

# Treating erectile dysfunction after radical radiotherapy and androgen deprivation therapy (ADT) for prostate cancer

A quick guide for health professionals:  
supporting men with erectile dysfunction

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The recommendations in this guide are based on a UK-wide consensus published in the International Journal of Clinical Practice in 2014. The consensus was reached by reviewing the literature on erectile dysfunction (ED) and a survey of UK specialists in the management of treatment-induced ED. This information is for all health professionals involved in the management of patients with erectile dysfunction after radical radiotherapy and androgen deprivation therapy (ADT) for prostate cancer.

## Introduction

Radiotherapy and androgen deprivation therapy for prostate cancer can cause erectile dysfunction – an under-diagnosed and under-treated condition which can significantly affect the quality of life of men and their partners. Men typically develop delayed and progressive ED over a few months to years. Early patient education and intervention is necessary to reduce the impact of ADT-induced loss of sexual desire and delayed ED on men and their partners.

- Radiotherapy (including external beam radiotherapy or brachytherapy) and ADT for prostate cancer can impair sexual function and lead to ED.
- ED can impact on a man's sense of masculinity, self-esteem and his quality of life.
- ED affects up to 85% of men receiving ADT, and a similar number of men after radiotherapy. External beam radiotherapy may be more likely to cause ED than brachytherapy.
- The impact on erectile function is not immediate. Radiotherapy and ADT induce structural changes in the penile tissue leading to delayed (for up to two years) or progressive ED.
- Early intervention can help restore erectile function and prevent ED.
- The benefits of ED rehabilitation are not immediately apparent to men, so it is especially important for clinicians to clearly communicate the rationale behind any erectile function rehabilitation programme.
- Currently, there are no other UK-wide guidelines for managing ED after radiotherapy and/or ADT.

## Guidance at a glance

- Involve the man and his partner in discussions about ED rehabilitation before and after radiotherapy/ADT.
- Assess the man and his partner's sexual function – the partner may also require support.
- Assess other health problems/current medications which may affect sexual function.
- Encourage adoption of exercise programme and lifestyle changes.
- Start the ED rehabilitation programme early, and no later than 3-6 months after ADT or radiotherapy has commenced.
- Consider combination therapy of PDE5-I tablets and vacuum erection device (VED) as first-line treatment.
- Consider including daily low-dose PDE5-I tablets in ED rehabilitation programme.
- Consider using the most effective PDE5-I, as judged by treatment trial.
- If initial treatment fails, consider alprostadil pellets, injections or topical alprostadil, followed by a penile implant.
- Re-assess erectile function regularly after starting a rehabilitation programme.
- Enable access to psychosexual therapy for men and/or couples who do not benefit from biomedical strategies alone and/or experience high levels of distress related to sexual changes.
- Duration of treatment depends on response – avoid strict time limits.

## Key recommendations for an erectile dysfunction (ED) rehabilitation programme

### Pre-treatment recommendations

- Discuss the impact of treatment on sexual function and rationale for early intervention with the patient and, if they wish, their partner.
- Assess the patient and partner's current sexual function.
- Assess the couple's readiness to engage in an ED rehabilitation programme.
- Assess comorbidities, concurrent medication and lifestyle habits that could affect sexual function.
- Assess baseline testosterone levels.

### Post-treatment recommendations

- Discuss the implementation of an ED rehabilitation programme with the man and his partner.
- Assess erectile function and sexual desire.

### Treatment pathway

- See Figure 1 (page 5) for a recommended treatment pathway for restoring erectile function after radiotherapy/ADT.
- Consider conservative approaches likely to support erectile function recovery (pelvic floor exercises and lifestyle changes).
- Consider first-line treatment with daily low dose PDE5-I and provide maximum recommended dose for on demand use.
- Use most effective PDE5-I for the patient at optimal dose on at least eight occasions before switching. Sildenafil is generic and is the most cost-effective PDE5-I.
- Consider combination therapy (PDE5-I + VED).
- Offer alprostadil pellets and intracavernosal injections, followed by a penile implant if initial treatment fails.

### **Treatment initiation**

- Initiate treatment (PDE5-I) soon after radiotherapy/starting ADT, no later than 3-6 months.

### **Psychosexual therapy and psychological counselling**

- Enable access to psychosexual therapy or psychological counselling, especially to men on ADT with persistent low desire and individual/couple distress.
- Encourage partner support for the sexual rehabilitation programme through psychosexual therapy or couple counselling as appropriate.
- Encourage the man to schedule regular sexual contact with or without intercourse, to assist the management of low desire.

### **Re-assessment**

- Once ED management is initiated, re-assess treatment response at regular intervals preferably every three months.

### **Treatment duration**

- Try PDE5-I drug/dose combination on at least eight occasions before switching to another drug/dose combination, unless patient reports adverse event warranting an early switch.
- Individualise duration of treatment for each man. Strict time limits are inappropriate in clinical practice.
- The duration of any treatment can range from three months until the man no longer needs treatment.

## Treatment pathway

Figure 1: Recommended treatment pathway for managing ED after radiotherapy/ADT\*

<b>Pre-treatment</b>	<ul style="list-style-type: none"> <li>Assess ED risk factors</li> <li>Assess baseline erectile function</li> <li>Explain sexual side-effects of radiotherapy/ADT</li> <li>Check baseline testosterone</li> </ul>	
	<b>Low libido (ADT)</b>	<b>ED (radiotherapy or brachytherapy)</b>
<b>First line<sup>§</sup></b>	<ul style="list-style-type: none"> <li><b>Psychosexual therapy and counselling<sup>†</sup></b></li> <li>+/- PDE5-I low dose daily + PDE5-I standard dose on demand <b>or</b> PDE5-I on demand only <b>or</b> PDE5-I on demand/daily use for 12 weeks or as long as needed</li> <li>+/- VED 10 min daily</li> </ul>	<ul style="list-style-type: none"> <li><b>Early initiation of PDE5-I</b></li> <li>PDE5-I low dose daily + PDE5-I standard dose on demand <b>or</b> PDE5-I on demand only <b>or</b> PDE5-I on demand/daily use for 12 weeks or as long as needed</li> <li>+/- VED 10 min daily</li> <li>+/- psychosexual therapy and counselling<sup>†</sup></li> </ul>
	<b>Conservative approaches:</b> Exercise programme; lifestyle advice; pelvic floor exercises	
	<ul style="list-style-type: none"> <li>Review at three months</li> <li>Specialist ED clinic referral</li> </ul>	
<b>Second line<sup>¶</sup></b>	Add ICI/transurethral or topical alprostadil	
	Review at three months	
<b>Third line</b>	Tertiary andrology service for consideration of penile implants	

\* Algorithm is a collation of survey responses of individual clinical practice.

§ The most effective combination depends on patient and partner needs. Daily and on demand PDE5-I used simultaneously is an off-label recommendation.

† Psychosexual therapy and counselling provided as an adjunct to biomedical ED management.

¶ Second line onwards usually through referral to specialist ED clinics.

**Responsibility for prescribing specific treatments is determined at local service level.**

### Duration of treatment

The decision to stop treatment depends on each patient, as the recovery time differs from man to man. Ideally, a treatment should be given until it's no longer needed.

## Advantages and disadvantages for each ED management strategy

Post radiotherapy/ ADT ED management strategy	Advantages	Disadvantages
<b>Conservative management</b> (exercise programme and lifestyle changes)	<ul style="list-style-type: none"> <li>• Improves/maintains erectile function.</li> <li>• Reduces risk of obesity.</li> <li>• Reduces risk of comorbidities.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires good compliance.</li> </ul>
<b>Psychosexual therapy/counselling</b>	<ul style="list-style-type: none"> <li>• Important in improving outcome of any sexual rehabilitation programme.</li> <li>• Improves acceptance of treatments and willingness to stay on treatments.</li> <li>• Can reduce feeling of lack of sexual spontaneity, dissatisfaction and fear of needles.</li> <li>• Offers support when other strategies are not successful.</li> <li>• Can help couples overcome distress and strengthen their relationship.</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive and time-consuming.</li> <li>• Skilled counsellor needed.</li> <li>• Requires commitment.</li> <li>• Not always available on the NHS (HSC in Northern Ireland).</li> </ul>
<b>Tablets (PDE5-Is)</b> (sildenafil, tadalafil, vardenafil and avanafil)	<ul style="list-style-type: none"> <li>• Easy to take.</li> <li>• Work for up to eight hours, or 24-36 for tadalafil.</li> <li>• Early initiation (within six months) of radiotherapy promotes early recovery and preservation of erectile function.</li> <li>• Can be taken on demand (when needed) or daily.</li> <li>• Acceptable to most men and partners.</li> <li>• Good tolerance generally.</li> <li>• Does not interfere with foreplay.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of side-effects.</li> <li>• Some men will need to take on at least 8-12 occasions to achieve a reliable response.</li> <li>• Need to be aware of drug interactions for men with comorbidities.</li> <li>• Requires good compliance.</li> <li>• Risk of treatment failure, especially for those still receiving ADT, after long-term ADT or men who's testosterone level recovery is slow or poor after ADT.</li> <li>• Possible cost issues.</li> </ul>
<b>Vacuum erection device (VED)</b>	<ul style="list-style-type: none"> <li>• Improves penile tissue oxygenation and helps maintain penile length.</li> <li>• Avoids medication.</li> <li>• Non-invasive.</li> <li>• No systemic effects.</li> <li>• Simple to use.</li> <li>• Cost-effective.</li> </ul>	<ul style="list-style-type: none"> <li>• Uncomfortable, clumsy or mechanical.</li> <li>• Requires commitment to learn.</li> <li>• Skilled instructor needed.</li> <li>• Not always acceptable to partners.</li> <li>• Altered penile sensations from constriction ring if used for penetration.</li> <li>• Erection does not feel/look natural.</li> <li>• Can be painful.</li> </ul>

Post radiotherapy/ ADT ED management strategy	Advantages	Disadvantages
<b>Pellets (transurethral alprostadil)</b>	<ul style="list-style-type: none"> <li>• Relatively easy to use.</li> <li>• Works quickly.</li> <li>• No needles.</li> <li>• Painless to insert.</li> <li>• No systemic effects.</li> <li>• Well-tolerated.</li> </ul>	<ul style="list-style-type: none"> <li>• High discontinuation rate.</li> <li>• Can be difficult to insert.</li> <li>• Urethral stinging.</li> <li>• May not be effective for all men.</li> </ul>
<b>Penile injections (ICI)</b>	<ul style="list-style-type: none"> <li>• More natural looking erections.</li> <li>• Quick administration and works quickly.</li> <li>• Usually effective – direct drug delivery.</li> </ul>	<ul style="list-style-type: none"> <li>• Uncomfortable or painful erections.</li> <li>• Requires good compliance.</li> <li>• Not acceptable to all men or their partners.</li> <li>• Good manual dexterity needed.</li> <li>• Skilled instructor needed.</li> <li>• Treatment may cause priapism (painful long-lasting erections), but risk is very low in this patient group.</li> <li>• Can cause pain and bruising.</li> <li>• Can cause fibrosis at injection site.</li> </ul>
<b>Topical cream (transdermal alprostadil)</b>	<ul style="list-style-type: none"> <li>• Works within 5-30 minutes and lasts for 1-2 hours.</li> <li>• Clinical trials show a positive outcome.</li> </ul>	<ul style="list-style-type: none"> <li>• Local irritation (stinging, pain and erythema).</li> <li>• Recently licensed so limited practical experience.</li> <li>• No trial evidence in this patient group.</li> </ul>
<b>Combination strategy</b>	<ul style="list-style-type: none"> <li>• Early combination of PDE5-I tablets and VED may be helpful in patients who don't respond well to monotherapy.</li> <li>• Combined strategy may have a better effect than treatments used in isolation.</li> </ul>	<ul style="list-style-type: none"> <li>• Need for multiple interventions.</li> <li>• Requires patient commitment.</li> <li>• Expensive and time consuming.</li> <li>• Not always available on the NHS/HSC.</li> </ul>
<b>Pelvic floor muscle exercises</b>	<ul style="list-style-type: none"> <li>• No cost.</li> <li>• Non-invasive.</li> <li>• No systemic effects.</li> <li>• Can give a sense of control.</li> </ul>	<ul style="list-style-type: none"> <li>• No published evidence of benefit when used alone as an ED management strategy.</li> </ul>

## Objectives of treating erectile dysfunction post radiotherapy/ADT

The goal of erectile function management strategies in men undergoing radiotherapy and ADT is restoring or maintaining assisted and non-assisted erectile function and preventing radiotherapy/ADT-induced structural changes in the penis.

Treating erectile dysfunction includes:

- providing a holistic approach towards the assessment and management of ED, especially in patients with comorbidities
- restoring erectile function at a level satisfactory to patient and their partner or to pre-treatment level
- maintaining erectile function and preventing or minimising reduction in penile length
- improving patient's quality of life and sexual self-esteem
- reducing anxiety levels associated with sexual intimacy.

Erectile function rehabilitation programmes, especially if initiated early on after radiotherapy/ADT, are effective in improving or restoring sexual function.

It is especially important for clinicians to clearly communicate the rationale behind any erectile function restoration programme and to make men aware that erectile function will not usually recover spontaneously while ADT is ongoing in the adjuvant setting.

## Predictive factors for recovery

The recovery of erectile function depends on the following factors:

- Presence of other health problems/ treatments – comorbidities and concurrent medication can increase risk of ED.
- General lifestyle factors (smoking, BMI, physical activity) – men of a healthy weight are likely to have better functional outcomes.
- Age of man – younger patients may have better results. Men with good pre-treatment erectile function have better results.
- Testosterone levels – normal levels are important for recovery of erectile function.
- Time it takes for testosterone levels to return to normal after ADT.



## Assessment of erectile function

Recommendations for assessing erectile function before and after radiotherapy/ADT include:

Assessing erectile function checklist	✓
Assess patient's sexual function pre- and post treatment, verbally or using validated sexual questionnaires*.	
Assess partner's sexual function pre- and post treatment, verbally or using validated sexual questionnaires*.	
Offer sexual counselling to men and their partners prior to initiation of ADT/radiotherapy to prepare them for sexual side-effects.	
Discuss sexual rehabilitation programmes with patient and his partner, if possible.	
Discuss lifestyle changes, testosterone levels and exercise programmes with men prior to initiating long-term ADT.	
Check baseline testosterone levels to exclude an existing testosterone deficiency.	
Assess general health, comorbidities and concurrent medication.	
Once ED treatment is started, re-assess patient regularly – at least every three months.	

\* Routinely available questionnaires include: the International Index of Erectile Function (IIEF); Sexual Health Inventory for Men (SHIM); Female Sexual Function Index (FSFI); Erection Hardness Score (EHS); Self-Esteem And Relationship (SEAR) questionnaire; Sexual Life Quality Questionnaire (SLQ-QOL); Miller Social Intimacy Scale (MSIS).

## How this guidance was produced

This quick guide is based on the comprehensive recommendations in: **White ID, et al. Development of UK guidance on the management of erectile dysfunction (ED) resulting from radical radiotherapy and androgen deprivation therapy for prostate cancer. Int J Clin Pract. 2014 doi: 10.1111/ijcp.12512**

The recommendations were developed from a review of the literature, along with a survey of 28 UK experts in the management of treatment-induced ED. Details of the methods used, and references, can be found in the full recommendations. There were study limitations due to general paucity of randomised studies in this patient group. Most of the recommendations are based on expert opinion and clinical practice, and the wording used ('offer' versus 'consider') denotes the certainty with which the recommendation can be made.

A separate quick guide covers the treatment of ED after surgery for pelvic cancers.

This guide was produced in October 2014. To be reviewed in October 2016.

## More information

The following organisations have more information about ED:

- Sexual Advice Association  
[www.sda.uk.net](http://www.sda.uk.net)
- British Society for Sexual Medicine  
[www.bssm.org.uk](http://www.bssm.org.uk)
- European Society for Sexual Medicine  
[www.essm.org](http://www.essm.org)
- International Society for Sexual Medicine  
[www.issm.info](http://www.issm.info)
- British Society for Sexual Health and HIV  
[www.bashh.org](http://www.bashh.org)

- European Association of Urology  
[www.uroweb.org](http://www.uroweb.org)
- British Association of Urological Nurses  
[www.baun.co.uk](http://www.baun.co.uk)
- British Association of Urological Surgeons  
[www.baus.org.uk](http://www.baus.org.uk)

The following organisations offer support and information about sexual and relationship difficulties:

- Relate  
[www.relate.org.uk](http://www.relate.org.uk)
- Relate Cymru  
[www.relatecymru.org.uk](http://www.relatecymru.org.uk)
- Relate Northern Ireland  
[www.relateni.org](http://www.relateni.org)
- Relationships Scotland  
[www.relationships-scotland.org.uk](http://www.relationships-scotland.org.uk)
- College of Sexual and Relationship Therapists  
[www.cosrt.org.uk](http://www.cosrt.org.uk)

## Professional support

Prostate Cancer UK offer face-to-face and online training for health professionals working with men with prostate cancer. We also offer access to educational bursaries for ongoing professional development – [prostatecanceruk.org/education](http://prostatecanceruk.org/education)

Health professionals can access free educational resources in Macmillan's Learnzone, including 'Sexual Relationships and Cancer', an online module on how to talk to patients about the issues surrounding sexuality and cancer – [learnzone.org.uk](http://learnzone.org.uk)

### Tell us what you think

If you have any comments about this publication, you can email:

[professionals@prostatecanceruk.org](mailto:professionals@prostatecanceruk.org)

## Patient information and support

Prostate Cancer UK and Macmillan Cancer Support have a range of booklets and fact sheets about prostate cancer. All their publications are free and available to order or download online at [prostatecanceruk.org/publications](http://prostatecanceruk.org/publications) and [be.macmillan.org.uk](http://be.macmillan.org.uk)

Some relevant resources are listed below.

### Prostate Cancer UK

#### Prostate cancer and your sex life

This booklet explains how prostate cancer and its treatment can impact on your sex life, how you feel about yourself and any relationships you have. It explains the sexual side effects of treatment, ways to manage the side effects, and support that is available. It includes a DVD featuring six men talking about how they dealt with changes to their sex life during and after treatment for prostate cancer.

Find out more about sex and prostate cancer at [prostatecanceruk.org/sex](http://prostatecanceruk.org/sex)

#### Sex and prostate cancer

This fact sheet describes how prostate cancer and its treatment can affect your sex life and your fertility. It includes information about the treatments available for sexual problems and where you can get support.

#### Living with and after prostate cancer: A guide to physical, emotional and practical issues

This booklet is for men living with prostate cancer, before, during and after treatment. It contains information about the physical and emotional effects of living with prostate cancer and its treatment, and looks at ways to manage them.

Call Prostate Cancer UK's Specialist Nurses on **0800 074 8383** (Monday to Friday 9am-6pm, Wednesday 10am-8pm).

### Macmillan Cancer Support

#### What to do after cancer treatment ends: 10 top tips

This leaflet helps people to get the support they need to lead as healthy and active a life as possible following cancer treatment.  
be.macmillan order code: MAC13615

#### Sexuality and cancer – information for men

This booklet explains the effects cancer and its treatments can have on sexuality and suggests ways of coping.  
be.macmillan order code: MAC14767

#### Cancer, you and your partner

This leaflet is about how cancer can affect a person's relationship with their partner, and was written in collaboration with Relate.  
be.macmillan order code: MAC12157

#### Cancer treatment and fertility - information for men

This leaflet discusses how cancer treatments can sometimes affect the fertility of men.  
be.macmillan order code: MAC12155

Information and support can also be found on the Macmillan website [macmillan.org.uk](http://macmillan.org.uk) including details of support groups and information centres in your area, and how people can join the Macmillan Online Community. Alternatively people can call the Macmillan Support Line on **0808 808 0000** to speak to a cancer specialist (Monday – Friday 9am-8pm).

To hear men's direct experiences of ED, see [healthtalkonline.org/peoples-experiences/cancer/prostate-cancer/impotence](http://healthtalkonline.org/peoples-experiences/cancer/prostate-cancer/impotence)

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We aim to improve the lives of everyone affected by cancer by working with health and social care professionals to deliver vital services and support.



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We provide all the resources you need to support your patients with prostate cancer and benign prostate disease.

## PROFESSIONAL SUPPORT

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