

Meaningful Learning Experiences

Strategic Commitment	✓	Part of a careers initiative across Greater Manchester
Curriculum Provision	✓	Covering the Key Stage 3 Science topic of 'Radiation'
Employer Partnerships	✓	Involving two leading hospital consultants
Reflective Young People		
Informed Career Choices	✓	Helping to widen participation in HE and NHS careers

Leading hospital consultants provide feedback on student work about Radiation

The project brief from the Science team at St Monica's RC High School in Prestwich identified the topic of Radioactivity – '*... How is it used in everyday life? How do we manage it safely? What are the benefits and the disadvantages?*' The brief stated that, '*We are quite poorly resourced and it can be difficult to bring to life for the pupils. We also have non-specialists within the department, who can struggle to engage pupils.*'

The ideal outcome was described as, '*Pupils knowledge of key area to improve, which in turn improves performance in assessments. Pupils enthused about career possibilities in areas that they would normally be unaware of, or may think out of reach.*'

An approach to the Widening Participation team at the University NHS Foundation Trust resulted in material showing how patients are advised about the benefits and risks associated with X-ray and CAT scan procedures, and students were told, '*... not everyone reads them – and some people get worried. Your challenge is to apply what you have learned about the beneficial and safe use of X-ray procedures: On one side of A4, using plain language and with a few illustrations.*'

Two consultant radiologists agreed to provide feedback about the students' work, also taking the opportunity to tell students something about their roles. Feedback included, '*All of them contained some very good points and demonstrated an understanding of some of the issues involved in using radiation in medical imaging. The topic is complex and of necessity some of the simplification means there are some inaccuracies.*'

Benefits for the Students

The project addressed key pupil issues identified in the teacher brief, particularly about subject knowledge and career aspirations. Even though the brief identified that the department was poorly resourced and supported by non-specialist teaching staff, pupils were presented with classroom resources and feedback from leading experts in the subject being studied – a Consultant Radiologist and Radiology Medical Governance Lead and the Honorary Professor of Musculoskeletal Imaging.

Benefits for the School

- The schools CEIAG ‘... is delivered to all students in Years 7 to 11 through Citizenship lessons, ... a series of structured lessons, activities in schools, assemblies, external trips and events ...’
- This programme enabled the school to develop exemplar projects showing how CEIAG can also be embedded within curriculum learning.
- The project was completed in spite of additional pressures while the school underwent structural changes in response to a challenging Ofsted report.

Benefits for the Employer

The Widening Participation service inspires and empowers members of the local community to gain employment at the Foundation Trust and the NHS more widely. The team delivers employability programmes, work experience placements and a variety of careers outreach programmes. This project placed no demand on their delivery services and involved senior clinicians without requiring them to leave their busy professional roles.

The collage features several educational resources:

- NHS Leaflet:** 'X-rays and other types of medical radiation'. It explains that X-rays are a type of radiation and that radiation can also come from radioactive substances. It provides information on natural sources of radiation in the world, such as rocks, water, and food, and discusses the measurement of radiation dose (mSv).
- Student Poster:** 'THE BENEFICIAL AND SAFE USE OF X-RAYS AND CT SCANS'. It explains that X-rays are a type of radiation called electromagnetic waves, which pass through the body to create images. It also discusses CT scans, which use a large hole with a scanner inside to create cross-sectional images of the body.
- Slide:** 'Disadvantages of having an X-ray or a CT scan'. It lists that CT scans are not as detailed as X-rays, can pick up more abnormal tissue in the body, and that a single CT scan can expose you to a really high dose of radiation. It also notes that while X-rays and CT scans are safe, they can cause unnecessary worry to patients.

Firstly I'd like to thank the students for committing to this project and thinking about how X-rays are used in hospital. I hope they found it useful.

Tilly Motterhead – clear and informative. Just a point to note that patients' who have a CT may feel nauseous but only if they have an injection of a "dye" to help with the scan. Most people however tolerate the scan very well with little or no side effects.

James Hindley - very clear, lovely diagrams and images. I would also add that CT can create 3d images of the body. Unfortunately X-rays are not 100% safe but the doses we generally use are safe. We always use as small a dose as possible to create an xray image or CT scan.

Lola Grogan – you have made a really important point: that because CT scans are so detailed these days sometimes we pick up things that we are not sure about but turn out to be nothing to worry about. This can cause unnecessary worry to patients sometimes. I also like your comments encouraging patients to ask questions and your explanations of having an xray and CT are clear.

Henry – very good presentation with very comprehensive facts about xrays and CTs with some very helpful information about Xray safety and details as to what CT stands for and how a CT image is produced.

Arek – excellent explanation of the risks of Xrays, and what an Xray and CT does. Your picture of the leg cut open may be a little gruesome though!

It is really important for the general public to have a realistic understanding of the risks of ionising radiation we use in Xrays and CT. As one of the students alluded to, we are all exposed to background radiation. This comes mainly from the rocks in the earth and from solar radiation (cosmic rays). In Manchester we receive a dose of 2mSv per year just by living our daily lives. A chest xray gives a dose of 0.03mSv – about 3 days of background radiation. A CT of the body may give a dose of 6 mSv – about 3 years of background radiation. In Medicine we always balance the risks against the benefits of any test or treatment and generally the risks of an xray or CT are considerably smaller than the benefits of "seeing" inside the body and making an accurate diagnosis.

In my job as a Radiologist I "read" xrays and scans and discuss the findings with other doctors and patients. To become a Radiologist you have to go to medical school for 5 or 6 years then spend another 8-10 years specialising. There are tons of exams (I was about 33 years old when I took my last exam!) but the job is immensely rewarding as I am privileged work with the general public, other doctors and the most expensive equipment in the hospital!

Thank you again to the students and good luck in your future

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Year 10 students applied their knowledge about 'Radiation' to create a concise and attractive patient information sheet. Feedback emails were received from a Consultant Radiologist and Radiology Medical Governance Lead and from the Honorary Professor of Musculoskeletal Imaging.