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The Royal College of Radiologists

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Radiotherapy Management of Muscle Invasive Bladder Cancer: Evaluation of a National Cohort

Overview

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- Why is there a need to re evaluate practice?
- NCRAS data 2016
- RCR Audit standards, methods & results
- Concurrent evaluation of BAUS data base
- What can we learn?

5 year bladder cancer survival unchanged

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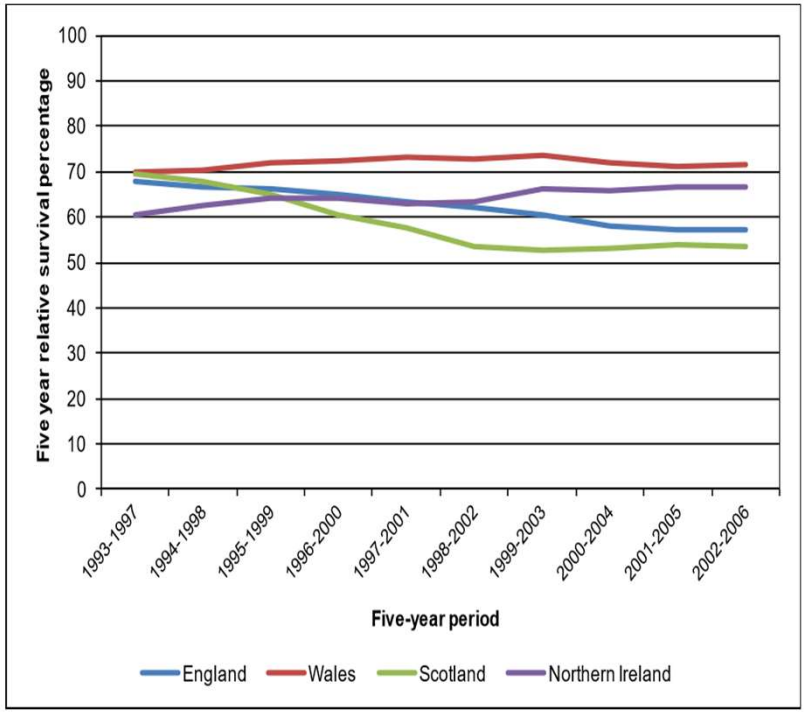
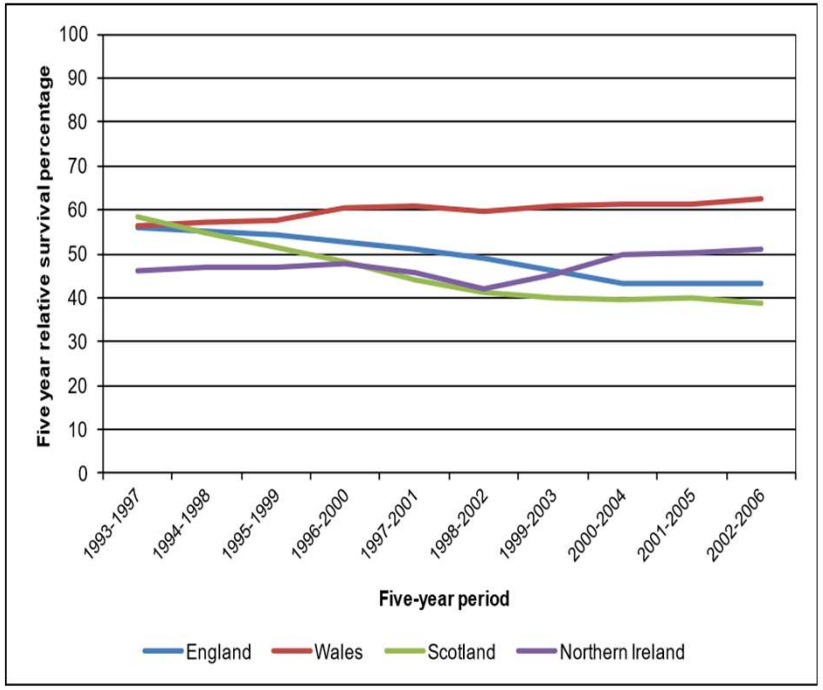
Figure 7: Five-year relative survival rate (%) for bladder cancer (ICD-10 C67), males, UK, 1993–2006



Source: Celtic National Cancer Data Repository

Figure 8: Five-year relative survival rate (%) for bladder cancer (ICD-10 C67), females, UK, 1993–2006



Source: Celtic National Cancer Data Repository

NCIN national cancer intelligence network
Using information to improve quality & choice

Rationale for MIBC Audit

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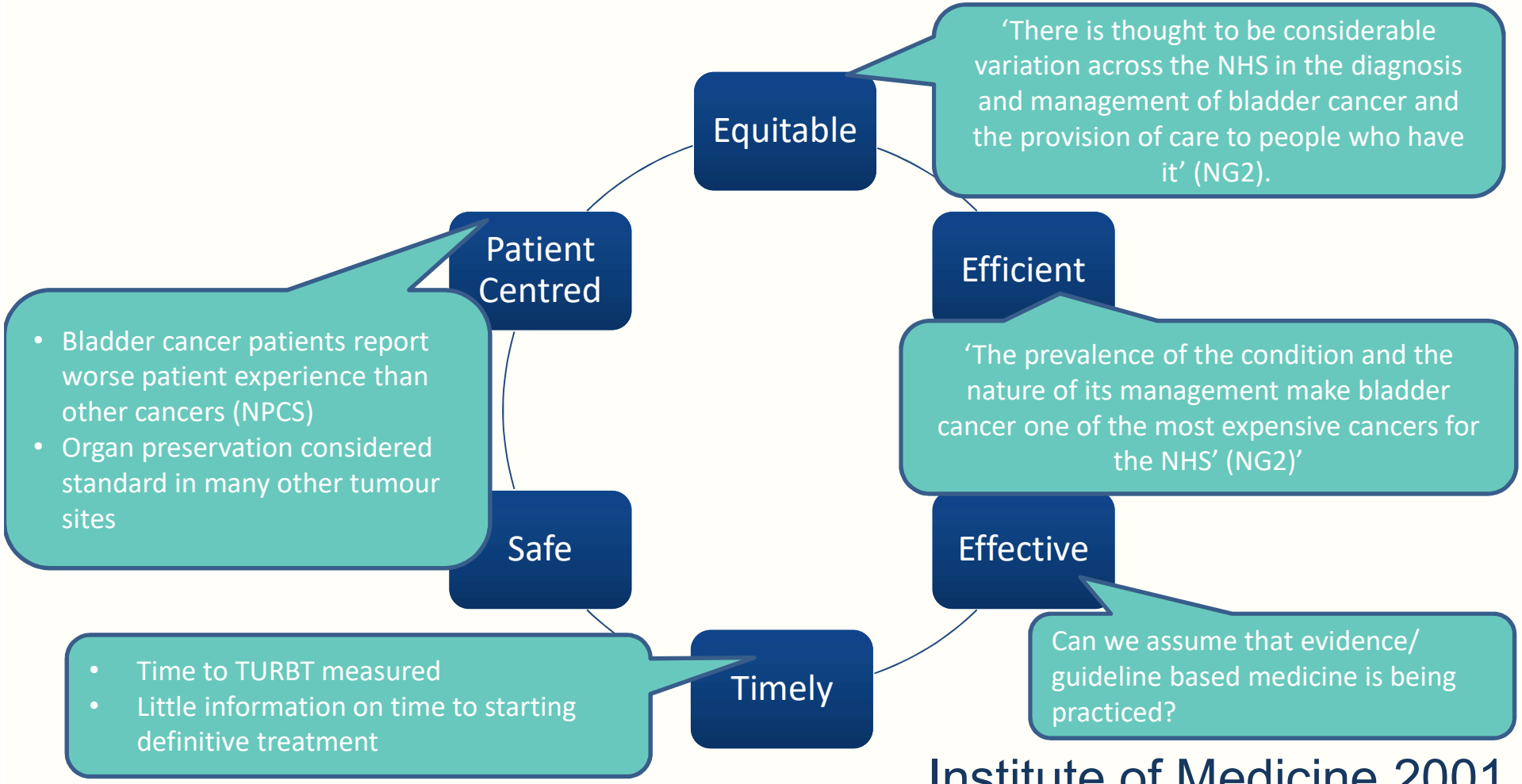
- Failure to fulfil 6 components of Health Care Quality



Institute of Medicine 2001

Discrepancy in managing GU cancers

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The National Picture 2016

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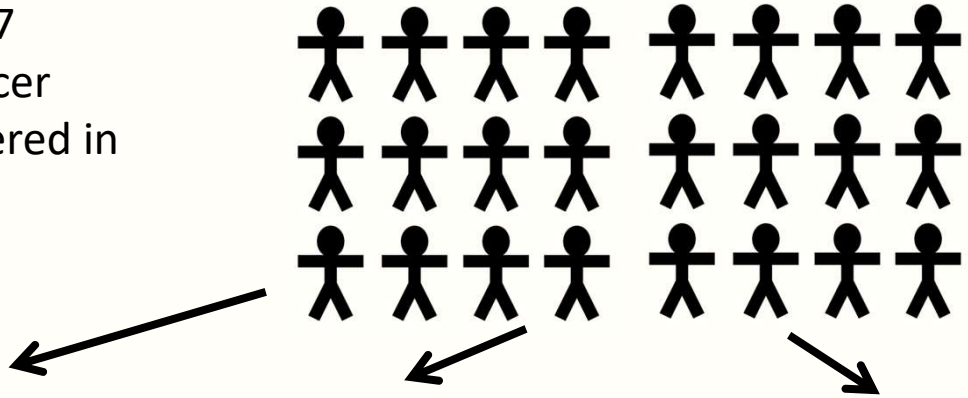
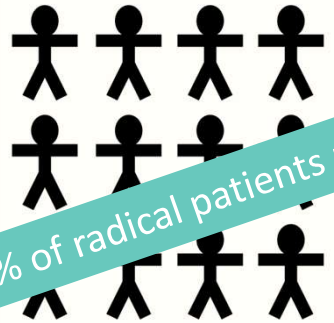
n=2519 (30%) stage II or III MIBC, median age 76

2016 n=8437 bladder cancer cases registered in England

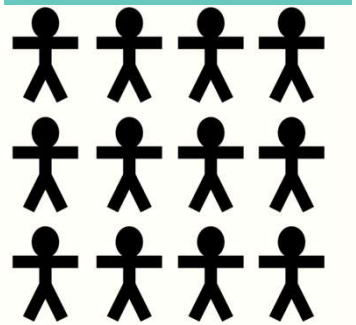


24% Cystectomy
37% NAC

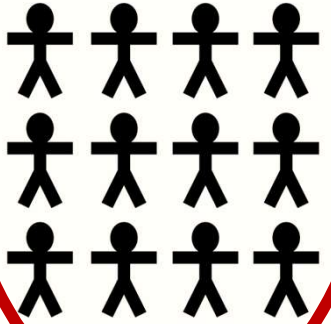


28% Radical RT
47% NAC

21% Palliative RT or chemo



26% no active treatment



43% of radical patients received multimodal treatment

Data courtesy of N Cooper, V Coupland, L Hounsome, C Roe, S Harden NCRAS, PHE (HES, RTDS, SACT, COSD, ONS)

Rationale for MIBC Audit

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- **With the constant failure to improve outcomes for MIBC patients, there is a need to re evaluate our practice**

- **Understand current practice across the UK to benchmark against NICE guidance and RCR guidelines**
  - NG2 (2015)
  - Radiotherapy dose fractionation (2nd edition) 2016
  - On target: ensuring geometric accuracy in radiotherapy 2008
  - The timely delivery of radical radiotherapy: standards and guidelines for the management of unscheduled treatment interruptions (3rd edition) 2008

Methods

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- All radiotherapy departments within the UK invited to complete an audit proforma for each patient having either radical or palliative radiotherapy to the bladder for MIBC
- 16 week period commencing 05/12/16 (113 days)
- 75 questions were completed for radical patients, 23 for palliative intent patients
- Anonymised data was uploaded electronically collated by the RCR
- Approval from BAUS committee to assess contemporaneous cystectomy data using existing BAUS data base

Audit Standards

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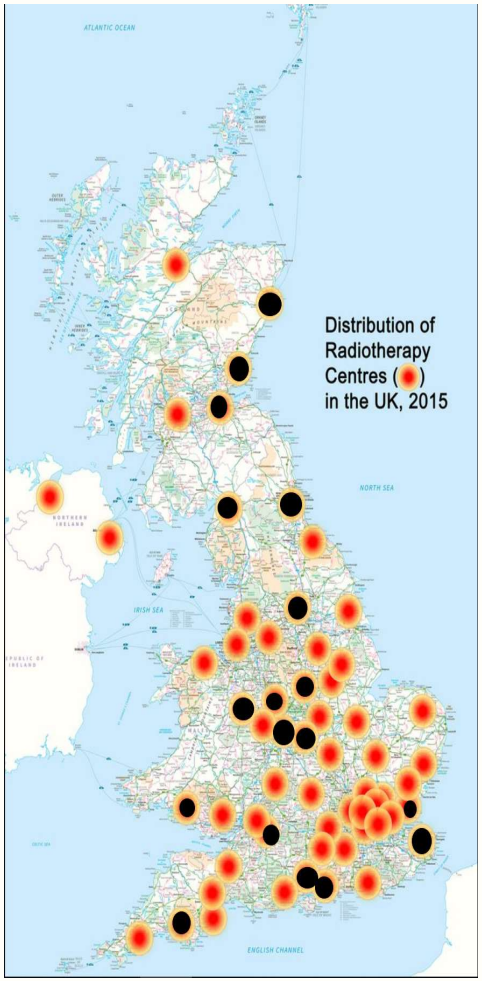
	Expected compliance
Diagnostic work up	
• CT/MRI Pelvis	95%
Neoadjuvant chemotherapy	
• Was NACT considered	
• Use of cisplatin based combination NAC	95%
Definitive radical treatment	
• Offer choice of radical cystectomy or radiotherapy with a radiosensitiser to people with MIBC	99%
Radiosensitisation	
• Use of a radiosensitiser	99%
Radiotherapy delivery, radical intent	
• Dose fractionation (60-64Gy/30-32# or 52.5-55Gy/20#) radical intent radiotherapy	99%
Radiotherapy delivery, palliative intent	
• Dose fractionation (6-8Gy/1# or 30-36Gy/5-6#) palliative intent radiotherapy	99%
Treatment verification	100%

Results



- 41/59 (69%) of centres submitted a total of **508** questionnaires.
- A median of 11 questionnaires were returned (IQR range=4-16 questionnaires) with a completion rate of 499/508 (98.2%).
- It is estimated that we captured the prospective data of 60% of patients receiving RT for MIBC.
  - Difficulty in estimating uptake of audit
  - Cross referencing to RTDS

- Denotes participating centre

Demographics

The British Association of Urological Surgeons

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Population		**Radiotherapy n=508**	**Cystectomy n=261**
	Median age	**78** (IQR 46-98) • 75 radical • 80 palliative	69 (IQR 38-88)
	Gender (% male)	73%	73%
	WHO Performance status ≤2	77%	
	WHO Performance status ≥3	10%	
Pathology	TCC	87%	77% MAV1
	Grade (3)	91%	97% SF1
	Confirmed T2 at least	81%	
Radiological stage *TNM 7	Stage II or III (T2-4 N0 M0)	64%	89%
	Stage IV (any T, N1-3 and/or M1)	25%	
	Stage IV nodal disease (any T, N1-3 M0)	13%	10%
	Stage IV (any T, any N M1)	11%	1% MAV2 SF2
Treatment intent	Radical	55%	
	Palliative	45%	

Slide 11

MAV1 includes stage II IIx III and IIIx (presuming that if N and M not completed patient managed as II or III)
Mohini Varughese, 07/11/2018

SF1 Correct
Sarah Fowler, 30/11/2018

MAV2 check with Sarah re M1
Mohini Varughese, 07/11/2018

SF2 correct - preop stage
Sarah Fowler, 30/11/2018

MIBC pathway

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1.5 Treating muscle-invasive bladder cancer

1.5.1 Ensure that a specialist urology multidisciplinary team reviews all cases of muscle-invasive bladder cancer, including adenocarcinoma, squamous cell carcinoma and neuroendocrine carcinoma, and that the review includes histopathology, imaging and discussion of treatment options.

Radical therapy for muscle-invasive urothelial bladder cancer

1.5.3 Offer a choice of radical cystectomy or radiotherapy with a radiosensitiser to people with muscle-invasive urothelial bladder cancer for whom radical therapy is suitable. Ensure that the choice is based on a full discussion between the person and a urologist who performs radical cystectomy, a clinical oncologist and a clinical nurse specialist. Include in the discussion:

- 97% discussed at local MDT, 62% discussed at Network/ Specialist MDT
- 97% patients seen by Uro oncologist with sub specialty interest in bladder cancer
- 75% patients reviewed by urologist who specialises in cystectomy
- Cystectomy discussed with 68% of radical RT cases
  - Planned but could not proceed in 20 cases (patient choice 8/20, co morbidity 4/20, toxicity of NAC 4/20, unresectable tumour 2/20)

Diagnostic radiology

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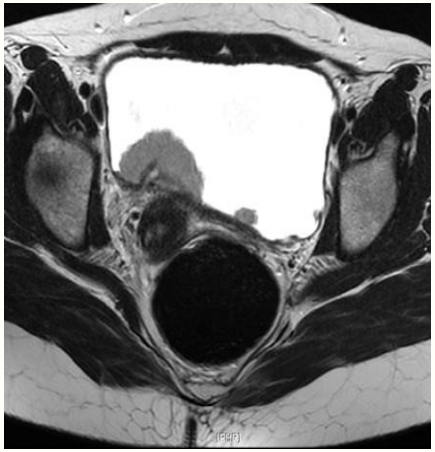
Diagnostic work up	RT n=280	Cystectomy n=195
CT/MRI Pelvis	97%	91%
CT urography/ other planned CT imaging to detect upper tract involvement	73%	
CT thorax	93%	
PET CT	13%	5%



Timelines TURBT to definitive treatment

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TURBT
- Day 0

NAC
- 1st cycle of NAC **57** days (IQR 46-74 days)

RT
- 1st fraction of radical RT (if NAC not received) **82** days (IQR 62-105 days)
- 1st fraction of radical RT (if NAC received) **155** days (IQR 129 – 184 days)
- 1st fraction of palliative RT 83 days (IQR 57-157)
- From RT consent to 1st fraction of RT 22 days (IQR 13-28 days)

In no other tumour site would these timelines to definitive treatment be acceptable

Timelines to Cystectomy

The British Association of Urological Surgeons

Diagnosis

- Date of diagnosis defined as date of first histological or cytological confirmation of malignancy (specimen taken, receipt by pathologist, date of report, date of admission to hospital due to malignancy, date of first consultation due to malignancy)

Cystectomy

- 124 days (0-2937 days)

Uniformity required to define date of diagnosis

MAV4

Neoadjuvant chemotherapy

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	Radiotherapy n = 279	Cystectomy n = 261
Considered/ Offered	66%	51%
Administered	42%	41%
Given as intended	70%	
1-2 Cycles of NAC	21%	
3-4 Cycles of NAC	68%	
5-6 Cycles of NAC	10%	

MAV4 Mohini Varughese, 07/11/2018

MAV3

Neoadjuvant chemotherapy (NAC)

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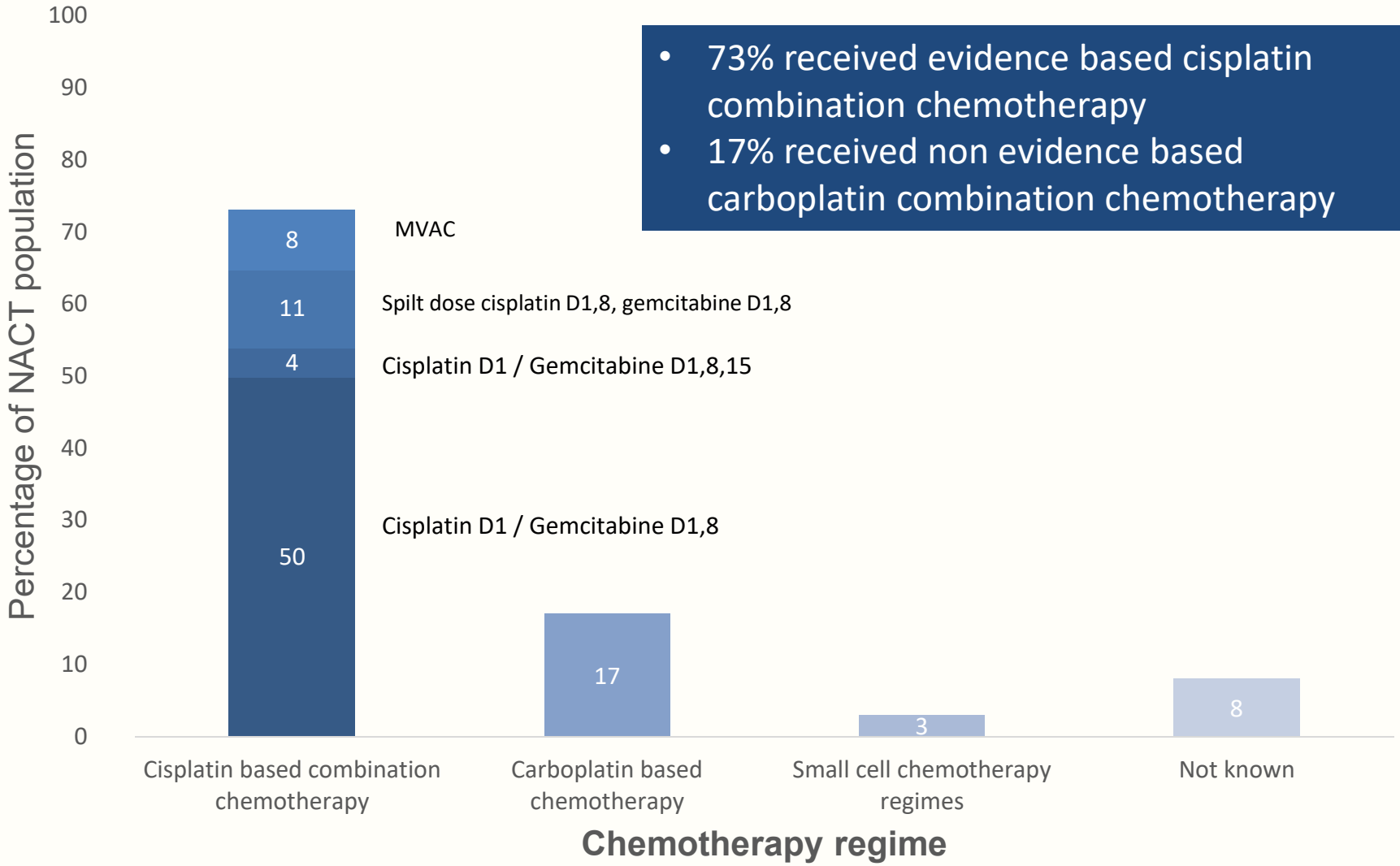
- 73% received evidence based cisplatin combination chemotherapy
- 17% received non evidence based carboplatin combination chemotherapy



MAV3 Mohini Varughese, 07/11/2018

Radical Radiotherapy Doses

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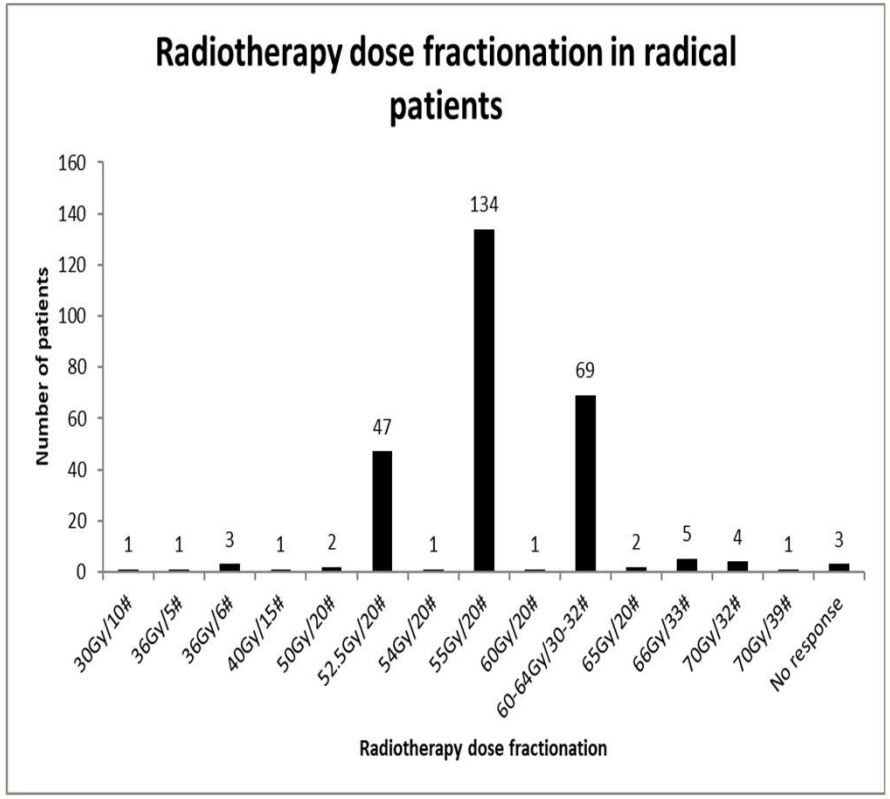
- 91% had radical doses as advised by the RCR dose fractionation document (2016)
  - 52.5Gy – 55Gy/20#
  - 60-64Gy/ 30-32#
- 2% had other radical dose defined by clinical trial
- 8 other non RCR/trial fractionation schedules prescribed for the minority of patients (7%)



Concurrent Radiosensitisation (CRT)

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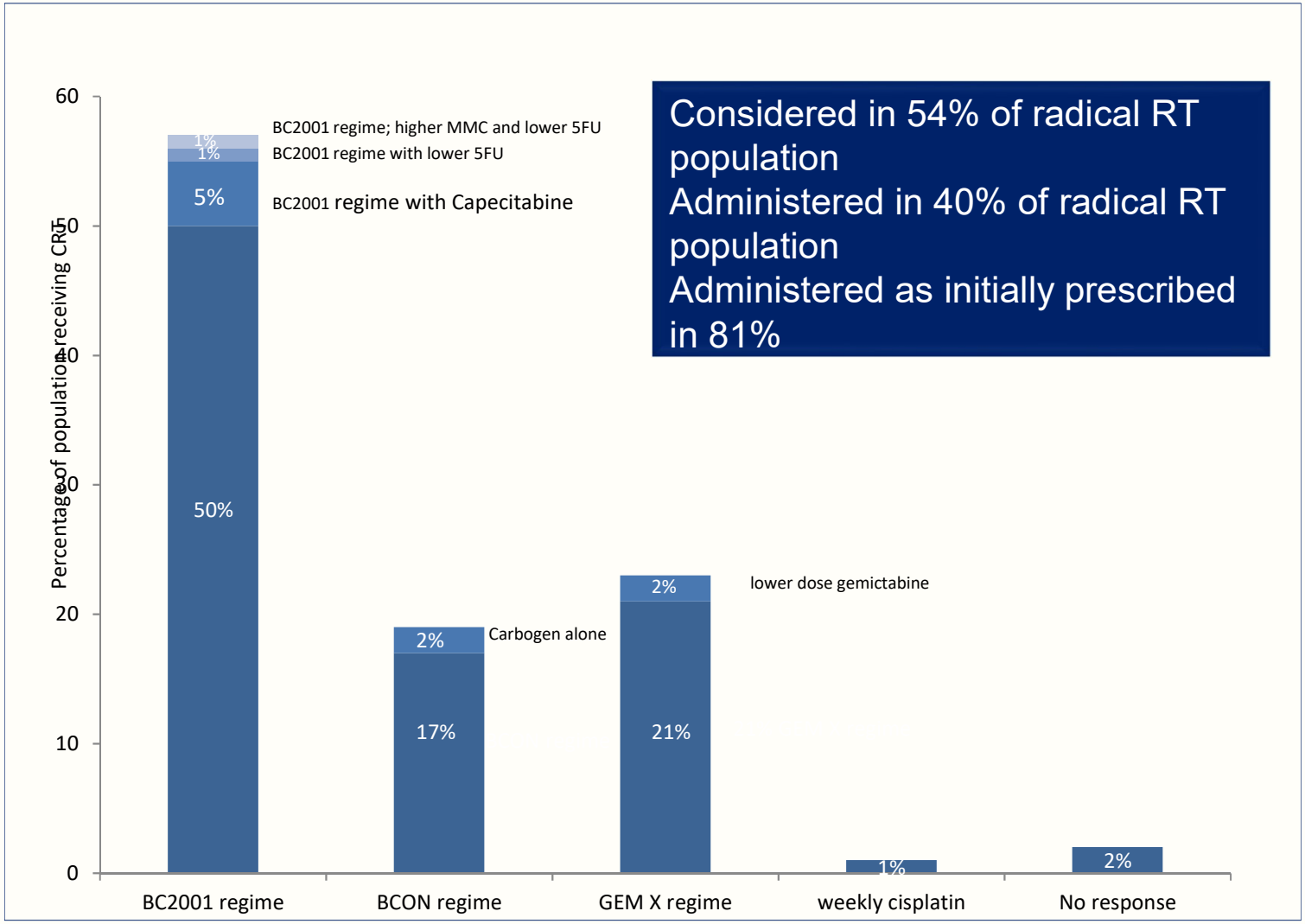

Considered in 54% of radical RT population
Administered in 40% of radical RT population
Administered as initially prescribed in 81%

Radiotherapy Delivery

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- **Whole bladder defined in 90% of radical patients**
  - 8% bladder + pelvic LN
  - 1.5% partial bladder
- **Treatment technique**
  - 52% conformal RT, 16 % IMRT, 32% VMAT
- **Treatment delays managed well**
  - 1% had a 5-7 day prolongation

Movement of the bladder wall > 1.5cm known to occur in 60% of patients, leading to inadequate tumour coverage in 33% of treatments

Sur RK, Clinkard J, Jones WG, et al. Changes in target volume during radiotherapy treatment of invasive bladder carcinoma. Clin Oncol (R Coll Radiol). 1993;**5**(1):30-3

'IGRT has the potential to optimise treatment of bladder cancer'
'Routine use of CBCT advised to ensure adequate targeting of bladder'

National Radiotherapy Implementation Group Report (IGRT), Guidance for implementation and use. 2012

Optimal treatment

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- Clinical Trials:
  - 8% of patients enrolled within clinical trials, predominately RAIDER (also Neoblade and IDEAL)
- Radical patients receiving NAC & CRT
  - 25% (69 patients)
- Radical patients receiving NAC and CRT as initially prescribed
  - 16% (45 patients)

Need to work to enhance recruitment to MIBC studies, and develop trials relevant to the majority of MIBC patients, not just select few who are 'trial fit'

Conclusion

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- Identification of the oldest radical MIBC RT population to date; demands consideration of age and morbidity appropriate treatments/ clinical trials, as well as consideration of using geriatric assessment tools
- Improvements of patient pathway essential
- Increasing use of NAC
- Penetrance of CRT is low
- Improvement in quality of radiotherapy delivery required; standardisation of dose, technique and utilisation of IGRT – need to aim for UK wide standard of care

Acknowledgements

- Participating radiotherapy centres (clinicians, radiographers, physicists) without whom this study would not have been possible
- COQIAC committee at the RCR
- NCRAS
- BAUS section of oncology
- Dr Sarah Treece, co lead
- Karl Drinkwater RCR Audit and Quality improvement officer
- Sarah Fowler BAUS Data & Audit Manager

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