PROTON THERAPY CLINICAL EDUCATION
A COMPREHENSIVE AND SPECIFIC TRAINING PROGRAM

CARRY OUT EFFECTIVE TREATMENTS FROM DAY ONE
FOREWARNED IS FOREARMED

Although over 100,000 patients have been treated in proton therapy over the years, this modality is relatively new. Therefore, your medical team may not have had a chance to gain hands-on experience with proton therapy.

To meet the needs for qualified clinical staff of the fast-developing proton therapy modality, Penn Medicine’s Roberts Proton Therapy Center, OncoLink and IBA have developed a training offer. It allows clinical staff to be prepared and educated to perform their mission from day one: Looking after patients and carrying out safe and effective treatments.

Specific education and hands-on training sessions are essential to put your staff at ease when using your system. Optimize your practice and benefit from the experience and expertise of Penn Medicine’s Roberts Proton Therapy Center.

This program has been designed to encompass and share the experience and know-how gained over years of proton therapy treatment in top clinical institutions.
PROTON THERAPY CLINICAL EDUCATION PROGRAM OVERVIEW

TO ENABLE YOUR CLINICAL TEAM TO BE OPERATIONAL FROM DAY ONE, IBA, PENN MEDICINE’S ROBERTS PROTON THERAPY CENTER AND ONCOLINK HAVE DEVELOPED TOGETHER A SPECIFIC PROTON THERAPY CLINICAL EDUCATION PROGRAM.

It encompasses both experience and expertise of the three partners, which are leaders in their respective fields. Penn Medicine’s Roberts Proton Therapy Center shares its deep clinical understanding and longstanding hands-on experience in proton therapy. IBA brings in its unrivalled experience and knowledge in proton therapy technology. Finally, the program benefits from OncoLink’s online platform and learning capabilities to deliver in-depth education online.

A dedicated program for each specialty

On top of a common-core module addressing the basics of proton therapy, the Proton Therapy Clinical Education program proposes specialized modules with proton specific education targeted for each specialist active in your clinical team:
- physicians,
- medical physicists,
- dosimetrists,
- radiation therapists,
- nurses.

The overall training is composed of e-learning sections followed by an internship at Penn Medicine’s Roberts Proton Therapy Center to gain hands-on experience with international clinical experts.

Participants first have access to online educational material. This material mainly consists of recorded lectures given by Penn Medicine’s Roberts Proton Therapy Center specialists, each covering specific topics. Each participant will have to complete the module and take an online examination to receive a certificate of completion.

Once this is achieved, participants will be hosted for an internship at Penn Medicine’s Roberts Proton Therapy Center. Participants will be given the chance to observe experienced users. They will also gain hands-on experience in proton therapy clinical practice. In short, your team can be trained at one of the most state-of-the-art proton therapy with leading experts in the field.

Thanks to this program, your team will be ready to perform their mission from day one: Looking after patients and carrying out safe and effective treatments.

The education program covers the necessary concepts and topics for the different members of a proton therapy practice team. It is developed to meet the needs of each specialty. They include, among others:
- Proton therapy in general: physics and clinical perspectives
- Clinical indications for adult and pediatric cases (Prostate, Lung, GI, Liver, CNS, Sarcoma, Head and neck, CNS, Neuroblastoma, Sarcoma, etc);
- Treatment volumes and treatment planning in proton therapy;
- Delivery modes and techniques: Double Scattering, Uniform Scanning, Pencil Beam Scanning;
- Treatment delivery workflow: Immobilization, Positioning, Simulation, and Verification;
- Imaging for proton therapy: Patient Alignment and Verification;
- Use of the IBA Proteus System (incl. software);
- Proton Beam delivery and measurement Methods;
- Quality Assurance Program for proton therapy with Scattered and Scanned Beams (incl. Importance of Proton Range and Range uncertainty);
- General Patient Management (Symptoms and site specific).

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ENABLE YOUR CLINICAL TEAM TO BE OPERATIONAL FROM DAY ONE. TRAIN THEM WITH ACOMPLISHED EXPERTS.
TEACHING MATERIAL EXAMPLES

HEAD AND NECK CANCER: PENCIL BEAM SCANNING TREATMENT
A. Lin, M.D., S. Both, Ph. D., J. Metz, M.D.

INTRODUCTION
Head and neck cancer has historically been treated with radiation using 3D conformal radiation therapy and more recently IMRT. However, these treatment methods are associated with swallowing related toxicities like xerostomia and dysphagia.1,2

Proton therapy, and especially with Pencil Beam Scanning, can be used to reduce dose to organs at risk, particularly to the oral cavity and to the minor and major salivary glands. We believe that these dosimetric improvements may translate to improvements in toxicity and long-term quality of life.

However, several considerations need to be taken into account in terms of plan robustness.3

MATERIALS AND METHODS
This patient has been treated at the Roberts Proton Therapy Center with the IBA ProteusPLUS system in its gantry treatment room configuration.

Thirty-five Pencil Beam Scanning fractions were delivered, with 2 posterior oblique fields. 7 of those fractions were given in Intensity Modulated Proton Therapy, to effectively spare the spinal cord.

Patient specific planning has included plan optimization with Eclipse 8.1 Treatment Planning System, and the plan has been specifically verified with the IBA Dosimetry Digiphant and Matrixx system.

CONCLUSION
In this clinical example, we present comparative treatment planning for a head and neck cancer case treated at the Roberts Proton Therapy Center.

In treating this indication with proton therapy, it is important to take into account robustness factors like inter and intrafraction motion, range uncertainties and set-up errors.

Hands-on experience on this indication and many others can be acquired through the Proton Educational Program.


HIGH RISK PROSTATE CANCER: PENCIL BEAM SCANNING TREATMENT
N. Vapiwala, M.D., S. Both, Ph. D., J. Metz, M.D.

INTRODUCTION
Proton therapy has been used to treat prostate cancer for several decades, and data demonstrate that it is a safe and effective treatment for low-, intermediate- and high-risk patients.1

In the case of some high-risk patients, there is a need to treat not only the primary tumor, but also lymph nodes situated close to the target.

In such a case, proton therapy, and pencil beam scanning in particular, can have a significant dosimetric advantage when compared to IMRT. Special attention must be paid, however, to account for mitigating factors such as intra-fraction motion.2

MATERIALS AND METHODS
This patient has been treated at the Roberts Proton Therapy Center with the IBA ProteusPLUS system in its fixed beam room configuration.

A total dose of 79.2 Gy(REE) was delivered to the primary site (prostate) and 50.4 Gy(REE) was delivered to the lymph nodes over a 9-week course of treatment.

Patient-specific planning included plan optimization with the Eclipse 8.1 Treatment Planning System, and the plan has been validated using the IBA Dosimetry Digiphant and Matrixx system.

CONCLUSION
In this clinical example, we present comparative treatment planning for a high-risk prostate cancer case treated at the Roberts Proton Therapy Center.

In treating this indication with proton therapy, it is important to take into account robustness factors like organ motion, range uncertainties and set-up errors.

Hands-on experience in treating this indication, and many others, can be acquired through the Proton Educational Program.

**LUNG CANCER: DOUBLE SCATTERING PROTON TREATMENT**
J. Metz, M.D., S. Both, Ph. D.

**INTRODUCTION**
Inoperable advanced stage Non Small Cell Lung Cancer is often treated with concomittent radiation therapy and chemotherapy, resulting in possible side effects including pneumonitis and esophagitis.

Proton therapy has been shown to be effective in this settings and could potentially reduce these side effects. [1,2]

Though IMPT can show better dose distributions on a static treatment plan [3], interplay effects and interfraction motion makes it often more suitable to use scattering techniques for proton irradation.

**MATERIALS AND METHODS**
This patient has been treated at the Roberts Proton Therapy Center with the IBA ProteusPLUS system in its gantry treatment room configuration.

- A total dose of 66 Gy(RBE) has been delivered with a Universal Nozzle in Scattering Mode.
- Patient specific planning has included plan optimization with Eclipse 8.1 Treatment Planning System, and the plan has been validated using the IBA Doseimetry Digihant and Matrixx system.

**CONCLUSION**
In this clinical example, we present comparative treatment planning for a bilateral lung cancer case treated at the Roberts Proton Therapy Center.

In treating this indication with proton therapy, it is important to take into account robustness factors like organ motion, range uncertainties and set up errors.

Future developments will see robust planning and faster beam delivery to allow for the use of scanning technologies in the treatment of NSCLC. Hands-on experience with treatment planning for these indications as well as follow up on the latest protocols and developments can be learned through the Proton Educational Program.

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PROTON THERAPY CLINICAL EDUCATION
CARRY OUT SAFE AND EFFECTIVE TREATMENTS FROM DAY ONE.

The Proton Therapy Clinical Education program is a comprehensive training course covering proton therapy clinical practice. It combines both e-learning sessions as well as hands-on internship in a renowned institution. This program enables your clinical team to be operational from day one. It is the fruit of a partnership between IBA, Penn Medicine’s Roberts Proton Therapy Center and OncoLink. It encompasses experience and expertise of the three partners, which are leaders in their respective fields. The program benefits from OncoLink’s platform and e-learning capabilities to deliver in-depth education online. Your team will benefit from IBA’s unrivalled experience and knowledge in proton therapy technology. Last but not least Penn Medicine experts will share their insights, deep clinical understanding and longstanding hands-on experience in proton therapy with the trainees during e-learning sessions and/or hands-on internship.

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