# An audit of image guided brachytherapy for locally advanced cervical cancer

**Descriptor:**

This audit will measure local brachytherapy practice for cervical cancer and the implementation of 3D based planning and treatment against national guidelines. Treatment will be assessed against Royal College of Radiologist guidelines.

**Background:**

The standard treatment of locally advanced cervical cancer is external beam radiotherapy (EBRT) with concomitant cisplatin chemotherapy followed by brachytherapy (BT). While EBRT for several years has been based on 3D dose planning, BT is still based on doses to points rather than volumes. Until recently the most commonly used system is relied on orthogonal X-rays were the BT dose was prescribed to point A and the reporting of doses to critical normal tissues is done by use of the ICRU reference points. In 2005, GEC-ESTRO published recommendations for the implementation of image guided and 3D planning for brachytherapy [1,2]. These recommendations are mainly derived from retrospective experience from Vienna with a MRI-based tandem-ring BT technique with combined. The major advantage of the technique is the possibility to conform the dose given by BT to the anatomy of each patient taking into account the tumour volume and the position of OAR. Using this technique, the Vienna group have reported 3-year local control rates of 96% and 90% for tumours of 2-5 cm and >5 cm diameter respectively, with a rate of serious bowel and urinary toxicity of only 2% [3]. Subsequently in 2009 the Royal College of Radiologists published a document to guide the introduction of image guided brachytherapy (IGBT) in the UK [4]. This details dose parameters for both tumour and OAR.

## The Cycle

**The standard:**

1. 3D imaging (CT, MRI or US) should be used to verfify postion of interuterine tube within uterine canal

2. 3D imaging (CT or MRI) used to contour tumour volume and OAR

3. 3D imaging (CT or MRI) used to plan treatment

4. The minimum equivalent doses in 2 Gy per fraction (EQD2) to point A or HRCTV should be 75-80 Gy

5. The maximum dose to OAR rectum 70-75 Gy( a/ß 3), sigmoid/bowel 70-75 Gy (a/ß 3) and bladder 90-95 Gy (a/ß 3)

**Target:**

• 100% 3D imaging (CT, MRI or US) should be used to verfify postion of interuterine tube within uterine canal

• 100% 3D imaging (CT or MRI) used to contour tumour volume and OAR

• 100% 3D imaging (CT or MRI) used to plan treatment

• 95 % should achieve minimum dose of 75 Gy EQD2 to point A/HRCTV of 75Gy

• 95% should remain in dose constraints for OAR

## Assess local practice

**Indicators:**

1. Proportion using 3D imaging to verify applicator position

2. Proportion using 3D imaging (CT or MRI) used to contour tumour volume and OAR

3. Proportion using 3D imaging (CT or MRI) used to plan treatment

4. Proportion with EQD2 to point A/HRCTV >75Gy

5. Proportion with dose to OAR within constraints

**Data items to be collected:**

In addition to the data items required for the above indicators:

• Age of patient

• EBRT dose/fractionation

• Concurrent chemotherapy used

• Stage of disease

• Size of tumour

• Overall treatment time

**Suggested number:**

An audit of all patients receiving brachytherapy for the radical treatment of locally advanced cervical cancer over a 6 month period.

**Suggestions for change if target not met:**

• Identify reasons for lack of implementation of image guided brachytherapy– these may include limited CT/MRI , lack of expertise, lack of medical physics personnel, shortage of radiographers, training issues etc. The information collected in this audit could be used to support a business case for additional resources

• Identify why dose to Point A/ HRCTV not achieved which may include limited no of insertions or contribution of EBRT to overall dose or the need to introduce interstitial techniques

• Identify why dose to OAR are being exceeded, if related to size or stage of tumour

• Re-audit in 12 months time

**Resources:**

- Personnel: Clinical director, audit lead, clinical oncologist, therapy radiographer

- Time: 12 hours to check records, review information and prepare report

**References:**

1. Haie-Meder C, Potter R, Van Limbergen E, et al. Recommendations from Gynaecological (GYN) GEC-ESTRO Working Group (I): concepts and terms in 3D image based 3D treatment planning in cervix cancer brachytherapy with emphasis on MRI assessment of GTV and CTV. Radiother Oncol 2005;74(3):235-45.
2. Potter R, Haie-Meder C, Van Limbergen E, et al. Recommendations from gynaecological (GYN) GEC ESTRO working group (II): concepts and terms in 3D image-based treatment planning in cervix cancer brachytherapy-3D dose volume parameters and aspects of 3D image-based anatomy, radiation physics, radiobiology. Radiother Oncol 2006;78(1):67-77.
3. Potter R, Dimopoulos J, Georg P, et al. Clinical impact of MRI assisted dose volume adaptation and dose escalation in brachytherapy of locally advanced cervix cancer. Radiother Oncol 2007;83(2):148-55.
4. RCR Implementing image guided brachytherapy for cervix cancer in the UK 2009

**Editor's comments:**

This audit is aimed to aid the introduction of IGBT in departments.

**Submitted by:**

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