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Some consultant radiologists find their productivity increases when working remotely. Should this be the new normal?

With much haste, the coronavirus disease 2019 (COVID-19) pandemic has revolutionised modern healthcare systems with forceful adaptation towards digitalisation of service delivery, including greater virtualisation of processes. Radiology, a speciality underpinned by technology, has embraced this shift through increasing remote radiology services, which has become a subject of optimism in view of potential productivity gains. Amidst an evermore pertinent backdrop of challenges, both old and new, productivity in radiology has become a key focus, it therefore begets conjecture that remote radiology work be the new norm.

Contextual challenges

Remote radiology provision was established in the pre-covid era with the outsourcing of work to teleradiology companies to address NHS service demand as well as enabling a 24/7 service. During the wake of the pandemic, the new challenges of social distancing and staff self isolation limited capacity of hospital-based service provision and provoked the Royal College of Radiologists (RCR) to support rapid rollout of remote reporting to supplement efforts [1].

The UK radiology landscape was already harried pre-covid with incessant demands for imaging unmatched by service provision; a burgeoning workforce shortfall with as little as 2/3 of adequate capacity achieved; and spiralling NHS expenditures beset by under-investment, with particular concern towards outsourcing as a prevailing factor [2,3]. Macro-environmental forces such as ageing populations, evolving healthcare needs of chronic diseases and socio-political change have been of further influence. 2 years into the pandemic, whilst remote practices continue, there is now the added burden of the backlog incurred from delayed imaging postponed by the pandemic as well as exigencies from remote clinical consultations [4]. Any increase in productivity, regarded loosely as the efficiency of radiologist outputs i.e. service delivery, would be favourable in such contexts.

Rationale for change

Qualitative and quantitative studies indicate remote working increases productivity [5-7]. An appurtenant UK study by Dick et al. found that reporting output increased by 140% compared to a pilot with clinicians describing a similar service experience provided pre-pandemic [5]. Even barring COVID, improved productivity has been demonstrated from remote working: the East Midlands Imaging Network (EMRAD) highlighted that turnaround times improved after trialling home reporting in 2016, and found that work achieved by 6 radiologists generated the equivalent of 1 extra radiologist. It is thought that productivity increases through minimised distraction and disruption to workflow compared to the hospital environment, allowing greater focus.

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It can be logically surmised that with greater productivity, greater operating capacity can be achieved to meet service demand as well as mitigate with workforce shortages. EMRAD has additionally shown that remote work reduced outsourcing needs, with as much as £1.3 million saved in cost [8], such a prospect is auspicious if upscaled across the NHS.

Beyond productivity, further benefits pertain to improved work-life balance and flexibility that would improve workforce stress and burnout; ultimately allowing for high quality services to be maintained in challenging times whilst being protective to workforce retention and recruitment. Operational resilience is maintained with remote work ipso facto being a natural form of social distancing [9]. As radiology becomes more 'green', the environmental impact of reduced emissions from commuting radiologists do indeed count.

On these grounds, standardisation of remote working is to be welcomed and it is understandable that the RCR supports this new way of working [10] to deal with the current challenges faced by radiology. It may be asserted that the COVID pandemic has spurred on the perhaps needed change.

Invisible radiologists

Since the advent of picture archiving and communication systems (PACS), there have been concerns that radiology is becoming a depersonalised speciality, the notion of remote consultant radiologists inevitably effectuates this. As departmental ambassadors for referring clinicians to discuss complex cases, choices of investigations and significance of results, careful attention is needed to preserve interdisciplinary communication. Virtual multidisciplinary team meetings (MDTs) are effective, and must be incorporated in remote radiology practices.

As educators, teaching of trainees can be negatively impacted. A US study examining "remote readouts" as side-by-side case-based teaching highlighted that both trainees and trainers felt such remote teaching was "negative" for atmosphere and personal training relationships [11]. A RCR national survey for trainees emphasised the value of consultant radiologist presence, including the hot-seat teaching "viva" experience that was lost during the pandemic and was not available remotely [12].

Technological barriers

The greatest impediment preventing normalisation of remote radiology services is the well-acknowledged immaturity of NHS IT (information technology) infrastructure. An overwhelming number of radiology departments currently struggle "to meet the IT requirements for a modern radiology service"[8]. Lack of interoperability exists nationally with inequality in IT systems and networks. Interconnectivity is beleaguered by widespread bandwidth issues within trusts and has been reported to reduce efficiency through poor VPN connection and image transfer speeds [4]. To improve transfer speeds for reporting, image compression has been used but at the expense of potentially reducing image quality. As such, remote working is currently adopted piecemeal to different extents, which may remain to

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exacerbate nationwide technological disparities in radiology until this is collectively addressed by significant investment.

Remote practice itself presents challenges. Home computing setups are not diagnostic workstations; the RCR had relaxed display standards to facilitate the use of home monitors, and consequently can be detrimental to reporting accuracy e.g. due to pixel drop out [1]. Greater productivity would be better achieved by deployment of diagnostic grade work stations. Difficulties in obtaining IT support remotely has been another concern, with as little as 50% of departments having support 24/7 [4].

Any potential productivity loss arising from technological difficulties should be factored during planning for remote working [9]; and given the current, fragmented state of NHS IT infrastructure, this would be paramount before any thought of normalisation.

Productivity is only one factor
It is dangerous to perceive radiology in the NHS as a linear process. Increasing productivity is just one contributory factor of the system and becomes purposeless in isolation, other determinants must individually and simultaneously be addressed to overcome challenges. The workforce should be maximised through recruitment, training and enhancing the working environment for retainment. Greater investment is needed system-wide for infrastructure as well as training and equipment. Other new ways of working should be supported including streamlined diagnostic pathways and innovative digital technologies such as artificial intelligence solutions and cloud based storage [10].

Conclusion and future considerations
In the context of many challenges threatening radiology, productivity offered by remote working paints much optimism if technological barriers are overcome. For now, a hybrid approach to remote working continues to be sensible, cautiously combining the productivity gains of remote working with on-site work.

There are too few contemporary studies on implementation of remote working within the UK. Most are limited in being only in the milieu of COVID, although currently they are very relevant, further data is needed when COVID recedes, preferably on a national scale if a true paradigm shift is to be considered.

In the immediate future, so long as COVID and isolation measures linger, a degree of remote reporting elements will likely be the status quo. A robust technological infrastructure is needed for this to be sustainably realised further.

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