



Brachytherapy in Africa

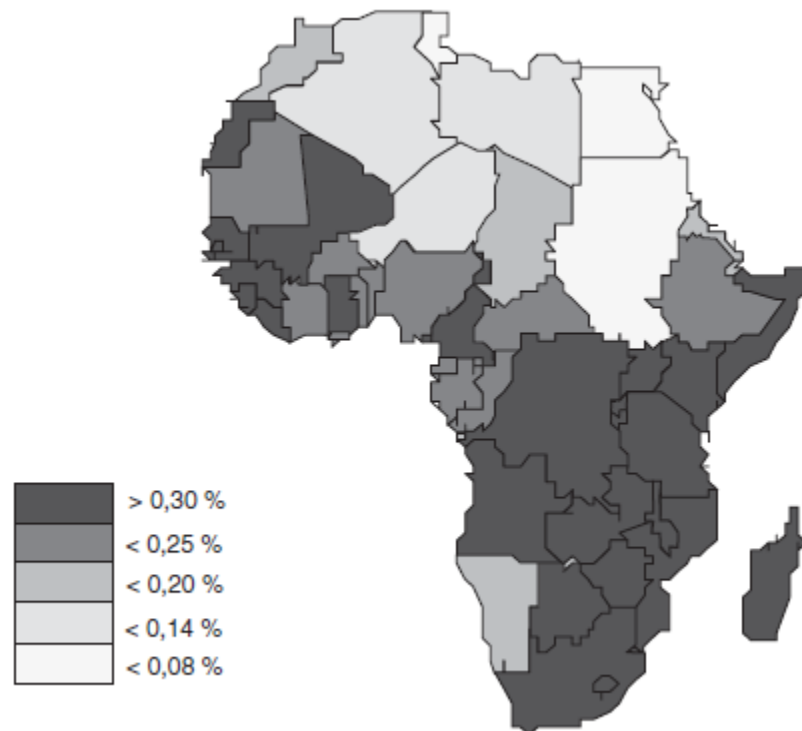
Deanine Halliman PhD
Sr. Director Medical Affairs
Elekta Brachytherapy

Cervix Cancer Education Symposium, January 2019, South Africa

Gynecologic Cancer InterGroup Cervix Cancer Research Network



Burden of cervical cancer in Africa
est. 2012 incidence per 100,000 women

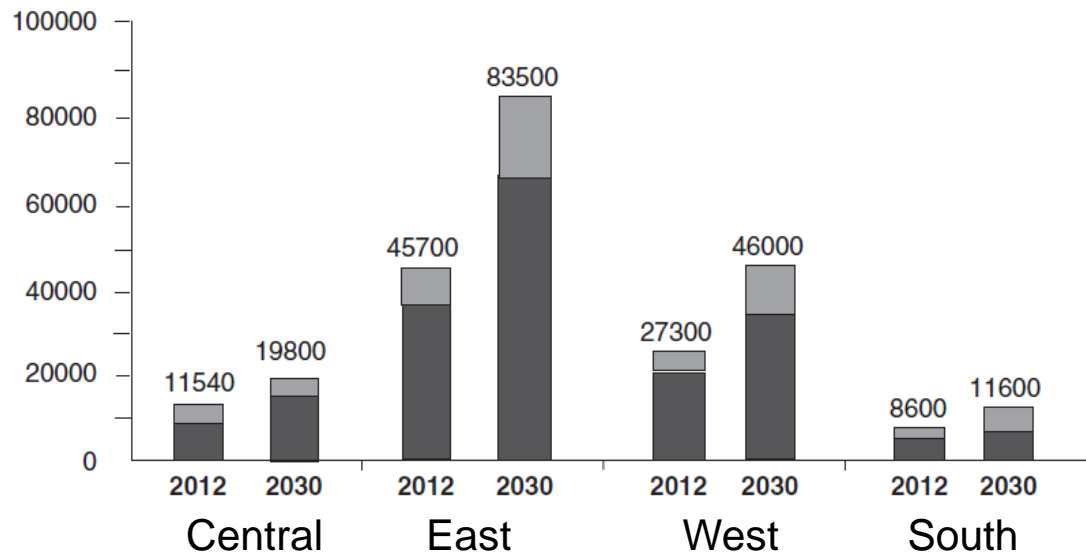


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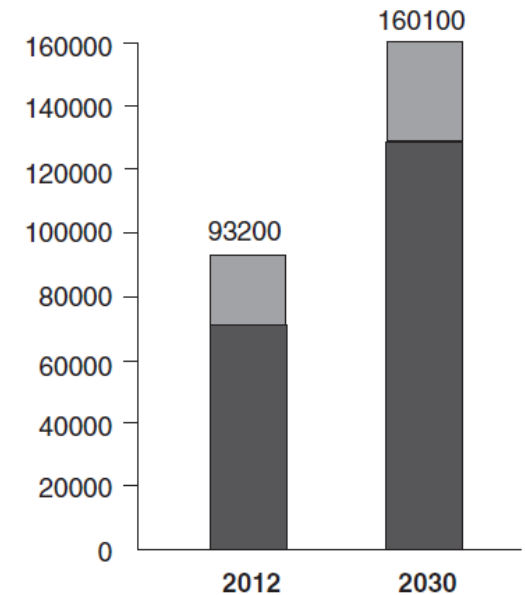


Estimated Number of New Cases according to Geographic Region, 2012 to 2030



< 65 years old
 > 65 years old

Estimated Number of New Cases in Sub-Saharan Africa



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Tackling a Preventable Disease

- Prevention first - address screening that can fit in low-resource areas
- Increase awareness about the signs, symptoms and progression of disease

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Trends in GYN Brachytherapy

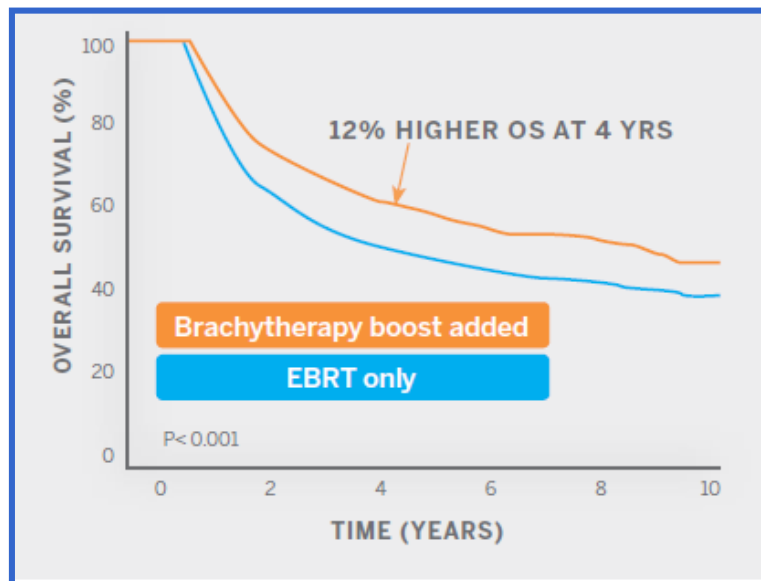
- Treatment Regimen and Competing Modalities
 - The Need of Brachytherapy
- 3D Image Guided Adaptive Brachytherapy
 - Supported by Clinical Outcome
 - Guidelines and recommendations
- Interstitial Brachytherapy
 - Growing Need

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Brachytherapy

Essential part in treatment of cervical cancer



In a recent study, cervical cancer patients that received brachytherapy as boost after external beam radiation therapy had a 12% better overall survival rate at four years than patients who didn't receive the brachytherapy boost.¹

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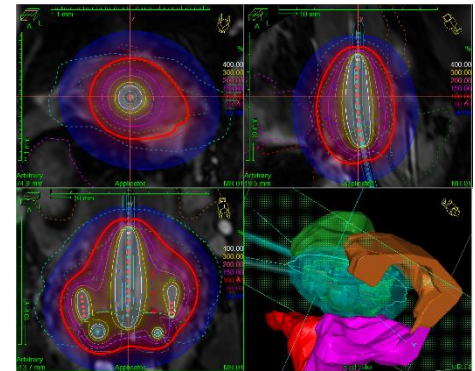
[1] Han K et al. Int J Radiation Oncol Biol Phys 2013;87:111-119

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3D IGABT

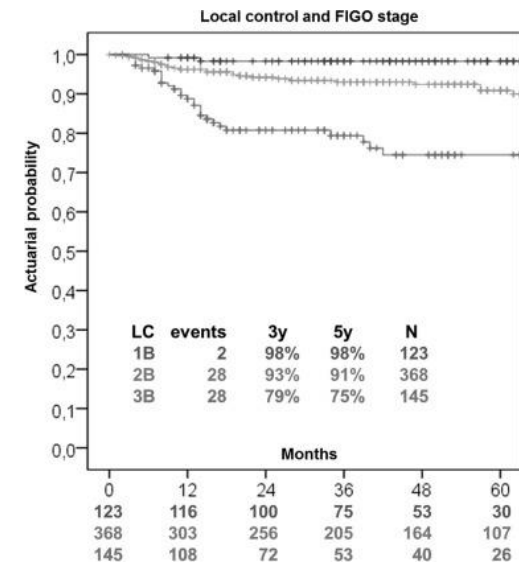
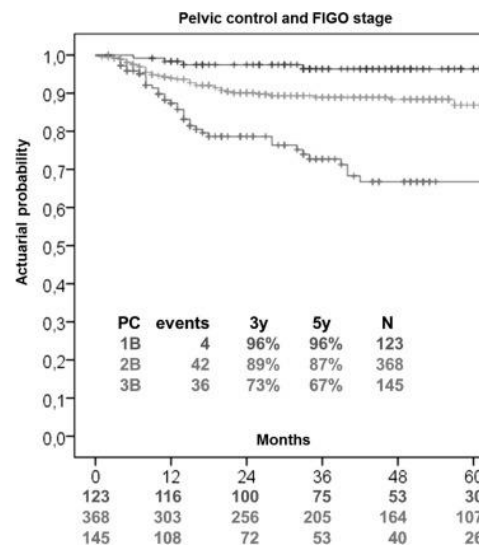
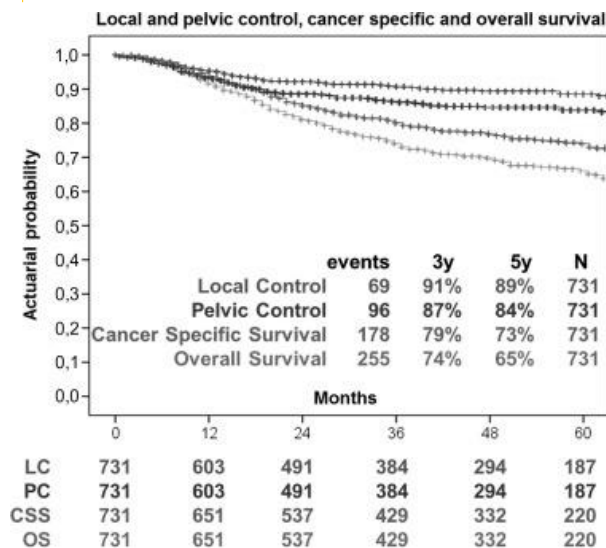
- Insertion of a CT/MRI compatible applicator with or without needles
- 3D Imaging (CT or MRI) with the applicator inserted
- Applicator Reconstruction on 3D Data
- Contouring
 - HR- CTV: High Risk Clinical Target Volume
 - IR-CTV: Intermediate Risk Clinical Target Volume
 - OAR: Organs At Risk
 - Bladder
 - Rectum
 - Sigmoid
- Dose plan adapted to the patients' case



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3D IGABT Improves Clinical Outcome



RetroEMBRACE Multi-center Study

IGBT improves pelvic control by approximately 10% compared to conventional 2D BT. [1]

IGBT improves overall survival compared to historical data [1] [8] [9]

[1] Sturdza et al, Radiother Oncol. 2016

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3D IGABT Improves Clinical Outcome

| RetroEMBRACE | | | |
|---------------------|--------------------------|-----------------------------|-------------------------------------|
| FIGO stage | Total number of patients | Overall Survival at 5 years | Cancer Specific Survival at 5 years |
| IB | 123 | 83% | 90% |
| IIA | 42 | 80% | 84% |
| IIB | 368 | 70% | 77% |
| IIIA | 23 | 42% | 48% |
| IIIB | 145 | 42% | 53% |
| IVA | 23 | 32% | 40% |
| Total | 731 | 65% | 73% |

[1] Sturdza et al, Radiother Oncol. 2016

| FIGO Stage | 5-Year Observed Survival Rate |
|------------|-------------------------------|
| 0 | 93% |
| IA | 93% |
| IB | 80% |
| IIA | 63% |
| IIB | 58% |
| IIIA | 35% |
| IIIB | 32% |
| IVA | 16% |
| IVB | 15% |

Based on data collected by the USA National Cancer Data Base from people diagnosed between 2000 and 2002

The above mentioned figures are not fully comparable.

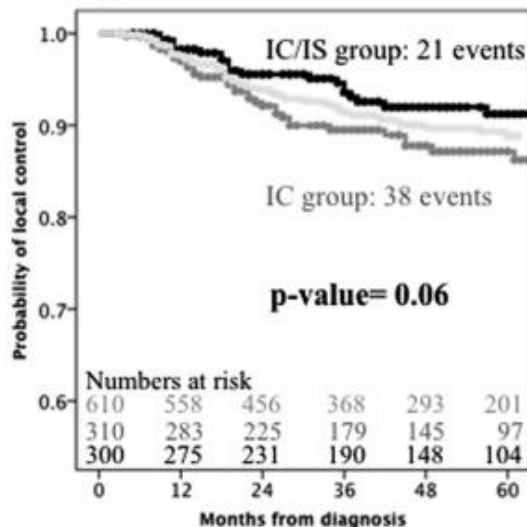
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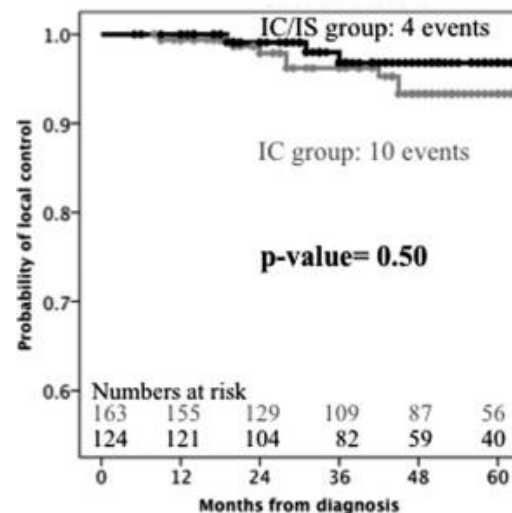


3D IGABT with interstitial needles improves Local Control

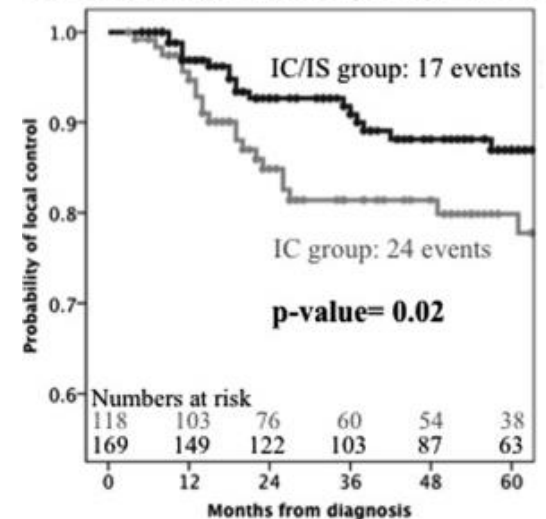
2A. All patients



2C. Small target volume ($CTV_{HR} < 30 \text{ cm}^3$)



2B. Large target volume ($CTV_{HR} \geq 30 \text{ cm}^3$)



Combined IC/IS brachytherapy improves local control by enabling a tumour specific dose escalation resulting in significantly higher local control in large tumours without adding treatment related late morbidity. [1]

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Engagement with the key stakeholders in the treatment of Cervical Cancer

Clinical Trial support

Education

Product/Procedure support and customer training

Innovation

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Support of EMBRACE 1 and EMBRACE 2 studies

Radiotherapy and Oncology 120 (2016) 365–369



ELSEVIER

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



Editorial

Image Guided Adaptive Brachytherapy in cervix cancer: A new paradigm changing clinical practice and outcome



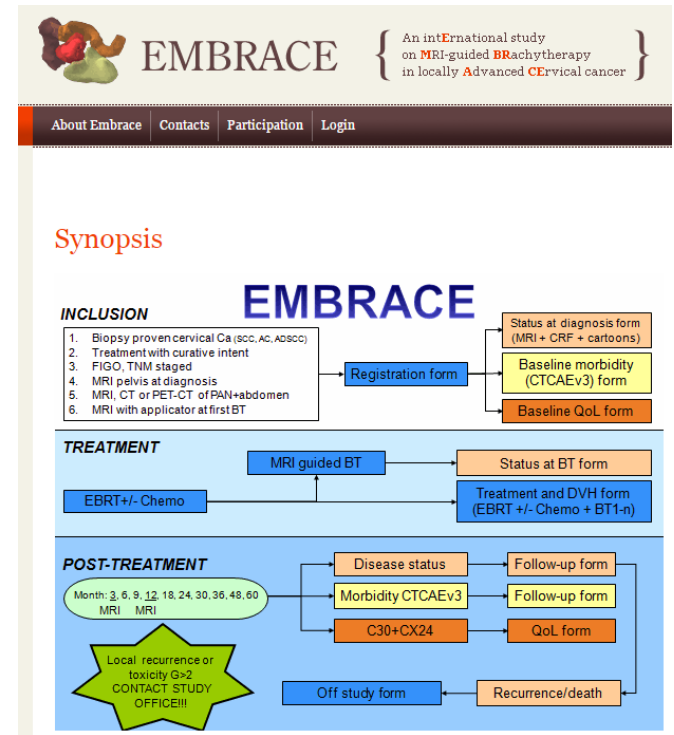
Kari Tanderup^a, Jacob Christian Lindegaard^a, Christian Kirisits^b, Christine Haie-Meder^c, Kathrin Kirchheiner^b, Astrid de Leeuw^d, Ina Jürgenliemk-Schulz^d, Erik Van Limbergen^e, Richard Pötter^{b,*}

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Image Guided Adaptive Brachytherapy (IGABT) in locally advanced cervical cancer (LACC) is increasingly recognized as the new paradigm replacing 2D brachytherapy and spreading throughout the world. This spread is at present predominantly in Europe [1], North America [2] and in major centres in Asia. The Gyn GEC ESTRO Recommendations I–IV [3–6] on MRI based IGABT have been used as the conceptual frame for these developments during the last decade and are now embedded into the recently published

Clinical outcome

There is growing clinical evidence that IGABT combined with radiochemotherapy leads overall to improved clinical outcome compared to 2D brachytherapy. This evidence is based on retrospective mono-institutional cohorts [15–18,44–48], on the prospective multicentre French comparative STIC trial [49] and now also on results from the RetroEMBRACE [19,20,24] and



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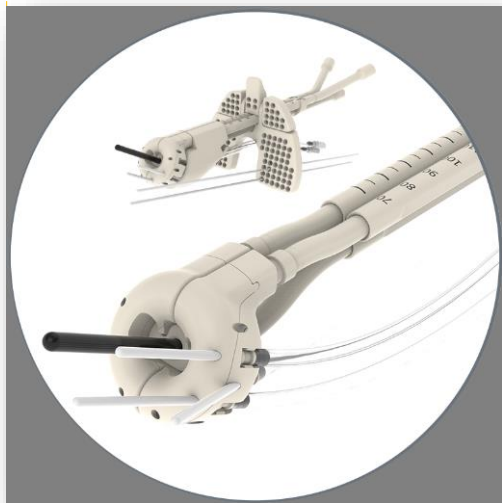
Support of GCIG and CCRN

- Gynecologic Cancer InterGroup (GCIG)
 - Global studies in endometrial and cervical cancer
- More focused collaboration with Cervix Cancer Research Network (CCRN)
 - Leading up to meeting today

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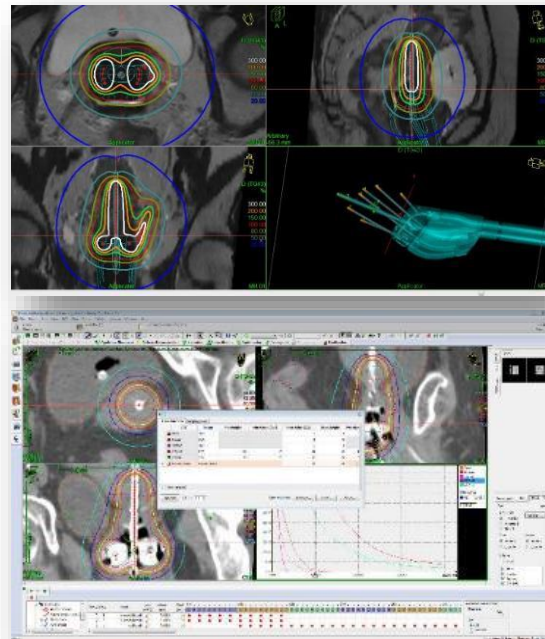


Elekta solutions for image-guided adaptive brachytherapy



Largest CT/MR compatible
applicator portfolio

Now also a new option for
advanced staged cervical
cancer: Venezia*™



Intelligent tools to simplify treatment
planning – eg. speed up reconstruction
and optimize dosimetry



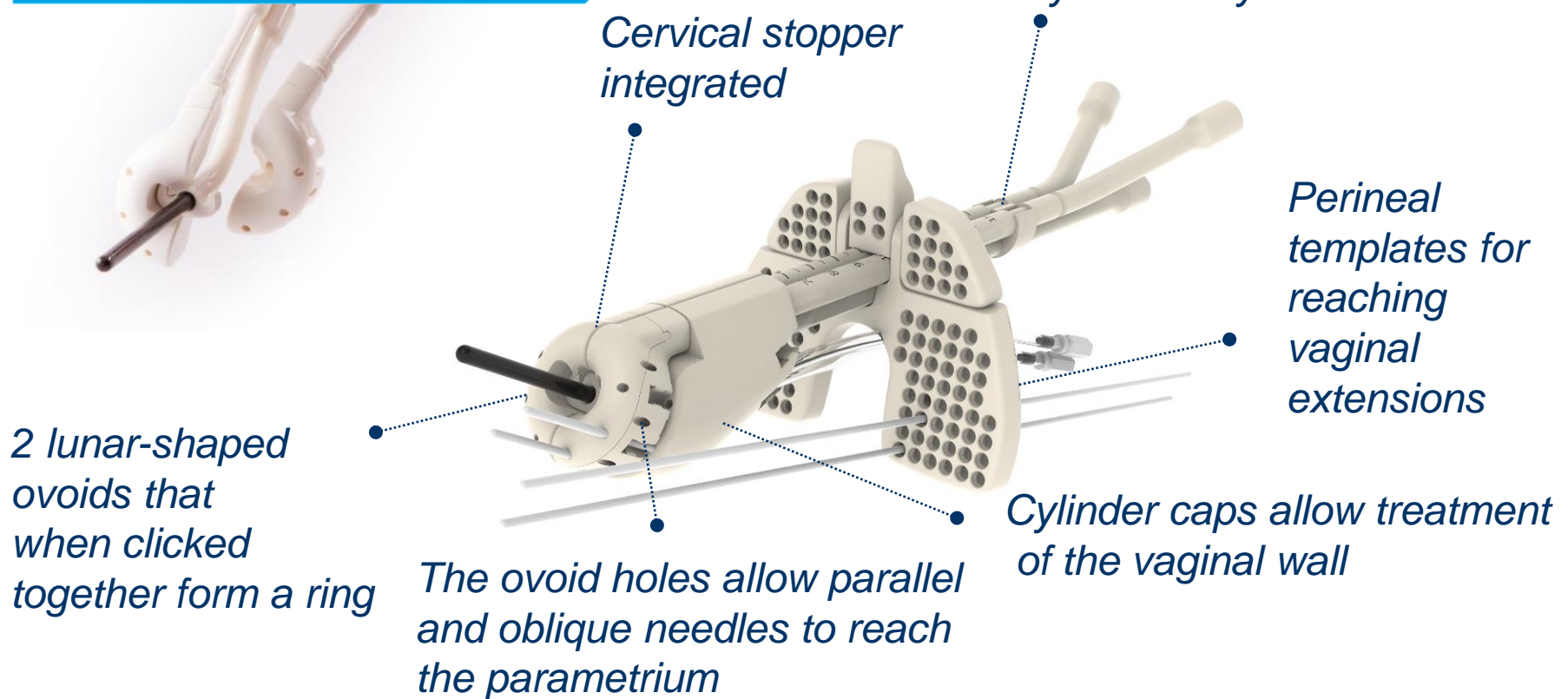
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GYNECOLOGIC
CANCER INTERGROUP

An Organization of International Cooperative
Groups for Clinical Trials in Gynecologic Cancers

Advanced Gynecological
Applicator
Venezia™



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- Educational concept with distinct identity
- Focused on general brachytherapy and clinical workflow rather than products
- For Health Care Professionals with interest in Brachytherapy
- Structured and organised
- Long-term relationship with customers
- Easy accessible

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The “one-stop-shop” for Brachy-education

- **Peer-to-Peer** Brachytherapy education
 - Educational Workshops
 - Educational Centers
 - On-site support (proctoring)
 - Fellowships
- Residency programmes
 - Physicians
 - Physicists

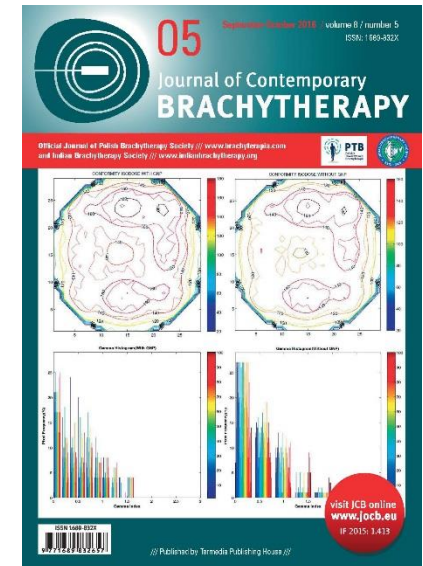
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Other components BrachyAcademy

- What's new in Brachytherapy
- Medical information (e-Library)
 - Research & publications
 - Awareness materials
- Educational video's
- Other:
 - BrachyTalk
 - Webcasts
- Educational Activity Corner Journal of Contemporary Brachytherapy
- Employee Medical Education



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BrachyAcademy Workshops

Body (tumor) sites

- Gyn (cervix)
- Prostate
- Breast
- Robot-Assisted Bladder Brachytherapy
- Head & Neck
- Rectum
- Skin

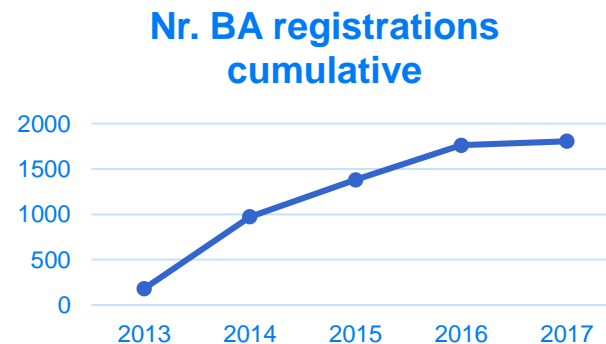
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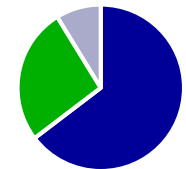


BrachyAcademy website (launch April 2013)

- 1805 'My Academy' registrations from 100 different countries:
 - 1167 spontaneous registrations
 - 480 via workshop registrations
 - 158 Elekta colleagues
- 5 workshops open for registration (10 workshops planned)
- 36 Educational Centers
- 400-plus items in e-library
- 39 BrachyTalk interviews
- English, Spanish, Chinese (Mandarin)



BA registrations (total 1805)



- Spontaneous
- Via workshop
- Elekta colleagues

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BrachyAcademy in development

- Visit, talk with and select Centres of Excellence for (domestic) peer-to-peer training purposes
- Visit, talk with and select Centres of Excellence to become Workshop sites
- Facilitate training of Radiation Oncologists and Physicists to become 'proctor', helping other centres to start Brachytherapy