

# Dose Fractionation of Radical Radiotherapy to Prostate Cancer in the UK

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## AIM

To understand the variation in dose fractionation of radical radiotherapy to prostate cancer by analysing the national radiotherapy dataset, RTDS.

## BACKGROUND

The NICE guidelines 2008 for men undergoing radical external beam radiotherapy for localised prostate cancer<sup>1</sup> recommend a minimum dose of 74Gy to the prostate at no more than 2Gy per fraction i.e. 37 fractions. Recent results from the CHHiP Trial D. Dearnaley et al<sup>2</sup> which compared this standard to hypofractionated radiotherapy recommended the study regime of 55Gy in 20 fractions over 4 weeks.

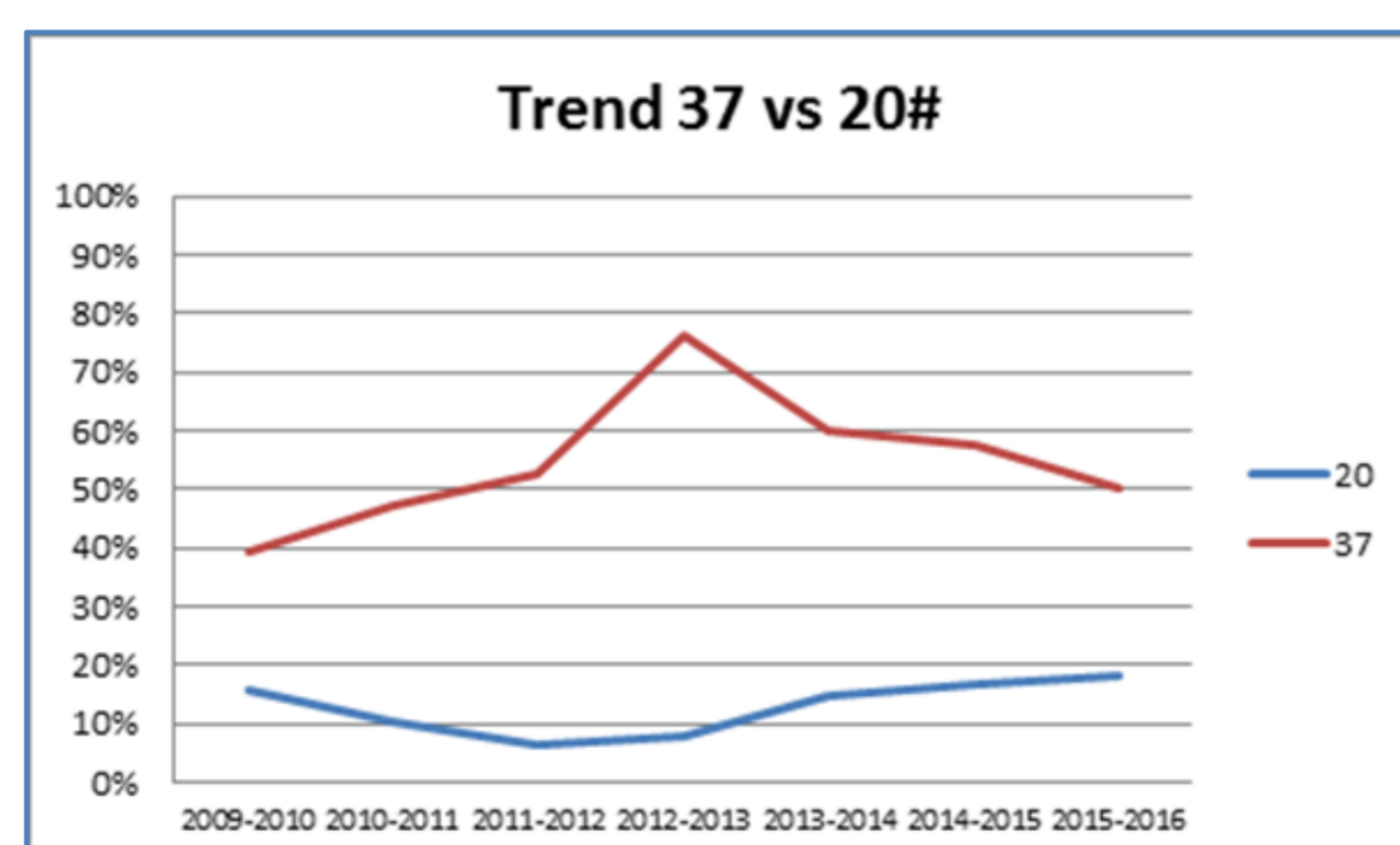
With this significant change in practice NHS England and the oncology community needed to understand the impact on radiotherapy services. The National Radiotherapy Dataset, RTDS allowed analysis of current radical dose fractionation and the reduction in attendances.

## METHOD

For patient receiving radiotherapy between April 2009 and March 2015 episodes of radiotherapy were selected from teletherapy RTDS records by primary diagnosis of prostate cancer (ICD10 C61), with treatment region as 'Primary' and radical intent to report the prescribed dose fractionation.

| No of Attendances | 2012-2013 | 2013-2014 | 2014-2015 |
|-------------------|-----------|-----------|-----------|
| 15                | 1%        | 2%        | 2%        |
| 16                | 0%        | 0%        | 0%        |
| 17                | 0%        | 0%        | 0%        |
| 18                | 0%        | 0%        | 0%        |
| 19                | 0%        | 2%        | 2%        |
| 20                | 8%        | 15%       | 17%       |
| 21                | 0%        | 0%        | 0%        |
| 22                | 0%        | 1%        | 0%        |
| 23                | 1%        | 2%        | 2%        |
| 24                | 0%        | 0%        | 0%        |
| 25                | 0%        | 0%        | 1%        |
| 26                | 0%        | 0%        | 0%        |
| 27                | 0%        | 0%        | 0%        |
| 28                | 1%        | 0%        | 0%        |
| 29                | 0%        | 0%        | 0%        |
| 30                | 0%        | 0%        | 0%        |
| 31                | 0%        | 0%        | 0%        |
| 32                | 1%        | 4%        | 5%        |
| 33                | 9%        | 7%        | 7%        |
| 34                | 0%        | 0%        | 0%        |
| 35                | 1%        | 1%        | 1%        |
| 36                | 1%        | 1%        | 0%        |
| 37                | 76%       | 60%       | 58%       |
| 38                | 1%        | 1%        | 1%        |
| 39                | 0%        | 1%        | 1%        |

The table shows the percentage of radical episodes for prostate cancer with the number of fractions (attendances) with chart trend for 37 and 20 # below



### Processing the data:

RTDS is reported by attendance, prescription and episode. To calculate the correct currency to determine actual given dose fractionation to the primary cancer, the analyst needed to identify firstly radical intent (as described in Using a complex clinical algorithm to predict treatment intent from the radiotherapy dataset<sup>3</sup>), to summate plans and phases of treatment to the primary and regional nodes without combining any additional prescriptions given in the same episode for example breast bud irradiation.

## RESULTS

RTDS UK reports around 25,000 prostate cancer patients per annum received external beam radiotherapy of which 2/3rds are with radical intent. In 2013/14 60% of radical patients, approximately 9,000, were prescribed 37 fractions.

### RTDS England: Prostate Cancer Radical Intent

Please note: There is a step change in the recording of Treatment Intent during 2011/12 before which, intent was calculated from the number of attendances submitted. Intent is now part of the submitted dataset.

Please note: There is a step change in 2011/12 when reporting of brachytherapy became mandatory.

### EPISODES

| Treatment Intent      | 2009 - 2010   | 2010 - 2011   | 2011 - 2012   | 2012 - 2013   | 2013 - 2014   | 2014 - 2015   |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Palliative            | 8,034         | 7,637         | 8,499         | 8,203         | 8,151         | 8,011         |
| Radical               | 10,744        | 11,208        | 12,345        | 12,653        | 14,320        | 15,868        |
| <b>Total Episodes</b> | <b>18,778</b> | <b>18,845</b> | <b>20,844</b> | <b>20,856</b> | <b>22,471</b> | <b>23,879</b> |

### ATTENDANCES

| Treatment Intent         | 2009 - 2010    | 2010 - 2011    | 2011 - 2012    | 2012 - 2013    | 2013 - 2014    | 2014 - 2015    |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Palliative               | 26,023         | 22,562         | 24,689         | 23,852         | 23,565         | 23,518         |
| Radical                  | 327,886        | 351,572        | 394,316        | 401,593        | 434,632        | 455,638        |
| <b>Total Attendances</b> | <b>353,909</b> | <b>374,134</b> | <b>419,005</b> | <b>425,445</b> | <b>458,197</b> | <b>479,156</b> |

## CONCLUSION

The results show that the majority of prostate cancer patients received radical radiotherapy intent with a dose fractionation regime of 37 fractions. With hypofractionation becoming the standard regimen in the UK the number of fractions and therefore attendances will decrease over time as shown. We estimate there will be a reduction in excess of 150,000 attendances per year

## DISCUSSION

The results of the CHHiP trial will allow a shift from 37 to 20 fractions, thus reducing the demand for radiotherapy. Policy makers and commissioners would benefit from routine reporting using RTDS to monitor this trend and to understand the capacity and demand in their service.

### REFERENCES

<sup>1</sup>Prostate cancer: diagnosis and treatment  
NICE guidelines [CG58] Published date: February 2008

<sup>2</sup>5 year outcomes of a phase III randomised trial of conventional or hypofractionated high dose intensity modulated radiotherapy for prostate cancer (CRUK/06/016): report from the CHHiP Trial Investigators Group; D. Dearnaley, I. Syndikus, H. Mossop, A. Birtle, D. Bloomfield, C. Cruickshank, J. Graham, S. Hassan, V. Khoo, J. Logue, H. Mayles, J. Money-Kyrle, O. Naismith, M. Panades, H. Patterson, C. Scrase, J. Staffurth, J. Tremlett, C. Griffin, E. Hall

<sup>3</sup>Using a complex clinical algorithm to predict treatment intent from the radiotherapy dataset (RTDS) Tracey Ellison, Andrew Bannatyne, Adrian Morris, Helen Forbes, Chris Ball



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