

COVID-19 Radiology department preparedness for COVID-19 – experience of a central-London hospital

Authors: Thomas Glover,^A Samir Alwan,^B Kathryn Wessely,^B Julia Hillier,^B Bruno Botelho,^C Catriona Davies,^B Suzanne Wakely,^B Farhat Kazmi,^B Nasir Khan^B and Na'eem Ahmed^B

ABSTRACT

The COVID-19 pandemic has placed significant strain on healthcare systems across the world, requiring rapid adaptation and a change in approach to the delivery of healthcare services. Although not always immediately at the frontline, radiology has a key role in the effort against the SARS-CoV-2 virus. Radiology preparedness, including the development of a set of policies and procedures designed to acquire and maintain enough capacity to support the ongoing care needs of patients both with and without COVID-19, is essential in this modern-day healthcare crisis of unprecedented magnitude.

KEYWORDS: COVID-19, radiology, preparedness

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Introduction

Since its emergence in November 2019 in Wuhan, China, the COVID-19 pandemic caused by the SARS-CoV-2 virus has spread rapidly across the world in a matter of months, affecting 212 countries and territories, with more than 3.8 million cases and 265,000 deaths worldwide as of 7 May 2020.¹ In the United Kingdom there have been over 200,000 cases and 30,000 deaths as of 7 May 2020,¹ with just under 25% of deaths in London.² Chest radiograph is a primary diagnostic tool alongside clinical assessment and lab parameters, while CT has been primarily reserved for complications and problem solving. The infectious potential of SARS-CoV-2 means that leaders must prepare appropriately in order to safely practice radiology. We describe our experience of preparedness for the COVID-19 pandemic at Chelsea & Westminster Hospital, a 430-bed hospital in central London.

Our radiology department focused on two main principles in our preparedness: providing a consistent, high-quality, timely service,

Authors: ^ARadiology registrar, Chelsea and Westminster Hospital NHS Foundation Trust, London, UK; ^Bconsultant radiologist, Chelsea and Westminster Hospital NHS Foundation Trust, London, UK; ^Cdirector of digital operations, Chelsea and Westminster Hospital NHS Foundation Trust, London, UK

Box 1. Radiology COVID-19 preparedness checklist

Ensuring a timely service by changing reporting, vetting and working practices

- > 'Hot' reporting of chest radiographs and same-day reporting of all cross-sectional imaging
- > Consultant 'hot' phone to facilitate cross-specialty conversations to help management
- > Extended radiology consultant coverage on site from 8am–10pm seven days a week
- > Adoption of a system to identify and escalate incidental COVID-19 changes on CT
- > Switch from paper to electronic vetting of all requests and prioritisation on basis of clinical urgency
- > Scheduling of urgent outpatient studies (eg CT colon, prostate MRI) as per national or locally agreed guidance
- > Virtual MDT meetings using Zoom with the development of new services including a daily ICU meeting

Ensuring patient and staff well being

- > Dynamic online master rota (Google Sheets) facilitating instant changes at short notice
- > Use of a zonal system to provide clarity for PPE required in different hospital areas
- > Easily accessible hospital intranet for PPE video guidance and mental health support
- > Formation of a departmental WhatsApp group for quick dissemination of information and maintaining staff morale

ICU = intensive care unit; MDT = multidisciplinary team; PPE = personal protective equipment.

and ensuring staff and patient wellbeing at all times. A summary of our departmental preparedness checklist is shown in Box 1.

Ensuring a timely service

We redesigned our service to support the hospital with access to an efficient imaging service and senior-led opinion. To achieve this, our department has made several changes in reporting, vetting and work practices.

Changes in our reporting practice

The crisis and consequent cancellation of the majority of outpatient lists has resulted in an overall reduction in imaging,

with focus shifting to supporting the hospital as much as possible. In the acute setting, we have organised our service to provide 'hot' reporting of chest radiographs. Imaging has been acquired and reported for clinicians in line with reporting guidelines from the British Society of Thoracic Imaging (BSTI).³ All cross-sectional imaging is also same-day reported. CT assessment of COVID-19 patients, reserved for cases where there is diagnostic uncertainty, is guided by local clinicians and performed in accordance with the BSTI decision making tool.⁴

A consultant 'hot' phone facilitates cross-specialty conversations to aid management. We have also maintained diagnostic capabilities for emergency imaging and for suspected cancers on the two-week-wait pathway, while elective imaging has been postponed where possible until further directives from hospital management structures.

Consultant radiologists are present on site seven days a week from 8am–10pm to facilitate senior clinical decision-making, with two shifts from 8am–3pm and 3pm–10pm. There are three consultants per shift, covering paediatric, musculoskeletal and general radiology, with a reserve team in case of staff illness. Overnight cross-sectional imaging continues to be outsourced to teleradiology from 10pm–8am. As before, a non-resident registrar provides overnight paediatric and emergency ultrasound cover with a consultant available on-call if required.

There is a separate interventional radiology rota. One consultant interventional radiologist covers emergency and urgent outpatient work from 8am–6pm and covers three other hospitals out-of-hours until 8am the following day. Consultants also provide daytime cover at other local hospitals when not on 24-hour shift. There is also a back-up rota with one consultant in reserve each day.

A robust system for identifying and escalating incidental COVID-19 imaging findings in asymptomatic outpatients has been introduced. Patients are kept on the CT scanner table until a consultant radiologist has reviewed the lungs immediately upon completion of the scan. If there are suspicious COVID-19 lung changes, the patient is informed and provided with a surgical mask, and a dedicated in-hospital COVID-19 team calls the patient to initiate ongoing management. The radiographers are also informed to ensure deep cleaning of the room before the next patient according to agreed standard operating procedures.

To help surgical and anaesthetic colleagues to carry out risk assessment prior to surgery, we have implemented the joint decision tool from the BSTI and British Society of Gastrointestinal and Abdominal Radiology (BSGAR) for patients presenting with an acute surgical abdomen.⁵ This has also been extended to include patients undergoing cancer surgery during the pandemic period.

Changes in our vetting methods

To ensure that we are performing the right scan at the right time, consultants are carrying out electronic vetting of all inbound requests and prioritising on the basis of clinical urgency. We have derived a clinical priority scoring system to assist schedulers.

Scheduling of some urgent outpatient studies has been guided by national guidance or regionally agreed decisions. For example, CT colonography has now stopped completely in line with guidance from the British Society of Gastroenterology Joint Advisory Group (BSG-JAG).⁶ Instead, it has been locally agreed that all suspected colorectal cancer patients will undergo CT abdomen pelvis with faecal tagging only. A list of these patients is being kept to ensure all high-risk patients deemed to require CT colonography can

be recalled for assessment as soon as is practicable. Regionally agreed decisions for prostate MRI have been made for North West London during the pandemic.

Changes in our working practice

To maximise social distancing and accommodate changing work patterns and colleagues who are self-isolating, we have switched to virtual multidisciplinary team (MDT) meetings to ensure that cancer work can continue. These meetings have been held on Zoom (<https://zoom.us>), sanctioned by our digital operations department and in line with national NHSx information governance guidance produced.⁷

Virtual working has also enabled us to set up new services to support colleagues throughout the hospital. For example, a daily meeting with the intensive care unit has been set up specifically to help guide management of COVID-19 patients.

Ensuring staff and patient wellbeing

Given changing working patterns, technology can be used to ensure staff workforce continuity. We have used Google Sheets (www.google.co.uk/sheets/about) to provide a rota that is dynamic and can be instantly updated.

Alongside Public Health England (PHE) and BSTI guidance, the hospital has created an online hub on the intranet with video guidance for donning and doffing of personal protective equipment (PPE). To assist staff in understanding the level of PPE required, a zonal system was derived for the hospital, including the intensive care unit (ICU), high dependency unit (HDU) and acute assessment unit (AAU). Each zone (clean, green and red) has different PPE requirements. Red zones such as ITU, HDU and AAU require maximal PPE (FFP3 mask, visor, long-sleeve surgical gown and gloves), while green zones such as CT/MRI control rooms and inpatient ultrasound rooms require surgical mask, white apron and gloves with optional visor depending on perceived level of risk. Clean zones including the radiology reporting rooms and other non-clinical areas do not require PPE.

A departmental radiology WhatsApp group (www.whatsapp.com) has been created to enable fast dissemination of important information and to receive feedback from the radiology frontline staff. This has helped to foster a sense of community and provides a means of keeping staff abreast of organised events such as hospital-provided lunches. It also keeps the team informed of NHS staff discounts and sources of psychological support such as mental health apps.⁸ The hospital also helps support staff wellbeing by directing staff to hospital-wide facilities such as health and wellbeing hubs available through the hospital intranet.

Conclusion

The COVID-19 pandemic has provided the impetus for change in radiology departments across the UK, with renewed focus on digital transformation and streamlining of services. Our department has adopted new ways of working to provide a timely and safe service for patients and staff. In particular, changes such as electronic vetting are likely to help improve departmental workflow. Furthermore, the clearance of departmental reporting backlogs during the pandemic has provided a unique opportunity to maintain rapid reporting turnaround times. Measures including the incidental COVID-19 CT escalation pathway and zonal PPE

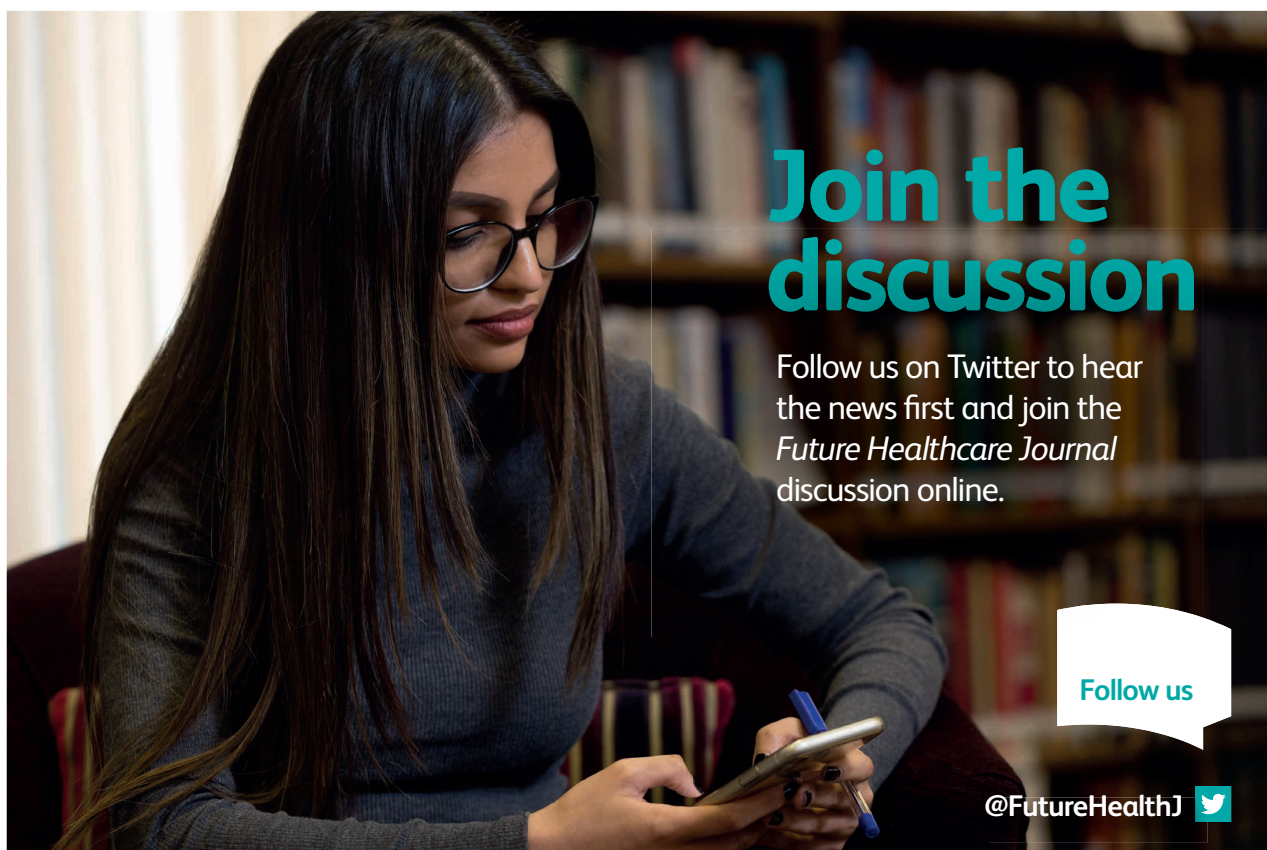
system, at least in the short to medium term, are also likely to help direct workflow as the pandemic abates.

Finally, we have looked in hope towards a post COVID-19 future, with early development of a capacity-demand tool to enable us to manage any surge in demand and incorporating remote-reporting capabilities to ensure imaging business continuity.⁹ ■

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Address for correspondence: Dr Samir Alwan, Department of Radiology, Chelsea and Westminster Hospital NHS Foundation Trust, 369 Fulham Road, London SW10 9NH. Email: s.alwan@nhs.net



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