Educational treasures in Radiology:

A free online program for Radiology Boards preparation

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Radiology Case. 2011 Feb; 5(2):23-30 :: DOI: 10.3941/jrcr.v5i2.732

ABSTRACT

Purpose: An objective tool is desired, which optimally prepares for Radiology boards examination. Such program should prepare examinees with pertinent radiological contents and simulations as expected in the real examination.

Background: Many countries require written boards examinations for Radiology certification eligibility. No objective measure exists to tell if the examinee is ready to pass the exam or not. Time pressure and computer environment might be unfamiliar to examinees. Traditional preparation lectures don't simulate the "real" Radiology exam because they don't provide the special environment with multiple choice questions and timing.

Materials and Methods: This online program consists of 4 parts. The entry section allows to create questions with additional fields for comprehensive information. Sections include Pediatrics/Mammography/GI/IR/Nucs/Thoracic/Musculoskeletal/GU/Neuro/Ultrasound/Cardiac /OB/GYN and Miscellaneous. Experienced radiologists and educators evaluate and release/delete these entries in the administrator section. In the exam section users can create (un)timed customized exams for individual needs and learning pace. Exams can either include all sections or only specific sections to gear learning towards areas with weaker performance. Comprehensive statistics unveil the user's strengths and weaknesses to help focussing on "weak" areas. In the search section a comprehensive search and review can be performed by searching the entire database for keywords/topics or only searching within specific sections.

Conclusion: www.RadiologyBoards.org is a new working concept of Radiology boards preparation to detect and improve the examinee's weaknesses and finally to increase the examinee's confidence level for the final exam. It is beneficial for Radiology residents and also board certified radiologists to refresh/maintain radiological knowledge.

TECHNICAL/IT & INNOVATIVE

EDUCATIONAL TREASURES IN RADIOLOGY

In this new series "Educational treasures in Radiology" we introduce the Radiology community to interesting and useful educational resources which can be found on the Internet. The World Wide Web (WWW) offers a plenitude of educational tools, programs and other resources. It becomes more difficult for the individual user to find the "best" resources and to separate the good from the less helpful ones. In each article of this series we present a selected online resource, which we think should be made aware to the Radiology community. This article focuses on *Radiology Boards*, a free online program for Radiology Boards preparation.

Many countries require written boards examinations for Radiology certification eligibility and increasingly change their Radiology Boards exams to computerized and standardized exams. In example, the American Board of Radiology [1] decided to move its Diagnostic Radiology examination completely to computer based [2]. The first Core Examination will be given the first week of October 2013 and the first Certifying Examination will be given in the fall of 2015 [3].

Currently, no objective measure exists to tell if the examinee is ready to pass the exam or not. Time pressure and computer environment might be unfamiliar to examinees and traditional preparation lectures don't simulate the "real" Radiology exam because they don't provide the special environment with multiple choice questions and timing. Therefore, an objective tool is desired, which optimally prepares for Radiology boards examination. Such program should prepare examinees with pertinent radiological contents and simulations as expected in the real examination.

This online program offers over 7000 questions with comprehensive information and explanations for the following sections:

- Clinical sections:
 - Pediatrics
 - Mammography
 - GI
 - IR
 - Nucs
 - Thoracic
 - Musculoskeletal
 - GU
 - Neuro
 - Ultrasound
 - Cardiac
 - OB/GYN
 - Miscellaneous

Physics related sections:

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- General Radiography
- Mammography
- Fluoroscopy/Fluorography
- Digital X-ray Imaging
- Computed Tomography
- Nuclear Radiology
- Ultrasound
- Magnetic Resonance
- Radiation Safety/Protection
- Radiation Biology/Effects
- NRC related materials

In the exam section the user may create a new Mock exam, review all previous exams, review scores and statistics or continue a paused exam (Figure 1).

The user may design individual exams by defining:

- number of questions
- timed or untimed exam
- repeat questions allowed or not
- covering all sections or only selected (to focus on weaker areas)

<u>The exam</u>

Users can create (un)timed customized exams for individual needs and learning pace. Exams can either include all sections or only specific sections to gear learning towards areas with weaker performance. As in a real exam scenario, the user may check the most appropriate answer choice(s) and click on "Next question" to proceed. If the user thinks this question is noteworthy it may be marked for later review. A quick access menu provides a list of each question in this particular exam for quick access (Figure 2). It is also a reminder for which questions have not been answered yet and which questions have been marked. The mark feature not only allows tracking the question within the exam but also after the exam has finished. After finishing an exam, the review mode allows to go through every question and the results. In addition, a comprehensive explanation is also provided for each question (Figure 3).

Analytics and learning curve

Comprehensive statistics unveil the user's strengths and weaknesses to help focusing on "weak" areas.

These statistics determine the learning curve of the user and demonstrate numeric statistics of the overall performance (Figure 4) as well as graphic statistics of performance for individual sections (Figure 5). A status report provides an overview of how many questions are available for each section.

<u>Search area</u>

The search area allows searching the entire database in a broad/general fashion or within specific categories. The search can be narrowed down by only searching within sections, questions, answers, explanations, diagnoses, keywords etc. (Figure 6).

Category and question overview

Every question is listed and may be reviewed by clicking on "Read question". In addition the respective section is displayed and can be also accessed (Figure 7).

Question review mode

By clicking on the appropriate tabs the user may read the question, answer, explanation, literature references and links to similar topics and help by a Radiology specific search engine to find additional peer reviewed information on the Internet (Figure 8).

Community integration

Radiology Boards has been implemented into Radiolopolis [5,6], an international Radiology community for education, research and clinical practice and users may share and use the contents and features also within this educational Radiology network (Figure 9). Radiolopolis members are automatically associated with a *Radiology Boards* account. Radiology Boards provides educational features within the "activity stream" on Radiolopolis such as "Teaching points" and "Questions of the day" (Figure 10).

In conclusion, *Radiology Boards* is a new working concept of Radiology boards preparation to detect and improve the examinee's weaknesses and finally to increase the examinee's confidence level for the final exam.

It is beneficial for Radiology residents and also board certified radiologists to refresh/maintain radiological knowledge.

Do you have a potential topic for "Educational treasures in Radiology"? Then please contact journals@edurad.org.

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FIGURES

R	adiology Boar	rds Prepared for Radiology Boards?
۵	Home	Search Category list New entry My entries My Exams My Learning Curve
⚠	About	Logged in as (Not you? -> Log out)
e	Member area	Start new exam
lat.	Physics boards	1. Continue exam - last worked on 01/24/2009 at 20:40 - View statistics
	Written boards <	
htt	Oral boards	2. <u>Review exam</u> - finished on 01/13/2008 at 12:18 - <u>View statistics</u>
Ð	Discussion forum	3. <u>Continue exam</u> - last worked on 01/07/2008 at 19:49 - <u>View statistics</u>
Ø	Related sites	4. Continue exam - last worked on 01/07/2008 at 19:44 - View statistics
6	Useful links	5. Continue exam - last worked on 01/10/2008 at 12:20 - View statistics
5	Disclaimer	6. Review exam - finished on 07/11/2008 at 10:12 - View statistics
*	Site map	7. <u>Continue exam</u> - last worked on 07/11/2008 at 11:07 - <u>View statistics</u>
6	Contact	8. Continue exam - last worked on 07/13/2008 at 22:30 - View statistics
2	Help	9. <u>Continue exam</u> - last worked on 08/28/2008 at 19:36 - <u>View statistics</u>
		10. <u>Continue exam</u> - last worked on 07/17/2008 at 08:07 - <u>View statistics</u>
		11. Continue exam - last worked on // at : - View statistics
		12. Continue exam - last worked on // at : - View statistics
		13. <u>Continue exam</u> - last worked on // at : - <u>View statistics</u>
		14. <u>Continue exam</u> - last worked on 07/20/2008 at 19:58 - <u>View statistics</u>
		15. Continue exam - last worked on 07/20/2008 at 19:58 - View statistics

Figure 1: In the exam section the user may create a new Mock exam, review all previous exams, review scores and statistics or continue a paused exam.

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	Prepared for Radiology Boards?
Home About Member area Physics boards Written boards < Oral boards	I repared for Radiology Boards: Search Category list New entry My entries My Exams My Learning Curve Logged in as (Not you? -> Log out) Exam mode Go to question
Discussion forum Related sites Useful links Disclaimer Site map Contact	Question 5: 2 3(marked) 4 5(unanswered) 6(unanswered) 7(unanswered) 8(unanswered) 9(unanswered) 1. They m 9(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswered) 10(unanswe
Help	 2. They a 11(unanswered) potence. 3. Most le 12(unanswered) 13(unanswered) 13(unanswered) 13(unanswered) 15. They in 15(unanswered) 16(unanswered) 16(unanswered) 17(unanswered) 18(unanswered) 19(unanswered) 20(unanswered) 19(manswered) 19(manswered)

Figure 2: As in a real exam scenario, the user may check the most appropriate answer choice(s) and click on "Next question" to proceed. If the user thinks this question is noteworthy it may be marked for later review. A quick access menu provides a list of each question in this particular exam for quick access. It is also a reminder for which questions have not been answered yet and which questions have been marked. The mark feature not only allows tracking the question within the exam but also after the exam has finished.

0	Member area	Review mode					
h	Physics boards						
8	Written boards <						
ш	Oral boards	Go to question 1 Go!					
2	Discussion forum						
Ģ	Related sites						
	Useful links	Ouestion A renal angiogram performed on a 25 year old newly diagnosed hypertensive shows					
5	Disclaimer	17: segmental areas of narrowing and dilatation involving both renal arteries and their lobar					
1	Site map	branches. Which of the following statements is true:					
2	Contact	Check all questions which are correct (one or more)					
0	Help	1. Stenting is necessary.					
		2. About 1% to 5% of hypertensive patients have the disease.					
		3. The average age of the patient at presentation is 30 to 40 years.					
		4. The disease is bilateral in 5% of patients.					
		 2. About 1% to 5% of hypertensive patients have the disease. 3. The average age of the patient at presentation is 30 to 40 years. 4. The disease is bilateral in 5% of patients. 5. The disease involves only the renal arteries. 					
		<- Previous question Next question>					
		Correct answer: The average age of the patient at presentation is 30 to 40 years.					
		Explanation: Renal artery stenosis affects only 1% to 5% of hypertensive patients. Fibromuscular dysplasia (FMD), accounts for 30% to 40% of renal artery stenosis. FMD is the most common cause of renal artery stenosis in children; however, the mean patient age at presentation is 35 years. The disease affects significantly more women than men, with a female:male ratio of 31.1. The lesion is bilateral in 40%, and when unilateral, it is more common on the right. Affected kidneys are typically ptotic. Three major types of dysplasias have been identified; initimal fibroplasia, medial fibromuscular dysplasia (incidence, 90%), and adventitial fibroplasia. Angiographically , FMD classically has alternating weblike stenoses and aneurysmal dilatations, giving a "string of beads" appearance and involving the middle segment of the renal artery and possibly beyond. The proximal renal artery is not involved. Multiple systems may be affected, including the carotid, vertebral, splanchnic, or 10% of patients. Stenting is rately needed. angioplasty results in cure or improvement in up to 10% of patients. Stenting is rately needed.					
		More about this question					
		Mark this question					

Figure 3: After finishing an exam, the review mode allows to go through every question and the results. In addition, a comprehensive explanation is also provided for each question.

	Prepared for Radiology Boards?					
۵	Home	<u>Search</u> <u>Category list</u> <u>Ne</u>	:w	entry	/ <u>My entrie</u>	s <u>My Exams</u> <u>My Learning Curve</u>
	About	Logged in as in the logged (Not you? -> Log out)				
P	Member area	Learning summer				
d	Physics boards	Learning curve				
8	Written boards <		_			
hi	Oral boards			То	tal statist	tics
3	Discussion forum	Section	%	Co	rrect answers	Wrong answers
			4	5	2	41
7	Related sites	Mamms	15	21	2	54
5	Useful links	GI	3		2	57
		IR	2	87 S	1	44
1	Disclaimer		6		6	81
Ν	Site map	Chest	1	11	1	62
•			5	5	5	81
s)	Contact	GU	3	•	2	54
2	Help		0			58
			0	1		18
		Cardiac				29
		OB/GYN	0	1		19

Figure 4: Comprehensive statistics unveil the user's strengths and weaknesses to help focusing on "weak" areas. These statistics determine the learning curve of the user and demonstrate numeric statistics of the overall performance.

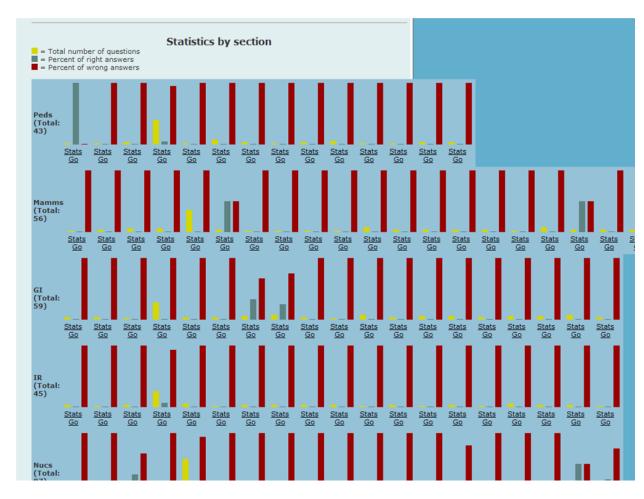


Figure 5: Comprehensive statistics unveil the user's strengths and weaknesses to help focusing on "weak" areas. These statistics determine the learning curve of the user and demonstrate graphic statistics of performance for individual sections.



Figure 6: The search area allows searching the entire database in a broad/general fashion or within specific categories. The search can be narrowed down by only searching within sections, questions, answers, explanations, diagnoses, keywords etc.

A Home	Search Category list New entry My entries My Exams My Learning Curve
About	Logged in as (Not you? -> Log out)
Member are	Search database for in Anywhere 🛩 Go!
A Physics boa	Read <u>Chest</u> Asbestos exposure is associated with all of the following except:
🕜 Written boa	s < Read guestion <u>Chest</u> Concerning pulmonary alveolar proteinosis, all of the following are true except:
ul Oral boards	Read Chest Regarding lymphocytic interstitial pneumonitis, all of the following are true except: guestion
Discussion	
Related site Useful links	Read Chest Concerning pulmonary manifestations of ankylosing spondylitis (AS), all of the following question are true, except:
Disclaimer	Read Chest Regarding pleural calcification, all of the following are associations except: question
▲ Site map	Read Chest Regarding Goodpasture`s syndrome, all of the following are true, except: question
Contact	Read Chest Concerning silo-filler`s disease, all of the following are true except: question
? Help	Read <u>Chest</u> Regarding Alpha-1-antitrypsin deficiency, which of the following is true? guestion
	Read guestion Chest A 55-year-old woman presents with a 4-cm right upper lobe lung mass that is more than 2 cm from the carina. Obstructive pneumonitis and ipsilateral mediastinal lymphadenopathy are also present. Which of the following represents the proper TNM classification for this tumor?
	Read Chest The retrocrural space includes all of the following structures except: guestion
	Read guestion Concerning cystic fibrosis, which of the following is true?
	Read guestion <u>Chest</u> Concerning lymphangiomyomatosis (LAM), which of the following is true?
	<u>Read</u> <u>Chest</u> All of the following are true regarding Pneumocystis Carinii pneumonia except:

Figure 7: Every question is listed and may be reviewed by clicking on "Read question". In addition the respective section is displayed and can be also accessed.

		Prepared for Radiology Boards?				
۵	Home Search Category list New entry My entries My Exams My Learning Curve					
\triangle	About	Logged in as (Not you? -> Log out)				
é	Member area	Question Answer Explanation References Similar topics All at once				
hat.	Physics boards	Next question >>				
	Written boards <	rds < Regarding lymphocytic interstitial pneumonitis, all of the following are true except:				
Ш	Oral boards	1. It is associated with AIDS.				
Ð	Discussion forum	2. Mediastinal adenopathy is common.				
Ø	Related sites	3. Patients are generally symptomatic.				
ð	Useful links	4. Pulmonary function tests demonstrate a restrictive pattern of disease.				
S.	Disclaimer	5. The disease can undergo malignant transformation.				
$\mathbf{\Lambda}$	Site map					
C	Contact					
?	Help					
_						

Figure 8: Question review mode - By clicking on the appropriate tabs the user may read the question, answer, explanation, literature references and links to similar topics and help by a Radiology specific search engine to find additional peer reviewed information on the Internet.

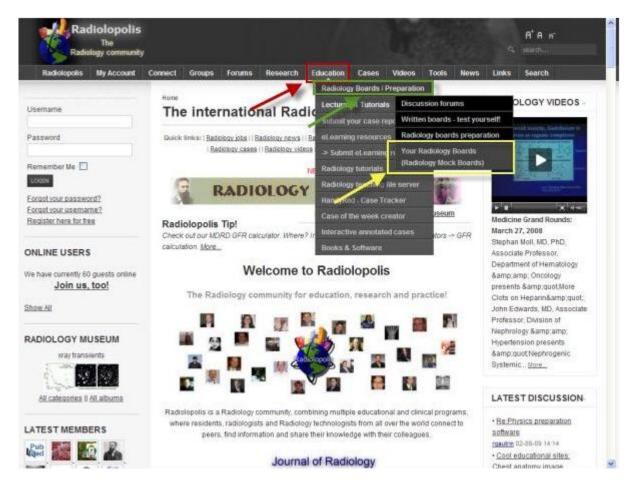


Figure 9: Community integration - Radiology Boards has been implemented into Radiolopolis, an international Radiology community for education, research and clinical practice and users may share and use the contents and features also within this educational Radiology network. Radiolopolis members are automatically associated with a Radiology Boards account.

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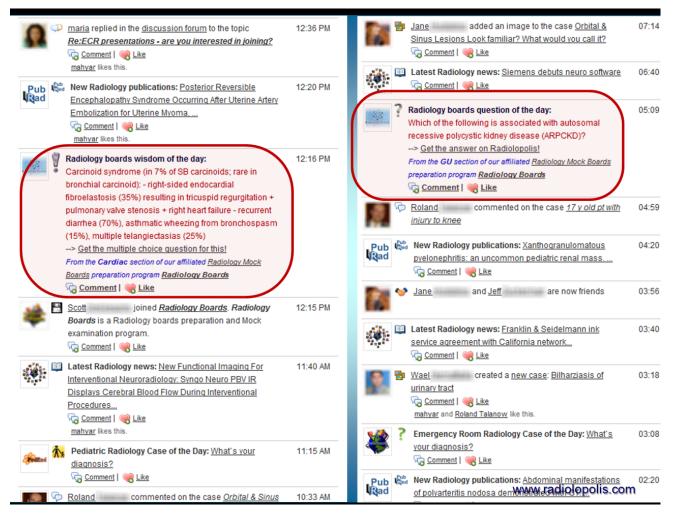


Figure 10: Community integration - Radiology Boards has been implemented into Radiolopolis, an international Radiology community for education, research and clinical practice and users may share and use the contents and features also within this educational Radiology network. Radiology Boards provides educational features within the "activity stream" on Radiolopolis such as "Teaching points" and "Questions of the day".

REFERENCES

1. The American Board of Radiology. http://www.theabr.org. Last accessed on 02/10/2011

2. Diagnostic Radiology CORE Examination Study Guide 2011.

http://www.theabr.org/forms/CORE%20Exam%20Study%20G uide_FINAL.pdf. Last accessed on 02/10/2011

3. The Exam of the Future: FAQs. http://www.theabr.org/present/faq_ic_v2.pdf. Last accessed on 02/10/2011

4. Talanow R. Prepared for Radiology Boards? A New Concept for Radiology Exam Preparation. AJR 2010; 194:A137-A154

5. Radiolopolis - the professional Radiology network for education, research and clinical practice. URL: http://www.radiolopolis.com - last accessed: 02/10/2011

6. Talanow R, Giesel F. Educational treasures in Radiology: Radiolopolis – an international Radiology community. Radiology Case. 2009 Aug;3(9):34-36.

KEYWORDS

Radiology boards; Radiology exam; exam preparation; Radiology examination

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