Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Radiology staff perspectives after decommissioning an artificial intelligence (AI) tool for expedited lung cancer triage

Jack Packer
1. Epsom & St Helier University Hospitals NHS Trust https://orcid.org/0009-0003-9627-1701
Geraldine Dean
1. Epsom & St Helier University Hospitals NHS Trust https://orcid.org/0009-0003-6063-0194
Mathew Storey
St George's University Hospital https://orcid.org/0000-0003-2258-0360
Christina Malamateniou
City St George's University of London https://orcid.org/0000-0002-2352-8575
Susan Cheng Shelmerdine
susan.shelmerdine@gosh.nhs.uk

Great Ormond Street Hospital for Children NHS Foundation Trust https://orcid.org/0000-0001-6642-9967

Research Article

Keywords: AI, decomissioning, chest X-ray, lung cancer

Posted Date: February 25th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8941291/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Abstract

Objectives: Adoption of artificial intelligence (AI) in radiology is well described, but little is known about staff attitudes when tools are withdrawn. This study examined how AI decommissioning influenced radiology staff perceptions of workflow, patient care, and future digital innovation.

Methods: Anonymous electronic survey was distributed to all radiology staff at a multi-site NHS Trust following decommissioning of a commercially available CXR AI triage tool used to expedite patients for same-day CT chest. Surveys conducted during AI adoption at three time points (pre-implementation, early post-implementation, and late post-implementation) have previously been published. This fourth survey repeated key items from earlier phases with additional questions specific to AI decommissioning. Responses were compared across phases.

Results: The response rate was comparable to prior rounds at 21.4% (40/187). Post-decommissioning, belief that AI had improved patient care remained high (70.0% versus 71.1%, 65.5%, and 67.9%). Simultaneously, 35% recalled that AI had caused logistical issues (higher than at late post-deployment, 26%). Personal comfort with AI being used on one's own healthcare imaging was low post-withdrawal (25.6% versus 31.1%, 48.3%, and 47.2% previously). Among reporting staff, 40% (2/5) were disappointed to no longer use the tool, while 20% (1/5) reported reliance on it. Free-text responses described relief at reduced workflow disruption and emotional burden (from frontline radiographers), alongside regret over lost patient benefits.

Conclusions: Decommissioning generated mixed responses, combining operational relief with perceived loss of clinical benefit. This highlights the importance of proactively managing AI withdrawal through clear communication and attention to staff expectations.

INTRODUCTION

Artificial intelligence (AI) systems are increasingly used to support radiology workflows, particularly in high-throughput modalities such as chest radiography. National evaluations, including the Artificial Intelligence Diagnostic Fund (AIDF), have demonstrated that successful deployment depends not only on technical performance but also on staff engagement, infrastructure and organisational readiness[1]. Much of the existing literature focuses on adoption and implementation, describing technical performance, workflow integration and early user acceptance [2]. In contrast, little attention has been paid to what happens when an AI tool is withdrawn from practice.

In parallel, the healthcare improvement evidence has developed robust frameworks for de-implementation of procedures with the systematic reduction of clinical practices that are ineffective or harmful[3]. Campaigns such as "Choosing Wisely" illustrate how withdrawing low-value interventions can improve patient safety and resource allocation[4]. However, digital and AI technologies have received less attention with regards to this topic.

Technology frameworks such as NASSS (Non-adoption, Abandonment, Scale-up, Spread and Sustainability) emphasise that complex technologies may be abandoned when they generate excessive organisational or cognitive burden[5]. Yet empirical data on the psychological and operational consequences on people and processes of withdrawing a functioning digital tool remain sparse. Repeated exposure to short-lived pilots or abruptly discontinued systems may also contribute to lack of trust and innovation fatigue, whereby staff become less willing to invest effort in future digital projects [6].

Previous work has evaluated changes in NHS radiology staff attitudes and perceptions towards AI for medical imaging across three time-phases during the implementation of a chest radiography AI triage tool (6 weeks pre-implementation, early post-implementation (1 month after 'go live') and late post-implementation (at 6 months after 'go live') [7]. This AI tool was designed to flag suspected lung cancer on out-patient referred chest radiographs, so that the patient could be referred for an expedited same-day CT chest examination whilst in the radiology department, rather than incur a delay waiting for the chest radiograph report and onward CT appointment several days later.

Unfortunately, despite multiple benefits, including halving the time to CT within this AI-enabled patient pathway over a 2-year period [8], further funding for the AI tool was unavailable, and the software was decommissioned in June 2025.

The aim of this study is therefore to build upon prior work evaluating staff attitudes to AI adoption [7], with a further timepoint – 2 months post-decommissioning. We evaluate staff attitudes after withdrawal of our AI system, and compare these with the earlier phases, to explore how decommissioning influences perceptions of workflow, patient care and attitudes towards future digital innovation.

MATERIALS AND METHODS

This work was registered as a quality improvement project within our trust with the code RAD007, hence ethical approval was not required. The survey was anonymous without asking for personal data and respondents gave consent at the beginning of the survey for the results to be used for research and education purposes.

AI tool and Clinical Pathway

The study was conducted in a multi-site NHS Trust comprising two district general hospitals and three community imaging units in Southwest London. The decommissioned AI tool was a commercially available algorithm that analysed outpatient GP referred CXRs at the point of image acquisition. Cases flagged as suspicious for lung cancer to the diagnostic radiographer taking the x-ray prompted them to ask for an immediate review by a Reporting Radiographer or Consultant Radiologist and, if results with AI corroborated, the diagnostic radiographer would then arrange for a same-day CT chest imaging appointment and inform the patient of the next steps.

Full details of the AI configuration, accuracy, changes in pathway processes and the initial three survey waves (pre-implementation, early post-implementation and late post-implementation) have been reported previously [7,8].

Decommissioning

The AI tool was decommissioned in June 2025 following the expiration of short-term pilot funding. Staff were informed two weeks before the withdrawal via departmental email communication, and the system was disabled without a transitional period or replacement pathway. Decommissioning meant that the AI no longer analysed CXRs at the point of acquisition or generated real-time flags for potential lung cancer.

Following decommissioning, the clinical pathway reverted to a fully human-led process. Diagnostic radiographers continued to assess CXRs at the time of acquisition and could contact a reporting radiographer or radiologist if an abnormality was suspected. Same-day CT remained possible as the slots were also maintained, but escalation now relied on diagnostic radiographer recognition of suspicious findings at time of imaging, and their discretion to inform reporting colleagues, rather than automated AI prompts. As a result, the opportunity for rapid CT referral remained possible, but without the systematic real-time triage previously provided by the AI tool. Reporters were asked to prioritise GP CXR referrals within their workflow to help maintain a rapid reporting turnaround given lack of automated flagging of potentially abnormal cases.

Decommissioning survey

Two months after the AI tool was decommissioned, an anonymous electronic survey was distributed to all radiology staff (radiologists, reporting radiographers, non-reporting radiographers and administrative staff) via the same departmental email lists and internal messaging channels as per prior AI adoption surveys performed. The first survey invitation was circulated on 27th August 2025 with reminder emails circulated on 8th September 2025 and 14th October 2025. The survey remained open for approximately 8 weeks (closing on 17 October 2025.).

The decommissioning survey was based on the original surveys[7], but only slightly adapted. The 24 retained items included key Likert-scale statements regarding perceptions of patient care, departmental logistics and personal comfort with AI were repeated and unchanged to enable consistent comparison across all four timepoints.

Four questions were re-phrased to reflect the post-AI context (e.g. current reporting times and perceived diagnostic accuracy without AI).

Five additional questions specifically addressed the experience of AI removal, including perceived changes in workload, emotional impact of no longer managing AI-positive flags, and reflections on how decommissioning influenced communication and attitudes towards future AI.

Most attitudinal items used 5-point Likert scales (1 = strongly disagree to 5 = strongly agree). A single-choice question asked respondents to select the main positive factor they felt the AI had previously brought to the department, and another asked for the main drawback. Free-text boxes captured more detailed reflections. The full survey is accessible via the **Supplementary Material Appendix 1**.

Participants

All radiology staff (radiographers and radiologists, administrative and technical staff) employed at the Trust across the different clinical sites were eligible to participate. Participation was voluntary and no incentives were offered. For this analysis, we included the responses where at least partial completion of the attitudinal items was ascertained.

All staff were included in this work to standardise our methodology with our prior surveys, and to ensure we could capture any second-hand opinions and ideas that clinical staff may have shared with other department members but not feel confident reporting themselves.

Statistical analysis

Descriptive statistics (frequency and percentages) were calculated for each survey item at the decommissioning timepoint. For Likert items, “agreement” was defined as a scored response of 4 (agree) or 5 (strongly agree) on a scale ranging from 1 to 5. Where closely comparable items existed in the previous three surveys, we report the decommissioning results alongside the earlier percentages to illustrate trends over time. Absolute frequencies and percentages for each Likert response category are reported in the **Supplementary Appendix.**

Subgroup analyses were performed for reporting staff (radiologists and radiographers who reported chest radiographs, and may have used the AI tool for assistance in reporting) versus non-reporting radiography staff (e.g. radiographers conducting the imaging tests, who had access to AI outputs to trigger onward review, but were not making final diagnostic decisions relating to the imaging) to explore differences in perceived reliance and attitudes towards AI.

Free-text responses were analysed using simple inductive content analysis[9] to identify recurring themes relating to workflow, emotional burden and perceptions of patient impact.

RESULTS

Respondent characteristics

Forty staff members (40/187, 21.4%) completed the decommissioning survey. The majority were radiographers (36/40, 90%) with the remainder comprised of administrative staff (2/40, 5%), a consultant radiologist and one assistant practitioner. Five respondents (12.5%) reported that they routinely reported

CXRs (radiologists or reporting radiographers). Most respondents had direct patient contact in their role and spanned a broad range of age groups and years of experience, with ages ranging from 21 to 70 years (mean 43.8 years) and experience ranging from less than one year to more than twenty-one years (mean 14.0 years) (Table 1).

Table 1

Demographics of survey respondents at different survey periods. Percentages of responses at each of the three time periods is calculated by using the total responses as the denominator for the relevant time period.

	Pre-implementation	Post-implementation (Early)	Post-implementation (Late)	Decommissioning
Date of survey	1 Oct – 1 Nov 2022	19 Jan – 19 Feb 2023	15 July – 15 Aug 23	27 August – 14 Oct 2025
Total Responses (response rate, n = 195)	45 (23.1%)	29 (14.9%)	53 (27.2%)	40 (21.4%)
Job Role				
Radiologist (consultant)	10 (22.2%)	3 (10.3%)	1 (1.9%)	1 (2.5%)
Radiographer (qualified)	26 (57.8%)	21 (72.4%)	36 (67.9%)	36 (90%)
Sonographer (qualified)	2 (4.4%)	1 (3.4%)	9 (17.0%)	0
Assistant Practitioner	0	1 (3.4%)	2 (3.8%)	1 (2.5%)
Administrative Staff	6 (13.3%)	3 (10.3%)	5 (9.4%)	2 (5%)
IT/PACS staff	1 (2.2%)	0	0	0
Age				
under 21 years	1 (2.2%)	0	0	
21– 30 years	7 (15.6%)	5 (17.2%)	12 (22.6%)	7 (17.5%)
31– 40 years	10 (22.2%)	8 (27.6%)	14 (26.4%)	10 (25%)
41– 50 years	13 (28.9%)	7 (24.1%)	14 (26.4%)	11 (27.5%)
51– 60 years	7 (15.6%)	5 (17.2%)	7 (13.2%)	7 (17.5%)
61–70 years	7 (15.6%)	4 (13.8%)	6 (11.3%)	5 (12.5%)
over 71 years	0	0	0	
Experience in job role (years)				
under 1 year	4 (8.9%)	1 (3.4%)	1 (1.9%)	2 (5%)
1–5 years	6 (13.3%)	5 (17.2%)	12 (22.6%)	7 (17.5%)
6–10 years	10 (22.2%)	5 (17.2%)	11 (27.8%)	8 (20%)

	Pre-implementation	Post-implementation (Early)	Post-implementation (Late)	Decommissioning
11–20 years	10 (22.2%)	12 (41.4%)	19 (35.8%)	10 (25%)
Over 21 years	15 (33.3%)	6 (20.7%)	10 (18.9%)	13 (32.5%)
Direct patient contact in job role?				
Yes	37 (82.2%)	26 (89.7%)	48 (90.6%)	37 (92.5%)
No	8 (17.8%)	3 (10.3%)	5 (9.4%)	3 (7.5%)
Reporting responsibilities for chest radiographs?				
Yes	13 (28.9%)	9 (31.1%)	10 (18.9%)	5 (12.5%)
No	32 (71.1%)	20 (68.9%)	43 (81.1%)	35 (87.5%)
Have you had much experience interacting with the AI tool since it was implemented?				
Yes, a lot	Not applicable	7 (24.1%)	24 (45.3%)	21 (52.5%)
Yes, some		11 (37.9%)	13 (24.5%)	14 (35%)
Yes, indirectly		4 (13.8%)	10 (18.9%)	1 (2.5%)
No, none		7 (24.1%)	6 (11.3%)	4 (10%)

Full distributions of Likert-scale responses (scores 1–5) for all survey items at each timepoint are provided in the **Supplementary Appendix (Tables S1 - S6).** These tables present absolute response counts and percentages for each Likert category, alongside summary statistics (mean, median and mode).

General Opinions of AI

Decommissioning did not reverse staff support for AI use in chest radiograph triage as a concept. Agreement that AI in general should be used to prioritise urgent chest abnormalities remained high after withdrawal (85% agreed or strongly agreed at decommissioning compared to 77.8–82.7% across prior survey phases). In contrast, autonomous AI diagnosis remained unfavourable, with 75% disagreement for an AI to report chest radiographs independently at decommissioning, similar to levels of disagreement during post-implementation phases (75.9% and 72.5%) and higher than at pre-implementation stage (53.3%). Support for human-in-the-loop models strengthened after AI removal, with 92.3% of respondents agreeing that radiologists or reporting radiographers should continue to review chest radiographs with AI acting as triage aid (compared to 86.7% – 89.7% agreement at prior survey phases) **(**Fig. 1, **Table S2).**

Despite AI withdrawal, perceptions of its influence for patient benefit remained stable. At decommissioning, 70% of respondents agreed or strongly agreed that AI use had improved patient care, consistent with earlier survey phases (ranging between 65.5–67.9% agreement). Perceived logistical burden regarding AI use increased after AI removal, with 35% of respondents agreeing or strongly agreeing that AI had caused departmental logistical problems, a proportion similar to pre-implementation expectations (33.3%), and higher than at late post-implementation (26.4%) **(**Fig. 2, **Table S2).**

Personal comfort with AI use declined after decommissioning. Only 25.6% of respondents agreed or strongly agreed that they would be comfortable with AI diagnosing their own chest radiograph, compared to 47.2% at late post-implementation, and 48.3% at early post-implementation. (**See** Figs. 1, 2, **Tables S1, S2).**

When asked to retrospectively identify the main benefits of the AI tool, almost half of the respondents (16/40, 40.0%) chose faster access to follow-up care, and about a third (13/40, 32.5%) selected time saving for patients and the department. Whilst the proportion of responses changed over the different survey phases, these two factors remained consistently the most frequently selected benefits across time (Table 2, Fig. 3a).

Table 2

Main perceived drawbacks and benefits of AI implementation for the radiology department (n, %).

	Pre-implementation (P) (n = 45)	Early Post-implementation (E) (n = 29)	Late Post-implementation (L) (n = 53)	Decommissioning (D) (n = 40)
Perceived Benefits				
Allow patients faster follow-up care	14 (31.1)	15 (51.7)	30 (50.8)	16 (40%)
Cost saving for department	1 (2.2)	0 (0.0)	0 (0.0)	6 (15%)
Increase digital education of AI for staff	3 (6.7)	5 (17.2)	2 (3.8)	5 (12.5%)
Reduce workload on radiology staff	1 (2.2)	1 (3.4)	0 (0.0)	N/A
Time saving for the department and patient	26 (57.8)	8 (27.6)	18 (34.0)	13 (32.5%)
No benefit	0 (0.0)	0 (0.0)	3 (5.7)	1 (2.5%)
Perceived Drawbacks				
Cause disengagement with the use of AI in radiology	7 (15.6)	1 (3.4)	1 (1.9)	1 (2.5%)
Increase time for the department and patient	20 (44.4)	0 (0.0)	8 (15.1)	4 (10.0%)
Increase workload for radiology staff	5 (11.1)	12 (41.4)	9 (17.0)	15 (37.5%)
No change to patient outcome or treatment	1 (2.2)	1 (3.4)	1 (1.9)	3 (7.5%)
No drawbacks	4 (8.9)	4 (13.8)	14 (26.4)	6 (15.0%)
Reduced satisfaction at work for staff	6 (13.3)	3 (10.3)	3 (5.7)	4 (10.0%)
Challenging conversations with	1 (2.2)	1 (3.4)	1 (1.9)	N/A

	Pre-implementation (P) (n = 45)	Early Post-implementation (E) (n = 29)	Late Post-implementation (L) (n = 53)	Decommissioning (D) (n = 40)
Perceived Benefits				
patients				
Risk of job loss	1 (2.2)	0 (0.0)	1 (1.9)	N/A
Reduce skills of radiology staff	0 (0.0)	1 (3.4)	1 (1.9)	N/A
Increased costs to department	0 (0.0)	5 (17.2)	14 (26.4)	8 (20.0%)
More mistakes in radiology reports	0 (0.0)	1 (3.4)	0 (0.0)	N/A

Increased workload for radiology staff was the most frequently cited drawback after decommissioning (35.0%) (similar to early implementation levels at 41.4%), followed by increased departmental costs (22.5%). Notably, concerns regarding increased time for patients to re-attend for follow up imaging or were substantially lower than pre-implementation expectations (10% vs 44.4%) and 12.5% of respondents did not think there were any drawbacks to the AI tool (reduced from 26.4% at late post-implementation), with an identical proportion (12.5%) reporting reduced satisfaction at work after decommissioning (an increase from 5.7% at late post-implementation) (Table 2, Fig. 3b).

Specific AI tool feedback (for staff with direct AI interaction)

Among staff who reported direct interaction with the AI tool (n = 36), perceived improvements in the reporting turnaround times, accuracy and patient experience and referring clinician experience were highest during active AI use, and declined following decommissioning. **(See** Fig. 4, **Table S3 – S4).**

Specific AI tool feedback (from reporters)

Reporter-specific responses at decommissioning were limited (n = 5). Whilst two reporters (40%) expressed disappointment at no longer using the AI tool, only one (20%) admitted to feeling reliant on the tool for their practice. Most responses clustered around neutrality for perceived impacts on speed and accuracy. Comments from reporting staff described the tool as a useful “safety net” that helped mitigate the risk of missing subtle findings, even if it did not fundamentally replace their own judgement. **(See** Fig. 5, **Table S5 – S6).**

Administrative Staff

Two administrative staff members responded to the decommissioning survey. Although numbers were too small for separate quantitative analysis, their responses suggested that removal of the AI tool was associated with fewer same-day escalations and a shift away from reactive pathway coordination, which was perceived as increasing the time to follow-up for some patients.

When reflecting on the period of AI use, one respondent highlighted perceived time savings for both the department and patients due to the radiographers taking over the pathway, while the other noted benefits related to learning and digital education around AI.

Free text responses

Overall, free-text responses reflected a combination of operational relief but also a sense that something clinically valuable had been lost (**See Supplementary Material Appendix ,Table S7**).

Several radiographers described the workflow as calmer and less fragmented after decommissioning, attributing this to the removal of real-time alerts that previously increased interruptions, time pressure and emotionally challenging patient conversations. Others noted that while some operational burden had eased, benefits associated with the AI pathway – such as more rapid escalation to CT - were no longer present.

Concerns raised following AI withdrawal included the loss of a rapid triage mechanism, the potential for subtle abnormalities to be missed without AI support, and disappointment that a tool perceived as clinically useful had been removed. Some respondents (both reporters and non-reporters) viewed decommissioning as a step backwards in digital innovation and a reduction in learning opportunities previously afforded by AI-highlighted findings.

Non-reporting radiographers highlighted the emotional and administrative demands of the AI-enabled pathway during live deployment, including managing patients flagged for same-day CT prior to definitive diagnosis and co-ordinating escalation. For these staff, AI withdrawal was perceived as reducing emotional and administrative burden although others expressed concern that the removal of AI might result in slower diagnostic escalation for patients.

Discussion

This study has demonstrated that staff experiences following AI tool decommissioning are complex, contextual based on staff roles and are reflecting both operational relief and clinical benefit loss. Many reported that their clinical workflow felt simpler without the need to act upon AI triage results, although belief that the AI tool had positively contributed to patient care remained high, with a subset of reporting staff expressing disappointment at its removal. Notably, personal comfort with AI applied to one's own imaging (if one were a patient) fell to its lowest level after withdrawal, despite having been high during early active deployment.

Comparison with earlier implementation phases

Our previous analysis across the pre-implementation, early and late implementation phases closely mirrored the well-known 'Gartner Hype Cycle' pattern [10], with early enthusiasm, a peak of frustration as logistical challenges emerged, and later partial adaptation. Our decommissioning data indicates that once the AI tool was removed, staff were more explicit in discussing operational disruptions it had created, particularly those related to real-time triage and coordination for same-day CT imaging. At the same time, the consistently high proportion of staff stating that AI improved patient care indicates a clear trade-off between managing operational difficulties and perceived clinically added value.

The decline in willingness to have AI used on one's own chest radiograph after decommissioning may indicate a preference for human-led diagnosis at the individual level, despite acceptance of AI as a population-level triage mechanism. A consistent theme in the decommissioning responses was the tension between the tool's high sensitivity (and consequently high false positive burden) and the emotional labour this created for radiographers in difficult discussions with patients. These experiences suggest that although radiographers valued the safety afforded by the high sensitivity at a systems level, the workflow and emotional implications contributed to mixed feelings about the tool in practice.

Reporters, in contrast, valued AI as a decision support tool and a safety net during image interpretation. Unlike diagnostic radiographers, they were not typically involved in direct patient communication at the point of triage and were therefore less exposed to the emotional weight of managing patient anxiety in response to AI-enabled positive findings. Nonetheless, the positive feedback for the AI tool is not without risk. One reporter expressed growing reliance upon the tool for work and disappointment at removal. Whilst this aspect was not fully explored in our work, it highlights how 'automation bias' may creep into practice, potentially leading to deskilling within the profession with long term AI usage, an already recognised phenomenon with AI use in radiology[11].

Comparison with wider literature

Relatively few studies have examined decommissioning of functional digital tools in healthcare. Broader digital health and implementation science literature has described phenomena such as non-adoption, abandonment and limited sustainability, but often focuses on technologies that fail to embed rather than those that are actively withdrawn after successful pilot use [12]. Removing low-value care is typically viewed as a positive step however, withdrawing a functional AI triage tool due to external constraints (such as from funding constraints, contract expiry, changes in strategic priorities, staff changes) may be experienced as a loss of capability rather than an improvement in care.

When a tool perceived as clinically useful is withdrawn for reasons unrelated to performance, some staff may experience this as the loss of a valuable component of their daily work (sometimes referred to in the literature as 'moral distress or moral injury'[13], stemming from the dissonance between sense of purpose and actual practice). Such withdrawal can disrupt established workflows, reduce confidence in the stability of digital initiatives, reduce trust in managerial decisions and create uncertainty about the longevity or scope of future innovations. Staff witness care quality decline for administrative purposes outside their control which could mean that repeated cycles of short-term pilots could reduce their

willingness to engage with future digital investment projects. This has been documented in broader literature and the term “provider technology fatigue” and burnout has recently been coined to represent this phenomenon [6]..

Decommissioning as proactive risk management

Recent frameworks examining automation withdrawal in high-reliability organisations emphasise that decommissioning should be recognised as an active stage in the technology lifecycle rather than an administrative end point [14]. This perspective reframes our experience and rather than viewing AI tool removal as a failure, it should be viewed as a foreseeable risk requiring systematic management strategies comparable to equipment failure or supply chain disruption.

We propose the concept of an “AI Off-Boarding Protocol” as one might for an employee or for high-reliability tools which could be conducted across three phases – namely i)pre-withdrawal (dependency audits, skill baseline testing, AI off drills); ii)transition (phased removal of the AI tool rather than abrupt cessation) and finally iii)post-withdrawal (extended retraining as needed, performance monitoring and psychological support). A phased approach in our situation may have allowed for incremental workflow adjustments whilst maintaining perceived patient safety benefits during transition and less conflicted feelings amongst staff at the end.

Limitations

There are several limitations to our study. Our sample size was small and predominantly composed of radiographers. Whilst radiographers were central to the AI triage workflow, the findings of the survey may limit generalisability to other professional groups or clinical actors with a different skill set, roles or responbilities. Furthermore, the survey was conducted in a single, multi-site NHS Trust using one particular AI tool, and may not be generalisable to other settings, AI tools or use cases. As with all survey studies, responses are subject to self-selection and social desirability biases[15]. We did not collect qualitative interview data to explore attitudes in greater depth due to anonymity of replies, which was intentionally preserved to create psychological safety in sharing views about the AI tool. We also did not survey referring clinicians or patients directly, so our inferences about their experiences are limited and based on second hand staff perceptions. Finally, although administrative staff were invited to participate and two administrative team members responded, their small number limited our ability to meaningfully assess how decommissioning affected administrative workload or task redistribution following AI withdrawal.

Implications for future clinical practice and digital decommissioning

This study adds to the literature by capturing staff experiences across the full lifecycle of an AI tool from pre-implementation to decommissioning. Our findings support the notion that decommissioning should be recognised as an active stage in the technology lifecycle than an administrative endpoint. Radiology departments implementing AI tools should proactively address sustainability planning, including how

tools may be funded after a pilot study and pro-actively communicate this with staff to avoid downstream disappointment when a well performing AI tool is withdrawn. When preparing to withdraw an AI tool, clear communication for both staff and patients is vital and a period of preparation is essential. Explaining the rationale for withdrawal and acknowledging the effort staff invested in adopting the system may help maintain trust during transition and for future AI initiatives.

Careful workflow planning is also crucial. Fallback pathways need to be robust, with clearly defined processes for urgent triage and escalation to maintain patient safety without automated prompts. Importantly, our work highlights the emotional toll and additional workload generated by real-time AI triage. Radiographers frequently described the challenge of managing patient anxiety triggered by flagged findings diminished once the system was removed, even though some clinical advantages were lost. This asymmetric balance between emotional labour and perceived benefit should be considered when adopting, withdrawing or modifying AI tools. Frank discussions with the frontline staff about their willingness to undertake such work including provisions for additional customised training, staffing and time should occur upfront.

Finally, to support a positive innovation culture, organisations should avoid cycles of pilot adoption followed by early withdrawal and should involve staff in decisions regarding continuation or decommissioning. Embedding decommissioning considerations within broader AI governance frameworks may promote more sustainable digital transformation in radiology.

Conclusion

Decommissioning a chest radiograph AI triage tool in an NHS Trust was associated with both operational relief and a sense of clinical loss. Staff perceived the AI-enabled pathway as logistically demanding but consistently believed that it had improved patient care, with some reporters regretting its removal. The end of an AI project can shape future attitudes towards digital innovation as much as its deployment. Those embarking on AI implementation should recognise that decommissioning planning, with attention to staff experience and sustainability is essential for maintaining trust and engagement in subsequent AI initiatives.

Abbreviations

AI	Artificial Intelligence
AIDF	Artificial Intelligence Diagnostic Fund
CT	Computed Tomography
CXR	Chest X-Ray
GP	General Physician / Family Doctor

IT	Information Technology
ML	Machine Learning
NASSS	Non-adoption, Abandonment, Scale-up, Spread and Sustainability
NHS	National Health Service
NOLCP	National Optimal Lung Cancer Pathway
PPIE	Patient and Public Involvement and Engagement
RIS	Radiology Information System
UK	United Kingdom

Declarations

Declaration of Generative AI and AI-Assisted Technologies:

The authors did not use generative AI or AI-assisted technologies in the preparation of this manuscript.

Acknowledgements:

We thank Daniel Togher, Jo Moon, Richard Mayola, Arman Medina, Jadwiga Repec, Moesha Meheux, Sarah Mather, Simon Rickaby and Mohamed Ziad Abubacker for their contributions to the earlier phases of this longitudinal survey project, and for supporting the implementation of the AI pathway within the department.

References

1. Ramsay AIG, Crellin N, Lawrence R et al (2025) Procurement and early deployment of artificial intelligence tools for chest diagnostics in NHS services in England: a rapid, mixed method evaluation. eClinicalMedicine 89:103481. https://doi.org/10.1016/j.eclinm.2025.103481
2. Najjar R (2023) Redefining radiology: A review of artificial intelligence integration in medical imaging. Diagnostics (Basel) 13(17):2760. 10.3390/diagnostics13172760
3. Cliff BQ, Avanceña ALV, Hirth RA, Lee SYD (2021) The impact of Choosing Wisely interventions on low-value medical services: a systematic review. Milbank Q 99(4):1024–1058. 10.1111/1468-0009.12531
4. Grimshaw JM, Patey AM, Kirkham KR, Hall A, Dowling SK, Rodondi N et al (2020) De-implementing wisely: developing the evidence base to reduce low-value care. BMJ Qual Saf 29(5):409–417. 10.1136/bmjqs-2019-010060

5. Shin HD, Hamovitch E, Gatov E, MacKinnon M, Samawi L, Boateng R et al (2025) The NASSS (Non-Adoption, Abandonment, Scale-Up, Spread and Sustainability) framework use over time: A scoping review. PLOS Digit Health 4(3):e0000418. 10.1371/journal.pdig.0000418
6. Hilty DM, Armstrong CM, Smout SA, Crawford A, Maheu MM, Drude KP et al (2022) Findings and guidelines on provider technology, fatigue, and well-being: scoping review. J Med Internet Res 24(5):e34451. 10.2196/34451
7. Togher D, Dean G, Moon J, Mayola R, Medina A, Repec J et al (2025) Evolution of radiology staff perspectives during artificial intelligence (AI) implementation for expedited lung cancer triage. Clin Radiol 81:106704. 10.1016/j.crad.2024.09.010
8. Storey M, Packer J, Sangvik Grandal N et al (2025) Early clinical evaluation of AI triage of chest radiographs: time to diagnosis for suspected cancer and number of urgent CT referrals. NEJM AI 3(1). https://doi.org/10.1056/AIcs2500539
9. Elo S, Kyngas H (2008) The qualitative content analysis process. JANm Leading globasl Nursing Research. https://doi.org/10.1111/j.1365-2648.2007.04569.xDigital Object Identifier (DOI)
10. Dedehayir O, Steinert M (2016) The hype cycle model: A review and future directions. Technol Forecast Soc Change 108:28–41. https://doi.org/10.1016/j.techfore.2016.04.005
11. Savardi M, Signoroni S, Benini S, Vaccher F, Alberti M, Ciolli P et al (2025) Upskilling ot deskilling? Measurable role of an AI-supported training for radiology residents: a lesson from the pandemic. Insights into Imaging 16(1):23. 10.1186/s13244-024-01893-4
12. Ahmed MI, Spooner B, Isherwood J, Lane M, Orrock E, Dennison A (2023) A systematic review of the barriers to the implementation of artificial intelligence in healthcare. Cureus 15(10):e46454. 10.7759/cureus.46454
13. Cartolovni A, Stolt M, Scott P, Suhonen R (2021) Moral injury in healthcare professionals: A scoping review and discussion. Pubmed 28(5):590–602. 10.1177/0969733020966776
14. Chambers DA, Glasgow RE, Stange KC (2013) The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. Implement Sci 8:117. https://doi.org/10.1186/1748-5908-8-117
15. Campbell S, Greenwood M, Prior S, Shearer T, Walkem K, Young S et al (2020) Purposive sampling: complex or simple? Research case examples. J Res Nurs 25(8). 10.1177/1744987120927206

Figures

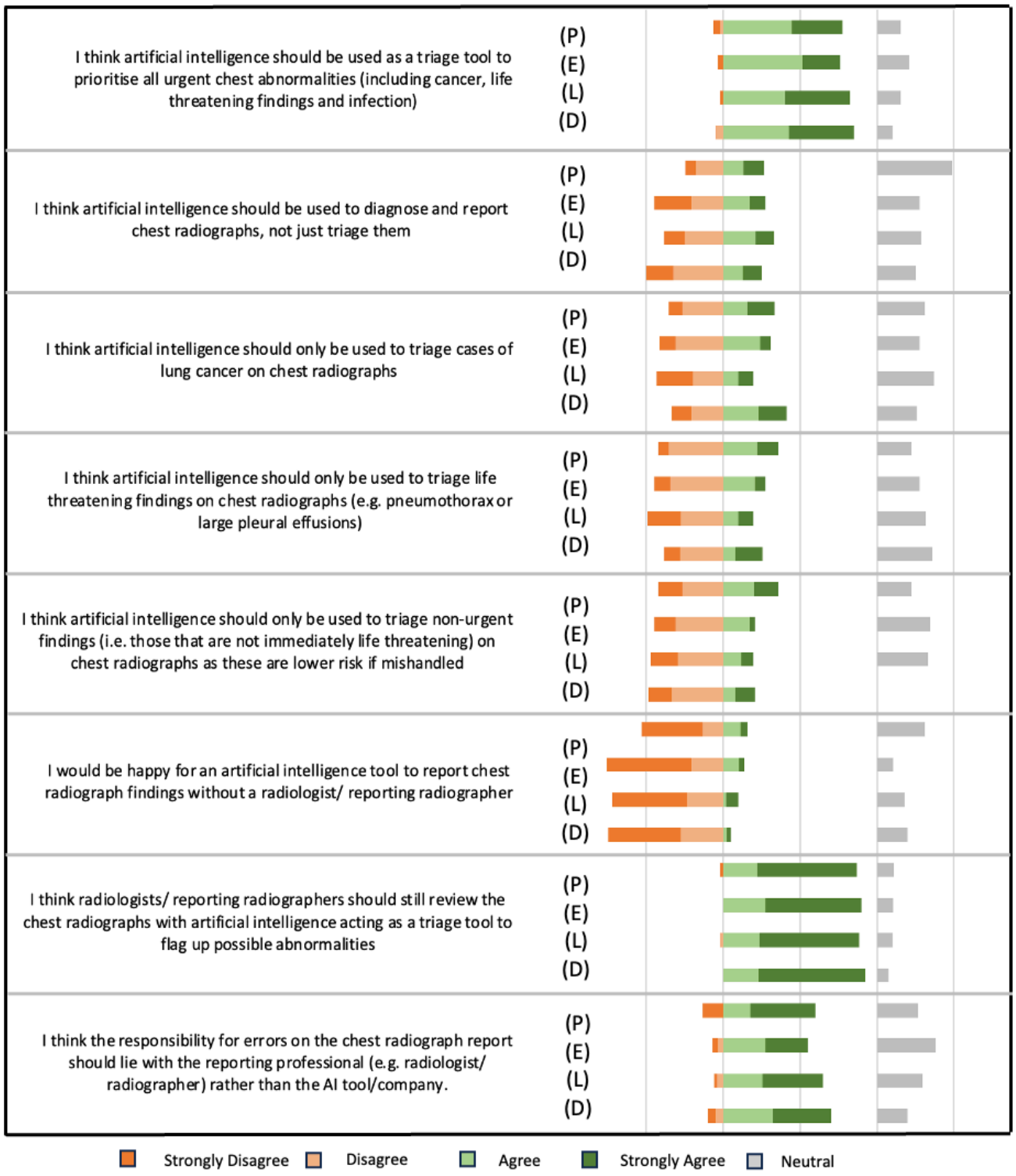


Figure 1

Divergent bar chart demonstrating differences in overall staff opinion on particular use-cases for AI relating to chest radiograph assessment, and themes of responsibility across the four study periods. Absolute values not provided, this bar chart is designed to demonstrate the relative differences across time. Vertical grid bars denote 50% level. *P = pre-implementation period (n = 45), E = early implementation period (n = 29), L = late implementation period (n = 53), D = Decommissioning (n = 40)*



Figure 2

Divergent bar chart demonstrating differences in overall staff opinion on issues pertaining to AI use across the four study periods. Absolute values not provided, this bar chart is designed to demonstrate the relative differences across time. Vertical grid bars denote 50% level. *P = pre-implementation period (n = 45), E = early implementation period (n = 29), L = late implementation period (n = 53), D = Decommissioning (n = 40)*

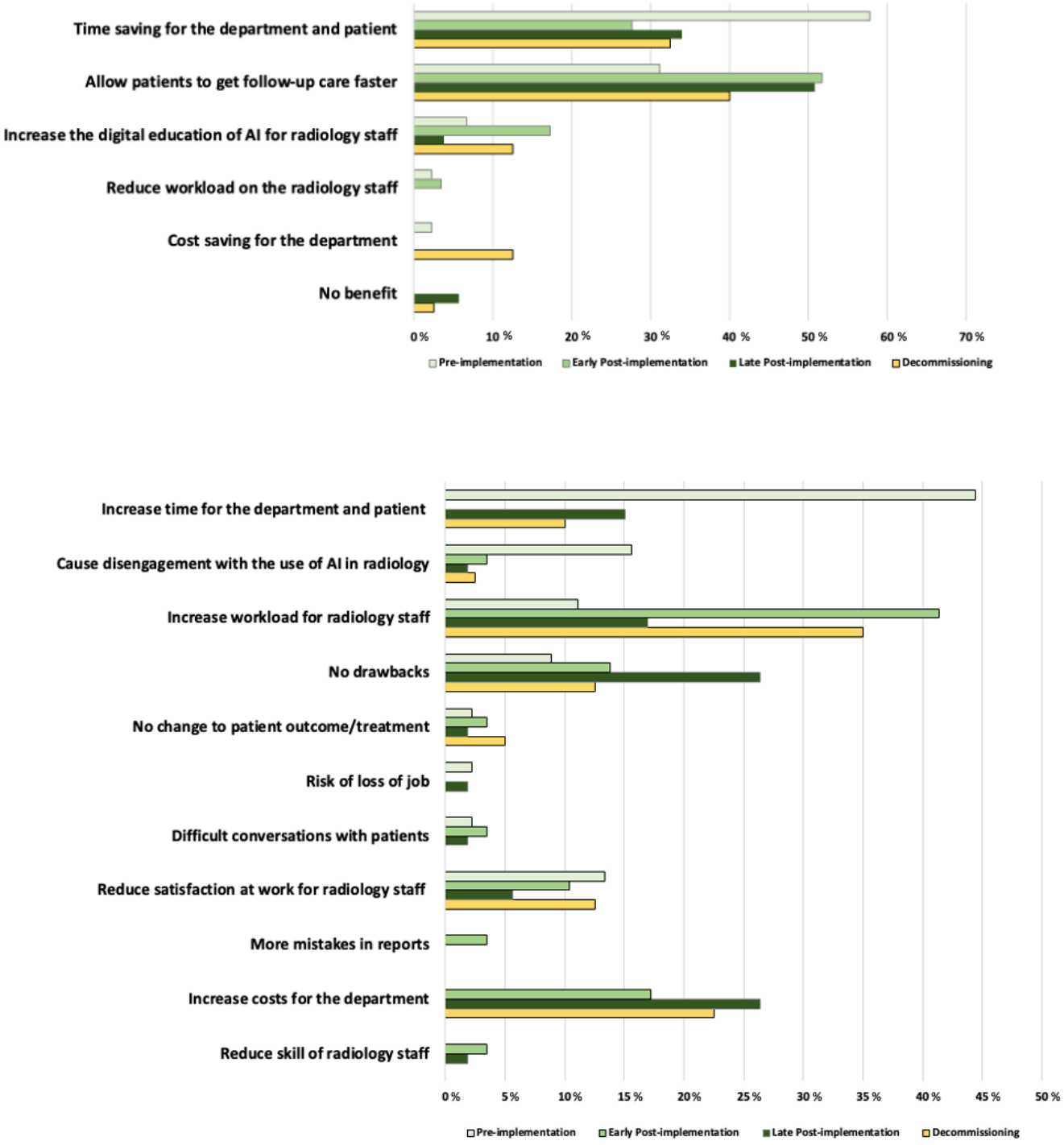


Figure 3

Bar chart demonstrating differences in (a) perceived benefits and (b) perceived drawbacks of AI implementation by all staff respondents during the four different study periods. *Pre-implementation period, light green (n = 45), Early implementation period, green (n = 29), Late implementation period, dark green (n = 53), Decommissioning period, yellow (n = 40)*

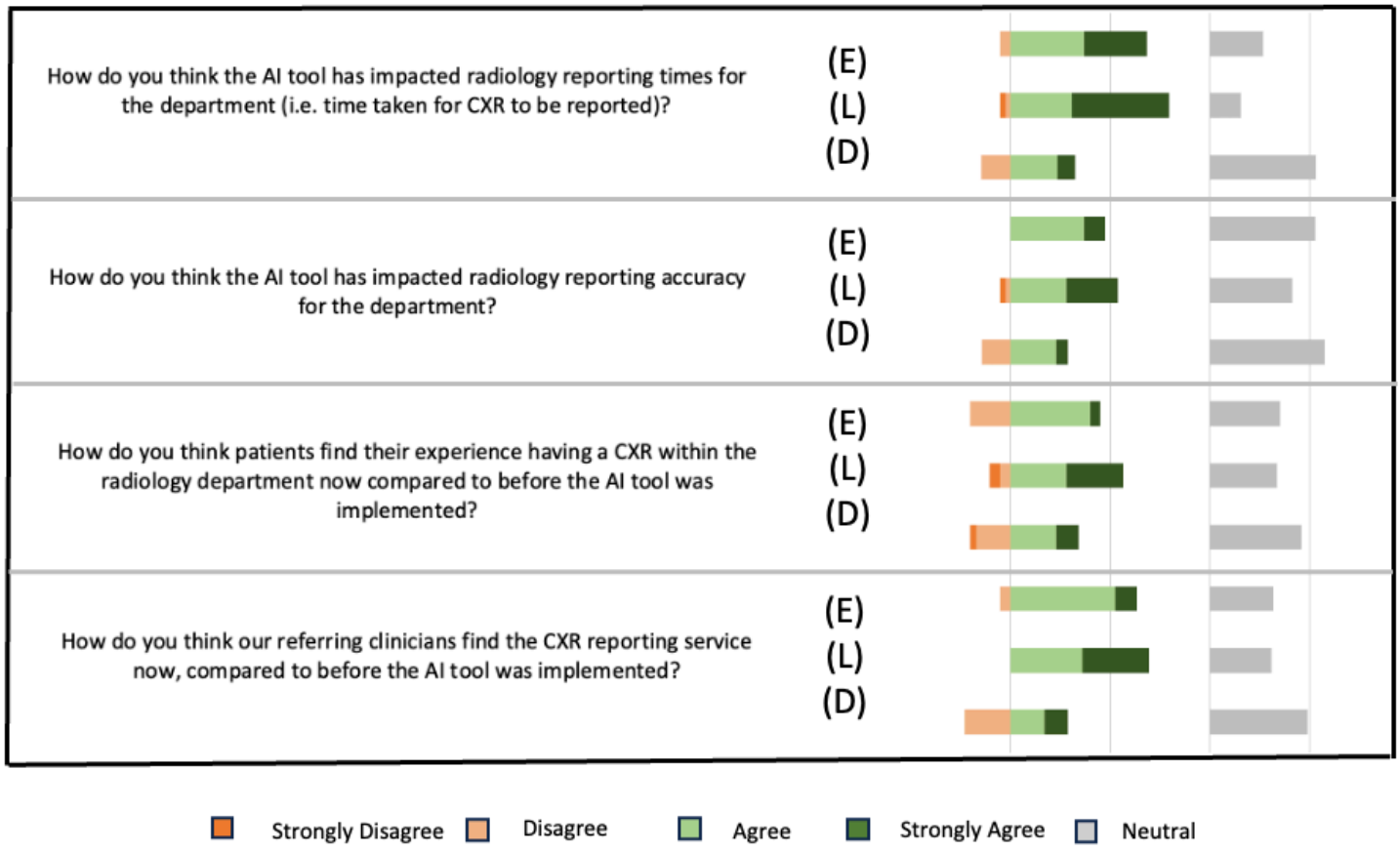


Figure 4

Divergent bar chart demonstrating opinions of staff who reported as having some or a lot of interaction with the AI tool (i.e. acquisition radiographers or reporting staff). These responses reflect personal opinions relating to impact of the AI tool (and decommissioning of it) for the department. Absolute values not provided, this bar chart is designed to demonstrate the relative differences across time. Vertical grid bars denote 50% level. *E = early implementation period (n = 19), L = late implementation period (n = 39), D = Decommissioning (n = 34)*



Figure 5

Divergent bar chart demonstrating differences of the reporting staff's opinion regarding AI usage and impact on their practice over the post-AI implementation and decommissioning study periods. Absolute values not provided, this bar chart is designed to demonstrate the relative differences across time. Vertical grid bars denote 50% level. *E = early implementation period (n = 9), L = late implementation period (n = 10), D = Decommissioning (n = 5)*

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- 06.SupplementaryAppendix.docx