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Jack Fennessy

Northern Clinical School, The University of Sydney

Ritwik Rattan

Junior Doctors, Hornsby Ku-ring-gai Hospital

Way Siow

Gastroenterology, Northern Beaches hospital

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Junior doctors' experiences of radiology education and suggestions for curriculum reform

Jack Fennessy,* Ritwik Rattan,< Way Siow□

* The University of Sydney
< Hornsby Ku-ring-gai Hospital
□ Northern Beaches Hospital

Abstract

Introduction:

Providing high quality and relevant radiology teaching for junior doctors and medical students is essential to ensure they are equipped with the essential skills needed for clinical practice. This study evaluates Australian junior doctors' experiences of radiology teaching, describes the influence of imaging on their current practice, and voices their preferences for ongoing training.

Methods:

Forty-one junior doctors practicing in New South Wales were surveyed about their experiences with radiology teaching in medical school and in post-graduate years, the influence of radiology on their current clinical practice, and their suggestions for changes to radiology teaching. Respondents' confidence independently interpreting various imaging studies was rated from 1 to 10.

Results:

Most respondents (63.4%) believed their radiology teaching in medical school did not sufficiently prepare them for clinical practice. Most respondents (80.5%) had some form of radiology teaching in the previous 12 months, with most (54.6%) teaching taking place informally on the wards. Respondents felt most comfortable interpreting Chest X-Rays (Med=7.0, SD=1.6), and least comfortable interpreting Ultrasound studies (Med=2.0, SD=1.5). Most doctors requested more teaching on Computed Tomography (65.9%), with a focus on the abdomen and pelvis (61.0%). 92.7% of respondents believed formal teaching on Point of Care Ultrasound (POCUS) should be introduced in medical school or post-graduate years.

Conclusion:

Future radiology teaching for medical students and junior doctors should focus on providing competency in the image interpretation skills relevant to clinical practice. Junior doctors would benefit from POCUS courses being integrated into the medical curriculum.

I INTRODUCTION

The role of medical imaging in modern medicine has become increasingly more important through the evolution of new imaging techniques and substantial reliance on imaging for diagnostic and therapeutic purposes. As such, junior doctors request and act upon the results of radiological studies on a daily basis. Often junior staff are required to interpret imaging at the point of care without an accompanying report, meaning their interpretation of imaging influences patient management decisions directly (Nyhsen et al., 2011). It is essential junior staff have a minimum standard for safely interpreting medical imaging for basic studies so that correct diagnoses are made and the identification of critical findings is not delayed.

Radiology teaching in Australia is typically included into medical school education as part of the study of body systems or in specialty blocks, however this teaching is rarely comprehensive and described by junior doctors as inadequately preparing them for their current and future practice (Ferris et al., 2016; Glenn-Cox et al., 2019; Nyhsen et al., 2013). In a similar way, the majority of radiology teaching for junior doctors is informal, based on the wards, and taught opportunistically by non-radiologist medical specialists or registrars (Ayasa et al., 2021; Cole, 2022). Considering there is no currently recognised national radiology curriculum for medical students, there is variable implementation of focussed radiology education across institutions leading to disparity in the competencies of graduates.

In addition to interpreting basic imaging, other radiology skills including the use of ultrasound can be highly valuable in providing radiology education. Point of Care Ultrasound (POCUS) has proliferated in its use cases. Its application was once limited to cardiac anaesthesia and procedures in intensive care units, but now finds use across a wide variety of specialties including emergency medicine, internal medicine, sports medicine and surgery (Douflé et al., 2022). Considering the barriers to implementing POCUS teaching for trainees in Australia due to constraints in time and available trainers, integrating basic POCUS training into medical school curricula has been proposed as a worthwhile intervention (Yastrebov et al., 2023).

This study evaluates Australian junior doctors' experiences of radiology teaching, describes the influence of imaging on their current practice, and voices their preferences for ongoing training. This article provides practical suggestions for implementation with the aim of achieving a national standardised radiology education curriculum to the benefit of junior doctors, and ultimately to the patients they care for.

II METHODS

Forty-one junior doctors practicing in hospitals across New South Wales (NSW), Australia were recruited to take part in the survey. Invitations to participate were emailed to a cohort of junior doctors practicing across two hospitals within the same network. All doctors were post graduate year (PGY) 1 to 4. Specialist doctors and trainee specialists were excluded from the study. The survey was conducted online and deidentified.

Respondents were asked about their experiences with radiology teaching in medical school and in post-graduate years, the influence of radiology on their current clinical practice, and their suggestions for changes to radiology teaching. A copy of the questions asked in the survey can be found in **Appendix I**. Most questions were multiple choice questions, and some asked respondents to rate their response to a prompt on a numerical scale. Respondents were asked about their confidence in interpreting different radiologic studies by modality. 'Ultrasound studies' referred to traditional ultrasound performed by sonographers as opposed to POCUS. A free text section was included at the end of the survey.

This study received ethics approval from the Northern Sydney Local Health District Human Research Ethics Committee with Dr. Jack Fennessy listed as the chief investigator (HREC reference number: 2025/ETH00771).

III RESULTS

Demographic information about the 41 respondents is shown in **Table 1**. All respondents graduated from Australian medical schools. The survey response rate was 51.3%.

Sixty-three percent of doctors believed their medical school radiology teaching was insufficient in preparing them for clinical practice. Most respondents (82.9%) agreed or strongly agreed that anatomy taught in medical school should place more emphasis on radiologically-relevant anatomy. Sixteen percent of respondents described their recent radiology teaching as unhelpful. Further responses to questions focussed on previous radiology teaching are shown in **Table 2**.

Questions concerning the impact of radiology on junior doctors' practice is shown in **Table 3**. Alongside this, respondents were asked to score how comfortable they felt independently reviewing different radiological studies (**Figure 1**).

The free text responses at the end of the survey were consistent in the themes that emerged. When asked what radiological skills respondents would most like to develop, answers included systematic interpretation of abdominal pathology particularly with ultrasound and Computed Tomography (CT), and procedures such as ultrasound-guided intravenous cannulation, lumbar punctures and pleural taps. When asked about impressions of radiologists as teachers and interactions with radiologists, answers were overwhelmingly positive, however requesting more formal teaching with case-based discussions by radiologists with junior staff. Image interpretation using cases known to the junior doctor staff were seen as potentially very valuable. Respondents further emphasised the value a formal Point of Care Ultrasound (POCUS) course introduced into the medical curriculum could provide to learning anatomy and developing basic ultrasound skills.

IV DISCUSSION

Enthusiasm for radiology teaching is high, however the majority of junior doctors included in this study believe that their medical school teaching insufficiently prepared them for clinical practice. It appears this is not limited to NSW as studies conducted in Western Australia (Glenn-Cox et al., 2019), England (Nhysen et al., 2013) and Ireland (Ferris et al., 2016) had similarly concerning responses when asked the same question (proportion answered as 'insufficient': 52%, 68% and 85% respectively). The problem lies not in a lack of resources available for medical students and junior doctors, as there are excellent online resources such as Radiopaedia (Radiopaedia, n.d.), Diagnostic Imaging Pathways (Diagnostic Imaging Pathways, n.d.), those provided by the Royal Australian and New Zealand College of Radiologists (RANZCR) (InsideRadiology, n.d.), and local multidisciplinary team meetings available for students to attend. There is however a well-recognised desire expressed by the Australian radiology community for a national medical imaging curriculum (Ayasa, 2025; Mendelson & Taylor, 2020). This will require radiology academics to continue to advocate for more involvement in medical school curriculum design and perhaps a closer integration of universities and radiology training programs which is the case in the United States.

Respondents in this study believed it would be beneficial if the anatomy taught in medical school included more radiologically-relevant anatomy. A student-initiated extracurricular anatomy education program at James Cook University has had success in running workshops for radiology anatomy and imaging techniques (Hattam, 2013). These students organised day-long interactive workshops taught by radiologists on anatomy, X-Ray, Computed Tomography (CT) and subspecialty sessions to fill the perceived shortages in anatomical teaching by medical schools (McLachlan & Patten, 2006; Mitchell & Batty, 2009). Randomised control trials have looked at various teaching methods on chest X-Ray interpretation skills among medical students and junior doctors, and found great benefit in a SAFMEDS (Say-All-Fast-Minute-Every-Day-Shuffled) approach (Dunne et al., 2022); a technique using daily flashcard revision to reinforce long-term memory. A cohort of students in NSW, Australia showed better post-intervention outcomes and improved engagement with adaptive tutorials as opposed to an online resource for learning Chest X-Ray (CXR) and CT pathology (Wong et al., 2015). Positive results have been shown for an e-

learning program in a cohort of 57 students from Griffith University (Salajegheh, 2016). No improvement was found in CXR interpretation outcomes with a flipped classroom model (Afzal & Masroor, 2019) or an artificial intelligence-based tool (Dao et al., 2022) for medical school teaching. When evaluating the most effective model of radiology teaching for integration into a medical school curriculum, proven efficacy, level of student engagement and the amount of resources required (time, teaching personnel etc.) will need to be taken into account. In times where medical school cohorts have grown to in excess of 300 students in a single year level, delivering engaging teaching has become difficult for educators (Ayesa, 2025). In the post-pandemic era particularly, there has been an increased reliance on, and comfort in, virtual teaching. Radiological content can certainly be delivered this way, however engagement is increased with in-person and smaller group teaching.

It is not only interventions at the medical school level that are required, as surveys of recently-graduated doctors in Australia and in Ireland have shown the vast majority of respondents indicated they needed more radiology education to prepare them for clinical practice (Ferris et al., 2016; Glenn-Cox et al., 2019). It is particularly important to provide relevant education at this stage as almost half of junior doctors are interpreting imaging before a formal report is available (Glenn-Cox et al., 2019). Radiologists are well positioned to be at the forefront of medical education in the future due to their wide knowledge base in diagnostics and specific skills that junior doctors could benefit greatly from (Ayesa, 2025; Ayesa et al., 2021). As demonstrated in this study and others, much of the radiodiagnostics and practical skills are being taught informally, often on the wards and by non-radiologist clinicians (Ayesa et al., 2021; Cole, 2022; Glenn-Cox et al., 2019). This paucity and variability of quality leads to inequity of radiology teaching across medical schools and hospital departments. Informal teaching alone has been demonstrated to lead to no improvement in X-Ray interpretation among a group of junior doctors (Vincent et al., 1988). The goal of a radiodiagnostics curriculum for medical students and junior doctors would not be to train them to have specialist skills, but to make safe and confident point-of-care decisions about their patients in real time. This would include identifying common and life-threatening illnesses, and knowing when to seek the advice of an expert radiologist (Ayesa et al., 2021).

Introducing an Australian radiology curriculum and educational standard for medical students is needed to ensure consistent delivery of teaching content (Ayesa, 2025). The Royal College of Radiologists (RCR) in the United Kingdom has produced a standardised radiology curriculum for medical students consisting of standards to prepare students for clinical practice. The learning objectives include interpreting plain radiographs of the chest, abdomen and musculoskeletal system, as well as interpreting common acute findings on head CT scans (The Royal College of Radiologists, 2022).²³ It is suggested these skills are integrated into simulation sessions and clinical examinations, as well as recommending students observe interventional radiology lists and shadow radiographers. A curriculum was developed by Mendelson and Taylor (2020) at the request of the University of Western Australia, however this has not yet been acted upon in any meaningful way. National standardised curricula also exist in the United States (Association of Academic Radiology, 2023) and Europe (European Society of Radiology, 2021).

Considering the clear enthusiasm for formal teaching in POCUS in this study, lower cost, increased portability of ultrasound machines, and increasing utilisation of ultrasound in multiple specialties of medical practice, a revitalised radiology medical curriculum should be at the forefront of ultrasound education (Solomon & Saldana, 2014). It should be noted that our enthusiasm for POCUS teaching includes the act of performing the ultrasound for this is where we believe much of the learning can be done, as opposed to interpretation of ultrasound images previously performed by a sonographer. POCUS teaching has been shown to enhance medical students' learning of anatomy and physiology, with the United States and parts of Europe already integrating formal teaching into their undergraduate curricula (Dietrich et al., 2019; Prosch et al., 2020; Stone-McLean et al., 2017). North America has been the leader in this space led by their Society of Ultrasound in Medical Education having influence at both an undergraduate and postgraduate level. Over 60% of medical schools report incorporating POCUS into their medical curriculum in a survey conducted 13 years ago (Bahner et al., 2014). This contrasts heavily with

current POCUS education in Australian and New Zealand medical schools to the students' detriment. The Australasian Society of Ultrasound Medicine (ASUM) has well-established POCUS programs such as the Certificate in Clinician-Performed Ultrasound (CCPU) which are ready for integration into medical schools. The University of New South Wales has commenced a curriculum review with a view to incorporate POCUS teaching (Yastrebov et al., 2023),⁸ and other medical schools should follow suit. The specifics of the implementation ultrasound teaching will need to be discussed among individual university faculties and in future studies, however could include university-run sessions identifying anatomical structures of the abdomen on volunteers in early medical school years, or shadowing sonographers in the radiology department of their assigned hospital in final medical school years. Hands-on use of ultrasound is important and should enhance their anatomy learning. Appropriateness of examination should be guided by both university and sonographer, with some examples including a renal tract or thyroid ultrasound under direct sonographer supervision.

The authors of this study propose the following interventions as part of a curriculum reform:

1. Development and recognition of a national radiology curriculum driven by RANZCR
2. Reform of the current medical school radiology curriculum including:
 - a) Specific competencies in image interpretation and paired evaluations
 - b) A shift from traditional anatomy teaching to more radiologically-focussed anatomy
 - c) Integration of longitudinal POCUS teaching
1. Continuation of formal radiology skills education for junior doctors
2. Increased collaboration between medical schools, academic radiologists and radiology training programs to assist with implementing the above

In conclusion, radiology education for medical students and junior doctors in Australia is not adequately preparing them for clinical practice. Future radiology teaching should focus on providing competency in the image interpretation skills relevant to clinical practice driven by a recognised national curriculum.

A Limitations

The limitations of this study include its relatively small sample size (n=41) and its predominance of PGY2 respondents over other year levels. A larger sample size might have increased the diversity of response and enriched the free text responses.

The survey overall was quite limited in the number of questions asked in an effort to keep the survey short to increase response rate. Future studies could also include information on whether respondents had undergraduate or postgraduate education, as well as more detail concerning their previous teaching.

Some of the questions in the survey such as 'Would you like to see formal Point of Care Ultrasound teaching introduced into the medical curriculum?' inherently had a positive bias, which might have directed respondents towards a positive response.

Future studies should also look to evaluate the implementation and effectiveness of the aforementioned proposed interventions.

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References

- Afzal, S., & Masroor, I. (2019). Flipped Classroom Model for Teaching Undergraduate Students in Radiology. *Journal of the College of Physicians and Surgeons Pakistan*, 29(11), 1083-1086. <https://doi.org/10.29271/jcpsp.2019.11.1083>
- Association of Academic Radiology. (2023). *AMSER Curriculum, Competencies, and Learning Objectives*. <https://www.aur.org/curriculum>
- Ayesa, S. L. (2025). Reflections on Australian radiology education: How can we innovate and improve? *Journal of Medical Imaging and Radiation Oncology*, 69(1), 88-90. <https://doi.org/10.1111/1754-9485.13786>
- Ayesa, S. L., Katelaris, A. G., Brennan, P. C., & Grieve, S. M. (2021). Medical imaging education opportunities for junior doctors and non-radiologist clinicians: A review. *Journal of Medical Imaging and Radiation Oncology*, 65(6), 710-718. <https://doi.org/10.1111/1754-9485.13266>
- Bahner, D. P., Goldman, E., Way, D., Royall, N. A., & Liu, Y. T. (2014). The state of Ultrasound Education in U.S. Medical Schools: Results of a National Survey. *Academic Medicine*, 89(12), 1681-1686. <https://doi.org/10.1097/ACM.0000000000000414>
- Cole, H. (2022). Letter to the editor: radiology for medical students: do we teach enough? A national study. *The British Journal of Radiology*, 95(1137). <https://doi.org/10.1259/bjr.20210508>
- Dao, L., Harmouch, S. S., Chin, A., Dao, T., Thian, Z., & Chartrand-Lefebvre, C.. (2022). Effect of an Artificial Intelligence Chest X-Ray Disease Prediction System on the Radiological Education of Medical Students: A Pilot Study [Preprint]. *medRxiv*. <https://doi.org/10.1101/2022.07.11.22277278>
- Diagnostic Imaging Pathways. (n.d.). *Radiologyacrossborders.org*. Retrieved 29 March, 2025, from https://radiologyacrossborders.org/diagnostic_imaging_pathways/
- Dietrich, C. F., Hoffmann, B., Abramowicz, J., Badea, R., Braden, B., Cantisani, V., Chammas, M. C., Cui, X. W., Dong, Y., Gilja, O. H., Hari, R., Nisenbaum, H., Nicholls, D., Nolsøe, C. P., Nürnberg, D., Prosch, H., Radzina, M., Recker, F., Sachs, A., Saftoiu, A., ... & Blaivas, M. (2019). Medical Student Ultrasound Education: A WFUMB Position Paper, Part I. *Ultrasound in medicine and biology*, 45(2), 271-281. <https://doi.org/10.1016/j.ultrasmedbio.2018.09.017>
- Douflé, G., Teijeiro-Paradis, R., Morales-Castro, D., Urner, M., Goffi, A., Dragoi, L., & Billia, F. (2022). Point-of-Care Ultrasound: A Case Series of Potential Pitfalls. *CASE (Philadelphia, Pa.)*, 6(6), 284-292. <https://doi.org/10.1016/j.case.2022.05.002>
- Dunne, K., Madden, C., Byrne, D., McCarthy, P., O'Connor, P., & Lydon, S. (2022). A randomized controlled trial of SAFMEDS to improve chest radiograph interpretation among medical students. *European Journal of Radiology*, 151, 110296. <https://doi.org/10.1016/j.ejrad.2022.110296>
- European Society of Radiology. (2021). *Curriculum for Undergraduate Radiological Education*. https://www.myesr.org/app/uploads/2023/08/esr_curriculum_for_undergraduate_radiological_education_june_2021.pdf
- Ferris, H. A., Joyce, M. B., & Hogan, J. (2016). Small Group Tutorials in Radiology: a Pilot Study. *MedEdPublish*, 5. <https://doi.org/10.15694/mep.2016.000043>
- Glenn-Cox, S., Hird, K., Sweetman, G., & Furness, E. (2019). Radiology teaching for interns: Experiences, current practice and suggestions for improvement. *Journal of Medical Imaging and Radiation Oncology*, 63(4), 454-460. <https://doi.org/10.1111/1754-9485.12896>

- Hattam, A. T. (2013). Incorporating clinically relevant radiology teaching into a medical student-initiated anatomy education programme. *Journal of Medical Imaging and Radiation Oncology*, 57(3), 348. <https://doi.org/10.1111/1754-9485.12061>
- InsideRadiology. (n.d.). *InsiderRadiology*. Retrieved 29 March, 2025, from <https://www.insideradiology.com.au/>
- McLachlan, J. C., & Patten, D. (2006). Anatomy teaching: ghosts of the past, present and future. *Medical Education*, 40(3), 243-253. <https://doi.org/10.1111/j.1365-2929.2006.02401.x>
- Mendelson, R. M., & Taylor, D. B. (2020). Medical student and intern radiology teaching. *Journal of Medical Imaging and Radiation Oncology*, 64(1), 71-72. <https://doi.org/10.1111/1754-9485.12977>
- Mitchell, R., & Batty, L. (2009). Undergraduate perspectives on the teaching and learning of anatomy. *ANZ Journal of Surgery*, 79(3), 118-121. <https://doi.org/10.1111/j.1445-2197.2008.04826.x>
- Nyhse, C. M., Lawson, C., & Higginson, J. (2011). Radiology teaching for junior doctors: their expectations, preferences and suggestions for improvement. *Insights into Imaging*, 2(3), 261-266. <https://doi.org/10.1007/s13244-010-0052-5>
- Nyhse, C. M., Steinberg, L. J., & O'Connell, J. E. (2013). Undergraduate radiology teaching from the student's perspective. *Insights into Imaging*, 4(1), 103-109. <https://doi.org/10.1007/s13244-012-0206-8>
- Prosch, H., Radzina, M., Dietrich, C. F., Nielsen, M. B., Baumann, S., Ewertsen, C., Jenssen, C., Kabaalioglu, A., Kosiak, W., Kratzer, W., Lim, A., Popescu, A., Mitkov, V., Schiavone, C., Wohlin, M., Wüstner, M., & Cantisani, V. (2020). Ultrasound Curricula of Student Education in Europe: Summary of the Experience. *Ultrasound International Open*, 6(1), E25-E33. <https://doi.org/10.1055/a-1183-3009>
- Radiopaedia. (n.d.). *Radiopaedia.org*. Retrieved 29 March, 2025, from <https://radiopaedia.org/>
- Salajegheh, A., Jahangiri, A., Dolan-Evans, E., & Pakneshan, S. (2016). A combination of traditional learning and e-learning can be more effective on radiological interpretation skills in medical students: a pre- and post-intervention study. *BMC Medical Education*, 16, 46. <https://doi.org/10.1186/s12909-016-0569-5>
- Solomon, S. D., & Saldana, F. (2014). Point-of-Care Ultrasound in Medical Education-Stop Listening and Look. *New England Journal of Medicine*, 370(12), 1083-1085. <https://doi.org/10.1056/NEJMp1311944>
- Stone-McLean, J., Metcalfe, B., Sheppard, G., Murphy, J., Black, H., McCarthy, H., & Dubrowski, A. (2017). Developing an Undergraduate Ultrasound Curriculum: A Needs Assessment. *Cureus*, 9(9), e1720. <https://doi.org/10.7759/cureus.1720>
- The Royal College of Radiologists. (2022). *Undergraduate Radiology Curriculum 2022*. The Royal College of Radiologists
- Vincent, C. A., Driscoll, P. A., Audley, R. J., & Grant, D. S. (1988). Accuracy of detection of radiographic abnormalities by junior doctors. *Emergency Medicine Journal*, 5(2), 101-109. <https://doi.org/10.1136/emj.5.2.101>
- Wong, V., Smith, A. J., Hawkins, N. J., Kumar, R. K., Young, N., Kyaw, M., & Velan, G. M. (2015). Adaptive Tutorials Versus Web-Based Resources in Radiology: A Mixed Methods Comparison of Efficacy and Student Engagement. *Academic Radiology*, 22(10), 1299-1307. <https://doi.org/10.1016/j.acra.2015.07.002>
- Yastrebov, K., Costello, C., Taylor, B., & Torda, A. (2023). Point-of-care ultrasonography-An essential skill for medical graduates? *Australasian Journal of Ultrasound in Medicine*, 26(4), 272-274. <https://doi.org/10.1002/ajum.12355>

Figure Legends

Figure 1. Respondents' Confidence in Independently Interpreting Imaging. CT: Computed Tomography; MR: Magnetic Resonance; XR: X-Ray.

Tables

Characteristic	N (% of Total)
<i>PGY Level</i>	
PGY 1	7 (17.1)
PGY 2	30 (73.2)
PGY 3	2 (4.9)
PGY 4	2 (4.9)
<i>Anticipated Career Specialty</i>	
Medical	8 (19.5)
Critical Care	7 (17.1)
General Practice	6 (14.6)
Radiology	4 (9.8)
Surgical	3 (7.3)
Obstetrics and Gynaecology	3 (7.3)
Psychiatry	3 (7.3)
Paediatrics	2 (4.9)
Pathology	1 (2.4)
Undecided	4 (9.6)

Table 1. Demographics of Respondents. PGY: post graduate year.

Question	N (% of Total)
<i>Have you received any radiology teaching in the last 12 months?</i>	
Yes – mostly formal teaching	11 (26.8)
Yes – mostly informal teaching	22 (53.7)
No	8 (19.5)
<i>If yes, in which setting was this teaching mostly conducted?</i>	
In-person classroom	12 (36.4)
On the wards	19 (57.6)
Virtual teaching	2 (6.1)
<i>Was your radiology teaching in medical school sufficient to prepare you for clinical practice?</i>	
Sufficient	15 (36.6)
Insufficient	26 (63.4)
<i>In which setting was your medical school teaching mostly conducted?</i>	
Virtual classroom	24 (58.5)
In-person classroom	8 (19.5)
On the wards	8 (19.5)
Radiology meeting room	1 (2.4)
<i>Who delivered most of the teaching you received?</i>	
Radiologists	21 (51.2)
Other specialist doctors (eg. Pulmonologists)	20 (48.8)
<i>What is your preferred teaching style for radiological content?</i>	
Interactive case-based discussion	23 (56.1)
Self-directed e-learning modules	9 (22.0)
Examination style / viva	5 (12.2)

<i>Slide show case-based presentation</i>	4 (9.8)
<i>Which modality would you most like further teaching on?</i>	
<i>Computed Tomography</i>	27 (65.9)
<i>X-Ray</i>	7 (17.1)
<i>Ultrasound</i>	5 (12.2)
<i>All of the above</i>	2 (4.9)
<i>In which body region would you most like further teaching on?</i>	
<i>Abdomen and Pelvis</i>	25 (61.0)
<i>Neuroradiology</i>	8 (19.5)
<i>Thorax</i>	3 (7.3)
<i>Musculoskeletal</i>	2 (4.9)
<i>All of the above</i>	3 (7.3)
<i>Would you like to see formal Point of Care Ultrasound teaching introduced into the medical curriculum?</i>	
<i>Good idea</i>	39 (92.9)
<i>Not needed</i>	3 (7.1)

Table 2. Previous Teaching and Suggestions for Future Teaching.

Question	N (% of Total)
<i>Where do you most commonly source radiological information when required?</i>	
<i>Internet websites</i>	40 (97.6)
<i>Radiology textbooks</i>	1 (2.4)
<i>Apps</i>	0 (0.0)
<i>Original articles or reviews</i>	0 (0.0)
<i>Electronic modules</i>	0 (0.0)
<i>How often do you review the patient prior to requesting their imaging?</i>	
<i>Always</i>	11 (27.5)
<i>Most of the time</i>	21 (52.5)
<i>Sometimes</i>	6 (15.0)
<i>Rarely</i>	2 (5.0)
<i>Never</i>	0 (0.0)
<i>How often do you review the imaging of the patients you're caring for?</i>	
<i>Always</i>	6 (14.6)
<i>Most of the time</i>	15 (36.6)
<i>Sometimes</i>	14 (34.2)
<i>Rarely</i>	5 (12.2)
<i>Never</i>	1 (2.4)
<i>Are you required to contact your radiology department to receive approval for imaging requests?</i>	
<i>Yes</i>	17 (41.5)
<i>No</i>	24 (58.5)
<i>How often do you visit your radiology department?</i>	
<i>Daily</i>	1 (2.4)
<i>Once per week</i>	6 (14.6)
<i>Once per month</i>	15 (36.6)
<i>Once per year</i>	12 (29.3)
<i>Never</i>	7 (17.1)

How confident do you feel ordering the correct radiological investigations for your patients?	2 (4.9)
Very confident	14 (34.2)
Mostly confident	15 (36.6)
Sometimes confident	7 (17.1)
Rarely confident	3 (7.3)
Not at all confident	
How comfortable do you feel discussing the most appropriate imaging with a senior doctor (eg. registrar or consultant)	
Very comfortable	0 (0.0)
Mostly comfortable	9 (22.0)
Sometimes comfortable	9 (22.0)
Rarely comfortable	13 (31.7)
Not at all comfortable	10 (24.4)

Table 3. Impact of Radiology on Current Clinical Practice.

Figures

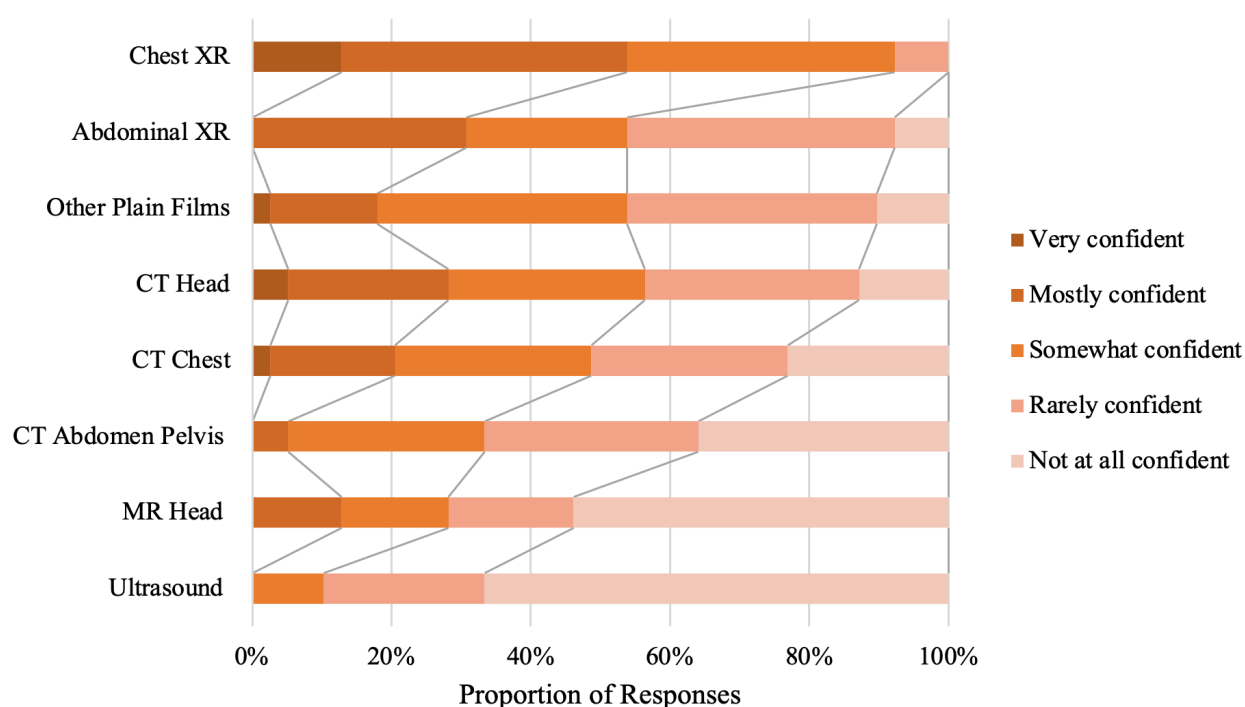


Figure 1. Respondents' Confidence in Independently Interpreting Imaging. CT: Computed Tomography; MR: Magnetic Resonance; XR: X-Ray.

Appendices

Appendix I. Survey Questionnaire

Survey title:

Junior Doctors' Experiences of Radiology and Radiology Teaching

Title subtext:

Answer honestly!

By completing this form you are agreeing to take part in this research study. The data will be used for educational purposes only and will remain de-identified.

Questions:

For how long have you been a junior doctor?

PGY1

PGY2

PGY3

PGY4

In which specialty do you plan to work in the future?

General Practice

Medical

Surgical

Critical Care

Psychiatry

Radiology

Unsure

Other (respondents can enter free text)

Have you had any radiology teaching in the last 12 months?

Yes – mostly formal teaching

Yes – mostly informal teaching

If yes, in what setting was this teaching most commonly delivered?

In-person classroom

On the wards

Over the phone

Virtual teaching

Other (respondents can enter free text)

How helpful have you found your recent teaching?

Select from 1 (not helpful) to 5 (very helpful)

Was the radiology teaching you received in medical school sufficient to prepare you for clinical practice?

Sufficient

Insufficient

How was your teaching in medical school mostly delivered?

In-person classroom

On the wards

Virtual classroom

Other (respondents can enter free text)

Who delivered most of your radiology teaching in medical school?

Radiologists

Other specialist doctors (eg. Pulmonologist)

Do you think existing teaching in medical school should place more emphasis on radiologically-relevant anatomy?

Select from 1 (don't agree at all) to 5 (agree fully)

Which of the following teaching methods do you find most helpful for learning radiology?

Interactive case-based discussion

Slide show case-based presentation

Examination style / viva

Self-directed e-learning modules

Other (respondents can enter free text)

Where do you most commonly source radiological information when needed?

Internet websites

Apps

Original research articles or reviews

Radiology textbooks

Other (respondents can enter free text)

How often do you view the imaging of your patients (ie. not just look at the report)?

Select from 1 (never) to 5 (always)

Are you required to contact your radiology department prior to ordering imaging (eg. CT, MRI)?

Yes

No

How often do you physically visit your radiology department (on average)?

Never

Once per year

Once per month

Once per week

Daily

When ordering imaging, how often have you physically seen the patient prior to ordering?

Select from 1 (never) to 5 (always)

How confident do you feel regarding ordering the correct investigations (eg. XR vs CT, contrast vs non-con)?

Select from 1 (not at all confident) to 5 (very confident)

How comfortable do you feel discussing alternative imaging techniques to those suggested by more senior doctors (eg. registrars, consultants)?

Select from 1 (not at all comfortable) to 5 (very comfortable)

How confidently would you be able to independently interpret: Chest XR

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: Abdominal XR

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: Other plain films

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: CT head

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: CT chest

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: CT Abdomen & Pelvis

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: Ultrasound studies

Select from 1 (not at all confident) to 10 (very confident)

How confidently would you be able to independently interpret: MR head

Select from 1 (not at all confident) to 10 (very confident)

Which imaging modality would you most benefit from further teaching on?

XR

CT

MRI

Ultrasound

Other (respondents can enter free text)

Which domain of radiology would you most benefit from further teaching on?

Neuroradiology

Head and neck

Thorax

Abdomen and pelvis

MSK

Other (respondents can enter free text)

What radiology skills would you like to develop? How would this be best taught?

(Respondents can enter free text)

What are your impressions of radiologists as teachers?

(Respondents can enter free text)

How have your interactions with radiologists been? (positive/negative, helpful/unhelpful etc.)

(Respondents can enter free text)

How do you feel about the introduction of formal Point of Care Ultrasound (POCUS) training being introduced for medical students / junior doctors?

Good idea

Not needed

Any other comments?

(Respondents can enter free text)