

Enhancing undergraduate clinical radiology education in a university teaching hospital

A two-year mixed methods evaluation of learner feedback to improve practice.

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**London North West
University Healthcare**
NHS Trust

Our Practice

- Integration of clinical radiology is a key component within the UK undergraduate curriculum with outcomes and capabilities aligned with the UK Regulator's (General Medical Council) outcomes framework.
- Our challenges include offering a comprehensive and learning objective targeted experience for the students in a limited amount of time (see sample medical student timetable).
- We also strive to deliver quality teaching by utilising our experienced radiologists and radiographers, whilst continuing to manage our departmental work load and provide safe patient care in a busy hospital with demanding service and research requirements.

NPH 5th Year Medical Student Rota 25/03/19

MONDAY		
0830	Induction meeting - Undergraduate Centre, Anup Jethwa/Margaret Ross	
0900-0930	Radiology introductory meeting - report to Radiology Secretaries, Dr Mostafa Eljaili	
0930-1000	Objectives/How to refer to Radiology tutorial – Seminar Room, Dr Mark Jenkins	
1000-1200	10-1200- St Marks Fluoroscopy – St Marks Radiology Consultant	
1300-1400	Teaching (Trauma)- Registrar's Room, Dr Priyesh Karia	
1400-1500	Stroke Meeting - Seminar Room, Dr Gabriel Cooper/Dr Wade Bayef	
1500-1530	CT scanning Main CT (CT Radiographers)	CT scanning A&E CT Scanner (CT Radiographers)
1530-1700	CT Reporting – Dr Rajiv Patel	
TUESDAY		
0830-0930	CT scanning (CT Colonography) Main CT (TBC) CT Reporting – Consultant Radiographer	
0930-1100	Trauma Radiograph Reporting – Registrar Room, Dr Sam Bayat	
1100-1215	Infectious Diseases MDT - Seminar Room, Dr Anthony Chambers	
1230-1330	Teaching (US) – Registrar Room, Dr Chun Wah So	
1400-1700	Acute (1.5h) NPH Duty Radiology Room Inpatient Ultrasound (1.5h) Ultrasound reception	Inpatient Ultrasound (1.5h) Ultrasound reception Duty (1.5h) NPH Duty Radiology Room
WEDNESDAY		
0900-1030	MRI 0900-1030 MRI radiographers	
1030-1100	Principles of MRI – SpR Study room, Dr Abbas Rezo	
1100-1200	Teaching (CXR) – SpR Study room, Dr Peter de Souza	
1200-1300	Teaching (AXR) – SpR Study room, Dr Yu Jip Lee	
THURSDAY		
0900-0930	Radiographs/Imaging – Main XRAY Radiographers	
0930-1045	Nuclear Medicine - Isotopes Victoria Topley, superintendent radiographer	
1045-1230	Intervention - Angio suite, consultant radiologist	
1300-1400	Quiz – Dr Mounir Soudani	
1400-1630	CXR and AXR radiograph 'reporting' – SpR Study room – Dr Peter de Souza	
1630-1700	Sign off / feedback session - meet in Registrars Room, Dr Peter de Souza	

Our Practice

- ▶ We host 4-5 final year medical students at our department for 1 week every month, offering a mixture of tutorials with incorporated “reporting” style quizzes, observation of reporting, radiographer–led sessions, and hands-on ultrasound teaching.
- ▶ The core undergraduate curriculum is composed of four main components:
 - 1) **Fundamental principles**
 - 2) **Common emergency conditions**
 - 3) **Imaging in other common presentations**
 - 4) **The role the radiologist as part of the multidisciplinary team.**
- ▶ Clinical teaching is grounded in Adult Learning theory; we deliver teaching and learning using a constructivist approach using role-modelling and work-based learning techniques.
- ▶ This enables medical students to experience interpreting a spectrum of clinical cases in a safe environment with targeted feedback and practical skills acquisition.

Methods

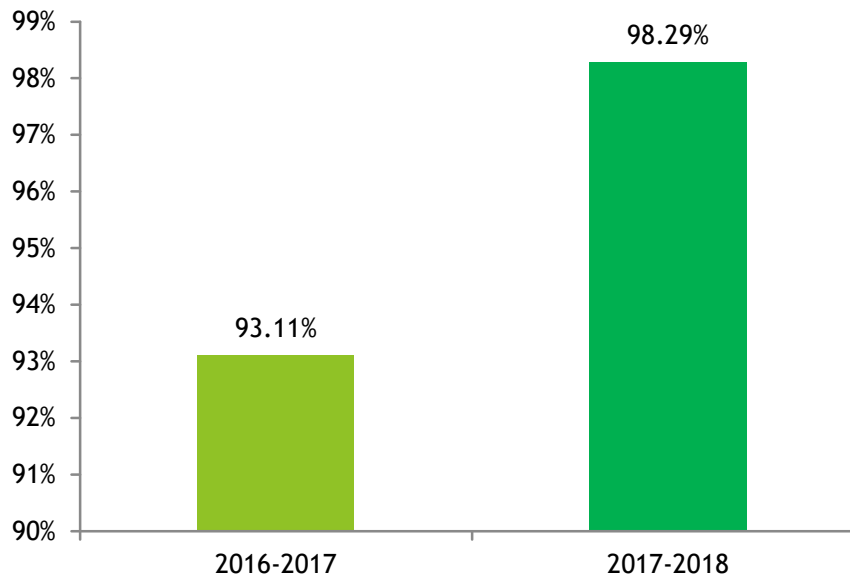
- ▶ We obtained retrospective feedback from learners to guide quality improvement and alignment to their learning requirements
- ▶ Our standard is to achieve 100% of feedback responses to be satisfactory or above.
- ▶ We use the results obtained to reflect on areas for improvement.

Methods

- ▶ A mixed methods approach of evaluation of teaching and learning was undertaken. The radiology registrars (residents) lead this programme, supervised by a Radiology Consultant.
- ▶ Quantitative data was collected using Likert scales (visual analogue) over a linear time period. Qualitative data was collected using open questions and thematic analysis.
- ▶ Paper feedback forms given out to the students at the end of their placement and are completed during dedicated feedback sessions scheduled on their timetable.
- ▶ Feedback was then used at each time point over the two year period to enact changes in our departmental curriculum and teaching programme. This was then subject to ongoing learner feedback, as described above.
- ▶ Feedback received from 43 students for 2017-18 cohort and 22 students from 2016-17 cohort.
- ▶ Feedback is given by each medical student for each session, using a **Likert** scale; 'Very Unsatisfactory', 'Unsatisfactory', 'Satisfactory', 'Good' or 'Excellent'.

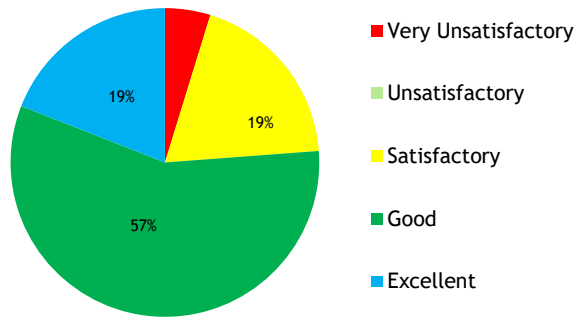
Results- Quantitative

Percentage of 'Satisfactory' or above responses

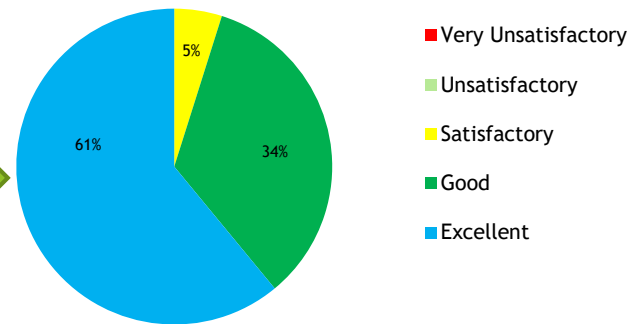


Results- Quantitative

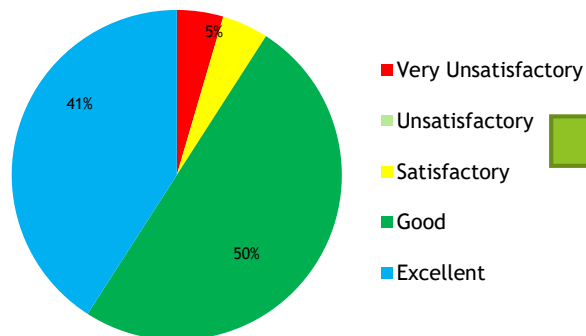
CT Reporting (with radiologist) 2016-2017



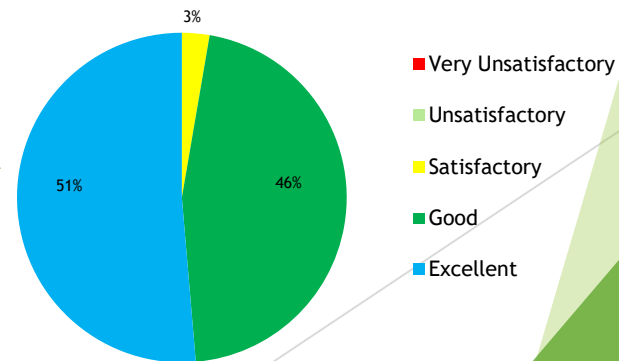
CT Reporting (with radiologist) 2017-2018



X-ray reporting (with radiologist) - 2016 - 2017



X-ray reporting (with radiologist) 2017-2018



Results- Qualitative - Positive

- ▶ The students outlined that they experienced a friendly and proactive department which was motivated to engage with their learning experience.

Very Welcoming
Department

- ▶ There was good response to specific advice; informal given from our residents to the students regarding their career and practical guidance for their early years of working in medicine. Especially relevant as the students were a matter of months away from beginning their internship years as junior doctors.

Received a lot of
Career Advice

Hands on Ultrasound
Session was Excellent

- ▶ The students were very satisfied with the structured tutorials which were devised and delivered by our residents. These aimed specifically for the learning needs of a final year medical students and pitched at their level.

Heavy emphasis on
teaching sessions was
excellent!

Duty radiologist
observation session -
Good advice for F1
(internship) year

Results- Qualitative -Negative

- ▶ The students felt that the purpose of the radiographer allocated sessions were unclear

Clearer objectives from radiographer sessions

Time allocated for watching scans was larger than necessary

- ▶ The students felt that MDT sessions could be too advanced and not enough was done to explain concepts to them and that there was a lack of their involvement.

MDTS meeting felt a bit lost as they were early on and we hadn't come across many CTs etc. Maybe have these later in the week

- ▶ There were certain occasions that fluoroscopy sessions were cancelled due to service demands at our hospital.

Discussion

- ▶ We believe that this is a feasible and effective template for other Radiology departments to set learning objectives to achieve the best outcomes for undergraduate radiology education.
- ▶ We have used quantitative and qualitative feedback to demonstrably improve the medical student experience.
- ▶ We aim to act on more recent feedback in an effort to further improve and tailor the timetable to achieve 100% satisfactory feedback in the forthcoming years. Potential improvements include:
 - ▶ Provide CT sessions early to give a better basic understanding to allow better engagement in CT heavy MDTs.
 - ▶ Allocate residents to MDT sessions to enhance student experience by explaining cases to them
 - ▶ Provide aims to the students and radiographers for the radiographer specific sessions so that there are clear objectives and they can be met.
 - ▶ In the case where fluoroscopy sessions are not available, we should construct an appropriate alternative plan for this session, such as a tutorial delivered to give a broad understanding of this modality.