Radiography

Joyce Seaton is a senior radiographer. She works for the Worcestershire NHS Acute Hospitals Trust. Here she explains why she chose to be a radiographer and gives an insight into her working day, as well as how to begin a career in radiography.

Why did I choose radiography as a career? A week's work experience in a local hospital gave me a taste of the various departments. I had enjoyed science at school and, although I found the pathology department fascinating, it was the X-ray department that really captured my imagination. It was bristling with activity. Radiographers were carrying out examinations not only in the department, but also on the wards, in the operating theatre, and working in accident and emergency, as part of a well-oiled team.

This was the ideal career for me. I have always been a people person and I love taking a good picture. Box 1 gives you an insight into my typical working day.

Types of radiography

We have certainly come a long way since Wilhelm Röntgen noted that the bones of his hand were more opaque than flesh to his newly discovered invisible rays. Bones are only part of the story. **X-ray** examinations can also be carried out using a 'dye' or contrast material, a substance with a high atomic number (see Box 2). This can outline a variety of body structures and vessels either as a static picture or when moving, as in **fluoroscopy**.

Other diagnostic imaging techniques include **CT** (computed tomography) and **MRI** (magnetic resonance imaging) scanners. These can produce three-dimensional images, enabling diagnosis and accurate measurements for treatment planning.

● **To find out about other types of medical imaging read the article in Catalyst Vol. 16, No. 2.**

Box 1 A typical working day

I switch on the equipment at the start of a new day, as a nervous student enters the X-ray room in the imaging department. The work is often unpredictable, but there is a pre-booked appointment for a kidney investigation today. I am to assess the student as she performs the entire examination. I talk to her while she calms down a little; she smiles and leads the patient reassuringly to the couch.

The control image, the first of a series, appears in front of me on the computer screen. Our new department is film-less. We no longer have a darkroom or smelly chemicals. Instead, we have a picture archive computer system (PACS) which is part of a new national programme for IT being delivered by the NHS. This enables digital images to be viewed at different hospitals. This is only one of the many exciting changes I have seen in radiography over the years.

The radiologist now arrives. He is a doctor who specialises in radiology. He has given us the go ahead to do the IVU (intravenous urogram), and will interpret the images when we have finished. He stays to give the injection of contrast. This is iodine-based and can cause an allergic reaction, so the patient is informed and observed carefully.

A certain amount of skill is now needed to align patient, X-ray tube, and image receptor speedily to obtain an image of the first flush through the kidneys. In this case, we are looking for evidence of kidney stones. These can be removed by the surgeon in theatre, and the radiographer is often needed to help him locate them. On studying the next images it appears that any stones have now gone.

The relieved patient is given instructions to go back to the doctor and a satisfied, happy student tidies away.

X-ray fluoroscopy image generated during a kidney investigation

Richard Haynes/Worcestershire Acute Hospitals Trust

Box 2 Atomic number

The higher the atomic number of a material the more difficult it is for X-rays to pass through it. Bone has an effective atomic number of 14 because it contains calcium and phosphorus as well as other lighter substances. The effective atomic number of soft tissue is about 7. Barium (atomic no. 56) salts are used to show up the alimentary canal in X-rays, and in the plaster on X-ray room walls. Lead salts are used in making the protective lead glass and lead-rubber aprons and gloves.

Another 'scan' which is well known about now is **ultrasonography**. This technique uses ultra high frequency sound waves to produce a moving image. It is used to look at babies before they are born to check that they are developing correctly.

Scans are also done in **nuclear medicine departments**. A radioactive isotope is administered to the patient and its radiation shows up how particular organs are functioning (see 'Radioactivity in medicine' on pages 11–13).

Above: *Joyce with the X-ray machine used for the procedure described in Box 1*

Becoming a radiographer

It is important to have spent some time in an X-ray or a radiotherapy department before applying to universities. Contact the personnel department at your local hospital to arrange this.

Box 3 Types of radiographer

There are two types of radiographer: diagnostic and therapeutic.

- **Diagnostic radiographers** produce images which can be used to diagnose conditions (as discussed in this article).
- **Therapeutic radiographers** work alongside specialists in cancer (oncologists). They use radiation with great accuracy to destroy harmful, fast-growing cells without damaging healthy ones. The same patient can be seen many times as the treatment progresses and will need considerable reassurance.

Box 4 Useful websites

www.newgenerations.org.uk
www.radiographycareers.co.uk
www.nhscareers.nhs.uk
The site for the Society of Radiographers is very helpful and has online videos:
www.sor.org.uk

Qualifications

Ideally you need to have an interest in science and good GCSE grades, as well as at least two A-levels or equivalent. However, the requirements do vary between universities.

At university, as well as attending lectures on the 3-year BSc course, students are given clinical placements where they receive practical training and see different imaging techniques.

Skills and qualities

As well as the obvious technical skills that are needed for the profession, it is important to be able to communicate well, to have compassion and to care about others.

When Marie Curie was recruiting for her radiology car in the First World War she said that her workers needed to be '*débrouillard*'. Roughly translated this means 'able to figure things out'. I believe that quality still holds true for radiographers today.

- **Check out atomic numbers on a periodic table (www.chemicalelements.com).**

Career progression

Radiographers can go on to specialise in the different types of imaging and have the opportunity to follow a postgraduate certificate, diploma or masters degree. There is scope for management positions, teaching and research, or work in the private sector, the armed forces, forensics, or overseas, where British radiographers are highly valued.

- **To view a selection of images including a kidney investigation select image gallery on www.radiologyinfo.org**