High dose rate (HDR) brachytherapy

High dose rate brachytherapy involves the temporary placement of a very intense radiation source directly into the prostate. Up to 18 thin hollow metal needles are placed through the perineum into the prostate under a general anaesthetic, very similar to the technique of transperineal prostate biopsies. Ultrasound images of the prostate with needles are downloaded to a computer and a treatment plan is developed. The iridium source is planned to dwell briefly at different points along each needle during treatment and after treatment all the needles are removed.

HDR brachytherapy is only performed at the Royal Adelaide Hospital, usually as day surgery and is used as:

- Monotherapy for low risk or low intermediate risk prostate cancer and two treatments a fortnight apart are delivered.
- As a single fraction boost to a shortened five-week course of external beam radiotherapy, aiming to deliver in total a higher radiation dose with reduced side-effects for higher risk prostate cancer. This will sometimes be delivered after a few months of androgen deprivation therapy.
- As salvage treatment with a single fraction delivered for a local recurrence after past external beam radiotherapy or LDR brachytherapy.

Preparation for the HDR brachytherapy involves an initial assessment in the Radiation Oncology Department at the Royal Adelaide Hospital and later an appointment with the Pre-operative Assessment Clinic regarding the anaesthetic for the brachytherapy.

On the day of the HDR brachytherapy, patients present to the surgical admissions suite before being transferred to the brachytherapy suite. Once anaesthetized, a urinary catheter is inserted, the trans-rectal ultrasound guided transperineal catheters into the prostate are inserted, the computerised plan is developed, the catheters are connected via cables to the HDR after loader and treatment is performed over about 20 minutes. The perineal and urethral catheters are removed, patients are transferred to recovery and once voiding are usually able to be discharged. The whole procedure takes about 2.5 hours and as no radioactive source is left in patients they are not radioactive.

Denby Steele MBBS FRACS Urologist
AMA House – 6B 1st Floor 161 Ward Street North Adelaide South Australia 5006

HDR brachytherapy is usually well tolerated but the following typical symptoms are seen:

- Mild tiredness
- Mild temporary perineal bruising and discomfort is expected and simple analgesics should suffice if needed.
- The stream commonly slows for a while but only about 5% of men are unable to void after the treatment and need the urethral catheter replaced. Tamsulosin is prescribed to relax the bladder neck muscles to improve voiding in the early post treatment period.
- Urinary frequency, urgency and dysuria or burning when voiding are also common but not usually adding much to these symptoms typically experienced after external beam radiotherapy. Drinking plenty of water can help relieve these urinary symptoms. Acidic fluids, caffeine and alcohol may worsen bladder irritability and if so, may need to be limited.
- Bowel symptoms, increased frequency of bowel actions, mucus production and occasionally constipation and rectal bleeding, are uncommon, less often seen than after external beam radiotherapy and not usually worse after an HDR brachytherapy boost following external beam radiotherapy.
- The ejaculate will be blood stained and ejaculation initially uncomfortable.
- Erectile dysfunction is common but not inevitable.