Session M2

M2.1 Real-world resources required to sustain a CBCT-guided online adaptive radiotherapy service

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At Royal Surrey we have treated 1677 CBCT-guided online-adaptive radiotherapy (oART) fractions using the Varian Ethos, predominately for bladder (960#) and cervix (681#). The additional resources required to maintain an oART service were extracted from data on delivered fractions.
Initial treatments were resource-intensive, requiring two treatment radiographers, one physicist and one clinician. This has been reduced to having only treatment radiographers present for the majority of fractions; the clinician is additionally required for the first fraction of Cervix treatments.
Mean treatment time (from CBCT to close of session) was 22.2 and 33.6 minutes for Bladder and Cervix respectively. Range of times was 16.8 – 41.0 minutes (mean 25.8), compared to an IGRT treatment slot of 12 minutes. Treatment time has a slight downward trend over time. Each fraction is reviewed offline by a physicist (15 minutes/#) and weekly by the clinician (10 minutes/#). An average of 2.4 and maximum of 8 oART fractions were delivered per day. The oART planning is estimated to be 1-2 hours in addition to the standard planning time, with a similar amount of additional time needed for plan checking including preparation of a backup Truebeam plan.
The additional time per patient for oART compared to IGRT is approximately 19 hours per patient, split between the professions. This increase in resource requirements has been absorbed into standard working practices within our NHS department, delivering significant reduction in organ doses and improving target coverage. Additional resources are likely to be required to further expand the service.

M2.2 Exploring non-medical prescribing by therapeutic radiographers - perspectives of prescribers and managers in Scotland, Wales and Northern Ireland

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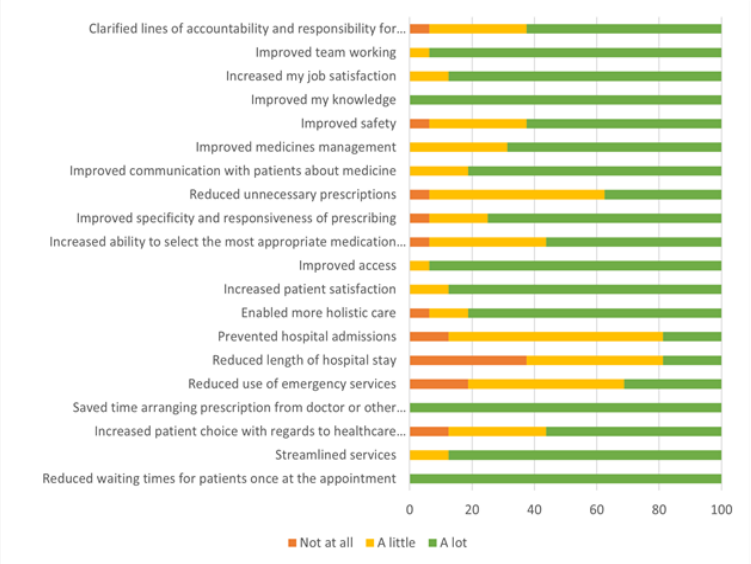
Background: In the United Kingdom (UK), non-medical professionals are authorised to prescribe licensed medical products, allowing improved access to medicines and cost-effectiveness. Limited information exists about the opinions and experiences of therapeutic radiographers (TRs) and Radiotherapy Managers (RTMs) regarding non-medical prescribing (NMP) in the UK's Devolved Administrations.
Methods: A mixed methods study was undertaken during 2022-2023, comprising an NMP-TR online survey (n=20) and semi-structured interviews with NMP-TRs (n=7) and RTMs (n=6). Survey participants were invited to NMP-TR interviews; RTMs were contacted via email. Survey data were analysed using SPSS® V28, with interviews conducted via MS-Teams, recorded, and transcribed verbatim. Anonymised data were thematically analysed to generate themes and sub-themes.1,2
Results: The top three identified benefits of NMP were reduced patient waiting times, saving time accessing medicines and improved TR knowledge (Figure 1). Frequently reported factors delaying and/or preventing prescribing related to legislative restrictions and implementation challenges (n=7, 63.6%). From the interviews, four main themes emerged. The most frequently mentioned was 'Advantages & Impact of TR NMP', with the subthemes: 'Optimising workforce resources' highlighting improved staff skills/workload utilisation; 'Improving medicines access & service efficiency'; 'Patient experience.' Other themes were 'Preparation for the prescribing role', 'Disadvantages of NMP', and 'Implementation and governance.' While NMP-TRs and RTMs shared similarities, the latter focused on challenges associated with implementation, e.g., funding streams and succession planning.
Conclusions: TRs in the Devolved Administrations perceive several advantages with NMP despite the identified challenges. These findings provide valuable insights for policymakers and healthcare professionals seeking to enhance NMP practice.

Table



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M2.3 UK survey of cervical cancer image guided and adaptive radiotherapy

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Background The gold-standard image-guided radiotherapy (IGRT) protocol for cervical cancer (CxCa) is daily 3-dimentional volumetric verification registered to bony-anatomy with online soft-tissue target coverage assessment[1]. Adaptive radiotherapy (ART) is recommended[1] to reduce radiation dose to normal tissue[2-6], potentially reducing patient toxicity.

We developed a survey to elicit current UK CxCa IGRT practice, gold-standard concordance, ART uptake and implementation barriers.

Method Ten UK multidisciplinary radiotherapy experts piloted the survey. Their feedback on clarity and content was incorporated into the final iteration.

The 28-question CxCa IGRT and ART survey, was hosted on Microsoft forms July-September 2023. All 62 NHS radiotherapy centres were emailed the survey link.

Results Forty centres responded. All perform daily IGRT for CxCa: 36/40 use 3-dimentional, 4/40 utilise 3- and 2-dimentional imaging. Bony-anatomy registration with soft-tissue review is most common (n=23). 32/40 deliver specific CxCa IGRT training.

75% of respondents rated CxCa the pelvic site to benefit most from ART. Yet 30/40 do not deliver ART. The top five barriers were:

- Limited physics time/workforce
- Limited oncologist time
- Staff shortages
- Limited planning time/staff
- Limited therapeutic radiographer time/workforce

Ten centres employ ART utilising plan-of-the-day (n=6), online adaption (n=1) or reactive offline adaption (n=3). Interest in partaking in a CxCa ART training programme was high, 18/40 stated “Yes”, 19/40 stated “Maybe”.

Conclusion Concordance with gold-standard IGRT practice for CxCa is high however implementation of ART is low. The benefit of ART for CxCa is recognised, however considerable barriers exist. A centralised training programme could help overcome these, interest in participation is high.

Table

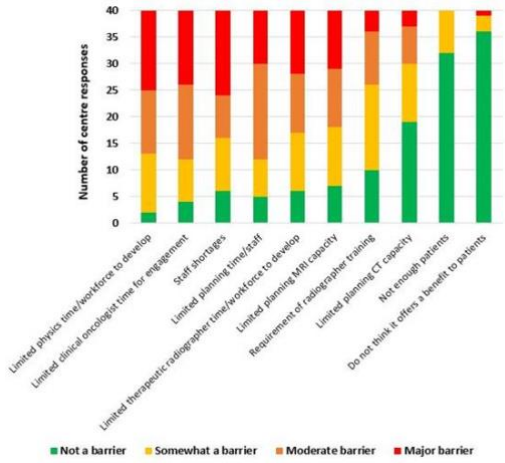

Figure: Barriers that made or are making implementation of cervical cancer adaptive EBRT a challenge.

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M2.4 Implementation of a late gastrointestinal (GI) effects of pelvic radiotherapy clinic led by Allied Health Professionals

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Pelvic Radiation Disease (PRD) can cause a range of chronic physical symptoms that can lead to psychological distress and social anxiety. Symptoms are often under-reported or misdiagnosed due to the limited knowledge of PRD amongst health care professionals1. Some of the GI symptoms experienced are entirely manageable with the correct diagnosis or the right supportive interventions2.

Lancashire Teaching Hospitals is piloting a service to manage late GI effects following pelvic radiotherapy. The service provides a multidisciplinary team approach, led by an Advanced Clinical Practitioner, Physiotherapist, and Dietitian; support from gastroenterology is available.

Aim Evaluate the need for the GI late effects service and the benefits of AHP collaboration, for complex and non-complex bowel presentations.

- Evaluate the number of referrals over 12months
- Classify interventions (complex or non-complex)
- Quantify dietetics input and physiotherapy referrals
- Evaluate pharmacological interventions used
- Evaluate patients' response to interventions
- Quantify confirmed diagnoses achieved
- Evaluate Gastroenterology input

Method The late effects data base provided the required data. Patient satisfaction and outcomes have been measured by pre and post Inflammatory Bowel Disease Questionnaires (IBDQ), Patients Global Impression of Change (PGIC) and Satisfaction Questionnaires

Results Fifty-nine new patient referrals were received, 82% of the patients were given dietetic interventions and 27% were seen by the physiotherapist. High levels of patient satisfaction and good response to treatment (IBDQ & PGIC) was shown. Conservative management (45%) and complex management (54%) is required across our patient population. Dietetic and physio support is integral to our specialist service.

References

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M2.5 Viability of treating prostate radiotherapy with an empty bladder protocol

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Background Prostate cancer patients treated follow a "bladder full" protocol for radiotherapy to move bladder and bowel out of high dose areas. This requires patients void and drink 500ml water 45-minutes prior to treatment/scanning. This protocol doesn't guarantee consistent bladder volumes. An empty-bladder protocol was trialled to help with patient comfort and smoother running of the radiotherapy service.
Methods 30-patients treated for low/intermediate risk cancer to prostate and seminal vesicles received an "empty-bladder" protocol and compared against the control: 30-patients in the same risk group.
Plan metrics compared: target coverage and conformity, organ-at-risk doses and complexity. Image matching times and ease were compared, along with number of occurrences when patients assessed for treatment and asked to re-prep.
Patient experience and acute toxicities compared utilising patient questionnaire and telephone CTCAE scoring.
Results Target coverage and most OAR doses were unaffected. Low dose rectum metrics increased, as did bladder metrics, but plans within protocol limits.
No significant difference between the groups XVI-auto-match to soft-tissue match.
Scan-no-treat rates due to bladder size where comparable, however a 36% reduction for bowel rescans and a 92% reduction in bladder scans was noted for the empty-bladder group.
Majority of acute toxicities had returned to baseline values at 3 & 6-months post treatment, no significant difference was seen between the groups.
Conclusions 30-prostate patients successfully treated with empty bladders. Plans and delivery logistics were similar leading to comparable toxicity results. However, time in department and on-set bladder/bowel issues were reduced leading to increased patient satisfaction.

M2.6 Optimising bowel and bladder preparation for patients undergoing prostate radiotherapy: A comparison study of two different preparation regimens

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Background This study aimed to compare the standard bowel and bladder preparation at the authors' department for patients undergoing prostate radiotherapy (micro-enema on the day of planning CT, daily micro-enemas during radiotherapy and a full bladder at CT and radiotherapy) with the recommendation by recent NIHR trials (micro-enemas 2 days before planning CT and on day of CT, micro-enemas for the first 10 fractions of radiotherapy and a partially-full bladder at CT and radiotherapy). Nationally, preparation regimens are inconsistent.
Method Two groups of 21 patients received 20 fractions of prostate IGRT. Group 1 followed standard preparation guidelines. Group 2 followed the new preparation. Data compared between the groups included:
*Number of patients requiring repeat CT appointments
*Number of repeated CBCT scans
*Week 4 treatment CTCAE lower GI toxicities
*Number of radiotherapy re-plans
Results Micro-enema use for 2 days before CT did not reduce the number of repeat CT appointments. There was no significant difference in the number of repeated CBCT scans fractions 11-20 for bowel issues (Group 1: M=0.86, SD 1.35, Groups 2: M=0.52, SD=1.03). Only 1 patient in Groups 2 required additional rectal preparation. The number of patients reporting CTCAE graded anal bleeding in Group 1 was higher than Group 2 (Group: 1 n=5, Group 2: n=1). The number of re-plans due to bladder issues was 3 in Group 1, and 1 in Group 2.
Conclusion Direct patient benefit was found with the new preparation. It has been implemented for patients undergoing prostate radiotherapy in the authors' department.