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Review of Available Online Educational Resources for Medical Physics Education

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Motivation

- **Medical physicists (MP) are involved in the education of undergraduate and graduate students, as well as residents.**
- **Currently, there is no reliable means of communicating or publicizing new online educational resources.**



Objectives

- **Share a summary of online resources that may be useful to the MP community for educational purposes.**
- **Caveat – This information is not complete and due to the nature of the internet, is constantly changing.**



Categories

- 1. List servers**
- 2. Professional organizations**
- 3. National/international agencies**
- 4. Universities websites**
- 5. Miscellaneous websites**



1. List Servers

- An e-mail management software application that handles subscription requests for a mailing list and distributes messages, newsletters, and other posts from members of the list to the entire list



1. List Servers

- **DXIMGMEDPHYS**
 - Diagnostic imaging MP mailing list
- **MEDPHYSUSA**
 - American MP mailing list
- **MEDPHYS**
 - Global MP mailing list
- **MEDPHYSBOARDPREPARATION**
 - List server intended for MP trainees who are in process of taking their MP board exam



2. Professional Organizations

- **American Association of Physicists in Medicine (AAPM)**
- **American Society of Radiation Oncology (ASTRO)**
- **European Society for Radiotherapy and Oncology (ESTRO)**
- **Health Physics Society (HPS)**
- **Radiological Society of North American (RSNA)**



Examples - AAPM

- **Available resources:**
 - **Links to Medical Physics, Journal of Applied Clinical Medical Physics, and Physics Today**
 - **Publications**
 - **Task Group and Work Group reports**
 - **Medical Physics Practice Guidelines**
 - **Virtual library and on-line learning center**
 - **Educators resource guide**



Examples - ESTRO

- **Available resources:**
 - **Curricula, guidelines, and elearning resources (e.g., videos, presentations, text).**
 - **Publications such as:**
 - **GEC-ESTRO Handbook of Brachytherapy**
 - **ESTRO physics booklets (series of 10 booklets)**

3. National/International Organizations



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- **International Atomic Energy Agency (IAEA)**
- **International Commission on Radiological Protection (ICRP)**
- **Society of Nuclear Medicine and Molecular Imaging (SNMMI)**



Examples - IAEA

- **Available resources:**
 - **Radiation oncology physics handbook and slides**
 - **Radiation biology handbook**
- **Radiation Protection of Patients (RPOP) site**
 - **Safety guides and reports, technical documents, and summary of radiological accidents**
 - **Training modules in diagnostic and interventional radiology, nuclear medicine, and radiotherapy.**

www.iaea.org

<https://rpop.iaea.org>



4. University Websites

- **MIT Open Courseware (OCW)**
 - In 2000, the MIT faculty proposed the OCW concept as a means to advance knowledge and educate students
 - Free and openly licensed digital publication of educational material
 - Includes MIT syllabi, lecture notes, assignments and solutions, exams and solutions



4. University Websites

- OCW Consortium
 - In 2002, the concept evolved and expanded to a worldwide community of 250 higher education institutions and associated organizations to form the OCW consortium
 - Collectively, the consortium has published material from more than 13,000 courses



5. Miscellaneous Websites

- **European Medical Radiation Learning Development (EMERALD)**
- **Remote Real-Time Education in Medical Physics (RREMPT)**
- **Computer-based learning modules for clinical dosimetry**



Example - EMERALD

- **Following a conference on post-graduate education in medical radiation in 1994, delegates from several EU universities and hospitals piloted a project to develop training material for medical physicists in diagnostic radiology, nuclear medicine and radiotherapy**
- **Materials included curricula and e-learning modules**



Example - EMERALD

- **Since site piloted, it has expanded:**
 - **European Medical Imaging Technology (EMIT) - training material on US and MRI**
 - **EMIT e-Encyclopedia for Lifelong Learning (EMITEL) – medical physics encyclopedia and multilingual dictionary**

TABLE 1. List of relevant online educational sites based on the initial work of AAPM TG 115. Each of the hyperlinks is categorized by the educational content they contain.

Professional Societies and Organizations			<i>Educational Categories</i>							
<i>Intended Audience</i>	<i>Author</i>	<i>Hyperlink</i>	<i>Physics/ Radiologic Physics</i>	<i>Anatomy & Physiology</i>	<i>Health Physics</i>	<i>Radiation Biology</i>	<i>Diagnostic Imaging</i>	<i>Nuclear Medicine</i>	<i>Radiation Therapy</i>	<i>Misc.</i>
Physicist	American Association of Physicists in Medicine (AAPM)	http://www.aapm.org	X		X		X	X	X	
	AAPM Medical Physics Resource Page	http://www.aapm.org/links/medphys/default.asp#lists	X		X		X	X	X	
Physicist, Physician	American Board of Radiology (ABR)	http://theabr.org								X
	ABR Foundation	http://www.abrfoundation.org					X		X	
Physicist, Physician	American College of Radiology (ACR)	http://www.acr.org			X		X	X	X	
	ACR Care in Point	http://3s.acr.org/cip/		X			X			
Physicist, Technologist	Association of Educators in Imaging and Radiological Sciences (AEIRS)	http://www.aeirs.org								X
Physicist	American Institute of Physics (AIP)	http://www.aip.org/education/	X							
General	American Institute of Ultrasound in Medicine (AIUM)	http://www.aium.org/					X			
General	American Nuclear Society (ANS)	http://www.ans.org	X							
Physician	Association of Program Directors in Radiology (APDR)	http://www.apdr.org/residents_and_fellows.cfm								X



Conclusions

- **Provide a summary to the medical physics community of potentially useful online educational resources.**
- **Since list of sites are not comprehensive and online content is ever changing, hope is that this material will be periodically reviewed and updated by an AAPM workgroup or subcommittee (e.g., Medical Physicists as Educators Subcommittee).**