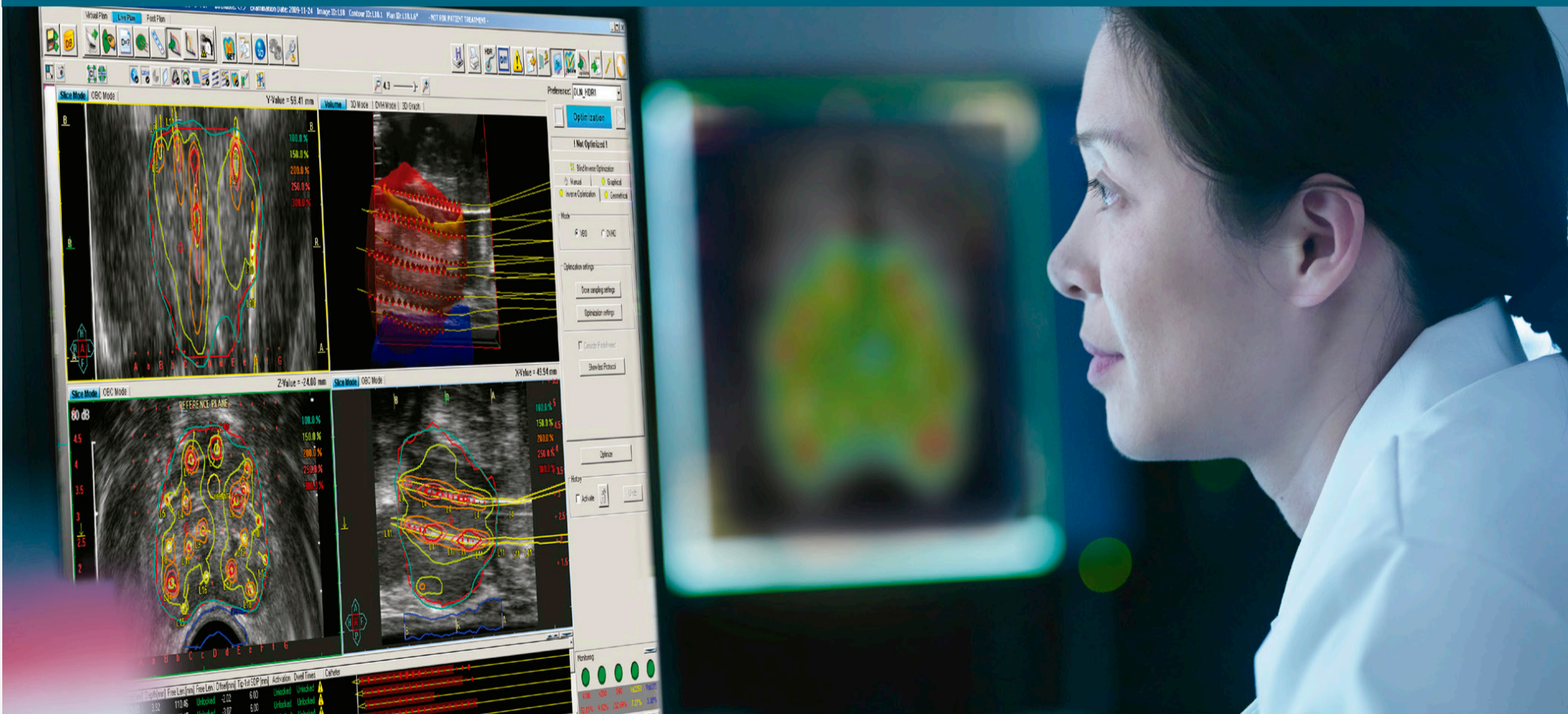


Elekta Studio

A guide for starting an HDR brachytherapy service for prostate cancer



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Introduction

Thank you for requesting this eBook on real-time HDR brachytherapy for treating prostate cancer. This publication is intended to give you a comprehensive overview covering several topics relevant to the adoption of this treatment modality.

First, we address **real-time HDR brachytherapy's advantages** versus traditional methodologies, then outline the array of equipment required for the seamless implementation of this technique. Lastly, this eBook covers the human and material resources needed for its effective execution and points you toward additional informational channels that can help you round out your understanding of this transformative modality for treating prostate cancer.

Elevate prostate cancer treatment with brachytherapy insights from radiation oncologists and physicists.



Chapter 1

Why real-time HDR brachytherapy for prostate cancer?

Prostate cancer is the most common urological cancer in men, particularly in developed countries.¹ The disease is effectively treated with surgery, EBRT – with or without HDR brachytherapy boost – or with HDR brachytherapy alone.

By virtue of its ability to precisely target prostate cancer from inside the prostate, as well as its safety and efficacy, HDR brachytherapy – either as a monotherapy or as a post-EBRT boost treatment – has proven to be an attractive technique, especially for intermediate and high-risk disease.²⁻⁶

Additional reading can be found here:

References: 1. Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin.* 2021 May;71(3):209-249. doi: 10.3322/caac.21660. Epub 2021 Feb 4. PMID: 33538338.

2. Valle LF, Lehrer EJ, Markovic D, et al. A systematic review and meta-analysis of local salvage therapies after radiotherapy for prostate cancer (MASTER). *Eur Urol.* 2021 Sep;80(3):280-292. doi: 10.1016/j.eururo.2020.11.010. Epub 2020 Dec 11. PMID: 33309278; PMCID: PMC10262981.

3. Kishan AU, Cook RR, Ciezki JP, et al. Radical prostatectomy, external beam radiotherapy, or external beam radiotherapy with brachytherapy boost and disease progression and mortality in patients with Gleason score 9-10 prostate cancer. *JAMA.* 2018 Mar 6;319(9):896-905. doi: 10.1001/jama.2018.0587. PMID: 29509865; PMCID: PMC5885899.

4. Tilki D, Chen MH, Wu J, et al. Surgery vs radiotherapy in the management of biopsy Gleason score 9-10 prostate cancer and the risk of mortality. *JAMA Oncol.* 2019 Feb 1;5(2):213-220. doi: 10.1001/jamaoncol.2018.4836. PMID: 30452521; PMCID: PMC6439553.

5. Kishan AU, Karnes RJ, Romero T, et al. Comparison of multimodal therapies and outcomes among patients with high-risk prostate cancer with adverse clinicopathologic features. *JAMA Netw Open.* 2021 Jul 1;4(7):e2115312. doi: 10.1001/jamanetworkopen.2021.15312. PMID: 34196715; PMCID: PMC8251338.

6. Kissel M, Pounou A, Ka K, et al. Efficacy and toxicity following salvage high-dose-rate brachytherapy for locally recurrent prostate cancer after radiotherapy. *Brachytherapy.* 2022.

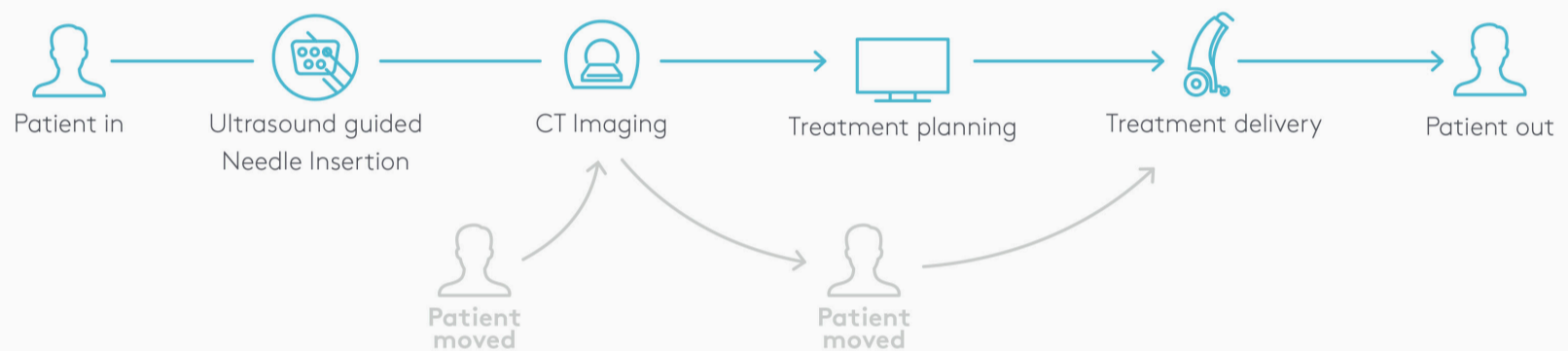
Chapter 2

Conventional versus real-time HDR brachytherapy

Conventional HDR brachytherapy

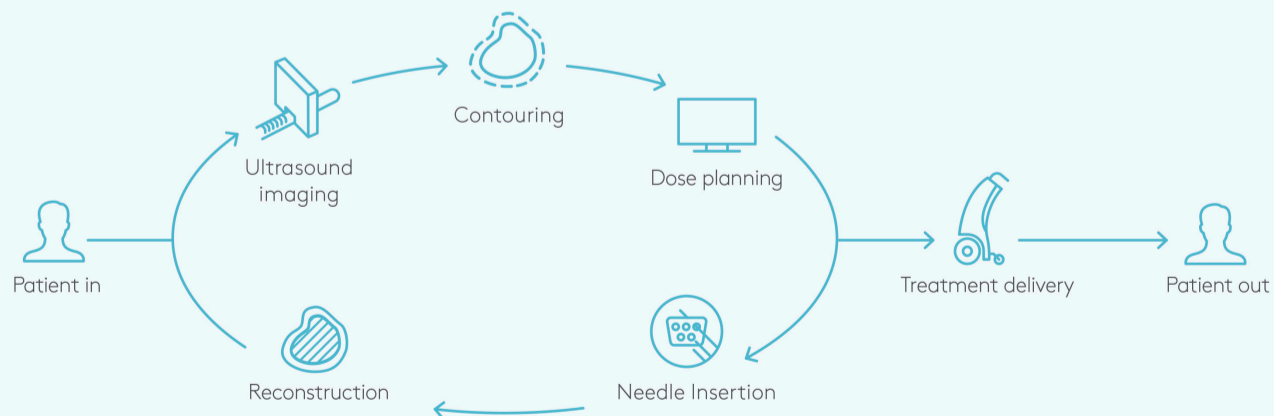
Reaching a target inside the patient with an interstitial brachytherapy application requires online guidance. Transrectal ultrasound (TRUS) is the modality of choice as it offers clear recognition of the anatomical region and the needles to be inserted.

Conventional HDR workflow



Genuine real-time HDR workflow

An efficient solution | Enhanced patient experience



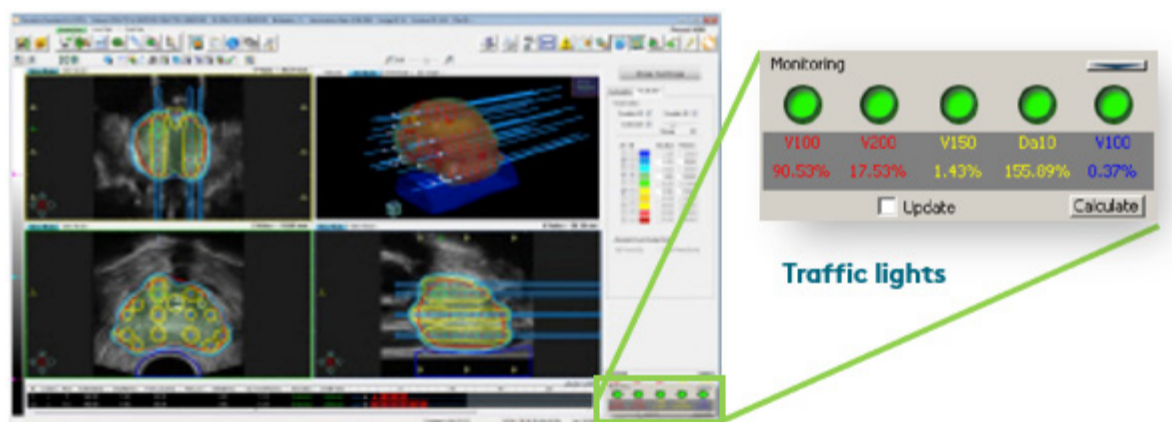
Patient in **one** location

Real-time, ultrasound-guided HDR brachytherapy

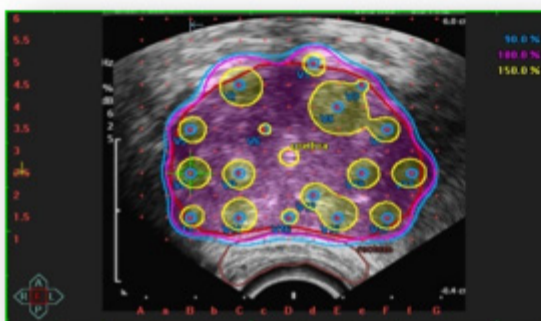
The real-time, ultrasound-guided Oncentra® Prostate solution provides a way to complete the entire HDR brachytherapy process in the procedure room. This includes initial ultrasound imaging, contouring, ultrasound-guided needle insertion, reconstruction, dose planning, and treatment delivery. Most important, this streamlined workflow enables physicians to plan needle paths virtually – using ultrasound images – before needle insertion. After needle insertion, it is possible to modify the positions of inserted needles and to further optimize the plan before treatment delivery. This leads to a reduced risk of needle displacement and streamlines the workflow, thus saving time.

For expanded workflow details click here. (link to article #3)

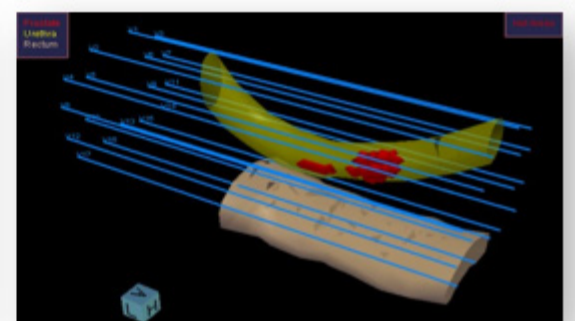
Discover a comprehensive exploration of **prostate brachytherapy** in our article, "Precision and Promise."



Traffic lights



Isodose visualization



Cold & Hot spots

Chapter 3

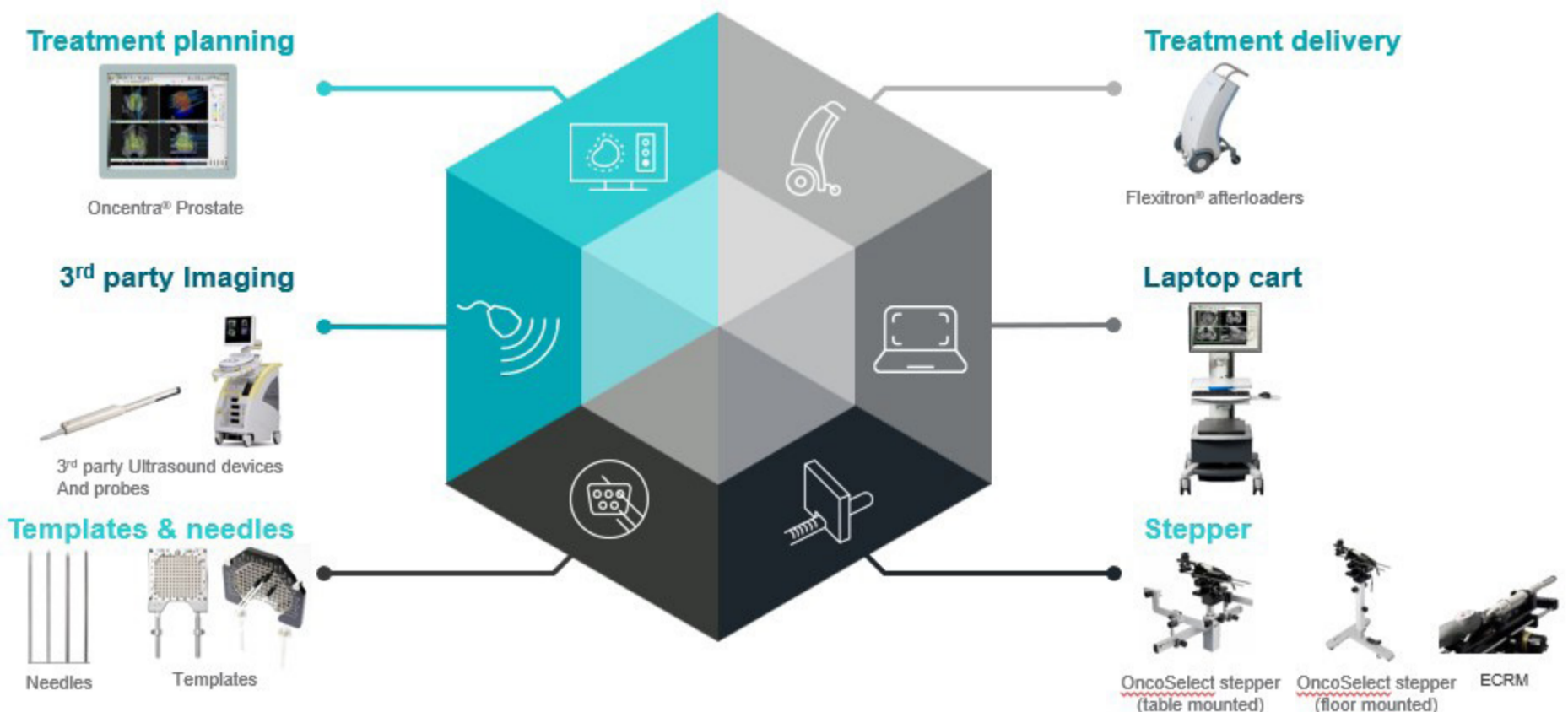
Required equipment

In this chapter we cover the equipment needed to perform Elekta real-time HDR brachytherapy. Consult your Elekta sales representative if you need further clarification on product selection.

Cart-mounted Oncentra Prostate® planning system

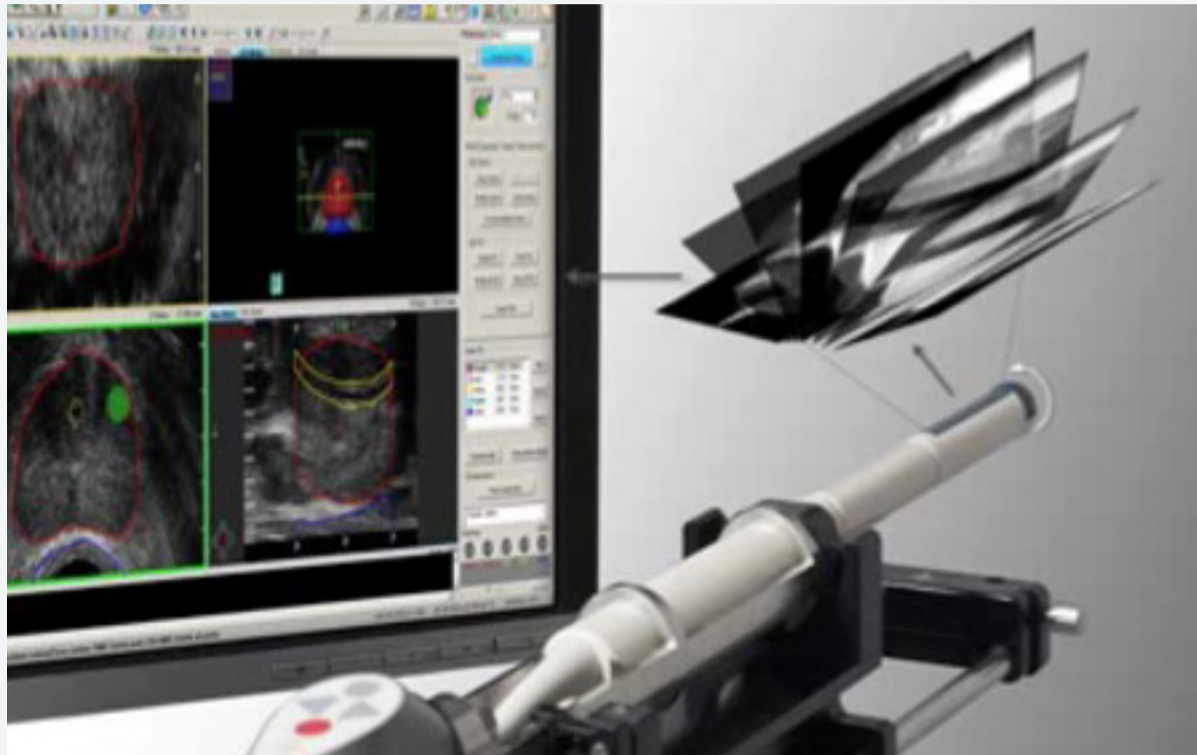
Oncentra Prostate is a highly efficient planning system dedicated for minimally invasive HDR prostate brachytherapy. The ultrasound system and (ECRM), see below, are operated directly by Oncentra Prostate, ensuring that live ultrasound images are available during the entire procedure for contouring, planning, needle placement and optimization. In addition to the ability to adapt the current plan easily to anatomical changes and real-time recalculation of the plan conformity, Oncentra Prostate decreases the possibility of errors and ensures maximum confidence. Mounted on the Prostate Laptop Cart, Oncentra Prostate is highly portable and the required cabling in the operating room is reduced to a minimum, thus ensuring a clean and safe working area.

Overview of real-time prostate solution



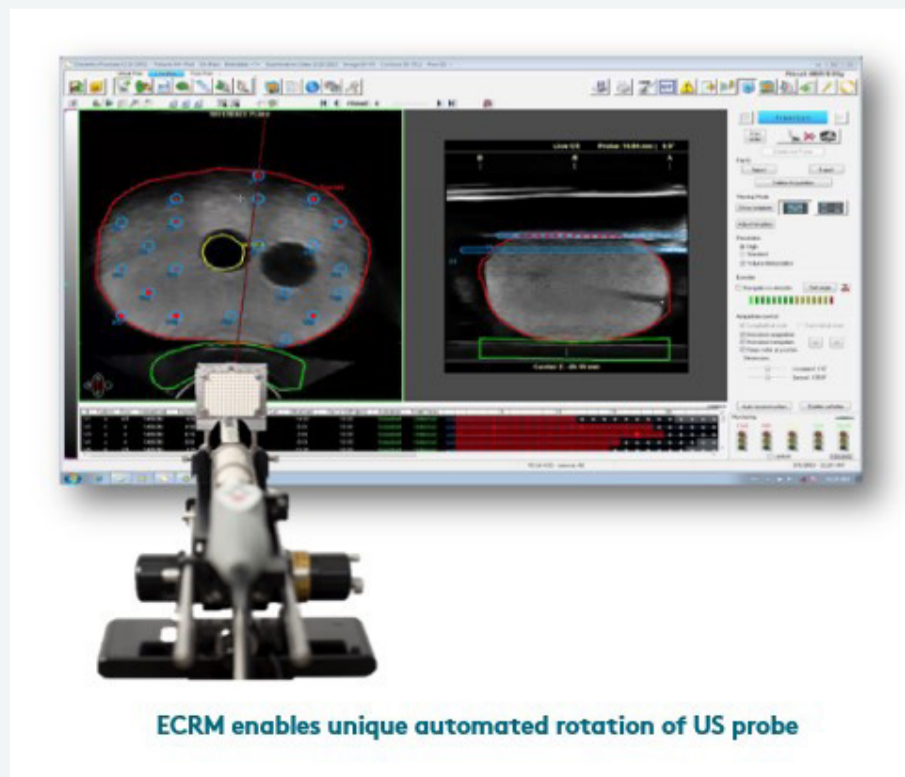
Third-party ultrasound and probe

Elekta offers you the flexibility to use your choice of ultrasound system and transducer. The transrectal ultrasound unit should be capable of both transaxial and sagittal (longitudinal) image acquisition.



OncoSelect® Stepper adapter with the Endo-cavity Rotational Mover (ECRM)

The OncoSelect Stepper and several prostate templates are tailored to the user's needs and provide template and ultrasound probe fixation and needle guidance. A variety of interstitial needles complements the treatment delivery options. Unique to the HDR Real-time Prostate Solution, the ECRM enables automated rotational movement of the ultrasound probe and is directly controlled by Oncentra Prostate.



Templates

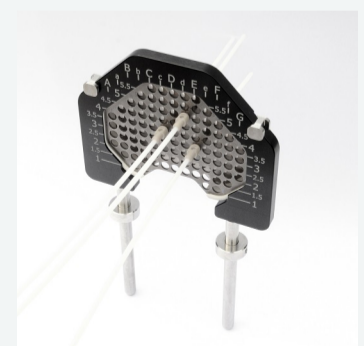
Depending on your clinical needs, Elekta offers your choice of two prostate templates.

Martinez Prostate Template

The Martinez brachytherapy prostate template was designed for maximum precision. The ultra-light template locks to the stepper or stabilizer during insertion and guides the needles under ultrasound guidance. The needles can be individually repositioned and locked for treatment. The individual locking insert ensures that the position of each needle – regardless of needle size – remains unchanged when adjusting another needle. The template can be used with a stepper or free-hand technique and can be sterilized with steam.

Non-clinical testing demonstrated that the Martinez prostate template is MR-conditional. A patient can be scanned safely, immediately after placement under the following conditions:

- Static magnetic field of 1.5T or 3.0T
- Maximum spatial gradient magnetic field of 720 Gauss/cm
- Maximum MR system reported, whole body averaged specific absorption rate (SAR) of 2/kg for 15 minutes of scanning (i.e., per pulse sequence)

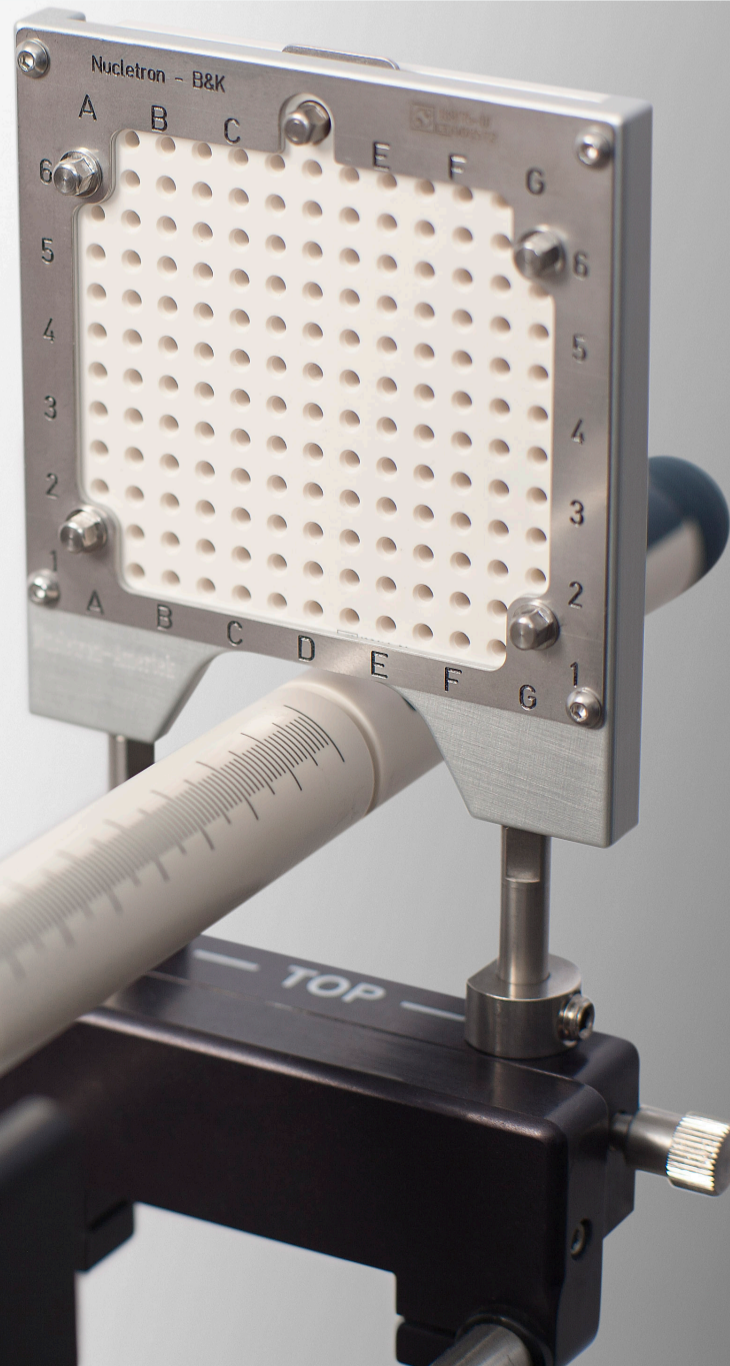
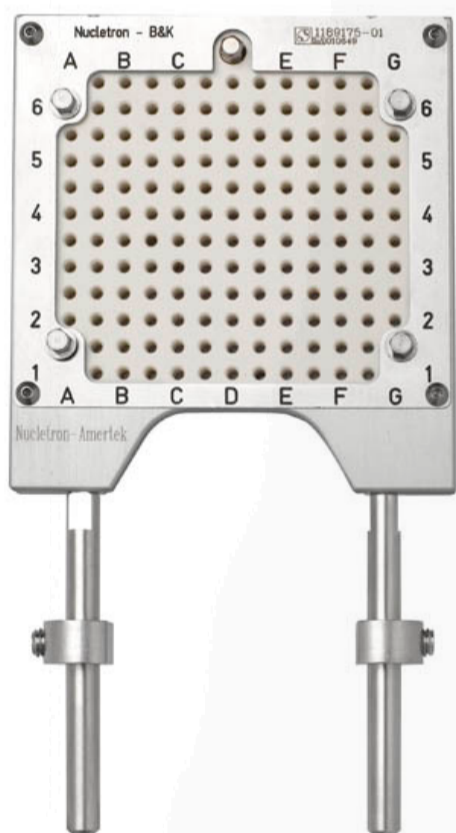


Prostate Stepper Template

The Prostate Stepper Template is an excellent solution for applying interstitial techniques in HDR prostate treatments. It is placed in a stepper holder, which is available for various ultrasound stepper devices. The template is best used in combination with ProGuide plastic needles and OncoSelect stepper and 1.9 mm stainless steel needles.

The template supports a variety of needles and is designed for guidance and fixation of ProGuide plastic needles in 5F and 6F and 1.9 mm stainless steel needles for the Prostate Stepper Template 6F. This square, light-weight template has a universal 5 mm grid array and a single-action locking system that locks all implanted needles in a single movement.

The single-action locking system accelerates the procedure and is designed to eliminate inadvertent movement of individual needles. Optional grid face plates for the template correspond with the grid of the ultrasound system used, such as GE, Siemens and B&K ultrasound systems. Grid face plates help determine the correct needle position with use of the ultrasound image, and can be mounted on the template itself or on the stepper holder.



Interstitial needles

Elekta offers a range of plastic and stainless steel interstitial needles for **HDR real-time prostate brachytherapy**.

ProGuide interstitial needles

The range of OncoSmart ProGuide needles was designed for interstitial applications and is compatible with CT and MR imaging. They are made with high-quality plastic and specifically developed for use with Elekta afterloaders. ProGuide needles are available with either a sharp tip to enable easy penetration of the skin surface or a round tip for maximum patient safety during treatment.

The rigidity of ProGuide needles is created by placing an obturator inside the needle during insertion.

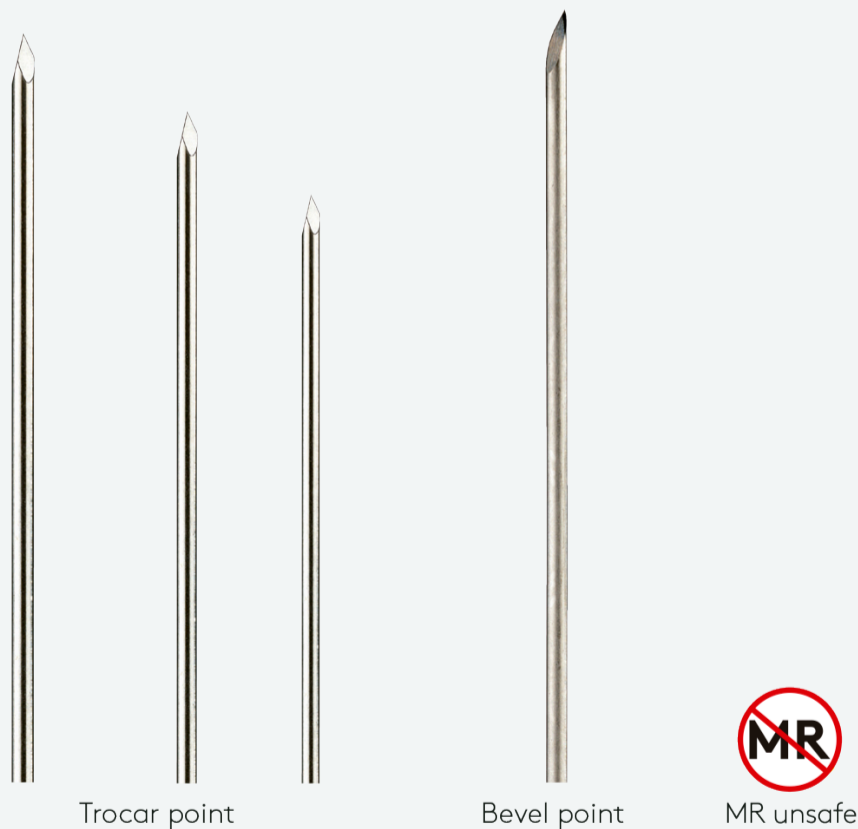
The obturator is a rigid tungsten alloy tool that maintains needle stability during insertion, preventing kinking or breaking. The obturator curve is intentional and prevents the obturator from shifting within the needle during insertion. ProGuide needles are delivered sterile and are for single-use only, while obturators are not delivered sterile and can be processed using steam sterilization or ethylene oxide.



Stainless steel interstitial needles

Interstitial needles are used for treatment of carcinoma for cases in which no lumen or cavity is available or in which additional and very precise target area coverage is required. The needles are designed to maintain their rigidity and sharpness throughout multiple treatments, in combination with appropriate templates.

Stainless steel needles have a needle tip that is either bevel- or trocar-shaped. The trocar and bevel tips facilitate insertion in the tissue. Obturators can be placed inside the needle during insertion to create additional rigidity. The needles are directly connected to the transfer tube of the Elekta afterloader. Metal needles can be sterilized using steam sterilization and ethylene oxide.






Flexitron® Brachytherapy Afterloading Platform

The most reliable and precise afterloader, designed to minimize the risk of errors and to provide compatibility with the widest range of applicators from Elekta.

Why Flexitron?

Performance you can rely on.

 <p>Designed to prevent human error, enabling enhanced safety for clinicians and patients</p>	 <p>Enables the best accuracy and precision in the market, revolutionizing the confidence in the treatment delivery</p>	 <p>Continuously enhanced, allows you to treat with great ease and reliability</p>	 <p>Offering personalized treatment solutions tailored to each patient's distinct needs and conditions</p>
Enhanced safety and trust	Best accuracy and precision	Reliability and ease of use	Great flexibility

Chapter 4

Recommended department resources and personnel

In addition to the equipment specified in Chapter 3, departments should also make sure to have:

- Appropriate software to enable importation of post-implant TRUS or CT or MR imaging with image fusion.
- A brachytherapy suite with adequate shielding to perform the HDR treatment, according to national radiation protection rules.
- Access to suitable imaging post-implant using TRUS, CT or MR.

Regarding the clinical team, HDR brachytherapy requires an experienced team to perform treatment planning and delivery, and to control all issues as they arise to ensure a successful clinical treatment. The decision to offer HDR brachytherapy should be made by a multidisciplinary team with access to all the diagnostic information defined in the preceding chapters. The implant team should be experienced in prostate interventional procedures, in TRUS and should include specialists skilled in the following:

- TRUS imaging
- TRUS-guided transperineal procedures
- CT or MR interpretation (if applicable)
- Use of planning software and dosimetric calculations
- Use of an afterloader and treatment delivery
- Patient care and comfort throughout the procedure

Given these considerations, the team is likely to include an imaging specialist, radiation oncologist, medical physicist, radiotherapy technician (i.e., radiographer, RTT) and a urologist. Documentation of the brachytherapy treatment must be performed according to national standards. It is helpful, when starting with this treatment modality to have a radiotherapist and medical physicist both of whom are experienced in prostate temporary brachytherapy on-site during the first three to give implant procedures. In addition, a visit to a center with sufficient experience in the use of TRUS and brachytherapy is highly recommended.

Chapter 5

Getting started

Elekta can offer you several ways to familiarize yourself with the real-time HDR brachytherapy workflow, including theoretical and practical courses, observational visits, webinars and articles. In addition, Elekta's BrachyAcademy, where many of these resources can be found, aims to advance the successful use of brachytherapy. BrachyAcademy comprises a comprehensive peer-to-peer medical education portfolio that includes clinical workshops and training visits at leading hospitals worldwide.

Theoretical courses

The European Society for Radiotherapy and Oncology (ESTRO), the American Society for Radiation Oncology (ASTRO) and the American Brachytherapy Society (ABS) offer an abundance of workshops and courses that you can participate in to learn about the principles and practice of real-time HDR brachytherapy for prostate cancer.

Practical courses

Participants can take advantage of clinical workshops focused on enhancing your treatment planning and delivery skills with HDR brachytherapy. During a given workshop, you will have the chance to meet with experts, observe cases in real time, and practice on treatment planning systems. Faculty will be on hand to cover subjects such as:

- Clinical method and procedure
- Implementation considerations (e.g., training requirements, learning curve, quality assurance)
- Hands-on experience
- Simulation/imaging

Learn more by visiting this **BrachyAcademy** [link here](#).

Observational visits

An observational visit is organized for individuals or small groups from a medical center to familiarize them with the workflow and implementation of brachytherapy in a fully equipped hospital (Educational Center). Trainees can observe the daily practice in the brachytherapy department and interact in person with the experts working there. An observational visit typically takes a few days and can take place in any country and in the language specified by participants. Contact us [here](#) or reach out to your Elekta sales representative to inquire about an observational visit.

e-Library

Our e-Library is an excellent repository of interesting presentations and webcasts about brachytherapy, and other useful tools for medical professionals. The information is mostly provided by medical experts sharing their assessments on brachytherapy. A selection of key publications and ongoing research in the field of brachytherapy is provided with links directing you to the article source (e.g., PubMed, clinicaltrials.gov). Elekta makes the publication selection, which will be regularly updated with relevant new publications.

Chapter 6

Go-live: Clinical consultancy and on-site Elekta support

An On-site Consultant Training is organized at hospitals that are ready to begin their brachytherapy service or broadening their brachytherapy to new indications. These hospitals typically are looking to receive on-site practical and/or clinical support. On-site Consultant Trainings are very well suited when, for example, a certain treatment will be performed for the first time at the hospital. The consultant is a certified radiation oncologist or physicist who is a recognized expert in a specific type of brachytherapy. Contact us here or reach out to your Elekta sales representative to inquire about On-site Consultant Training.



Elevate prostate cancer treatment with brachytherapy



Conclusion

We hope you have found this eBook on **real-time HDR brachytherapy** helpful. Oncentra Prostate was developed to offer a real-time workflow for HDR prostate brachytherapy. The integration of all components in a single solution ensures that products interact seamlessly. With a design that results in highly conformal and uniform treatment plans, you can be sure that you will meet clinical objectives in the most efficient and dedicated way.

Schedule a meeting with our team to start HDR brachytherapy at your hospital or clinic.

[**CLICK HERE**](#)