MEANINGFUL INNOVATION

Viggo Mommaerts, treated with proton therapy
Proton therapy is currently considered to be the most advanced form of radiation treatment possible.

It is considered the most advanced form of radiation treatment available in the fight against cancer thanks to the uniform dose deposition and the reduction of the doses to the tissue adjacent to the tumor. Protons deposit the majority of their energy within a controlled zone while limiting the impact on the healthy tissue that surrounds the tumor, meaning larger doses can be deposited in the tumor without increasing the risk of secondary effects or long-term complications. This has the potential to improve the treatment results and the patients’ quality of life.

Unfortunately, not enough patients can benefit from proton therapy. Less than 1% of all patients who are undergoing radiation therapy currently have access to it.

The only thing we, as parents, could do for Viggo was to look for the best therapy in the world so that after treatment, he could maintain a high quality of life.

Valérie Verlinden
Viggo’s mother

IBA is the pioneer in proton therapy
The advantages of proton therapy.

Nowadays proton therapy is used to treat many forms of cancer. It is particularly appropriate in situations where treatment options are limited and conventional radiation therapy using a photon beam presents unacceptable risks to patients. These situations include and are not limited to: eye and brain cancers, head and neck cancers, prostate, liver, lung, breast, and pediatric cancers, as well as other tumors in close proximity to one or more critical structures.

The advantages of proton therapy

• Little to no radiation beyond the tumor
• Lower integral dose per treatment
• Potential to lower the risk of side effects
• May improve the quality of life during and after treatment

Ramesh Rengan MD PhD
Medical Director, SCCA Proton Therapy
Associate Member, Clinical Research Division Fred Hutchinson Cancer Research Center. Associate Professor, Department of Radiation Oncology, University of Washington School of Medicine, USA

Improving the quality of life during and after cancer treatment
A new era for proton therapy treatment.

While proton therapy today accounts for less than 1% of radiation therapy treatments, studies estimate that at least 20% of radiation therapy patients would benefit from proton therapy. A large number of clinical trials are under way to demonstrate the benefits of proton therapy. IBA develops new, more affordable solutions and technologies that will further increase the adoption of proton therapy. These developments will shape the future of proton applications, and undoubtedly open a new era for proton therapy treatment.

Perspective on radiation therapy patients receiving proton therapy as part of their treatment

<table>
<thead>
<tr>
<th>% patients</th>
<th>today</th>
<th>following reports &amp; policies*</th>
<th>following clients’ experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td></td>
<td>20%</td>
<td>45%</td>
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Following our clinical practice experience, we have been able to implement PBS technology and Cone Beam CT which have allowed us to open new protocols and increase to 40% the number of patients eligible for proton treatment at our center.

James M Metz, MD
Chair of Penn Medicine Department of Radiation Oncology
Executive Director, OncoLink, Philadelphia, PA, USA

Proton therapy typical cancer indication mix (% patients)

- Head & Neck: 10%
- Brain: 10%
- Lung: 20%
- Genitourinary: 10%
- Gastro-intestinal: 20%
- Retreatment: 5%
- Pediatrics: 15%
- Sarcoma: 5%
- Genitourinary: 10%
- Pediatrics: 15%

Source: data from a cutting edge academic center in the United States

For more information on the clinical effectiveness of proton therapy, please contact us to receive:
- IBA Selected Proton Therapy Bibliography (08/16)
- IBA series of Clinical White Papers.

Or download them at: www.iba-protontherapy.com/
Recognition of the clinical advantages of proton therapy.

Awareness of proton therapy within the medical community is growing, just as the number of patients treated with proton therapy grows. The interest is reflected in the increasing amount of clinical data that has become available. Last year more than 700 scientific papers were published.

To keep up with the new findings, IBA compiles and updates the available data into a series of white papers, dedicated to each specific indication. This series of white papers contains information about current practices and the opportunities and challenges for proton therapy in oncology. Besides making available general information about proton therapy, these white papers present an overview of the available data and results for specific indications, targeting stakeholders in cancer radiation therapy around the world.

The IBA users meeting is a unique opportunity to connect with other worldwide experts in proton therapy. It allows exchanging ideas and sharing recent developments with the worldwide technology leader in the field of proton therapy. The Skandionkliniken is happy to be the next center to host the IBA users meeting in 2018.

Håkan Nyström, PhD
PhD, Chief Physicist at Skandionkliniken, Uppsala, Sweden

IBA gathers its customers every year to build proton therapy of tomorrow

IBA users meeting in Dallas, TX, USA, March 2017

Data from https://clinicaltrials.gov/

Source: https://www.ncbi.nlm.nih.gov/pubmed
Use keywords: “Proton beam therapy” and “Proton therapy”

PT market scoreboard
Growth in prospective clinical trials
108 trials open and recruiting

728 scientific papers published last year

Publication statistics per year

Data from https://clinicaltrials.gov/
IBA makes proton therapy more accessible.

IBA has been researching and developing ways to minimize the cost of proton therapy and make it more accessible to all cancer patients.

In line with this commitment, the Proteus®ONE is a compact single-room solution that is more affordable while also being easier to install, operate and finance. Proteus®ONE delivers the latest improvements in proton therapy: Image-Guided IMPT.

It 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 helping the medical staff work more efficiently.

With Proteus®ONE, proton therapy becomes accessible for more patients worldwide. Interest in this compact solution has grown rapidly.

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
Medical Director
Willis-Knighton Cancer Center, Shreveport, L.A. USA
Treating with Intensity Modulated Proton Therapy.

IBA continues to provide the most advanced technologies to its partners and maintains its unrivaled position as an innovator in proton therapy.

IMAGE-GUIDED PROTON THERAPY (IGPT)
Measurement tools are important to maximize the efficiency of radiation therapy, and fine tuning these tools significantly increases the precision of proton therapy. IBA 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. Those advanced imaging technologies ensure quick and accurate patient position verification by comparison with diagnostic CT images during the treatment planning process. IBA also benefits from a partnership with Philips Healthcare to provide superior diagnostic imaging expertise.

PENCIL BEAM SCANNING
Pencil Beam Scanning (PBS) easily and precisely sculpts the dose in complex volumes. PBS is a proton beam delivery mode which paints the target volume, one layer at a time, voxel by voxel, to precisely match the shape of the tumor. It allows clinics to sculpt the dose with very high levels of conformity and dose uniformity, even in complex shaped tumors. PBS provides the opportunity to increase the number of clinical indications for proton therapy and contributes to minimizing the overall radiation dose.

THANKS TO PBS, MORE CLINICAL INDICATIONS ARE TREATED BY PROTON THERAPY

IBA spends about 10% of its annual revenues on research and development.
IBA continues to strengthen its leading market position.

Proton therapy is IBA’s principal source of growth for the future, particularly since the company also enjoys the position of uncontested global market leader. IBA provides the systems for more than half of all proton therapy treatment projects in the world.

The company benefits from the increasing global adoption and acceptance of proton therapy as it is considered as the most advanced and precise treatment option for radiation therapy patients. IBA has continued to maintain its strong leadership in the field, securing approximately 50% of all proton therapy solutions ordered. To date, more than 50,000 patients have been treated by IBA customers, more than on all competitor systems combined.

Thanks to new collaborations with Philips and Toshiba, IBA further strengthens its world leadership in proton therapy remaining at the forefront when it comes to delivering the latest in innovative cancer therapy in key regions.