# Audit of biochemical recurrence rates and toxicity following combination of external beam radiotherapy and HDR brachytherapy for locally advanced prostate cancer

**Descriptor:**

AIM:

To establish local biochemical recurrence rates and toxicity outcomes, for patients treated with combination of EBRT and HDR brachytherapy for locally advanced prostate cancer

OBJECTIVES:

Compare local outcomes with the published literature; consider the implications for local service delivery if HDR boost is offered routinely for locally advanced prostate cancer

**Background:**

External beam radiotherapy (EBRT) with androgen deprivation therapy is internationally the standard of care for locally advanced prostate cancer since the publication of the MRC PR07 and the SPCG-7/SFUO-3 trials [1-2]. The efficacy of radiotherapy for prostate cancer is dose dependent; randomised trials have proven the benefit of radiation dose escalation [3]. NICE recommends the combination of EBRT and high dose rate (HDR) brachytherapy as an option for dose escalation based on current evidence [4]; however brachytherapy use is traditionally lower in the UK compared to the rest of Europe and the USA.

This audit is intended to establish a baseline of local outcome and toxicity data for patients treated with HDR boost and to compare this with the Mount Vernon phase 3 trial and retrospective review [5-6]. Also, to establish the EBRT+HDR regime used locally compared with that used in the published literature. It is also important for local and regional service delivery, to establish the numbers of patients being treated in this way particularly if the centre does not have a prostate HDR brachytherapy service.

## The Cycle

**The standard:**

1. Phase III randomised trial of EBRT plus HDR boost versus EBRT alone reported by Hoskin et al [5]

2. Mount Vernon retrospective review of patients treated with EBRT plus HDR boost reported by Chin et al.[6]

**Target:**

• Mean PSA relapse free survival in range of 95% confidence intervals reported in Mount Vernon Phase 3 trial

• To compare with Mount Vernon retrospective review 3 year actuarial biochemical relapse free survival and toxicity data

## Assess local practice

**Indicators:**

• Biochemical relapse free survival

• Toxicity

**Data items to be collected:**

DEMOGRAPHIC DATA:

   • Date of birth

   • Date of diagnosis

CANCER DATA:

   • T stage

   • Gleason score

   • PSA at diagnosis

   • Use of concurrent hormones

RADIOTHERAPY DATA:

   • Dose of EBRT- total dose and number of fractions

   • Dose of HDR boost- total dose and number of fractions

   • Date radiotherapy started

   • Date radiotherapy completed; whether pelvic nodes treated

SURVIVAL DATA:

   • Date of biochemical recurrence

   • Date of development of metastatic disease

   • Date of death

   • Date of last follow up

TOXICITY DATA:

   • Any acute or late toxicity recorded ideally graded using CTCAE grades

**Suggested number:**

At least 50 patients for useful comparison with standards.

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

• Compare T stage/Gleason score/PSA between local data and standard to ensure differences in outcome are not related to proportion of high risk patients

• Compare BED data and ensure that local regime is comparable with standard and consider changing regime if not achieving comparable dose escalation or if toxicity is unacceptably high

• Ensure CT planned conformal treatment is used for EBRT to reduced toxicity

• Establish a database for further prospective data collection and to establish longer term survival and toxicity data

**Resources:**

• Access to patient’s radiotherapy and clinical notes: electronic or paper depending on local practice

• SPSS or similar statistics software for creation of database and for statistical analysis

**References:**

1. Warde P, Mason M, Ding k , Kirkbride P, Brundage M, Cowan R et al for the NCIC CTG PR.3/MRC UK PR07 investigators. Combined androgen deprivation therapy and radiation therapy for locally advanced prostate cancer: a randomised, phase 3 trial . The Lancet, Early Online Publication, 3 November 2011 doi:10.1016/S0140-6736(11)61095-7
2. Widmark A, Klepp O, Solberg A et al. Endocrine treatment, with or without radiotherapy, in locally advanced prostate cancer: an open randomised phase III trial. The Lancet 2009;373:301-308
3. Pollack A, Zagars G, Starkschall G et al. Prostate cancer radiation dose response: results of the M.D. Anderson phase 3 randomised trial. Int J Radiat Oncol Biol Phys 2002;53:1097-1105.
4. NICE Interventional Procedure Guidance 174: High dose rate brachytherapy in combination with external-beam radiotherapy for localised prostate cancer. [https://www.nice.org.uk/guidance/ipg174](http://www.nice.org.uk/nicemedia/live/11215/31529/31529.pdf)
5. Hoskin PJ, Motohashi K, Bownes P et al. High dose rate brachytherapy in combination with external beam radiotherapy in the radical treatment of prostate cancer: initial results of a randomised phase three trial. RadiotherOncol 2007; 84(2):114-20
6. Chin Y, Bullard J, Bryant L, Bownes P, Ostler P, Hoskin P. High Dose Rate Iridium-192 Brachytherapy as a Component of Radical Radiotherapy for the Treatment of Localised Prostate Cancer. Clinical Oncology 2006; 18: 474e479

**Submitted by:**

A C Pascoe and D Muthukumar

**Published Date:**

Tuesday 16 April 2013

**Last Reviewed:**

Monday 16 April 2018