

## Educational Portals

Technological progress opened new perspectives to Ultrasound; on the other hand new clinical applications are emerging with the need for the practitioner to stay up to date and also refresh personal knowledge. In addition to traditional educational sources, the internet every day offers even more a cornucopia of websites on which e-learning and specific sources of information on ultrasound are available.

E-books, journal articles and other electronic learning material, can be purchased and instantly downloaded. On the other hand, there is a wide offer of free of charge learning materials on the web too. The use of tablet pc's with web navigation and multiple functions, serves as personal electronic libraries ready for consultation also during practice, offering easy reading experience with links for internet pages. Some use different specialized tablet applications, while others prefer a simplified organization with read only opportunities.

Among the most useful e-books, the authoritative EFSUMB course book on ultrasound prepared by prestigious experts, updating the ultrasound state of the art, is highly advisable. Other e-books on ultrasound can be purchased at various web portals. Many paper books offer codes for accessing their web pages for further reference and ample illustrations. Video illustrations of these books are possible giving learning opportunities available only on the web.

EFSUMB has an online educational portal with cases and video presentations. It also offers a post-graduate web course and links to useful web pages. In the EFSUMB blog the member practitioner can stay in touch with the colleagues, discuss particular topics, such as the most recently presented on CME accreditation, and to ask questions. A recent newcomer and rapidly growing part of the this educational portal is the EFSUMB ATLAS which offers state of the art images with succinct but adequate descriptions (www.efsumb-atlas.org).

Among the best web sites for e-learning are those of ESR with EURORAD cases and EPOS presentations, the sites of RSNA and

their two journals, the site of the American Institute of Ultrasound in Medicine, that of the Australian Institute of Ultrasound, the site of American College of Radiology with their cases, etc. Wide possibilities of free journal articles can be found. There is the possibility to earn continuous medical education (CME) credits online, too, in many web sites.

The recent advancements of ultrasound, in the midst of initial enthusiasm and literature reports, should be applied in clinical practice with care and only when warranted by the guidelines. The EFSUMB

web site shows as main titles in the home page its guidelines for CEUS and Ultrasound Elastography applications prepared by specialized experts in these fields.

In addition to that, Pubmed search provides the possibility to find literature references and read the abstracts and the full text of the free articles. It also has a search option but only for free of charge articles.

General searches with the common used search engines is not particularly advisable as the redundancy of in-authoritative web sites where one is directed, may induce focusing and spending time on unimportant and sometimes misleading information. Quickly refreshing some notions of the pathological basis of disease

The screenshot shows the EFSUMB ATLAS website interface. At the top, there is a logo for the European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) and the text 'EFSUMB ATLAS'. Below the logo is a search bar with the text 'Search Atlas Database For:' and a 'GO' button. To the right of the search bar is a 'HOME' button. The main content area is titled 'CEUS NON LIVER GUIDELINES > Gastrointestinal Tract > Inflammatory bowel disease'. Below this title is a grid of video and image thumbnails. Each thumbnail has a play button icon and a title. The titles include: 'Acute diverticulitis of the sigmoid colon', 'Crohn's Disease - Cine loop of CEUS of a fibrous stenosis 001', 'Crohn's Disease - Cine loop of CEUS of a fibrous stenosis 002', 'Crohn's Disease - color doppler ultrasonogram of small intestine', 'Crohn's Disease - colour flow signals in the GI wall', 'Crohn's Disease - Enterocutaneous fistula located at the left lower quadrant', 'Intestinal Loops of Colon Sigmoid', 'Non-enhancing lesion with hyperenhancing rim and septa - abscess formation', 'Ulcerative Colitis - enhancement of the sigmoid colon wall', and 'Ulcerative Colitis - time intensity curves of a sigmoid colon wall'. A left sidebar contains a detailed navigation menu with categories like 'CEUS LIVER GUIDELINES', 'CEUS NON LIVER GUIDELINES', and 'ELASTOGRAPHY'. The bottom of the page has a footer with the text 'Atlas Display System Concept & original design © Kosmos Design 2013 Software © Kosmos Software Limited 2013 Content © EFSUMB 2013'.

with wikipedia might be acceptable when one is in a hurry at work, but using internet at large, to look up information for compiling the report of an examination might lead to flaws and errors. During an ultrasound examination with a difficult presentation, the physician could mistakenly be over-involved with the identification of one or a few signs of specific diagnoses that he knows of, and he might re-enforce his confidence with the web search, yielding a misleading report that leaves out more probable diagnoses. In such problematic cases the author of this letter, has found useful in his experience, giving a report of ultrasound description, refraining from quick web consultations, and keeping contact with the physician that has the patient in his care. It is better, later, after work, to look up authoritative sources and ask the referring physician for useful clinical information and exchange opinions with him or her about possible diagnoses that are compatible with the ultrasound presentation. Sometimes, it has also been useful, recalling the patient for ultrasound, after consulting the literature on the web and on this basis discussing with the referring physician.

Specific diagnostic imaging search engines could be useful: [www.yottalook.com](http://www.yottalook.com) and [www.searchradiology.com](http://www.searchradiology.com). With these searches, links to many authoritative free of charge publications can be found. Going straight to the web site of a specific journal and searching there, without a general search, is a viable option for someone who has a favorite journal such as *Ultraschall in der Medizin (EJU)*, *Radiographics*, *Radiology* and *American Journal of Roentgenology*. Many journals offer for free, online, the articles that are not of their very recent journal issues. One can also search for only images with the radiology web searches, when the aim is to further reinforce the learning and memory of what one has studied. In such a situation, after one has gained theoretical notions, [www.ultrasoundcases.info](http://www.ultrasoundcases.info) is found useful by many colleagues; well organized web site with abundant images and little or no descriptions and explanation of signs. Hours of image reviewing can be spent in this web site, with organ based or

pathology based organization. Reviewing a plethora of cases and images counts as experience and helps the ultrasound operator to progress up in the learning curve and increase confident accuracy in the diagnosis. [ecomovies.it](http://ecomovies.it), [siumb.it](http://siumb.it) and many European national ultrasound societies offer in their web sites ultrasound courses, case reports, image and videos galleries, their journals and other online learning materials. Interesting is the Case of the Month of EFSUMB. Furthermore, EFSUMB as mentioned above has an educational portal and is planning to start online courses with EFSUMB CME credits.

A panoply of ultrasound case reports and lectures can be found in a variety of other General Imaging web sites, as for example, [goldminer.arrs.org](http://goldminer.arrs.org); [mypacs.net](http://mypacs.net); [rad.usuhs.edu/medpix](http://rad.usuhs.edu/medpix); [radiology.casereports.net](http://radiology.casereports.net); [medicalrounds.com](http://medicalrounds.com); [acr.org](http://acr.org); [med-ed.virginia.edu/courses/rad/](http://med-ed.virginia.edu/courses/rad/) (tutorials on thyroid, testicular and emergency ultrasound); [learningradiology.com](http://learningradiology.com); [auntminie.com](http://auntminie.com); [radquiz.com](http://radquiz.com). ... For advanced searches: [clinicalkey.com](http://clinicalkey.com). For ga-

mutts in imaging differential diagnosis: [gamuts.acr.org/](http://gamuts.acr.org/). Furthermore, some manufacturers offer ultrasound images in their web site or sponsor ultrasound learning sites. Access to journals can be found through [isradiology.org](http://isradiology.org).

Cautious and responsible evaluation of the source and reliability of internet information is crucial.

In conclusion, e-learning is a most useful tool for the ultrasound practitioner in helping his progress in the path of continuous lifelong learning, honing his specific skills and enhancing the diagnostic confidence. Improving the quality and the offer of e-learning is therefore mandatory since "Education is the most powerful weapon which you can use to change the world" (Nelson Mandela)

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