

## EDUCATIONAL RESOURCES

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### RADIATION PROTECTION OF PATIENTS WEBSITE OF THE IAEA AS A MAJOR RESOURCE FOR MEDICAL PHYSICISTS

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**Abstract-** The radiation protection of patients (RPOP) website of the IAEA (<http://rpop.iaea.org>) has been one of the major resource that medical physics professionals have utilized in the last few years. The website was established in Sept 2006 and has grown to be at top website of the world in the area of medical radiation protection. Besides conventional area of practice that medical physicists are involved in, the website also provides extensive material on radiation protection in use of fluoroscopy outside radiology in gastroenterology, urology, orthopedic surgery, protection in dentistry, in hybrid imaging, bone mineral densitometry and also material relevant for referring physicians. The website provides training material as power point slides for free download and posters on radiation protection in fluoroscopy and computed tomography. This paper describes thinking behind development of this website, purpose and orientation, how search optimization was performed to enable appearance on first page of search (like Google search), performance indicators and results achieved.

**Keywords-** Website management, Search optimization, radiation protection, patient protection, medical radiation protection, IAEA RPOP website

#### INTRODUCTION

Way back in 2004 during a meeting of the Steering Panel of the International Action Plan on Radiological Protection of Patients (IAPRPOP) of the IAEA [1], it was deemed appropriate to initiate actions for a website dedicated on this topic. No website in the world at that time was able to provide information on:

1. Radiation doses to patients in diagnostic radiological procedures
2. What actions are needed to optimize patient doses while maintaining image quality or clinical purpose

3. Which radiological medical procedures are associated with radiation risks that cannot be ignored, what are risks and how to deal with them

4. Specialized training material for various professionals

During the planning phase, issues that needed careful attention were:

a) Should the new website be a resource to let people know what the organization does or it be a scientific resource to meet needs of users?

b) Should it have dominant orientation towards regulators or hospital professionals?

With these in background, the path we followed is as given below:

#### ORIENTATION TO PURPOSE

Most websites are directed at letting visitors know what the organization or company does. Whereas it was a unique opportunity to be beneficiary based. Radiation protection of patients neither reflects an organization nor is a subject like radiology, medical physics, radiation oncology... There is a purpose in the name itself. If there are few billions of patients who undergo radiological examinations each year, how the website can make a difference to them. Just by providing information that concerns some thousands of regulators or medical physicists, one cannot achieve safety of billions of patients. That provided answers to above two questions. There were many issues pertaining to the mandate of the IAEA and if the website should provide information only for health professionals who have responsibilities assigned under the Standards [2] or extend to information for patients. Many times the purpose (safety) gets lost as tools and how to use tools take over and mask the purpose. Rules become more important than the purpose

for which rules were made. Although these debates took away lot of time, fortunately we kept track of the purpose and started with information for health professionals first and in subsequent years for patients.

Another important decision making point was when we were ready with training material and had to decide if we should make them available as power point slides or as pdf. Fear that .ppt slides will be modified by people and may then contain wrong information that can tarnish the image of the IAEA had to be dealt with to allow more weightage to the benefits of providing flexibility to users and making training material more useful than the pdf. In those years it was not common to make available .ppt files on websites and we were among the first ones to take bold step and make available huge training material for free download.

Many home pages tend to be too crowded. We were conscious that we need to keep home page somewhat cleaner with lesser information. At the same time we wanted specialist audiences to be seen on home page, such as interventional cardiologists, children, pregnant patients, training material and Member States. We also decided to add rolling texts on “Did you know?” to make home page attractive. Besides conventional area of practice that medical physicists are involved in, the website also provides extensive material on radiation protection in use of fluoroscopy outside radiology in gastroenterology, urology, orthopedic surgery, protection in dentistry, in hybrid imaging, bone mineral densitometry and also material relevant for referring physicians.

After launching website in Sept 2006, an important issue was how will people find us?. It was not possible to coin a catchy short name to add to domain [iaea.org](http://iaea.org). The trends in web were getting directed towards “search”. Remembering URLs, navigating information pages through home page were becoming less important than reaching directly through search engine. We decided to keep short abbreviated name [rpop](http://rpop) to represent radiation protection of patients. Although no one knew this but we felt that with time it will become popular.

### SEARCH OPTIMIZATION

The guiding principles were that the person should not find himself lost in a sea of information, should be able to reach the site dealing with information he is seeking in a matter of seconds.

Our emphasis was on search optimization such that addition of commonly used terms for subject of the website could lead people to first page and on top of first page of search results. No one likes to go to second page of search. After a month or so of starting website, on adding “radiation protection of patients” in Google search, I could spot our website only on page 34. Thus it

was a big challenge to bring on page one. It required lot of research. Most business organizations like hotel, travel industry etc have to pay significant amount to Google to bring them on first page of Google search which we could not do, being Governmental organization. We had to create meta tags to search terms, to headings, sub-headings in content pages, search which terms are used by visitors to website to reach us and enhance material pertaining to those terms.

### UPDATES

Many websites are initiated enthusiastically but not updated regularly. Our emphasis was to update the website such that just by looking at the home page, one gets a feel that the website is current. We wanted our website to be a resource that people look onto when they have to find the status of a controversial subject or happenings in the field. Latest News provided the column for this. Latest literature column was created to bring to the attention of visitors a snap shot of important papers published in the field and upcoming events is primarily an area for events of IAEA or organizations involved in IAPRPOP.

### CONTENTS

It is very easy to provide long answers with lot of information, but more difficult to provide short answers with only meaningful information. There is lot of information available in world from different sources, some times conflicting. People get confused and they are looking for information from an authentic source, which they can rely upon and quote. Our objective was to meet this need. Guidelines that were prepared for contents were:

1. The questions should be catchy, inviting attention and be practically oriented as the audience is largely medical professionals rather than physicists
2. The questions should be so framed that the first line of the answer can give a feel of answer. There is need to keep in mind that the readers are busy, they should just get feel in first line itself. Those interested to read more will go through full text of answer.
3. The answers should be short and crisp, invariably not exceeding 7 lines, at most 10. If more detailed information is absolutely essential, it should be provided through hyperlink (to another question, another heading with response or to another source within the website or to external website) rather than extending the same question to more than 10 lines.
4. References should be in following hierarchy a) publication of international organisations such as ICRP,

UNSCEAR, WHO, EC etc. b) statements of professional bodies in authentic publications c) international journals of repute.

5. Dynamic content with reasonable frequency of updates
6. Meeting the needs of grass roots rather than confining to professional societies or organizations
7. Mega Mall concept- all under one roof

PERFORMANCE INDICATORS AND RESULTS  
ACHIEVED

There are a number of performance indicators for a website. Initially we had access to only reverse proxy for hit statistics but then when Google Analytics started to become popular in 2008-2009, we switched over to it. It provides statistics on visits, geographic distribution.

Fig. 1 gives visits and page views on RPOP website in last five years. There has been continuous increase in visits and the growth rate in visit has been 27 to 53 % per year during 2008-2012 (Table 1).

Fig. 2 depicts download statistics of training material that has been made available for free download as power point slides in different areas [3]. In recent years translated material into Spanish and Russian been added and data for these languages is also included. Overall there have been more than 30,000 downloads of training material every year for the last 3 years (Table 2).

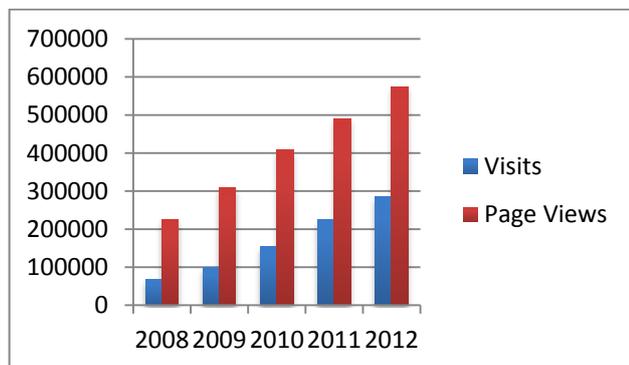


Figure 1. Visits and page views on RPOP website in last five years

Our vision has been to make a difference in the world where more than 3.6 billion diagnostic X ray examinations are conducted every year [4,5,6,7]. In that respect, while training courses, training material and website are powerful resources, still they do not have possibility to affect billions of examinations. To extend outreach further we have developed posters and made them available for free download on website [8]. These posters can be downloaded freely from website and can

be printed in any size without affecting quality. They have been translated into 18 languages so far.

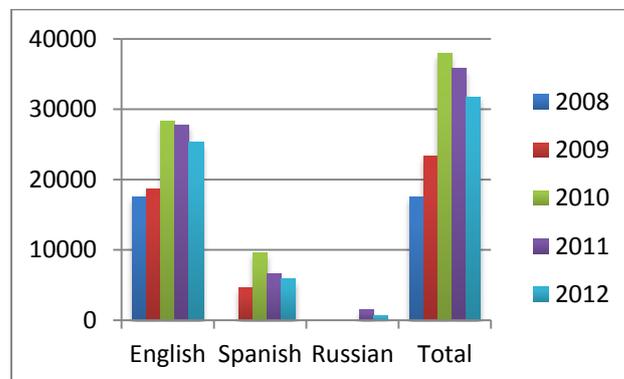


Figure 2. Download statistics of training material in different languages from RPOP website

Top ten search key words in last few years are listed in Table 3 and top ten countries visiting RPOP website are listed in Table 4. The shift as a result of making website available in Spanish language is visible in Table 4.

Table 1: Growth rates of visits on RPOP website

Year	Visits	Growth rate
2008	67,641	NA
2009	100,393	48.42%
2010	153,475	52.87%
2011	223,739	45.78%
2012	285,753	27.72%

Table 2: Top Downloads every year

Topic		2012	2011	2010	2009	2008
Training Material	Total	31693	35753	37945	23296	17496
	English	25270	27759	28327	18723	17496
	Spanish	5819	6563	9618	4573	NA
	Russian	604	1431	NA	NA	NA
Posters	Total	11101	422	NA	NA	NA
	English	10135	405	NA	NA	NA
	Others	966	17	NA	NA	NA

Table 3: Top ten search keywords

Year	Keywords
2012	Eritema, fluoroscopy, digital radiography, dental radiology, erythema, ct colonography, radiography, what is erythema, colonography
2011	Fluoroscopy, erythema, digital radiography, what is erythema, dental radiology, radiography, ct colonography, interventional cardiology, upcoming events
2010	Fluoroscopy, digital radiography, dental radiology, what is erythema, ct colonography, interventional cardiology, digital radiology, upcoming events, radiography
2009	Fluoroscopy, digital radiography, dental radiology, digital radiology, what is erythema, interventional cardiology, upcoming events, iaea workshop justification, radiography
2008	Fluoroscopy, digital radiography, dental radiology, digital radiology, interventional cardiology, paediatric radiography, radiotherapy and pregnancy, therapeutic nuclear medicine, iaea training

Table 4: Top ten countries of visit

Year	Keywords
2012	United States, United Kingdom, Spain, Mexico, Canada, India, Colombia, Argentina, Australia, Chile
2011	United States, United Kingdom, India, Canada, Australia, Spain, Malaysia, Philippines, Japan, Brazil
2010	United States, United Kingdom, Canada, India, Australia, Malaysia, Spain, Philippines, Germany, Japan
2009	United States, United Kingdom, Canada, India, Australia, Germany, Spain, Malaysia, Croatia, Belgium
2008	United States, United Kingdom, Canada, Mexico, Australia, India, Spain, Malaysia, Italy, Philippines

## VII. HOW CAN ONE CONTRIBUTE?

The website provides feedback mechanism and has links with social media. A large number of medical physicist have contributed voluntarily to translation of posters into many languages and to some part of the website. Many medical physicists have contributed to development of training material and contents of the website and there is always need for further contribution

by professionals. The expert panel, which reviews contents before they are uploaded, has many medical physicists. Medical physicists are primary users and contributors to the contents. The training material as provided on the website is routinely used by many thousands of medical physicists, the world over, for training purpose. The feedback provided has helped to improve material.

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