NPCA
National Prostate Cancer Audit

NPCA Performance Indicators

Annual Report, 2017

Data collection

The National Prostate Cancer Audit (NPCA) works with the National Cancer Registration and Analysis Service (NCRAS), Public Health England as data collection partner in England. NCRAS collects patient-level data from all NHS acute providers and from a range of national data feeds. This includes the Cancer Outcomes and Services Dataset (COSD), which specifies the data items to be submitted routinely by service providers via MDT electronic data collection systems to the National Cancer Data Repository (NCDR) on a monthly basis.

NPCA dataset

The audit collects data on the diagnosis, management and treatment of every patient newly diagnosed with prostate cancer and discussed at a MDT meeting, or shortly thereafter, in England from the 1st April 2015. The NPCA dataset comprises three broad categories:

1. NPCA Minimum data set 1 (MDS-1): The first category of data items are collected for **all men newly diagnosed with prostate cancer** during the initial phase of management.

2. NPCA Minimum data set 2 (MDS-2): The second category of data items are collected for all patients who have **undergone radical prostatectomy**.

3. NPCA Minimum data set 3 (MDS-3): The third category of data items are collected for **all men for whom external beam radiation therapy or brachytherapy is planned with or without hormone deprivation therapy**.

The NPCA dataset primarily comprises COSD data items with a small number of additional data items created specifically for the NPCA. A summary of the NPCA dataset can be found on the website.[1]

The NPCA team link these data to other datasets submitted by Trusts to NCRAS including Cancer Registration data, Hospital Episode Statistics (HES) data and the National Radiotherapy Dataset (RTDS) to produce the English dataset for analysis in the NPCA Annual Report. These data provide additional information related to staging (Cancer Registration data), mode of admission, comorbidities, type of procedure or intervention (HES), radiotherapy type, intent, number of attendances and dose (RTDS).

Reporting periods

The reporting period for the NPCA Annual Report 2017 is date of diagnosis between 1st April 2015 – 31st March 2016, which includes all 'short-term indicators'. 'Medium-term indicators' require longer follow-up (up to two years post-treatment) so the diagnostic period is earlier between 1st April 2014 – 31st March 2015.

[1] http://www.npca.org.uk/prospective-audit-tools/

NPCA Performance Indicators – 'short-term'

Title	**Potential 'over-treatment' of men with low-risk localised prostate cancer**	
Outcome	The proportion of men with low-risk localised prostate cancer undergoing radical prostate cancer therapy	
Domain	Treatment allocation	
Level of reporting	sMDT	
Reporting period	1st April 2015 – 31st March 2016	
Specification	**Numerator**	Number of patients with low-risk localised prostate cancer undergoing radical prostate cancer treatment (radical prostatectomy, external beam radiotherapy and/or brachytherapy)
	Denominator	Number of patients with low-risk localised prostate cancer
	Exclusions	Diagnosing Trusts with <10 patients recorded
	Risk adjusted	Yes, patients' age and comorbidity profile
	Outlier reporting	Yes
Related guideline	NICE Quality Standard 2 (2015). *'Men with low-risk prostate cancer for whom radical treatment is suitable are also offered the option of active surveillance'*	

Title	**Potential 'under-treatment' of men with locally-advanced prostate cancer**	
Outcome	The proportion of men with locally-advanced prostate cancer undergoing radical prostate cancer therapy	
Domain	Treatment allocation	
Level of reporting	sMDT	
Reporting period	1st April 2015 – 31st March 2016	
Specification	**Numerator**	Number of patients with locally-advanced prostate cancer undergoing radical prostate cancer treatment (radical prostatectomy, external beam radiotherapy and/or brachytherapy)
	Denominator	Number of patients with locally-advanced prostate cancer
	Exclusions	Diagnosing Trusts with <10 patients recorded
	Risk adjusted	Yes, patients' age and comorbidity profile
	Outlier reporting	Yes
Related guideline	NICE Quality Standard 3 (2015). *'Men with intermediate or high-risk localised prostate cancer who are offered non-surgical radical treatment are offered radical radiotherapy and androgen deprivation therapy in combination'*	

Title	**Unplanned readmission within 3 months after radical prostatectomy**	
Outcome	The proportion of men who had an emergency readmission within 90 days of radical prostatectomy	
Domain	Outcomes of treatment	
Level of reporting	Trust where surgery takes place	
Reporting period	1st April 2015 – 31st March 2016	
Specification	**Numerator**	Number of patients who had an emergency readmission within 90 days of radical prostatectomy
	Denominator	Number of patients who had a radical prostatectomy
	Exclusions	Trusts with <10 patients recorded Patients with < 90 days of follow-up
	Risk adjusted	Yes, patients' age and comorbidity profile
	Outlier reporting	Yes
Related guideline	No	

NPCA Performance Indicators – 'medium-term'

Title	**Severe genitourinary toxicity following radical prostatectomy**	
Outcome	The proportion of men experiencing a severe urinary complication requiring an intervention following radical prostatectomy	
Domain	Outcomes of treatment	
Level of reporting	Trust where surgery takes place	
Reporting period	1st April 2014 – 31st March 2015	
Specification	**Numerator**	Number of patients who experienced at least one complication severe enough to require an intervention within two years of follow-up following radical prostatectomy
	Denominator	Number of patients who had a radical prostatectomy
	Exclusions	Trusts with <10 patients recorded. Patients with a bladder cancer diagnosis. Patients who received adjuvant/salvage radiotherapy from date of radical prostatectomy to end of follow-up..
	Risk adjusted	Yes, patients' age and comorbidity profile
	Outlier reporting	Yes
Related guideline	No	

Title	**Severe gastrointestinal toxicity following radical external beam radiotherapy**	
Outcome	The proportion of men experiencing a severe gastrointestinal toxicity requiring an intervention following external beam radiotherapy	
Domain	Outcomes of treatment	
Level of reporting	Trust where radiotherapy takes place	
Reporting period	1st April 2014 – 31st March 2015	
Specification	**Numerator**	Number of patients who experienced at least one complication severe enough to require an intervention within two years of follow-up following external beam radiotherapy
	Denominator	Number of patients who underwent external beam radiotherapy
	Exclusions	Trusts with <10 patients recorded. Patients with a bladder cancer diagnosis. Patients who received additional brachytherapy or who received adjuvant/salvage radiotherapy within a year of radical prostatectomy. Patients who had GI interventions for example colonoscopy for reasons unrelated to radiotherapy, such as part of a screening programme.
	Risk adjusted	Yes, patients' age and comorbidity profile
	Outlier reporting	Yes
Related guideline	No	

Note: The medium term indicators report on men who were treated with either radical radiotherapy or radical prostatectomy within the time period of 1st April 2014 to 31st March 2015. As the NPCA only started in April 2014 these indicators can only display outcomes for men who were both diagnosed and treated within this time frame. Therefore the number of patients treated appears lower than what is expected annually for each specific treatment centre. In subsequent audit years the reported patient numbers will be more in-keeping with what is expected.

Prostate cancer disease status

Men were assigned to a disease status category (low, intermediate, locally advanced or advanced prostate cancer) in accordance with a modified D'Amico Risk Classification using an algorithm developed by the NPCA team according to their TNM stage, Gleason score and PSA. This algorithm was published in the NPCA Annual Report published in 2015 [insert link].

Derived TNM stage and Gleason score were obtained from the cancer registration dataset and PSA from COSD.

Definition of radical prostate cancer treatment

A patient was considered to have undergone radical treatment for prostate cancer if he was identified as having received radical prostatectomy, radical external beam radiotherapy or brachytherapy.

HES records were used to identify patients who had undergone radical prostatectomy. A combination of HES and RTDS records were used to capture whether a man underwent external beam radiotherapy or brachytherapy.

Patients were only considered to have undergone primary prostate cancer treatment if the procedure date in HES or RTDS was within 12 months of the date of diagnosis.

Identification of severe genitourinary or gastrointestinal toxicities

The NPCA have developed and validated two coding-frameworks, the first to capture severe genitourinary toxicity following radical prostatectomy[2] and the second to capture severe gastrointestinal toxicity following external beam radiotherapy.[3] HES records were used to identify relevant OPCS-4 procedure codes to capture complications comparable to grade 3 toxicity according to the NCI Common Toxicity Criteria for Adverse Events Scoring system (i.e. requiring hospital admission or procedural intervention).

Comorbid disorders

The Royal College of Surgeons (RCS) Charlson comorbidity score was calculated using HES records.[4] A comorbidity is defined as any hospital admission with one of the following diagnoses in the last year, including the current admission: congestive cardiac failure, peripheral vascular disease, cerebrovascular disease, dementia, rheumatological disease, liver disease, diabetes, hemiplegia/paraplegia, AIDS/HIV; or any of the following diagnoses at a previous hospital admission in the last year: myocardial infarction, chronic pulmonary disease or chronic renal disease.

Risk-adjustment

[2] Sujenthiran A, Nossiter J, Charman S et al. National population-based study comparing treatment-related toxicity in men who received Intensity-modulated versus 3D-Conformal Radical Radiotherapy for prostate cancer. Int J Radiat Oncol Biol Phys.2017

[3] Sujenthiran A, Charman SC, Parry M, Nossiter J, Aggarwal A, Dasgupta P, et al. Quantifying severe urinary complications after radical prostatectomy: the development and validation of a surgical performance indicator using hospital administrative data. BJU international. 2017;doi:10.1111/bju.13770 (Epub ahead of print).

[4] Armitage JN, van der Meulen JH, Group RCoSC-mC. Identifying co-morbidity in surgical patients using administrative data with the Royal College of Surgeons Charlson Score. Br J Surg. 2010;97(5):772-81.

The NPCA will determine performance estimates for the NHS Providers adjusted for their patients' age and comorbidity profile. The adjusted outcomes are estimated using indirect standardisation. The adjusted rate is determined by:

(Number of observed events/ number of expected events) x Overall national rate

Where:

Observed events = the number of patients at a Trust or sMDT with the outcome (i.e a patient with low-risk prostate cancer who underwent radical treatment).

Expected events = the sum of the predicted risks over all patients at the Trust or sMDT, not just those with the outcome, on the basis of a multivariable regression model.

Overall national rate = the average rate in all patients included in the analysis.

If a provider tends to treat patients who are lower risk than the national average, their adjusted outcomes will be higher than their observed outcomes. Conversely, if a provider tends to treat patients who are a higher risk than the national average, their adjusted outcomes will be lower than their observed outcomes.

Detection of a potential outlier

Expected performance at a national level will be derived from NPCA data. Prior to any comparison among NHS Trusts, any differences such as patient characteristics that may be associated with the outcome of interest are take into account. The NPCA will estimate performance estimates for the specialist MDTs and Trusts adjusted for their patients' age and comorbidity profile.

Statistically derived limits around the expected level of performance will be used to define whether or not a Trust is a potential outlier. The width of these limits reflects the amount of uncertainty in the indicator estimated for each Trust.

The NPCA will generate funnel plots using two-sided control limits defining differences corresponding to two standard deviations (SD; inner control limits) and three SDs (outer limits) from the national average performance. Trusts that are more than 3 SDs from the national average performance level (outside of the outer limit) are flagged as an 'alarm' and those between 2 and 3 SDs are considered an 'alert'.

Low volume (<10 patients) Trusts are excluded from the funnel plots as it is not possible to produce statistically meaningful performance indicators.

Information regarding the NPCA Outlier process can be found here [insert link].