallium-68 for the diagnosis of neuroendocrine tumors, and Copper-64 for a more accurate diagnosis of prostate cancer.

The contribution of molecular imaging in prostate cancer is increasing rapidly, especially for Positron Emission Tomography (PET). The introduction of PSMA receptor tracer is probably the biggest success in Nuclear Medicine in recent years. ⁶⁸Ga-PSMA has rapidly become the preferred radiotracer for PET imaging in Prostate Cancer, for its excellent theranostic characteristics.

Stefano Fanti, Prof.

Professor of Diagnostic Imaging and Director of the Nuclear Medicine Division & PET Unit at the S.Orsola Policlinic Hospital, Bologna, Italy

The Cyclone®KIUBE was designed with a reduced environmental impact in mind. Its technology enables the production of a wide range of radioisotopes while consuming less energy. The Eco mode of the "vacuum standby" reduces electricity consumption by 50% which has an immediate financial impact for the user. An environmental study demonstrated that the Cyclone®KIUBE emits 20% less CO₂ during its lifetime, which is below the market standard.

Jean-Michel Geets

IBA Fellow, Product Manager & IntegraLab® Leader
IBA RadioPharma Solutions



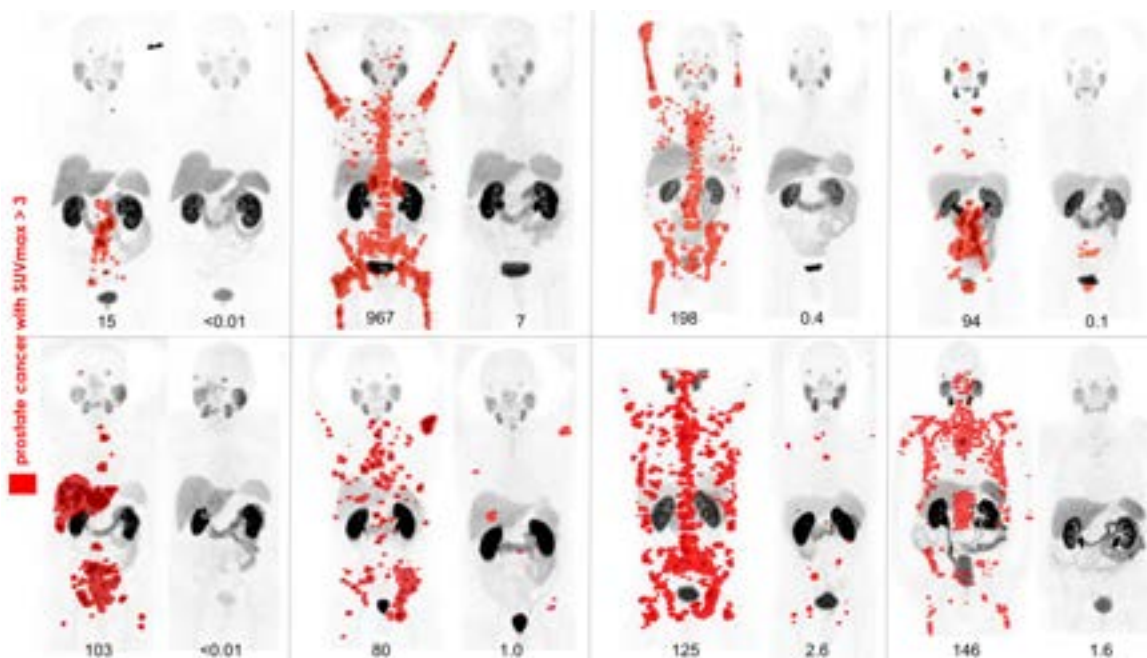


A combination of diagnosis and therapy: theranostics

Theranostics is a new field of medicine combining specific targeted therapeutics with targeted diagnostic tests. Medical imaging is revolutionizing personalized medicine by helping avoid costly and unnecessary therapies.

IBA supports the Oncidium Foundation

The Foundation's priority include promoting the awareness among patients and physicians, investing in research and scholarship, supporting and financing the development of new radiopharmaceuticals for therapy, supporting clinical best practice and improving access to patients.
Oncidium-life.org



Example of the use of theranostics for the treatment of prostate cancer: the extent of the spread of the tumor in each patient, before and after treatment with Lutetium-177-PSMA is clearly visualized using PSMA PET. The patients' quality of life was enhanced and pain reduced, with a marked reduction of the prostate-specific antigen PSA, a tumor marker.

With the kind permission of Professor Michael Hofman, Peter MacCallum Cancer Centre, Melbourne, Australia



A PREFERRED MODALITY FOR CARDIAC IMAGING

Major technological breakthroughs were achieved in the diagnosis of coronary heart disease through Positron Emission Tomography (PET). IBA's 70MeV cyclotron enables the production of Rubidium-82 which can be used for non-invasive myocardial perfusion tests.



Cardiac PET imaging can be very useful for the management of many patients with suspected or known heart disease. Cardiac PET imaging is increasingly used as new centers are established and clinical guidelines incorporate cardiac PET imaging into the management algorithms.



Terrence D. Ruddy,

MD, FRCPC, FACC, FAHA, FCCS
Professor of Medicine and Radiology, University of Ottawa
Director of Nuclear Cardiology,
University of Ottawa Heart Institute

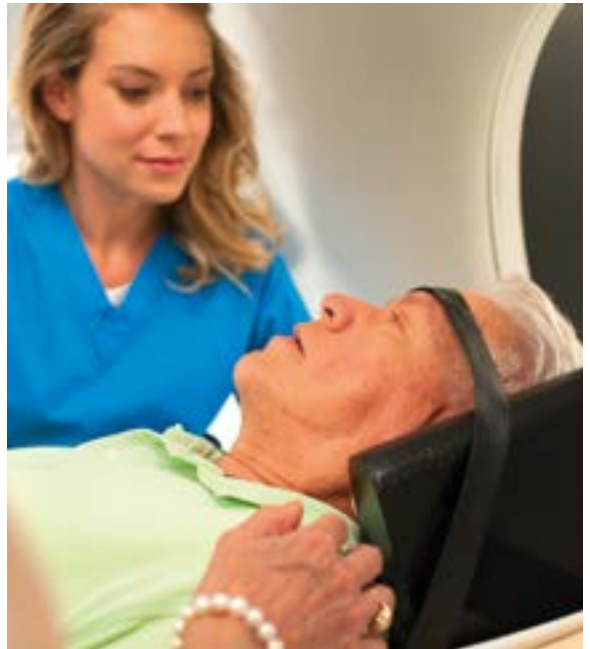


A MAJOR BREAKTHROUGH IN THE DIAGNOSIS OF NEURODEGENERATIVE DISEASES THANKS TO PET

According to the WHO, around 50 million people worldwide have dementia. The majority suffer from Alzheimer's disease. The total annual global societal cost of dementia is estimated to be USD 818 million, equivalent to 1.1% of global gross domestic product.

The evaluation of brain function with PET molecular imaging is playing an increasingly important role in the positive diagnosis of neurodegenerative diseases, in particular dementias and parkinsonian syndromes.

Amyloid PET imaging yields a diagnostic accuracy of 90% in the diagnosis of Alzheimer's disease. Several tracers have received marketing approval for this indication, including 18F-florbetaben, which was developed and produced with IBA equipment.



➤ **A technology that is also used for the diagnosis of heart disease and neurodegenerative diseases**

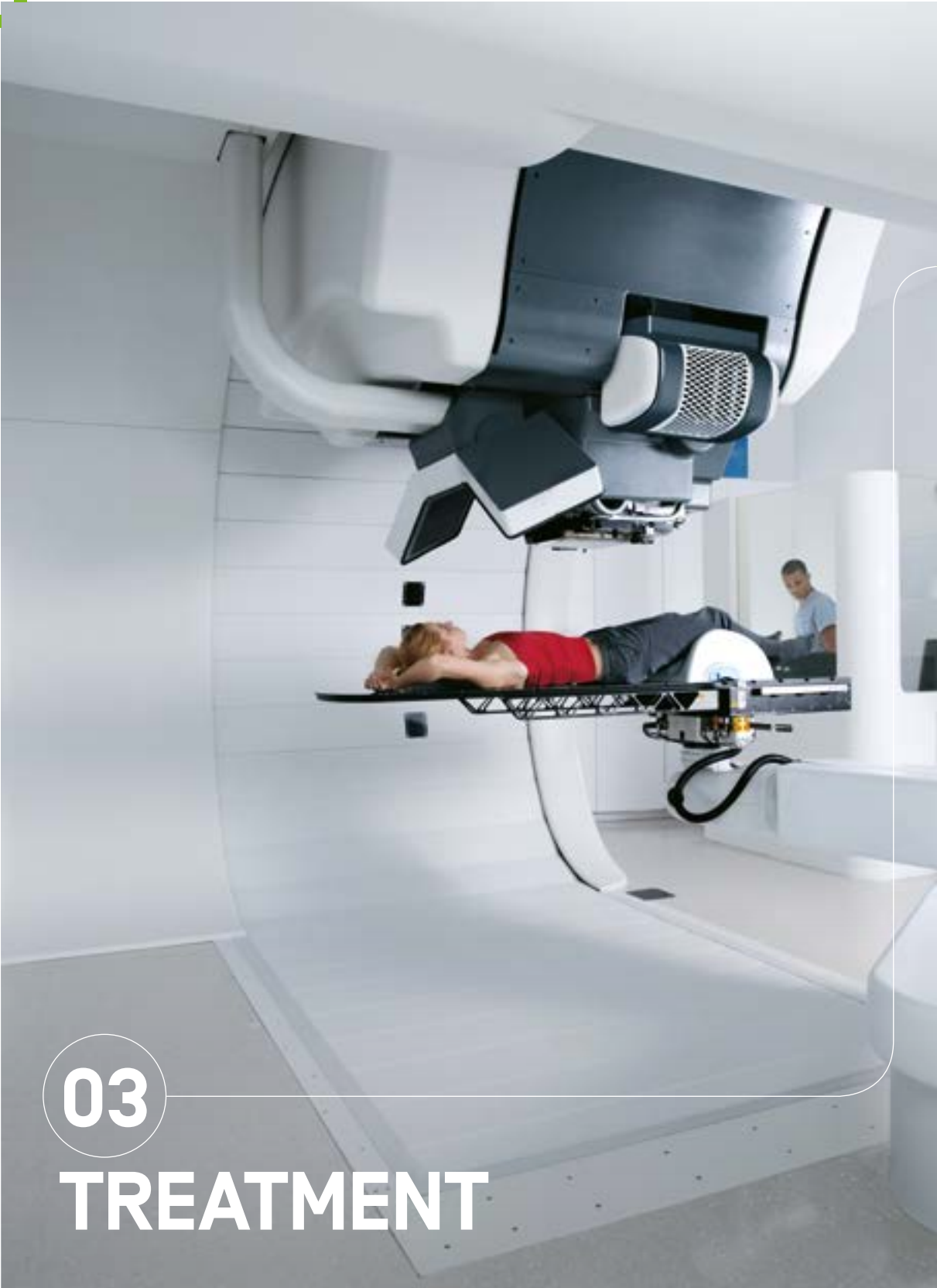


Imaging amyloid- β and tau aggregates with PET are highly sensitive biomarkers for early and differential diagnosis of Alzheimer's disease before irreversible brain damage or cognitive decline has occurred. Molecular imaging may also offer new strategies to monitor disease progression and assess the effectiveness of next-generation, disease-modifying treatments.



Udunna Anazodo, PhD,

PET/MRI Neuroimaging Scientist, Lawson Health Research Institute,
Assistant Professor, Depts. of Medical Biophysics & Clinical Neurological Sciences, Western University, London, Ontario, Canada



03

TREATMENT

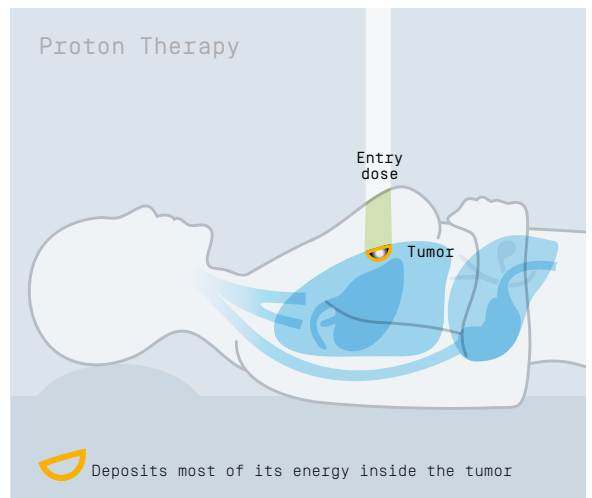
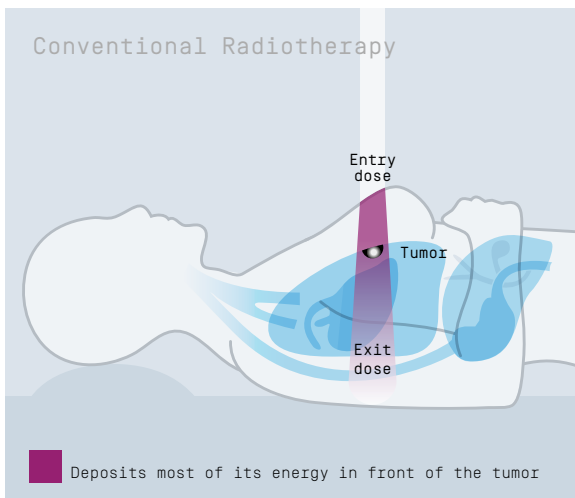
PROTECT, ENHANCE AND SAVE LIVES CONTRIBUTING TO MORE TARGETED TREATMENT

We are the global leader in proton therapy. This is considered the most advanced and most accurate radiation therapy currently available and a valuable treatment modality for thousands of women, men and children who are diagnosed with cancer.

This treatment destroys the cancer cells by radiating them with a proton beam. Protons release their maximum energy in a precisely controlled area within the tumor while limiting the amount of dose radiation that is deposited in the healthy tissue surrounding the tumor. This is not the case for photons, the most common type of radiation used in cancer therapy (conventional radiotherapy).

Moreover, proton therapy enables more dose to be released inside the tumor without increasing the risk of side-effects or long-term complications, which, consequently, can improve the outcome of the treatment and enhance patient's quality of life.

➤ Proton therapy has the potential to enhance the quality of life of patients during and after the treatment



Viggo has been in remission since November 2018

We fought hard to be able to give Viggo the best treatment possible, and we are convinced that proton therapy played a crucial role in his recovery. We are sure of this: he would have not been in such robust health if he had been treated with conventional radiotherapy.

This was the best treatment we could have given him. At the time, proton therapy was a real turning point for us. It helped us gather the strength we needed to start this treatment and we passed this optimism on to Viggo who kept on smiling throughout this ordeal.

Viggo has been in remission since November 2018. He is doing very well, he is our little miracle. He is now in year 2 (primary school), the second brightest child in his class and perfectly bilingual. Like any other boy, he is really enjoying life.

The Erasme university hospital in Brussels (Belgium) asked us to participate in a study to observe the evolution of children after heavy treatments (chemotherapy, radiotherapy, surgery). Viggo had a very high score on their IQ test.

We are always proud of our children but perhaps we are even prouder when we see how our children overcome obstacles with such courage.

Steve Mommaerts and Valérie Verlinden,

The parents of Viggo, who underwent proton therapy in 2012 at the age of 13 months

Our mission is to make this technology accessible to any patient who could benefit from it, which is far from the case today. Globally studies have shown that 20%³ of patients who undergo radiation would benefit from proton beam therapy. Currently, less than 1% of all patients who are treated with radiotherapy receive this more targeted treatment.

Every day, our IBA team focuses on two major initiatives. Working closely with their users and partners to ensure that a maximum number of patients can benefit from this therapy option while simultaneously working on consolidating clinical evidence to increase the number of cancer indications that can be treated with proton beam therapy.



[3] Extrapolation to the world's population by IBA based on the report of the Netherlands Health Council. <https://www.healthcouncil.nl/documents/advisory-reports/2009/12/11/proton-radiotherapy>

INFORMATION ABOUT THE TREATMENT

To ensure increased use of proton therapy, it is of paramount importance that doctors, stakeholders in cancer therapy, and patients receive accurate, timely information enabling them to choose the most appropriate treatment from a range of existing alternatives.

We organize several courses on proton therapy with our customers and their practitioners (e.g., Roberts Proton Therapy Center, United States; Institut Curie, France; UMC Groningen Protontherapiecentrum, the Netherlands; Apollo Proton Cancer Centre, India) to educate professionals about the potential benefits of proton therapy and how best to identify those patients that will most benefit from it.

As part of this endeavor, we regularly enter into collaboration with national cancer associations. These valuable partnerships enable us to work in close collaboration with the caregivers in the field who serve as valuable sources of information when a patient receives a cancer diagnosis.

Finally, we also developed a “patient” page, which includes specific information on proton therapy as well as links to specialized institutions.

A dedicated webpage for patients

IBA’s dedicated webpage for patients (in English) was published at the end of 2017. In 2018, the information was added in 9 other languages (French, Dutch, Spanish, Czech, Italian, Portuguese, Russian, Chinese, and German) making it more accessible. These pages were translated in part by IBA volunteers who wanted to help make available information about proton therapy. Patients can also find a list of IBA proton therapy centers on this page, as well as links to testimonials and the contact details of patient associations and cancer information resources. This page enables patients to learn more about the next steps to start a proton therapy treatment.⁴

Belgian Foundation against Cancer



Fondation contre le cancer

The first proton therapy center in Belgium, where IBA is based, will be inaugurated in September 2019. In the run-up to this opening, IBA is working with the Belgian Foundation against Cancer, a national association that aims to inform patients about the various therapy options. Our Medical Affairs Director provided a training to the association’s members to explain what proton therapy does in preparation of the calls that the announcement of the center’s opening is bound to trigger.

[4] <https://iba-worldwide.com/proton-therapy/for-patients>

IDENTIFYING THE PATIENTS WHO STAND TO BENEFIT FROM PROTON THERAPY

The advances in cancer treatment are numerous and are increasingly related to personalized medicine, i.e., finding the best combination of therapies for patients by cancer type, genetics and other parameters, which are becoming increasingly better understood. Additionally, this also enables certain patients to avoid undergoing certain treatments with serious side-effects which would not be effective for their specific case. IBA supports all efforts to develop approaches based on predictive models.

For example, Professor H. Langendijk of the UMC Groningen (the Netherlands) developed a method for selecting patients for proton therapy based on the risks of side-effects and named the model-based approach (see the BeSTRO quote). This methodology ensures that each patient will be referred to the best treatment based on the expected results and the reduced risk of side-effects, therefore optimizing the overall benefit for patient and society.

The Dutch authorities have based their reimbursement of the cost of proton therapy on this predictive approach. This modern reimbursement policy means new technology could be adopted faster, helps control cost, and the accuracy of the models is continually reassessed.

Our Dutch colleagues have developed a method that is specifically adapted to radiotherapy, based on decades of sensitivity data they collected for normal organs based on the delivered dose. Using current technology, they can now predict for each patient, based on a scan of the patient and a virtual comparison of the administered dose to the healthy tissues with protons or photons, if the benefits of protons are significant and whether the moderate additional cost is clinically justified.

BeSTRO

(Belgian Society for Radiotherapy and Oncology) and the College of Physicians for the Radiotherapy Centers.

Focus group on the benefits of protons for breast cancer

The results of the breast cancer focus group that was organized at the Centre Antoine Lacassagne in Nice (France) were significant. IBA gathered a remarkable panel of 20 high-level experts with varied profiles, including oncologists, physicians and epidemiologists, from America and Europe, who favored varied and complementary approaches. The focus group provided us with a rare opportunity to discuss protons for breast cancer and arrive at a multidisciplinary consensus on a range of specific themes for extending this proton therapy to new indications. These prominent thought leaders reached a consensus on the usefulness of proton therapy in cases where breast cancer is detected early. Breast cancer accounts for 20 to 25% of patients in radiology, and the cancer is detected

early in two thirds of the cases. This is large numbers of patients who have experienced a very good survival rate for this in the long-term. We have noted, however, that the risk of secondary lung cancer surges after 30 years, even outweighing the risk of cardiac toxicity.

Hence the interest of using protons to limit the dose that is released to the lungs.

Jean-Philippe Pignol, Dr.

Former Medical Co-Director of Holland PTC (Rotterdam, the Netherlands) Professor and Department Head of the Department of Radiation Oncology Dalhousie University (Halifax, Canada)



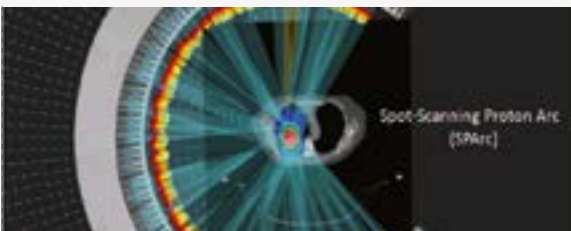
PUSHING BACK THE BOUNDARIES OF TECHNOLOGY

Pushing back the boundaries of technology and anticipating new developments in proton therapy is aligned with our spirit of innovation. These technological evolutions are being developed for future proton therapy centers, but we will also ensure that our existing centers can be upgraded to these technologies, through our service offerings.

Proton Arc Therapy

IBA wants to constantly improve proton therapy for the benefit of patients. We have worked hard to advance this technology, in close collaboration with our customers and through R&D partnerships.

Thanks to our close collaboration with the Beaumont Proton Therapy Center (United States), we were able to deliver the first irradiation of a Proton Arc Therapy plan on a phantom.



Soon, this technological evolution will offer patients numerous advantages:

- Enhanced dose conformity at the tumor level and reduction of the total dose received by the patient,
- The possibility to increase the dose delivered to the tumor and potentially reduce the number of treatment sessions for the patient,
- Less time in the treatment room, hence increased comfort for patients.



To get our son the best treatment possible, we had to spend six weeks in Switzerland while our oldest stayed behind in Belgium with his grandparents. Having a center in Belgium, close to home, is crucial. This allows you to concentrate 100% on the therapy and well-being of your child and avoid the terrible emotional burden as a result of having to undergo therapy far away from home. This plays a major role in the quality of life during therapy.

Steve Mommaerts and Valérie Verlinden,

The parents of Viggo, who underwent proton therapy in 2012 at the age of 13 months

MAKING THE TREATMENT MORE ACCESSIBLE

To achieve our mission, we must work hard to ensure the maximum number of patients who can benefit clinically from proton therapy have access to it. This includes reducing the cost of this technology and the maintenance so that more centers are opened facilitating greater access for patients.

In addition, we are working diligently with our customers, industry and patient associations for better reimbursement of this therapy by public and private insurers and broader coverage for increased indications for proton therapy.

DEVELOPING OUR SERVICES

Proton therapy is a rapidly developing technology. To date, more than 180 000 patients have received this treatment, and this number is expected to double by 2025. Likewise, the number of IBA centers in operation is set to double by 2022.

This compelled us to demonstrate our agility and resilience by increasing our focus on the services we offer to our Proteus® users. In keeping with our mission statement, we are committed to delivering total reliability of our systems, to ensure the continuity of patient treatments. We continue to modernize equipment so our customers and patients have access to the latest technological advances. We offer training courses to help caregivers maintain and improve their skills and support. And finally, we assist in the collecting and compiling of clinical evidence and conducting of proton therapy research.



We treated our first patient with our Proteus®Plus system in 2012. This machine has a lifetime of more than 25 years. So it was crucial that we received the guarantee that we would be able to implement the technological advances that would be developed in the future on our machine. Thanks to the upgrade in 2018, we were able to reduce the time per treatment session. This has enabled us to reduce the treatment time and enhance the comfort of most of our patients. In 2018, we treated an additional 550 fractions compared to 2017.



Dennis Mah, Ph.D.

Physics Director,
ProCure New Jersey, United States



04

QUALITY

PROTECT, ENHANCE AND SAVE LIVES BY CONTRIBUTING TO QUALITY ASSURANCE FOR EQUIPMENT

Our priority is to ensure that patients receive a safe, accurate and reliable diagnosis and treatment.

In medical imaging and radiotherapy, radiation must be used with great caution and precision.

The prescribed dose [expressed in Gray [Gy]] must be rigorously respected, in terms of intensity and location. The life of patients, their safety and the success of their treatment depends upon it.

In medical imaging, the objective is to reduce patient exposure to radiation, while maintaining good image quality.

In radiotherapy, the idea is to expose tumor masses to a higher dose of destructive rays, with millimeter precision, while reducing the exposure to healthy tissue as much as possible.

In both cases, the accuracy of the equipment and the control of the dose are of paramount importance. For this dosimetry instruments are needed, to calibrate and control the diagnostic and therapeutic equipment.

This is the responsibility of our Dosimetry business, which develops a range of tools to calibrate radiation equipment and verify the dose of ionizing radiation that the patient absorbs during medical imaging and radiotherapy.

1 Gy

WHAT IS A GRAY (Gy)?

The gray measures the total absorbed energy of radiation



500

Head &
Neck scans



200 000

Intra-oral
X-rays



1 000x

Annual
public limit



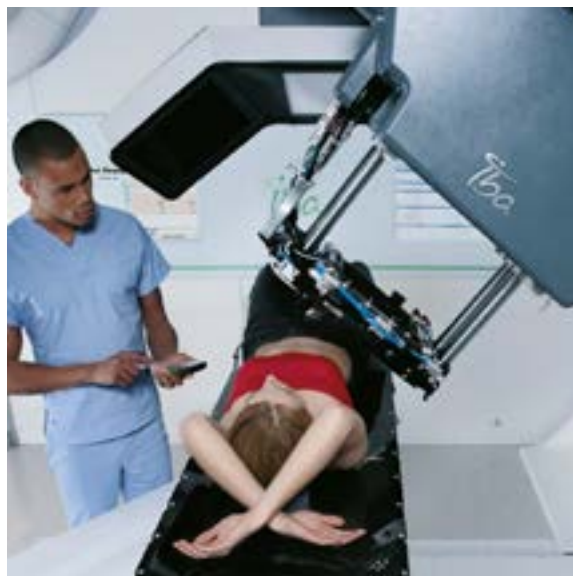
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The patients' safety and the excellence of the care they receive are a major concern in our radio-oncology department at Queen's Hospital as well as in cancer therapy centers around the world. Modern quality assurance and the dosimetry of radiation are vital for the success of our vision in terms of clinical excellence. Nowadays we use extremely accurate dosimetry solutions, that enable us to perfectly measure and evaluate the therapeutic dose that we should administer to each patient. Our dosimetry work helps us gain a very precise understanding of the therapeutic dose that is administered to the patient's tumor, prior to the treatment. This enables us to optimize each therapy to obtain the best possible therapeutic results and guarantee patient safety to the best of our ability.

||

Liz Crees

Head of Radiotherapy Physics & Cancer
Speciality Manager Queen's Hospital, Romford,
United Kingdom



SAFE RADIOTHERAPY: QUALITY ASSURANCE DURING THE OPERATION OF EQUIPMENT FOR THE TREATMENT OF PATIENTS

It is vital that the adequate calibration of the equipment is checked during a series of quality controls to ensure patient safety. These controls are designed to certify that the radiotherapy and proton therapy equipment will deliver the required dose in the exact location designated by the medical team. It also increases physician peace of mind about their patients' safety.



SAFE MEDICAL IMAGING: QUALITY ASSURANCE FOR A BETTER DIAGNOSIS AND BETTER CONTROL OF THE DOSE

The quality assurance solutions for medical imaging and radiotherapy imaging contribute to improving image quality to ensure a more accurate diagnosis and therapy, while better controlling the radiation dose released by the machine. Our dosimetry solutions offer a complete and instant analysis of the released dose to obtain the required imaging with just one exposure and ensure machines are available sooner for the next patient.



IMAGING MARKERS: SAFER AND MORE EFFECTIVE RADIATION TREATMENTS

The flexible markers are directly inserted in the soft tissue and can be visually identified while the patient is positioned for radiotherapy treatment. They are minimally invasive, ensuring the patient comfort. These markers also facilitate a more precise positioning of the patient to maximize therapy efficacy.



05

COMMITMENT

PROTECT, ENHANCE AND SAVE LIVES BY CONTRIBUTING TO HIGH QUALITY EMPLOYMENT AND WORKING ENVIRONMENT

Would our mission statement to Protect, Enhance and Save Lives still make sense if it hadn't been put into practice for and by our employees?

As Yves Jongen, IBA's founder, always reminds us, our people are IBA's most valuable asset.

These men and women, who are all experts in their field, are exceptionally passionate and enthusiastic about what they do. Our employees collectively undertake to play an active role in putting our mission statement into practice. We support and encourage their initiatives by providing them with a safe and stimulating place to work.

COMMITTED EMPLOYEES

Around the world, our employees engage in work that demonstrates their energy, engagement and desire to always go one step further for a cause that they care about, namely to ensure that every patient has access to the most beneficial treatment for their cancer.



Men and women whose daily commitment to make our mission a reality, deserve to be praised. I wish to thank them for helping us to achieve our mission to Protect, Enhance and Save Lives.



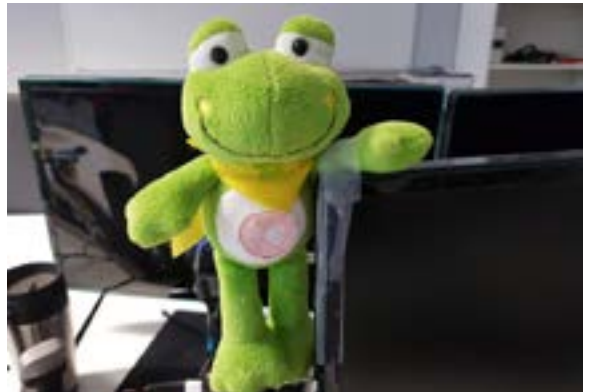
Olivier Legrain
CEO, IBA



Oklahoma City, State of Oklahoma, Warrenville, State of Illinois, United States – IBA employees raised funds to fight cancer, by shaving their heads during the Saint Baldrick charity event.



Fairfax, State of Virginia, United States – Santa Claus and the IBA employees visited the children at the Inova Schar Cancer Institute, where an IBA proton therapy center is set to open in 2019.



Bernd the frog, who puts a smile on the faces of all the children that are treated in an IBA proton therapy center.



Let Us Run So They Can Walk, Chennai, India – This half-marathon, which was organized in Chennai, India, aimed to raise funds for 103 leg prostheses for disadvantaged people and to provide financial support to schools in need.



Rock Against Cancer, Louvain-la-Neuve, Belgium – A rock festival, organized by IBA employees, to raise funds for cancer associations.



Thank You Day, Dresden, Germany / Oklahoma City, State of Oklahoma, Royal Oak, State of Michigan, Philadelphia, State of Pennsylvania and Seattle, State of Washington, United States – Taking the time to thank and congratulate employees and customers for their daily commitment as part of our mission.

PRIORITY N° 1: A SAFE WORKING ENVIRONMENT

Providing our employees with a safe place to work, with the highest quality standards, is a priority for IBA. This enables us to avoid incidents that could have a negative impact on the continuity of service and consequently on providing patients with the most accurate diagnosis and the safest possible therapy. Our employees recognize IBA's commitment to providing a safe working environment in 2018. We improved working conditions for working at heights and updated our training on ionizing radiation. The design of our equipment is also continually evaluated to make it more effective, both for patients and the operators. By raising the awareness of each of our employees, we achieve the standard of excellence that we set ourselves for safety, both in our factories, offices and at our customer sites.

IBA has established a new notified body and obtained Medical Device Single Audit Program (MDSAP) certification in a spirit of continuous improvement and in anticipation of the new European regulation on medical devices.

Let's play the quality assurance game

In April, all the staff at our Louvain-la-Neuve headquarters (Belgium) joined us in quality assurance training. This training course was then organized for employees at other sites around the world. In 2018, IBA focused on "Step Up our Quality of Execution"; a perfect opportunity to launch this global training on quality-related topics. Our IBA employees received an overview of our quality processes and an understanding of the importance of quality in all that we do.



We work day and night, 365 days a year, in direct contact with patients, to make proton therapy possible.



Antje Gaebel

Proton Therapy Site Administrative Assistant,
WPE Proton Therapy Center, Essen, Germany

A WORKPLACE THAT FOCUSES ON SUSTAINABLE DEVELOPMENT

IBA completed a large-scale building project in 2018, having built new infrastructure to cope with the evolution of the market in our various business lines: a 9 000 sqm building, housing offices, a warehouse and an assembly hall. With this expansion, we will be able to triple our production and adapt to the growth of the market.

From the outset, we thought about the sustainable dimension of this passive building, on various levels and paid special attention to the office layout, light and operational elements to provide a stimulating work environment where our employees can thrive.

Low activation concrete

Proton therapy treatments generate secondary radiation, that irradiates part of the walls of the room where the cyclotron is located. This is a massive, concrete structure, with walls that can be up to 3 meters thick. The concrete is activated by the secondary radiation. When the center is dismantled, several decades later, this concrete is categorized as radioactive waste, and must be processed as such. The low activation concrete that IBA developed with the help of reliable, high quality partners, means the product of radioactivity can be significantly reduced.



The Beam Factory

This new building is a perfect example of IBA's desire to use each stage of its development to generate a positive impact for our planet. We put this into practice in the structure of this building.

One of the main objectives for this site, as stated in the specifications, was to help reduce greenhouse gas emissions, by optimizing our energy and raw materials consumption. We realized there were three major ways to do this, which would allow us to reduce and even neutralize the negative impact: the choice of materials, the use of renewable energy (solar especially) and recycling.

Our heating and cooling equipment and lighting account for most of the energy consumption. We utilize a high level of insulation, combined with smart automation of the solar protection, in line with the weather conditions to reduce our energy requirements by approximately 15%, compared to a "passive" building.

We also take maximum advantage of daylight, so that each workstation has optimal exposure. This enables us to achieve daylight autonomy of more than 60%. We accomplish this by designing a building with offices that are arranged in a comb structure and by limiting the building's height to just two floors, with large windows and high lintels.

We recycle as well by recovering the energy used by our production facility to heat the building. The constant heat, that is produced during the testing process of our particle accelerators, is evacuated with cooling units. Rather than release this heat into the atmosphere, we instead chose to direct it to heat pumps that power the air conditioning units of the offices and workshops. With this system, we can meet 95% of the building's heating and cooling needs.

And finally, the building has an underground bunker, made of low activation concrete (see page 32).





Contact IBA

Thomas Ralet
Vice-President Corporate Communication
Phone: +32 10 47 58 90
E-mail: investorrelations@iba-group.com

Version française sur demande.

Ion Beam Applications, SA

Chemin du Cyclotron, 3
1348 Louvain-la-Neuve, Belgium
Phone: +32 10 47 58 11 - Fax: +32 10 47 58 10
RPM Nivelles - VAT: BE 428.750.985
E-mail: info-worldwide@iba-group.com
Website: www.iba-worldwide.com

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PROTECT +
ENHANCE +
SAVE LIVES