

# Quality assurance practice guidelines for transperineal LDR permanent seed brachytherapy of prostate cancer

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# 1. Introduction

This document has been written by a panel of clinicians and physicists who have a large experience in low dose rate (LDR) permanent seed prostate brachytherapy. It was instigated following the UK and Ireland Prostate Brachytherapy Annual Meeting in 2011 to produce a framework document whereby LDR prostate brachytherapy could be performed to a high standard in designated centres throughout the UK and Ireland. This guidance will produce a framework where quality measures can be audited to ensure a minimum standard is met.

The need for these quality standards was highlighted after the well-publicised errors in a centre in the United States,<sup>1</sup> where a lack of training and quality assurance led to poor quality implants and high toxicity in a number of patients.

We hope the adherence to these standards would prevent such an occurrence happening in the UK and Ireland; however, currently there are no standards in place that are peer reviewed for this procedure.

## **Prostate brachytherapy**

Prostate brachytherapy can be delivered with differing dose rates: low (LDR) and high dose rate (HDR). LDR brachytherapy involves the insertion of radioactive seeds under ultrasound guidance into the prostate to achieve a conformal high dose of radiation to the prostate. It is usually given as monotherapy but can be used as a boost to external beam radiotherapy (EBRT). With LDR brachytherapy, the seeds are left *in situ* permanently and emit radiation gradually over several months.

In contrast, HDR prostate brachytherapy is predominantly used as a boost to EBRT. Catheters are positioned within the prostate using ultrasound guidance and the planned treatment is delivered using a remote afterloading unit with a single Iridium-192 stepping source. The number of fractions in current schedules varies between one and four. However, in the UK, most centres now follow a single fraction regime, based on the work of Morton *et al.*<sup>2</sup>

The scope of guidelines within this document is focused on LDR permanent seed brachytherapy only.

## **Centres performing LDR prostate brachytherapy**

The number of prostate brachytherapy implants performed in the UK and Ireland during 2008 was 1,452 and this increased to 1,745 in 2010.

## **Practice guidelines**

A number of guidelines have been produced on prostate brachytherapy including:

- Interventional Procedure Guidance on LDR brachytherapy for prostate cancer<sup>3</sup>
- Department of Health consultation document for the service development of prostate seed brachytherapy<sup>4</sup>
- The Royal College of Radiologists report on the role and development of brachytherapy services in the UK.<sup>5</sup>

These documents do not focus on training and quality assurance for the technique. The guidelines published in the current document have been developed by the UK and Ireland Brachytherapy Group in conjunction with The Royal College of Radiologists. The objective of the group was to produce guidelines that a centre can follow in order to conduct high-quality LDR prostate brachytherapy and to provide a template for quality assurance audits.

## 2. Patient selection

Patients selected for prostate brachytherapy are those whose disease is localised to the prostate<sup>6</sup> so that there is a strong possibility that the radiation dose from the brachytherapy sources can adequately encompass the disease extent. The following exclusion criteria should be applied to the use of prostate brachytherapy:

1. Life expectancy <5 years
2. Pathologically positive lymph nodes
3. Distant metastases
4. Poor anatomy that would lead to a suboptimal implant; for example, very large median lobe, large gland size, large transurethral resection of the prostate (TURP) defect
5. Significant obstructive uropathy
6. Unacceptable operative risk.

For patients at higher risk of extra-capsular disease, the addition of EBRT or neoadjuvant hormonal therapy may be considered; although clinicians must appreciate there remains controversy concerning their use and a scarcity of supporting clinical data. The optimal doses and treatment volumes have yet to be established for EBRT. Androgen deprivation therapy (ADT) has a role in patients at high risk of metastases and treated with EBRT.<sup>7</sup> However, the value and duration of ADT used in conjunction with brachytherapy have not yet been established. The most common ADT agents used are luteinising hormone-releasing hormone analogues, but antagonists are emerging in this role, and other agents such as 5 $\alpha$ -reductase inhibitors and anti-androgens may also be considered in the cytorreduction of large glands prior to brachytherapy. New and emerging systemic agents may well have a future role in conjunction with prostate brachytherapy.

### Patient data

It is recommended that for auditing purposes the following minimum patient data are collated:

- Gleason score
- Prostate volume: preoperative
- Prostate-specific antigen (PSA): preoperative and postoperatively up to 5–10 years
- Disease T-stage
- Preoperative International Prostate Symptom Score (IPSS) or American Urological Association Symptom Score (AUASS)
- Postoperative IPSS or AUASS on an ongoing basis (minimum 1 year)
- Severe postoperative complications requiring surgical intervention
- Rate of postoperative catheterisation
- Pre- and post-implant dosimetry
- Use of hormonal therapy prior to implant
- Previous transurethral resection of the prostate (TURP).

Additional data that are desirable includes:

- Maximum flow rate
- Postvoid residual urine
- Postoperative bowel function
- Postoperative potency
- Quality of life including International Index of Erectile Function (IIEF): pre- and postoperatively.

# 3. Brachytherapy team

## The team

The brachytherapy team should comprise of the following members.

### *Mandatory*

- Radiation oncologist who holds an appropriate Administration of Radioactive Substances Advisory Committee (ARSAC) certificate, or its equivalent in Ireland
- Medical physicist expert (MPE)
- Radiation physicist/dosimetrist/technician
- Radiation protection advisor (RPA)
- Specialist nurses or radiographers with a brachytherapy interest
- An individual sufficiently experienced in transrectal ultrasound (TRUS) to perform reliable image acquisition – both during the initial volume study and during the implant procedure.

### *Desirable (if available)*

- Urologist with an understanding of dosimetric principles and the basic radiation aspects of the case (for example, safety and protection issues) and/or
- Diagnostic radiologist with an interest in TRUS.

To ensure service resilience, there should be a minimum of two radiation oncologists in the team who are able to perform brachytherapy and two medical physicists. The staff mixture of radiation physicists and dosimetrists is dependent on the local setting.

## Training requirements

Training should be undertaken that is appropriate to the role of the individual in the team. It is the responsibility of the lead radiation oncologist and MPE to ensure that all staff within their group has undergone the appropriate training.

### *Clinical oncologist*

The clinical oncologist should undergo a period of supervised cases before performing the procedure solo. The recommended training of the clinical oncologist is as follows:

- Mentored planning cases: 5
- Observation cases: 5
- Mentored implant cases: 10
- Monitored solo cases: 10.

Post-implant dosimetry of the solo cases should be assessed by the mentoring team. Established brachytherapy centres should adopt these recommendations for new members of staff. Proctors involved in mentoring should have completed 100 cases in the last three years and have experience in the specific technique being mentored.

### *Medical physicist expert*

The medical physicist should be qualified to act as an MPE<sup>8</sup> in the field of brachytherapy. The MPE is responsible for source and patient dosimetry, quality assurance programme, optimisation and safety of the treatment and treatment planning, and ensuring compliance with appropriate legislation and permits. Training should follow the requirements for the radiation oncologist. Proctors involved in mentoring should have been leading the physics in a centre performing 100 cases in the last three years and have experience in the specific technique being mentored.

### *Radiation physicist/dosimetrist*

The radiation physicist/dosimetrist should undergo training for the treatment planning and observation components of the technique. In addition, training is required for seed calibration, handling and storage of seeds and post-implant dosimetry plans.

### *Specialist nurses/radiographers*

The team should include dedicated nurses/radiographers who have been trained in the brachytherapy technique and in the management of the urological symptoms encountered after brachytherapy.

## 4. Minimum numbers of implants per centre

To ensure that adequate ongoing experience in brachytherapy is maintained, it is recommended that the population covered by a centre should be sufficient to ensure a minimum of 25 implants per year. If the population is smaller, it is recommended that centres should work in conjunction with larger units. While there is no evidence in the literature with regards to the minimum caseload, as it is essential to ensure a suitable infrastructure based on patient throughput, clinical expertise and long-term viability, it is recommended that an implementation plan should be enacted at individual centres with the objective of performing a minimum of 25 cases per oncologist per year within a 3-year period. On an ongoing basis, an individual clinician should aim towards performing 25 cases per year.

## 5. Patient information

Patients should be provided with written information that explains the procedures and the side-effects that they might experience. This should be written and provided by the individual centres. Information included in the leaflets should include guidance on radiation safety. This would include the guidance on the following: contact with young children and pregnant women in the first two months; sexual contact and the use of condoms for the first five ejaculations; and contacting the implanting centre if pelvic surgery, post-mortem and cremation are required within the first 20 months post-implant. Patients should sign and date, as part of the consent process (see Appendix 1), that they understand the information received. A laminated card containing mandatory information that the patient can carry should be provided (see Appendix 2) and it is a requirement that the card be carried by the patient for a minimum of 20 months.

## 6. Patient consent

Patient consent for the procedure is required at the time of implant. Consent should be acquired by a person qualified in the procedure; this can include a specialist nurse or radiographer. At time of implant, in addition to the standard patient identification, it is recommended that it is documented whether previous pelvic radiation has occurred. It is the responsibility of the clinical oncologists to sign for the treatment prescription. The brachytherapy team are responsible for confirming the patient identification. Two members of the physics team should independently check the seed calibration and needle loading; the planner and checking physicist should check that the correct details have been entered into the treatment planning system (patient details, seed activity and dose prescription).

## 7. Brachytherapy procedure

### Equipment

Brachytherapy should be performed in a suitable area at a centre that is permitted to handle, store and use radioactive sources and to conduct the procedure. The radioactive sources should only be handled in a room designated for that purpose. With regard to equipment, the following components are deemed necessary to conduct brachytherapy:

- TRUS with template software
- High-resolution biplanar ultrasound probe (5–12 MHz)
- Stepping unit
- Seed planning/dosimetry software
- Shielded needle holder (essential for two-stage process)
- Consumables, such as seeds, stabilisation and implant needles
- Appropriate selection of radiation monitors
- Seed calibration system.

It is also desirable to have connectivity between the ultrasound, stepper and planning systems. An X-ray image intensifier is also useful for the procedure to verify the correct placement of the seeds. Cystoscopy equipment is useful to check that no seeds have been left in the urinary tract and may be performed if the necessary urology skill is available. Sterilisation and anaesthesia facilities must be available.

## Planning procedure

Dosimetric planning should be performed on all patients either before or during the actual procedure. The planning process can follow one of the following processes:<sup>9</sup>

1. Pre-planning: a two-step procedure where there is a delayed execution of the treatment plan. A TRUS pre-plan takes place usually 2–4 weeks before seed implantation.
2. Intraoperative planning: plan created in operating room (OR) immediately prior to the procedure.
3. Interactive planning: stepwise modification of the treatment plan using computerised dose calculations that have been obtained from image-based needle-position feedback.
4. Dynamic dose calculation: constant updating of the dose distribution using continuous seed position feedback.

The PROBATE group of GEC-ESTRO<sup>10</sup> recommend that the following dosimetric parameters are aimed for and recorded.

### *Clinical target volume (CTV)*

(Prostate gland plus a 3 mm margin in each direction for T1–T2 prostate cancer. This can be constrained to the rectum posteriorly and bladder neck cranially).

- $V100_{CTV}$  (percentage of CTV volume that receives the prescription dose)  $\geq 95\%$
- $V150_{CTV}$  (percentage of CTV volume that receives the 150% prescription dose)  $\leq 50\%$
- $D90_{CTV}$  (dose that covers 90% of the CTV volume)  $>$ prescription dose

However, historically the majority of centres with long-term data only recorded the  $V100$  for the prostate gland and typically the  $V100_{prostate}$  should be at least 98% and the  $V150_{prostate}$  40–65%; this may also be acceptable.

### *Rectum*

- $D2cc_{rectum}$  (the minimum dose in the most irradiated 2 cc volume of the rectum)  $<$ prescription dose
- $D0.1cc_{rectum}$  (the minimum dose in the most irradiated 0.1 cc volume of the rectum)  $< 200$  Gy

### *Urethra*

- $D10\%_{urethra}$  (the minimum dose in the most irradiated 10% of the prostatic urethra)  $< 150\%$  of the prescription dose
- $D30\%_{urethra}$  (the minimum dose in the most irradiated 30% of the prostatic urethra)  $< 130\%$  of the prescription dose

## Seed calibration

All brachytherapy sources are assigned a source strength calibration by the manufacturer. It is the responsibility of the institution's MPE to verify independently that this calibration is correct before clinical use. The practical measurement of source strength may be assigned to trained individuals under the supervision of the MPE, with a MPE available for immediate consultation. The American Association of Physicists in Medicine (AAPM) Low Energy Brachytherapy Source Calibration Working Group<sup>11</sup> recommended quality control and quality assurance procedures for brachytherapy sources prior to clinical use and cover calibrations of sources in sterile needles, cartridges and strands, which cover most scenarios of seed use in the UK. The recommendations made in this document follow closely to those of the AAPM working group.

Every institution performing permanent seed prostate brachytherapy must have appropriate calibration equipment, typically a well-type ionisation chamber and electrometer that has traceability to a primary standard for all source types used at that institution. Calibration procedures undertaken at the institution must ensure that traceability is not compromised. This equipment should be recalibrated at the frequency recommended by the primary standards laboratory or after a major repair. The AAPM TG-40 report<sup>12</sup> recommends a calibration frequency of two years and this is currently followed by National Institute of Standards and Technology (NIST). A stability check of the calibration equipment should also be performed at least every six months using a long-lived radioactive check source, for example Cs-137, that can be reproducibly positioned within a well-type ionisation chamber. The reading, corrected for ambient conditions and decay, should be within 2% of the baseline measurement.<sup>13</sup> Alternatively taking a ratio of the readings from two devices (secondary standard/tertiary standard) could be used as a stability check.

Ideally, every radioactive source that is implanted into a patient should be independently measured. In practice, this is not always possible due to various constraints. Hence, it is recommended for each batch of sources used for permanent seed prostate brachytherapy that the following quantities, dependent on source form, are required to be measured independently before clinical use:

- Sterile sources located in MICK<sup>®</sup> magazine
  - A minimum of 10% of the total or two magazine cartridges of 15 seeds, whichever is greater
- Sterile stranded sources
  - A minimum of 10% of the total or two strands of ten seeds, whichever is greater
- Loose seeds
  - A minimum of 10% of the total or 20 seeds, whichever is greater.

The following actions should be taken depending on the difference found between the manufacturer's source certificate and the measured value.

- If the mean source strength of the measured sources agrees within 3% of the manufacturer's stated source strength and the absolute difference of all the individual source/strand measurements are within the quoted calibration uncertainty on the manufacturer's certificate, the sources can be used clinically.
- If the mean difference is greater than 3%, the first step of investigation of the discrepancy should be to increase the sample size.
- After increasing the sample size, if the mean difference is still greater than 3%, further action must be taken to resolve the differences.
- If the mean difference is greater than a 5% action limit, the manufacturer should be consulted, if possible, to assist in resolving the differences. For measurements performed in the OR with the patient anaesthetised, discussions between the radiation oncologist and the MPE should take place regarding the consequences of proceeding with the implant using the measured source strength.

This working group will leave it to the discretion of the local MPE to decide whether the measured value or the manufacturer's certificate value should be used for the dosimetry calculations.

Some centres may use third-party source handling and calibration services. These third-party services typically measure all sources before preloading them into needles. The third-party measurements should not replace the responsibility of the end user to perform independent verification. To maintain this end user verification requirement, it is recommended that additional sources are purchased for calibration purposes for each batch of seeds used. A minimum of an additional 5% of the total seeds is required to be purchased from the same batch as the preloaded for this calibration.

### **Postoperative dosimetry**

It is a requirement to perform post-implant computerised tomography (CT) (or magnetic resonance imaging [MRI])-based assessment of dosimetry on all patients in order that the actual dose delivered can be compared with the treatment plan. The optimal timing of CT post-implant dosimetry is not known and it can be performed at Day 0, 1 or 2–6 weeks post-implant. The timing of post-implant imaging should be kept consistent within each practice and any changes should be audited. Whenever it is done, it is incumbent on the treating radiation oncologist and physicist to review the case to ensure quality parameters are met. If quality parameters are not met, remedial action should be considered where appropriate.

In summary, computed tomography (CT) (or magnetic resonance imaging [MRI])-based dosimetry should be conducted under the following circumstances:

- CT (or MRI) post-implant dosimetry must be performed on all patients
- Dosimetry should be reviewed carefully to ensure that quality is maintained where a change of personnel has occurred or if changes in the technique have taken place.

Post-implant dosimetry should measure the following parameters:

- Target volumes:  $D_{90\%}$ ,  $V_{100\%}$  and  $V_{150\%}$  for the prostate
- Organs at risk:  $D_{10\%}$  and  $D_{30\%}$  for the urethra (if possible);  $D_{2cc}$  and  $D_{0.1cc}$  for the rectum.

### **Physics treatment planning checks**

All plans must have an independent check by a second physicist who must check that all the relevant patient demographics, seed activity, seed placement, spatial dose distribution and dosimetric indices are acceptable and perform a manual calculation, typically based on a nomogram.



# 8. Quality assurance

## Ultrasound imaging

Accurate image guidance and dose calculation depend on the quality and accuracy of the ultrasound images. Visualisation of the prostate and other critical structures with the ability to identify the locations of the inserted seeds is necessary for good quality implants. Therefore, quality assurance of the ultrasound system used for prostate brachytherapy procedures is essential. The AAPM Task Group 128<sup>14</sup> recommends quality assurance procedures with a specific focus on tests applicable to image guidance during a prostate implant procedure. The tests cover greyscale visibility, depth of penetration, axial and lateral resolution, distance measurement, area measurement, volume measurement, needle template/electronic grid alignment and geometric consistency with the treatment planning computer. This paper recommends that the users follow the recommendations of the AAPM Task Group as stated on an annual basis, after repair/system adjustments or more regularly if the equipment is frequently transported around the institution. The tests should be performed by a trained member of staff who has familiarity with both the ultrasound equipment and prostate brachytherapy.

For all implantation techniques, it is recommended that users verify the alignment of the electronic grid overlay on the ultrasound system with the treatment planning system (TPS) grid template at least every three months or if the implanting team suspect misalignment. It is also recommended that before assembly of the template to the stepper the alignment settings are correct to the baseline measurements of the last quality assurance check.

## Treatment planning system (TPS)

Computerised treatment planning plays a crucial role in prostate brachytherapy. Production of clear and accurate treatment plans results in smooth and straightforward implantation, which in turn produces good quality implants. Therefore, it is essential that a robust quality assurance program for the TPS is established to confirm the continuing accuracy of the dosimetric calculations. This quality assurance programme should be designed to complement checks on the individual treatment plans.

It is recommended by this working group that before any clinical use of the TPS that a check is made on the seed source data to ensure the integrity of the system. This seed source data check should include the source type, activity of the seeds and the anisotropy correction. This can be achieved using a standard plan (set up during commissioning containing multiple sources) visually verifying computed isodose curves to the commissioning baseline. Multiple dose points should also be verified against the commissioning baseline. Any discrepancies should be immediately discussed with the institution's MPE prior to clinical use of the system. On a quarterly basis, more extensive quality assurance tests should be performed on the TPS, which include:

- Verification that the dosimetric algorithm (TG43-U1)<sup>15</sup> computes dose correctly. This should be performed for single and multiple sources and should verify the accuracy at multiple points in transverse and sagittal orientations, verify isodose computation and verify the anisotropy function by calculating doses at arbitrary angles/distances around the sources. All dose calculations should be within 1%
- Verification that plan evaluation tools, including dose volume calculations, function correctly. Compare dose volume histogram (DVH) parameters calculated using a standard plan with that performed at commissioning. All DVH parameters should be within 5%.
- Verification of geometric accuracy of imaging modalities used in prostate brachytherapy:
  - Specific ultrasound quality assurance tests are described in Section 8. Specific tests in conjunction with a stepping unit device should verify the connectivity to the TPS. A series of tests should include: volume acquisition, template alignment, spatial accuracy and TPS volume calculation of known objects.
  - Verification of the geometric accuracy of the imaging modality used for post-implant dosimetry using specially designed phantoms consisting of targets at known positions; for example, the Baltas Phantom.<sup>16</sup> Geometric reconstruction should be within 1 mm.
  - If image registration is utilised at the institution, testing of this functionality must be included.

For a TPS used for intraoperative procedures, additional tests should include verification of the accuracy of the tracked stepper in longitudinal position (depth) and rotation. The test should verify that the TPS and stepper readouts for depth and rotation measurements agree to the expected to within 1 mm and 1 degree, respectively.

## 9. Minimum standards

Implant quality is considered satisfactory if the  $V_{100}$  for the prostate is  $\geq 80\%$  and poor or unsatisfactory if the  $V_{100}$  is  $< 80\%$ . The minimum target for the  $D_{90}$  for the prostate is 90% of the prescription dose and for the rectum  $D_{2cc}$   $<$  prescription dose. The CT:ultrasound volume ratio should be recorded and be  $\geq 0.9$ . If this is not established, further investigations into the target delineation are warranted.

In patients where it is determined that the implant quality is clinically sub-standard, a careful review of the case by the treating team is warranted, including careful review of the contouring accuracy and seed identification. In those cases where underdosing has occurred, the treating team should review the disease and patient characteristics and decide whether to accept an underdosing or consider further radiotherapy treatment. A further brachytherapy procedure may be conducted immediately following the first implant if this is deemed clinically necessary in the individual case. Such procedures require a good degree of experience and are not recommended for inexperienced centres.

## 10. Data storage and access for peer review

Data should be collated within a database and preferably on a web-based system in addition as this will help facilitate peer review. Data protection regulations must be observed in all cases. A departmental review of the data is recommended. Internal audit meetings (minimum four per year) should be established and actions taken where required, including additional training if the required standards are not met.

## 11. Audit procedure

It is recommended that a peer-review audit should be conducted at two-year intervals. A random selection of implants should be reviewed to verify the quality of the different teams performing implants. Personnel qualifying as auditors are those who have performed 100 cases in the past three years (oncologist) or been the physics lead in 100 cases in the past three years (physics). Auditors should select patients from the dataset according to the disease and implant characteristics so that a variety of implants can be assessed.

## 12. Conclusions

This document aims to provide guidance on the quality assurance protocol that should be established for centres conducting prostate brachytherapy in the UK and Ireland. It has been generated by a group of experienced practitioners of prostate brachytherapy. It is considered that by auditing outcomes a higher quality of prostate brachytherapy implant can be achieved.

# Appendix 1. Example consent forms

## Oncologist

### Name of Procedure: PROSTATE BRACHYTHERAPY

**Statement of Oncologist:** (to be filled in by health professional with appropriate knowledge of proposed procedure, as specified in consent policy)

I have explained the procedure to the patient. In particular, I have explained **the intended benefits:**

\_\_\_\_\_

**Serious or frequently occurring risks:**

Possible Early Side Effects	Possible Late Side Effects	Uncommon Late Side Effects
Tiredness	Impotence	Inflammation of the rectum
Painful urination	Minor bowel changes	Urethral narrowing
Urinary frequency & urgency		Late malignancy
Erectile dysfunction		
Urine retention		
Sore rectum		
Perineal discomfort & bruising		

- (tick) Radiation Protection Advice Given
- (tick) Prostate Brachytherapy side effect sheet
- (tick) **Dynamic prostate brachytherapy** leaflet has been provided.

**Fertility discussed with patient**

Radiation may harm your sperm and it is strongly advised that you and your partner do not try to conceive for one year after treatment.

**Photographs discussed with patient.** It may be necessary to photograph the treatment area. Any photography will only be used for the patient's personal medical records. I have explained that in line with the Data Protection Act the patient has the right to control the future use of photographs and videos taken during the course of medical treatment.

This procedure will involve:

- general and/or regional anaesthesia
- local anaesthesia
- sedation

I have discussed what the procedure will involve, the benefits and risks of any available alternative treatments (including no treatment) and any concerns of those involved.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Name (Print) \_\_\_\_\_ Job Title \_\_\_\_\_

## Patient

### Statement of patient

Please read this form carefully. If your treatment has been planned in advance, you should already have your own copy of page 2 which describes the benefits and risks of the proposed treatment. If not, you will be offered a copy now. If you have any further questions, do ask – we are here to help you. You have the right to change your mind at any time, including after you have signed this form.

I **agree** to the procedure or course of treatment described on this form.

I **understand** that you cannot give me a guarantee that a particular person will perform the procedure. The person will, however, have appropriate experience.

I **understand** that I will have the opportunity to discuss the details of anaesthesia with an anaesthetist before the procedure, unless the urgency of my situation prevents this. (This only applies to patients having general or regional anaesthesia.)

I **understand** that any procedure in addition to those described on this form will only be carried out if it is necessary to save my life or to prevent serious harm to my health.

I **have been told** about additional procedures which may become necessary during my treatment. I have listed below any procedures which I **do not wish to be carried out** without further discussion.

.....  
 .....  
 .....

Patient's signature ..... Date .....

Name (PRINT) .....

# Appendix 2. Patient information card

<p><b>Radionuclide Instruction Card</b> <b>Prostate Iodine-125 Implant</b></p> <p>The holder of this card received a radioactive iodine-125 implant to their prostate at ..... on.....</p> <p>Carry this card until:.....(After this date please destroy the card)</p> <p>Please show this card to the doctor if you need medical treatment, as this may assist your doctor in the management of your case.</p> <p>If this card is found please return this card to: Department Address</p>	<p>Patients Name:.....</p> <p>Hospital No:.....D.O.B...../...../.....</p> <p>Signed:.....Date:.....</p> <p>Total Content Activity Implanted: .....MBq on .....</p> <p>Radionuclide: Iodine-125 (sealed source in seed form)</p> <p><u>Advice</u> Please follow the advice we gave relating to pregnant women, small children for the <b>first 2 months</b> and for sexual contact. If a seed is passed, pick up using a spoon or long handled tweezers and flush it down the toilet.</p> <p>It is safe for pelvic surgery, post mortem examinations and cremation to occur after <b>20 months</b>. Prior to this date please contact us on the numbers below.</p> <p>Departmental Contact Numbers including Medical Physics</p>
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# Acknowledgements

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