

# Contributing to Saving Lives!



My partner in brachytherapy  
and radiation therapy



# What is Brachytherapy?



Brachytherapy is a form of radiotherapy that treats cancer by irradiation from a short distance. Two different forms of brachytherapy are used today: permanent and temporary brachytherapy.

In permanent brachytherapy, a small radioactive source is implanted in the tumorous tissue, while in temporary brachytherapy, the radioactive source is placed directly inside or close to the site of the tumor for a limited and defined period of time.

Over the last decades, brachytherapy has been proven to be very effective and safe. In the case of prostate cancer, it provides a good alternative to the surgical removal of the prostate gland (prostatectomy) and reduces the risk of some of the long-term side effects. As the radiation source is positioned directly at the site of or inside the tumor, healthy tissue is less exposed to radiation than with external beam radiation therapy and the risk of adverse effects is reduced. Brachytherapy is often an outpatient procedure and the patient can restart professional or other activities within a week. This noticeably increases the patient's quality of life.\*

Brachytherapy is commonly used to treat tumors in numerous body sites, such as the cervix, endometrium, prostate, breast, esophagus, nasopharynx, lung and bronchus, lip and oral cavity, as well as the eyes.

\*See [www.bebig.com ->Cancer News](http://www.bebig.com->Cancer News) for references.

# Permanent Brachytherapy

## Prostate Seed Implantation



Eckert & Ziegler BEBIG manufactures radioactive implants, which are mainly used in the treatment of localized prostate cancer. The seeds have the shape of little capsules containing a small quantity of a radioactive isotope, I-125 (Iodine-125). Eckert & Ziegler BEBIG offers two different types of seeds which are available in several configurations.

**IsoSeed®:** is a loose seed, available in two seed types, for use with the **Mick® Applicator**.

**IsoStrand®:** consists of 10 IsoSeed® with 1.0 cm seed center-to-center spacing. The unique design of the biodegradable spacers and the structure of the outer suture ensures excellent strand placement.

**IsoCord® and IsoCord® Needle Loading Station:** IsoCord® are seed chains in a safe and convenient magazine. They are cut into the desired length with the unique IsoCord® Needle Loading Station, which provides superior radiation shielding during the whole process of strand cutting and needle loading. IsoCord® provides excellent strand placement characteristics and outstanding visibility under X-ray and ultrasound. IsoCord® can be delivered with any IsoSeed®.

Eckert & Ziegler BEBIG also provides full installation to hospitals, including treatment planning systems, ultrasound scanners and a complete range of accessories.

# Temporary & Permanent Brachytherapy

## Brain Tumor Treatment



Several studies have shown that stereotactic brachytherapy with iodine-125 seeds is an elective treatment of brain tumors as well as brain metastasis<sup>1</sup>. Using low dose schemes has sophisticated the seed treatment significantly making it safe and a valuable addition to surgery, chemotherapy and other radiation treatments for select patients.

**IsoSeed® for Brain Tumor Treatment:** is offered as I25.S17plus with nine activity classes determined for an effective stereotactic treatment. This seed is intended for the temporary or permanent treatment of localized brain tumors. These include small circumscribed glial tumors of WHO graded I-IV (Astrocytoma, Oligodendrogloma, Ependymoma, Glioblastoma and other central nervous system tumors) as well as in brain metastases. The sterile and loose IsoSeeds are implanted using closed double catheters with an inner diameter of  $\geq 1$  mm. IsoSeed® I25.S17plus for Brain Tumor Treatment can be fixed inside the catheter with spacers, filaments or clips.

Class number	Air kerma strength in $\mu\text{Gy m}^2/\text{h}$	Apparent activity in mCi	Apparent activity in MBq
A01	0.25 – 1.96	0.2 – 1.5	7.4 – 57
A02	1.97 – 3.23	1.6 – 2.5	58 – 94
A03	3.24 – 4.50	2.6 – 3.5	95 – 131
A04	4.51 – 5.77	3.6 – 4.5	132 – 168
A05	5.78 – 7.04	4.6 – 5.5	169 – 205
A06	7.05 – 8.31	5.6 – 6.5	206 – 242
A07	8.32 – 9.58	6.6 – 7.5	243 – 279
A09	9.59 – 11.48	7.6 – 9.0	280 – 334
A10	11.49 – 13.39	9.1 – 10.5	335 – 390

Activity classes  
IsoSeed® I25.S17plus for Brain  
Tumor Treatment

<sup>1</sup>cf. Brainstorm 1 / 2016, 125 Jod-Brachytherapie zur Behandlung von Hirntumoren: ein Follow-Up, ed. Deutsche Hirntumorphilfe e.V.

# Temporary Brachytherapy

## Ophthalmic Cancer Treatment



Eckert & Ziegler BEBIG offers a series of proven products for temporary brachytherapy of eye tumors, as there are uveal melanomas and retinoblastomas. The company is the only global provider of Ru-106 (Ruthenium-106) Eye Applicators as well as specific accessories. The product portfolio also includes the COMS Eye Applicators used together with the high activity IsoSeed® I-125.

**Ru-106 Eye Applicators:** are unique brachytherapy sources consisting of a thin film of Ru-106, a beta emitter, encapsulated within pure silver sheets with a total thickness of only 1 mm. Due to its half-life of 374 days, the Ru-106 Eye Applicators can be used a number of times within one year.

**Accessories for Ru-106 Eye Applicators:** Transparent or Silver Dummies help to optimize the positioning of the applicators. They are available for all types of Ru-106 Eye Applicators. The provided Safety and Sterilization Container supports proper handling.



**I-125 Ophthalmic Seeds and COMS Eye Applicators:** The ophthalmic IsoSeed® I-125 has a particularly high activity. The matching COMS Eye Applicators consist of gold plaque shells and silicone inserts with a predefined slot pattern to place the seeds. COMS Eye Applicators are available in 5 different sizes.

# Temporary Brachytherapy

## Multiple HDR Applications



The Eckert & Ziegler BEBIG SagiNova® HDR afterloader can be used for the treatment of gynecological cancers and other indications such as cancer of the esophagus, bronchus and nasopharynx, prostate, breast and lung, as well as lip and oral cavity.

**SagiNova®:** With the help of applicators and catheters, the miniaturized radiation source is driven from a shielded safe directly into or next to the tumor. SagiNova® is the only afterloader available with an integrated In-Vivo Dosimetry System. This feature along with the automatic catheter length measurement and the precise source position check emphasize the afterloader's reputation of enabling for a high level of accuracy. Furthermore, SagiNova® provides an advanced graphical user interface (GUI), remote support and the customizable tool QAssist which supports physicists by defining and running site specific quality assurance. Eckert & Ziegler BEBIG afterloaders can be equipped with either a widely-used Ir-192 source or with a Co-60 source, which has a particularly long life.



**SagiPlan®:** is a flexible and user-friendly treatment planning system that supports all HDR applications. It enables 3D planning (based on CT, MRI, US, etc.), orthogonal planning and real-time prostate planning. SagiPlan® is equipped with dose optimization and advanced catheter reconstruction tools, and supports DICOM import and export, as well as image fusion. SagiPlan® additionally offers a new GUI that was developed in cooperation with brachytherapy experts and usability engineers.

**Eckert & Ziegler BEBIG HDR Applicators:** are for use with SagiNova®, MultiSource and GyneSource Ir-192 and Co-60 Systems. The MR Safe and MR Conditional Applicators enable a broad choice of treatment options allowing for individualized image guided brachytherapy treatments. All available applicators from Eckert & Ziegler BEBIG and Mick Radio-Nuclear Instruments are implemented in databases of SagiPlan®. This allows for fast and accurate reconstruction and enables precise automatic measurement of the internal length of the applicator.

# Temporary Brachytherapy

**Mick Radio-Nuclear Instruments HDR Applicators:** With the addition of the prominent Mick® HDR Applicators to the Eckert & Ziegler BEBIG portfolio, the HDR Applicator offering spans an even broader range of administrations from prostate to skin, including multiple CT/MR designs for a variety of gynecological treatments. The applicators are available for Eckert & Ziegler BEBIG, Varian and Elekta/Nucleron transfer tubes<sup>2</sup>. Highlights include:

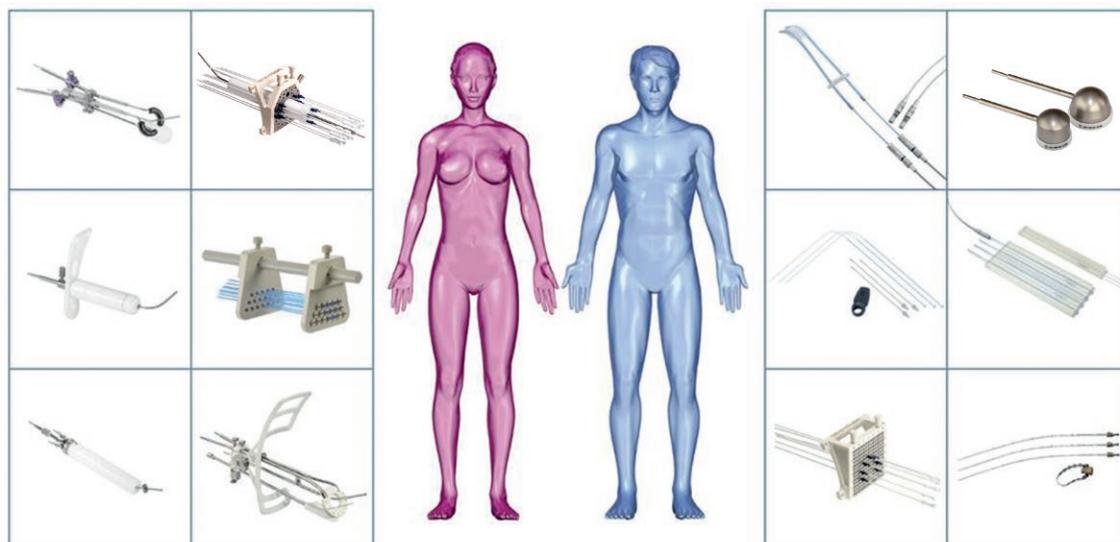
The **CT/MR M.A.C. Interstitial GYN Template** features a template design with optional intrauterine tube enabling complete or targeted treatment of the vagina, cervix, endometrium and parametrium. The set is available with 36 needle concentric channels and a variety of diameters to be integrated easily into current practice.

The **CT/MR Contour Prostate Template** facilitates interstitial needles for the treatment of prostate cancer. Needles can be positioned and locked individually which allows the reconstruction on the treatment planning system directly after insertion.

The **CT/MR Split Ring Applicator's** patented design combines the benefits of several other intracavitary applicators, with the ability to be configured as a closed ring or split into four different diameter distances in either symmetric or asymmetric arrangements.

The **CT/MR Segmented Vaginal Applicator** is designed to treat accurately and completely covering vaginal and cervical tumors. The four-segment design in multiple widths allows to adapt the applicator length and diameter to a variety of anatomies.

The **CT/MR Ring & Tandem Applicator** is designed to treat accurately and reliably in nearly any anatomy with a range of ring angles, intrauterine tube lengths, build-up cap sizes and an optional rectal retractor to increase distance to organs at risk and eliminate the need for packing.



*The Eckert & Ziegler BEBIG and Mick Radio-Nuclear Instruments HDR Applicator Portfolio*

<sup>2</sup>The intrauterine tubes have been tested for mechanical compatibility with the indicated manufacturer's transfer tubes to confirm there are no internal source obstructions. Users are responsible for validating intrauterine tube compatibility, including treatment planning systems, with their afterloading equipment. Varian is a trade name/trademark of Varian Medical Systems, Inc. Elekta/Nucleron are trade names/trademarks of Elekta AB (publ).

# EBRT Accessories

## Accessories for External Beam Radiation Therapy



Eckert & Ziegler BEBIG also offers accessories for External Beam Radiation Therapy (EBRT). These include fiducial markers in preloaded needles to support visualization during radiation therapy and brachytherapy procedures as well as bolus material that is designed to provide maximum dose build-up for photon energies.

**Mick® Gold Fiduciary Markers<sup>3</sup>:** are well proven conventional solid gold markers, each individually preloaded in a pre-waxed needle. Mick® Gold Fiduciary Markers are available in 3.0 mm and 5.0 mm lengths as well as in 1.2 mm and 1.0 mm diameter.

**Eckert & Ziegler BEBIG Gold Fiduciary Markers<sup>4</sup>:** These gold markers are loaded in a ripple hub pre-waxed needle. Eckert & Ziegler BEBIG Gold Fiduciary Markers are available in 3.0 mm and 5.0 mm lengths and can be ordered single packed or in sets of 3.

**Superflab:** supports dose build-up for the patient's contour during high energy photon and electron radiation treatments. Superflab is made of a proprietary synthetic gel. Since the molded material does not suffer inelastic strain from normal stresses, Superflab does not have to be bagged or wrapped in plastic film to maintain its shape. Superflab is offered in various sizes starting with 30 x 30 cm up to 50 x 120 cm as well as different thicknesses.

<sup>3</sup> Manufactured by CP Medical, Inc.

<sup>4</sup> Manufactured by Riverpoint Medical

# X-Ray Units

## For Superficial and Orthovoltage Treatments

Type **T-105 x-ray therapy units** are intended for superficial x-ray therapy in a range of 10 to 100 kV. The unit consists of a mobile trolley mounted with a x-ray tube stand. A separate control desk and a touchscreen PC enable procedures to take place from a shielded place. One of the four filters can be selected directly at the tube head.



The **T-160** is a standalone solution, specifically designed for sites with limited space. The available energy allows for the application of superficial x-ray treatment to orthovoltage therapy. As an option, the system can be expanded from a local to a networking verification & recording system.



With its broad energy spectrum, the **T-200** system allows for superficial x-ray treatment and orthovoltage therapy. An integral part of it is a networking verification & recording system, with powerful functions for treatment planning and documentation. Convenient x-ray tube stand solutions, whether 3-D ceiling mounted or ground-based column stand, are to predetermine the T-200 as the standard solution for hospitals and practices.



The powerful 300 kV unit provides high-dose rates for orthovoltage deep therapy. The choice of "soft" spectra for superficial x-ray treatment is also possible. The **T-300** effectively completed the range, in clinical practice, of radiotherapy procedures, with the easy-to-use 3-D Ceiling Mount. An integral part of it being a powerful networked verification & recording system.



The **ioRT-50** unit delivers superficial x-ray therapy and intraoperative radiation therapy following re-section and consists of an all-in-one mobile trolley mounted with a tube stand. It can be operated by an adapted touch screen panel or by a tablet. The tube head is mounted on a spring arm and can be turned in two axes. A clamping mechanism enables the preselected stand position to remain stable during treatment.

# Eckert & Ziegler BEBIG Today

Eckert & Ziegler BEBIG is a European-based group active in the medical device segment of the health care industry. Its core business is the production and distribution of medical products for the treatment of cancer using brachytherapy. The company's headquarters are in Germany, with production facilities in Germany and in the USA, as well as offices throughout Europe, Asia and the USA. In addition, Eckert & Ziegler BEBIG has a worldwide network of distributors and agents to support the international marketing and distribution of its product line. The company's products and equipment are intended for use by oncologists, radiotherapists, urologists, ophthalmologists and medical physicists. Eckert & Ziegler BEBIG employs approximately 145 people.



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