

Dr Julian Morris  
Senior Coroner  
London Inner South  
Southwark Coroners Court  
1 Tennis Street  
London  
SE1 1YD

10<sup>th</sup> December 2024

Sent by email:



Dear Dr Morris,

**Royal College of Radiologists Response to Regulation 28: Prevention of Future Deaths report issued on 8 November 2024 in relation to the death of Lacey May Brookman.**

I was very sorry to read about the death of Lacey and I would firstly like to express my sincerest condolences to Lacey's family for the very sad and tragic loss of their child. We take the matters raised in your report very seriously and I hope this letter is helpful in outlining how we are committed to learning from them.

The Royal College of Radiologists (RCR) is the leading professional membership body for Clinical Radiologists and Clinical Oncologists, with over 17,000 members globally. The RCR is a charity and aims to lead, educate and support its members and improve the quality of care in its specialties for the benefit of patients and the public.

A key priority for the RCR is to advocate for expansion of the radiology workforce. RCR census data has shown severe shortages in the radiology workforce, including a 30% shortfall of Consultant in Clinical Radiology. Almost all (97%) of radiology leaders (Clinical Directors who lead imaging departments in the NHS) report that workforce shortages cause delays and backlogs and 91% of Clinical Directors said that workforce shortages are impacting negatively on patient safety.

We have been asked to address the diagnosis of retrocaecal appendicitis and specifically to consider availability and use of ultrasound scanning in abdominal pain at any time, but especially out of hours.

In formulating our response, we have sought opinion from the following Special Interest Groups affiliated with the RCR: The British Medical Ultrasound Society (BMUS), The British Society of Paediatric Radiology (BSPR), The British Society of Gastrointestinal and Abdominal Radiology (BSGAR) and The British Society of Emergency Radiology (BSER).

Special Interest Groups are independent organisations who provide advice and expertise in certain areas of practice.

Retrocaecal appendicitis is indeed relatively common as stated in your report and can be a difficult diagnosis to make clinically. All patients, including children presenting with abdominal symptoms suspicious for retrocaecal appendicitis (and other serious acute abdominal conditions), are referred for diagnostic imaging at the discretion of the clinical team treating them. The degree of urgency typically reflects the seriousness of the clinical presentation as assessed and conveyed by the referring clinician.

Some patients remain remarkably "well" for a long time despite the presence and ongoing progression of serious acute abdominal pathology, and consequently the referral for diagnostic imaging may come late in the course of disease. Ultrasound and Computerised Tomography (CT) are the two commonest imaging investigations in this clinical scenario, with MRI as a relatively uncommon alternative (see RCR [iRefer](#) guideline p28).

Ultrasound and CT are widely available in all hospital settings. What is critical is that the referral for abdominal ultrasound or/and a CT scan and the associated radiologist opinion is made in the first place. This call can be very difficult and is dependent on training, experience and familiarity and with the availability of senior support for advice and discussion.

Once the referral is made then urgent imaging is typically available within hours of admission to hospital and the exact algorithm of whether CT or Ultrasound will be preferred depends on the precise clinical scenario as well as the local availability of equipment and suitable expertise. Ultrasound is operator dependent and there is a considerable learning curve and requirement for ongoing practice in order to master diagnosis. In experienced hands, ultrasound is a very powerful diagnostic tool for the assessment of abdominal pathology and it has great benefits in the diagnosis of conventional appendicitis in that it can be a relatively rapid, portable, bed-side test that does not involve ionizing radiation. It also has a high sensitivity and specificity for the diagnosis of appendicitis and discriminating from other bowel pathologies (e.g. mesenteric adenitis, inflammatory bowel disease and ovarian torsion in girls), again when used in experienced hands.

As with the clinical assessment of retrocaecal appendicitis, however, diagnosis with ultrasound can be challenging even with very experienced operators. In expert paediatric radiology centres abdominal ultrasound can identify appendicitis with fairly high confidence, but identifying retrocaecal appendicitis can be challenging even in such expert hands.

We recognise the GIRFT report: "[Paediatric acute abdominal pain and appendicectomy: Best practice pathway guidance](#)" from June 2022. This document does not specifically evaluate retrocaecal appendicitis but recommends ultrasound as the first line investigation in children with suspected appendicitis who require imaging with some further information around which children this will be. This report recommends the use of a risk score and imaging for those with diagnostic uncertainty, an intermediate risk score or for those whose symptoms are not resolving with a low risk score. It also details the importance of multidisciplinary working and involvement of paediatricians and general surgeons as well as paediatric surgeons when they are available.

We note that ultrasound was available in the centre to which Lacey presented but that tragically even provision of ultrasound and CT on the day of the referral did not facilitate curative treatment.



More generally, the availability of ultrasound out of hours varies greatly between hospitals. Expertise in imaging severely ill children may be limited in non-specialist centres who may not see these cases regularly and that may necessitate transferring patients to a specialist paediatric centre. NHS trusts which run most radiology services in the UK are currently further limited by workforce pressures and particularly by the availability of Consultant Radiologists because, as described above, there is currently a 30% shortage in the UK and 91% of Clinical Directors state that workforce shortages are impacting negatively on patient safety. The location of the appendix can be extremely variable within the abdomen and the GIRFT document does not specifically address retrocaecal variations of appendicitis. We are not aware of specific guidance on retrocaecal appendicitis but advocate using similar imaging strategies to general appendicitis.

However, as with more conventionally sited appendicitis, ultrasound is advised as the first line of imaging investigation following rigorous clinical assessment. Even in such a scenario, if a patient does have a retrocaecal appendicitis, then the initial ultrasound may be equivocal or not show a cause for the child's illness.

This is because the retrocaecal appendix lies behind the caecum which can contain extensive gas and ultrasound cannot penetrate air or bowel gas and may therefore not be able to visualise the enlarged appendix, surrounding inflammatory change or, an abscess related to a perforated appendicitis.

Even readily available expert-level abdominal and bowel ultrasound in specialist centres can miss a retrocaecal appendicitis, so the availability of point of care ultrasound in this case is unlikely to have been a critical factor.

Even if the appendix is not visualised, secondary signs can sometimes be elicited on ultrasound to raise suspicion of a diagnosis of appendicitis. On occasions, and when the appearance is initially equivocal, we advocate ongoing clinical evaluation and repeating the ultrasound at a short interval to assess for evolving features that may support a diagnosis. This is applicable whenever a positive diagnosis is not made and particularly relevant if ultimately a patient is shown to have retrocaecal appendicitis.

Ongoing, clinical assessment is essential and if there are concerning clinical features or no clinical improvement then in the severely ill child where ultrasound cannot reach a diagnosis, the child should be further evaluated with additional imaging, a CT or Magnetic Resonance Imaging (MRI) scan being performed depending on the clinical expertise of the centre. Alternatively, an experienced paediatric surgeon may decide to take a severely ill, deteriorating child or a child with classical clinical symptoms of appendicitis directly to the operating theatre without obtaining further imaging.

CT can identify retrocaecal appendicitis with high confidence without the requirement for expertise in paediatric bowel ultrasound and, outside of specialist paediatric centres, CT is more widely available than the level of ultrasound which would be required to identify appendicitis in children with confidence.



CT scanning is available 24 hours a day in all relevant hospitals in the UK, with due consideration given to the radiation exposure involved in abdominal CT in a child with non-specific symptoms. There are of course understandable reservations about referring children for CT scanning as it involves exposure to ionising radiation. It is possible that due to these reservations, together with the generally late presentation of retrocaecal appendicitis and that, as above, some children with this condition remain remarkably "well" for a long time, results in a delay in considering the diagnosis and consequently in making a referral for CT scanning.

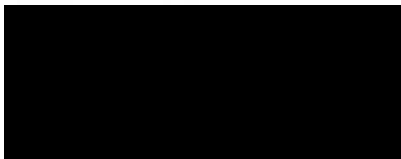
If the exposure to radiation can be justified then CT scans with intravenous contrast of the abdomen and pelvis has the advantage over ultrasound in that the images are not obscured by gaseous distension of bowel and the appendix and associated inflammatory changes are more commonly seen. Alternatively, MRI can be used to obtain a representation of the bowel/appendix and internal organs. MRI techniques have an advantage of avoiding the use of ionizing radiation although the scanning time is typically significantly longer than CT and thereby posing particular problems in younger children who cannot lay still and the pool of experts who can confidently interpret them is smaller than that for CT.

Ultrasound, CT and MRI all require considerable training to perform and interpret correctly and the availability of abdominal ultrasound which must be performed in person may be particularly limited by availability of on-site expertise. Images for CT and MRI may be acquired locally and transmitted remotely which is a common technique in multi-site trusts or when on-call services are provided through a network.

In conclusion, we recognise that the diagnosis of retrocaecal appendicitis can be challenging both clinically and radiologically. We advocate prompt assessment by experienced clinicians including expert surgeons and radiologists. Given the workforce shortages in the UK and the ramifications for delayed diagnosis this may necessitate early transfer to specialist centres where paediatric surgeons and paediatric radiologists are more available.

I am grateful to you for bringing these matters of concern to our attention and for giving us the opportunity to respond. Once again, I express my deepest condolences to Lacey's family and loved ones.

Yours sincerely,



RCR President

