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## Free Internet Resources for Radiologists



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This is the second in a series of three articles written by Dr Andrew Dixon, Managing Editor for Radiopaedia.org and Dr Fiona Pathiraja, Chair of the Junior Radiologists' Forum at the Royal College of Radiologists.

In the first article in this series, we suggested that any radiologist not utilising the internet to improve their diagnostic process is at risk of falling behind the modern professional standard. So which websites should radiologists be using? In this article we review a selection of the currently available free open access websites of most relevance to radiologists and radiology trainees.

### **Radiopaedia**

[www.radiopaedia.org](http://www.radiopaedia.org)

An impressively large free radiology resource founded by Australian radiologist Dr Frank Gaillard. The site consists of an open-edit encyclopaedia built collaboratively by thousands of users. The site's 8,000 articles follow a consistent style guide, usually include numerous case examples, and directly reference the peer reviewed literature. Due to the wiki nature of the project, the articles constantly grow and update, with every edit reviewed by a team of radiologists. The site is also home to over 18,500 individually authored cases including scrollable CT and MRI. Search for 'Joubert Syndrome' and you have more than 15 case examples, whereas in a textbook you might find one or two static images. The site's playlist and quiz mode feature is excellent for teaching, both for educators who can quickly prepare tutorials, and for trainees who can work through and share playlists in preparation for board exams. The site is funded through advertising and delivers online courses for free in 115 developing countries and at low cost elsewhere. A large social media network and YouTube channel further enhance the site.

#### **How best to use it:**

Radiopaedia is ideal as your quick reference during day-to-day reporting both for checking facts and for finding comparative case examples. The playlist and quiz mode features are invaluable to trainees and educators alike, and are changing the way radiology is taught.

### **Radiology Assistant**

[www.radiologyassistant.nl](http://www.radiologyassistant.nl)

A non-profit educational website founded by co-editor in chief Dr Robin Smithuis for the Radiological Society of the Netherlands. It consists primarily of articles co-authored by one to three individuals with expertise in the topic being covered. The articles have a set publication date and present a systematic overview of core knowledge based on regional pathologies and clinical presentations. Most overviews are comprehensive and are accompanied by relevant annotated images, diagrams and tables which are often directly referred to in the text. General references are included at the end of each article. The website is free of advertising.

#### **How best to use it:**

While it can often be useful for quick fact reference, this site is most useful for acquiring or reviewing a general overview of a region or topic, and in this respect it is often superior to Radiopaedia.org.

### **Radiology Masterclass**

[www.radiologymasterclass.co.uk](http://www.radiologymasterclass.co.uk)

This website was set up by UK radiologist Graham Lloyd-Jones and is primarily aimed at medical students and junior doctors. It is also a useful place to start if you are looking to get into radiology. The learning is focused around chest, MSK trauma and abdominal plain films and an introduction to brain CT. The free tutorials provide a structure with which to approach a specific test e.g. Research abdominal X-ray. A useful 'hoverover' feature allows anatomy to be superimposed onto plain film/CT images, which is particularly good for getting to grips with basic radiological anatomy. Self-assessment options are also available through a gallery. Further courses can also be purchased.

#### **How best to use it:**

Useful interactive introduction to radiology and radiological anatomy via self-directed learning for medical students and junior doctors. Unlikely to be of great use to radiologists in daily practice, but good to be aware of for teaching purposes.

### **ARRS Goldminer**

<http://goldminer.arrs.org>

A search engine that provides access to over 500,000 images from peer reviewed biomedical journals. Funded by the American Roentgen Ray Society, the site has no advertising or commercial affiliation. Visitors can search for a topic or disease and receive a result that is not unlike a Google image search. The image thumbnails are however small; often too small to facilitate any real assessment without clicking through to the journal article, and the results can vary greatly in relevance. Advanced search features to limit imaging modality, patient demographics and journals can improve quality.

#### **How best to use it:**

Most of the time Google images and Radiopaedia.org will have you well covered when trying to find a case comparison image to boost your diagnostic confidence. But on the rare occasion they fail you, then ARRS Goldminer can be worth a try.

### **The Ultrasound Site**

[www.theultrasoundsite.co.uk](http://www.theultrasoundsite.co.uk)

A relatively new UK-based website founded by Stuart Wildman who, like most contributors to the site, is an extended scope physiotherapist with advanced training in musculoskeletal sonography. The site consists largely of individually authored MSK ultrasound case studies. All studies include a discussion of the clinical presentation of the patient, ultrasound images and many of them feature video too. The site includes tips on scanning and injection technique, and there is reference to peer reviewed literature where appropriate. It is well integrated with the usual social

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media channels and also has its own active forum pages. The site offers ultrasound courses in the UK and also displays a small amount of advertising as sources of funding. There is a free member registration process to receive case studies directly to your email inbox.

**How best to use it:**

If you have an interest in MSK ultrasound or need to upskill then this site is great. For radiologists who infrequently perform MSK injections, the ability to quickly review an ultrasound guided injection technique before picking up the needle can be particularly useful.

**Other Websites**

There are of course many other openly accessible radiology websites that can be of use to radiologists and radiology trainees including William Herring's LearningRadiology.com and James Smirniotopoulos' MedPix site (<http://rad.usuhs.edu/medpix>). Of the many non-radiology medical websites, the orthopaedic site orthobullets.com is worthy of special mention as its articles frequently include medical images and descriptions of imaging appearances and imaged-based classification systems.

In the final article of this series, we will be examining the role of social media in the continuing professional development of radiologists. In particular we will be looking at how free open access website resources, blogs and journals can allow radiologists to share knowledge and collaborate like never before.

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Dr Andrew Dixon is a consultant radiologist at the Alfred Hospital in Melbourne, Australia. He is a managing editor for Radiopaedia.org, an editorial board member for the Journal of the American College of Radiology, and founder of the Radiology Channel on YouTube.

Dr Fiona Pathiraja is a radiology registrar at University College London Hospitals, United Kingdom. She is chair of the Junior Radiologists' Forum at the Royal College of Radiologists which represents over 1,000 radiologists in training in the UK.

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