A5.5 Diagnostic efficacy of bi-parametric versus multiparametric magnetic resonance imaging for detection of prostate cancer in Thai patients

Chalida Aphinives; Lalita Tabkhampa; Kulyada Eurboonyanun

Faculty of Medicine, Khon Kaen University

Background: The bi-parametric MRI (bpMRI) is based on T2-weighted (T2W) imaging and functional sequences diffusion-weighted imaging (DWI). The multiparametric MRI (mpMRI) was composed of bpMRI and dynamic contrast enhancement (DCE). However, the value of DCE MRI in the detection of prostate cancer is still controversial.

Method: Retrospective analysis of 109 men who underwent mpMRI with prostate biopsy from January 2015 to March 2021. The bpMRI examination included T2W, DWI, and apparent diffusion coefficient map (ADC map), then added DCE to the mpMRI examination with masked clinical and laboratory information. Two diagnostic radiologists interpreted both examinations separately. The performance, diagnostic test accuracy, and subgroup analysis were analyzed.

Result: Around one-third (31.2%) of 109 patients were positive malignancies. The diagnostic accuracy of bpMRI was less than mpMRI, especially in the PI-RADS 3 group. The intra-observer agreement between bpMRI and mpMRI was moderate. The inter-observer agreement between the two readers was minimal agreement.

Conclusion: The mpMRI was more accurate in the detection of prostate cancer than bpMRI, especially in the PI-RADS 3 group.

1. Alabousi M, Salameh JP, Gusenbauer K, Samoilov L, Jafri A, Yu H, et al. Bi-parametric vs multiparametric prostate magnetic resonance imaging for the detection of prostate cancer in treatment-naïve patients: a diagnostic test accuracy systematic review and meta-analysis. BJU Int. 2019 Aug;124(2):209-220.
2. Thestrup KC, Logager V, Baslev I, Møller JM, Hansen RH, Thomsen HS. Bi-parametric versus multiparametric MRI in the diagnosis of prostate cancer. Acta Radiol Open. 2016 Aug 17;5(8).

Proffered papers: Standards and service development

B4.1 The acceptability of x as an alternative to physical grids to UK-based diagnostic radiographers

Emma Hyde

University of Derby

Background: Virtual Grid software uses a mathematical algorithm to remove radiation scatter and improve image contrast, without the need for a physical grid. It has been designed to enable radiation dose reduction whilst increasing image quality (Imaging Technology News, 2014; Radiopaedia, 2022). Despite the introduction of Virtual Grid software to the UK in recent years, anecdotal evidence suggests that there has been limited uptake and use. This study set out to investigate the acceptability of Virtual Grid software to UK-based Diagnostic Radiographers, by identifying the enablers and blockers to its use.

Method: Following ethical processes, a small-scale study is being undertaken to collect perceptions and opinions about the acceptability of the use of Virtual Grid software within the UK-based Diagnostic Radiography community. Qualitative data will be collected via online focus groups, which will be audio-recorded and transcribed verbatim. Transcripts will be analysed using thematic analysis to identify enablers and barriers to Virtual Grid software use, with the goal of increasing its' acceptability.

Results: Data collection will be starting in Spring 2023, and early results will be reported at UKIO 2023.

Conclusion: The use of Virtual Grid software has the potential to make a significant impact on radiographic practice, by supporting radiation dose reduction alongside improved image quality. Understanding the barriers and enablers to the use of Virtual Grid may help to support an increase in its acceptability and use.

1. Imaging Technology News (2014) Virtual Grid Adapts Contrast on X-rays to Improve Quality of Exams taken Without a Grid. Available at: https://www.itnonline.com/content/virtual-grid-adapts-contrast-x-rays-improve-quality-exams-taken-without-grid
2. Radiopaedia (2022) Virtual Grid. Available at: https://radiopaedia.org/articles/virtual-grid?lang=gb

B4.2 Implementation of a multidisciplinary team-centred research model in a clinical MRI department

Georgina Hopkinson[1]; Erica Scurr[1]; Geoff Charles-Edwards[2]; Dow-Mu Koh[2]; Christina Messiou[2]; Jessica Winfield[2]

[1]The Royal Marsden NHS Foundation Trust; [2]The Royal Marsden NHS Foundation Trust & The Institute of Cancer Research

Background: Research-active hospitals lead to improved patient outcomes(1,2,3,4). This has been embraced by the College of Radiographers, who reference research engagement from practitioner level in the recently published Education and career framework (5). However, significant staffing shortages across radiology (6,7,8) and clinical sciences (9) plus increasing workload overall(10) are barriers to research and development(11). With a growing portfolio of quality development projects, service evaluations and prospective imaging-led research an efficient model has been developed to integrate research and development into routine workflow in a busy NHS clinical MRI environment. We have completed 16 projects with radiographers or physicists as first or last authors using this method in 2022, shared at national and international level.

Purpose: This poster will provide an overview of the our developed workflow including step-by-step processes and case study examples in a way that could be adapted into practice by others.

Summary of contents: It will offer key learning experiences and share what we believe to be an exemplar model of multidisciplinary integration of quality development, service evaluation projects and research into a clinical MRI department, allowing patients to participate in prospective imaging research during their clinical visits. Our multidisciplinary model relies almost exclusively on existing clinical staff (radiographers, radiologists and physicists) and minimises additional patient visits. The group has demonstrated the value of multidisciplinary research by increasing capacity and capability in multiple areas including research methods, governance, patient recruitment and consent, data curation, data analysis and academic writing as well as reports of increased role satisfaction.

1: Downing A. et al, 2017, High hospital research participation and improved colorectal cancer survival outcomes: a population based study, Gut 2017 Jan;66(1):89-96. doi: 10.1136/gutjnl-2015-311308. Epub 2016 Oct 19 2: Ozdemir B. et al, 2015, Research activity and the association with mortality, PLoS One 2015 Feb 26;10(2):e0118253. doi: 10.1371/journal.pone.0118253. eCollection 2015 3: Jonker, L. & Fisher, S.J., 2018, The correlation between National Health Service trusts' clinical trial activity and both mortality rates and care quality commission ratings: a retrospective cross-sectional study, Public Health 2018 Apr;157:1-6 doi: 10.1016/j.puhe.2017.12.022. Epub 2018 Feb 10. 4: Jonker, L., 2019, Patients admitted to more research-active hospitals have more confidence in staff and are better informed about their condition and medication: Results from a retrospective cross-sectional study, Journal of Evaluation in clinical practice 2019 https://doi.org/10.1111/jep.13118 5: College of Radiographers, 2022, Education and Career Framework for the Radiography Workforce (4th Edition), 12604-CoR-ECF-Interactive-v9a (sor.org) 6: The Royal College of Radiologists. (2021). Clinical Radiology UK workforce census 2020 report. https://www.rcr.ac.uk/publication/clinical-radiology-uk-workforce-census-2020-report 7: The College of Radiographers. (2020). Diagnostic Radiography Workforce UK Census 2020. https://www.sor.org/getmedia/c83fbeca-5d8a-4bdc-98a7-526e49da08bb/CoR_diagnostic_radiography_workforce_uk_census_2020_report_v6 8: Pedersen, M., 2022, What motivates radiographers to start working with research?, Radiography Vol 29, Issue 1, pg 215-220 https://doi.org.10.1016/j.radi.2022.11.003 9: Institute of Physics and Engineering in Medicine, 2021, Report on the 2021 Survey of the Diagnostic Radiology and Radiation Protection Workforce. diagnostic-radiology-and-radiation-protection-workforce-report-on-2021-survey-final.pdf (ipem.ac.uk) 10: NHS England. (2020). Diagnostic Imaging Dataset Annual Statistics release 2019/2020. www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/10/Annual-Statistical-Release-2019-20-PDF-1.4MB.pdf 11: Rodrigues J.C.L. et al, (2022), Current pressure on the UK imaging workforce deters imaging research in the NHS and requires urgent attention, Clinical Radiology, Vol 77, Issue 12 Pg 913-919 https://doi.org/10.1016/j.crad.2022.07.015

B4.3 Lessons from leadership in wellbeing for healthcare staff

Reem Hasan; Amelia Staniland; Zosia Hedges; Ally Patten

InHealth

Purpose or Learning Objective: Healthcare is going through one of its most challenging periods in the UK with staffing and attrition a critical issue, so there has never been a more important time to focus on the health and wellbeing of our people. InHealth launched a new wellbeing strategy in 2022 with a wellbeing guardian and champions across the organisation to support this. This study investigates the impact and outcomes across a range of domains 18 months on.

Methods or Background: Analysis of quantative and qualitative data gathered over 18 months, looking at how the InHealth wellbeing strategy has influenced the following areas: Improving personal health and wellbeing, professional wellbeing support, environment, managers and leaders, fulfilment at work, relationships and data insights.

Results or Findings: Whilst looking after the wellbeing of staff is not a new concept for InHealth, this refreshed approach galvanises existing work and empowers staff to improve their health and wellbeing, and support each other on this journey. The wellbeing strategy is closely linked with the equality, diversity and inclusion strategy, ensuring a comprehensive and tailored approach. The results show significant improvements in all domains which contributes to mutual benefits for staff and the organisation.

Conclusion: Focusing on the wellbeing of the workforce should be a key priority for all industries, especially in healthcare. Benefits include a healthy and happy workforce, reduced sickness absence, better engagement and greater productivity and performance. This will lead to improved patient care and outcomes. Limitations None

NHS sickness absence rates – NHS Digital Thriving at Work: Stevenson/Farmer review of mental health and employers, 2017 BMA supporting health and wellbeing at work 2018 https://www.forbes.com/sites/nazbeheshti/2019/01/16/10-timely-statistics-about-the-connectionbetween- employee-engagement-and-wellness/?sh=58aada3b22a0 Workplace Burnout Survey | Deloitte US Health, Wellbeing and Productivity in the Workplace | RAND Work-life balance | Mental Health Foundation NHS Health and Wellbeing review, Boorman, 2009 https://www.england.nhs.uk/a-focus-on-staff-health-and-wellbeing/leadership-andmanagement/ Employee engagement, sickness absence and agency spend in NHS trusts, NHS England/The King's Fund, 2018

B4.4 Developing a reporting radiographer service within a private organisation

Siobhan Edwards-Bannon

Practice Plus Group, Portsmouth Urgent Treatment Centre

Background: Radiographer reporting has developed over the last 3 decades however creating a new reporting service within any organisation is challenging. This paper looks specifically at the challenges in developing a reporting service within the private sector, how those have been overcome to establish an in-house reporting service and how this has benefitted the organisation.

Learning Outcomes:

- Clearly outlining the steps taken to create a reporting service
- Understanding the challenges presented
- Understanding the benefits of the reporting service
- Exploring future developments

Summary of Content:

Introduction

- Briefly explaining the organisational structure and justifying the need for investment to develop a reporting service in a private provider of NHS services.

Challenges in implementation

- Education (Considerations of type of course, cost and location)
- Mentoring (finding a mentor without in-house support available)
- Preceptorship (creating a programme)
- Clinical Governance and framework for service (starting from scratch and understanding requirements)

Benefit of the Radiographer Reporting Service

- The value of reporting professionals on the imaging floor
- Staffing recruitment and retention
- Proving value of financial investment

Further Development of the service

- Creating a network
- Establishing reporting capacity to determine ability to increase workload

The Royal College of Radiologists (2022), Radiology reporting figures for service planning 2022, London: The Royal College of Radiologists.
The Royal College of Radiologists (2022), Clinical Radiology job planning guidance for consultant and SAS doctors 2022, London: The Royal College of Radiologists.
The Royal College of Radiologists (2019), CQC Radiology review: where are we now? London: The Royal College of Radiologists.

B4.5 Establishing the size and scope of the imaging support workforce: A first stage analysis of national workforce data in England

Julie Nightingale[1]; Beverly Snaith[2]; Sarah Etty[1]; Trudy Sevens[1]; Shona Kelly[1]

[1]Sheffield Hallam University; [2]University of Bradford

Background: Demand for diagnostic imaging is rising against a backdrop of persistently high workforce vacancies. Recent reports (Halliday et al 2020; Richard 2020) highlight support workers (including clinical support worker and assistant/associate practitioner roles) as a key enabler to unlock capacity and capability, yet there is sparse data relating to the size and scope of this workforce. This research addresses this evidence gap and will be the first comprehensive compilation of imaging support workforce data in England.

Method: Following ethical approval, anonymised data from NHS Electronic Staff Records (ESR) were analysed. The proportions of support workers within the imaging workforce and their employment bandings were analysed at NHS Trust, regional and national level. Data for one region was analysed in detail to establish inclusion and exclusion criteria for the wider dataset; accuracy was checked with other workforce data dashboards.

Results: Data related to Imaging Services from 137 NHS Trusts in England demonstrated wide variations. In the pilot region presented (22 Trusts) the support workforce as a proportion of the wider workforce was a mean of 27.8% (SD = 9.3), with wide variations in utilised grades. Data differed from workforce data dashboards and resources.

Conclusion: Known data recording inaccuracies within the ESR system resulted in discrepancies between the different workforce data dashboards. However, this census provides vital evidence of the scope and scale of the support workforce which is the first step in a multi-method research programme to determine how they can best contribute to imaging delivery, improving the patient experience and reducing health inequalities.

1. Halliday K, Maskell G, Beeley L, Quick E. NHS. Radiology GIRFT Programme National Specialty Report. November 2020. https://www.gettingitrightfirsttime.co.uk/wp-content/uploads/2020/11/GIRFT-radiology-report.pdf
2. Richards M. NHS England. Diagnostics: Recovery and Renewal, October 2020. Independent Review of Diagnostic Services for NHS England . Prof Sir Mike Richards. https://www.england.nhs.uk/publication/diagnostics-recovery-and-renewal-report-of-the-independent-review-of-diagnostic-services-for-nhs-england/

Proffered papers: Radiotherapy technical

C5.1 Literature review: Is there a clinical need for carbon ion radiotherapy in the UK?

Ellie Light; Pete Bridge

University of Liverpool

Background: The biological characteristics of Carbon Ion therapy can lead to lower grade toxicities and increased tumour response. This has led to Kirkby et al (2020) proposing that the UK would benefit from a heavy ion centre. There has, however, been limited discussion of patient cohorts, associated side effects and overall benefit to treatment. This review aimed to investigate the potential clinical benefits of a heavy ion centre.

Method: A search of the literature was conducted using PubMed and Science Direct with the search term "Carbon ion therapy". A critical review of the evidence was performed to evaluate the current clinical use of carbon ion therapy through analysing the associated toxicities, overall survival (OS), local control (LC), progression-free survival (PFS) and the incidence of secondary cancers.

Results: After critical appraisal with CASP, data was extracted from 81 papers. The findings indicated that carbon ion therapy has proven to be a more clinically effective treatment for malignancies such as nasopharyngeal tumours, chondrosarcoma and chordoma, inoperable bone and soft tissue sarcomas, non-small cell lung cancer, liver cancer and prostate cancer. More work is needed to strengthen the evidence base for some other tumour types.

Conclusion Carbon ions show promising survivorship along with few adverse effects for some tumour sites, suggesting strong clinical gains for a carbon ion facility. Whilst other malignancies have shown promising data, higher quality evidence is needed to establish value for them.

1. Kirkby, K.J., Kirkby, N.F., Burnet, N.G., Owen, H., Mackay, R.I., Crellin, A., Green, S. (2020) Heavy charged particle beam therapy and related new radiotherapy technologies: The clinical potential, physics and technical developments required to deliver benefit for patients with cancer. Br J Radiol. 93(1116):20200247

C5.2 Using ProKnow to audit post implant dosimetry of I-125 prostate brachytherapy implants: DVH comparison with Oncentra Prostate and Variseed

Daniel Emmens[1]; Katie McHugh[2]

[1]Maidstone and Tunbridge Wells NHS Trust; [2]Cambridge University Hospitals NHS Foundation Trust

Background: A group of NHS Trusts would like to use the ProKnow software to audit post implant dosimetry for prostate patients receiving brachytherapy with I-125 seeds. Comparisons will be made between Trusts and against RCR minimum standards[1]. The impact of using ProKnow for this audit depends upon differences between its own DVH calculation engine and the participating Trusts' treatment planning systems' (TPS). An NHS task group has looked at these differences for EBRT, but brachytherapy plans have steeper dose gradients and higher maximum doses.