

## **Who is a Radiologist? The Perception in Enugu, Nigeria**

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### **Abstract**

*Incorrect perception of the public regarding the radiologist is a source of growing concern. For radiology to enjoy a prestige commensurate to its output, attract quality students and adequate funding, it is imperative for the public to appreciate who a radiologist is. This paper sought to obtain responses on questions from a medical community. Structured questionnaire administered to a total of 511 respondents from University of Nigeria Teaching Hospital and responses thereof were analyzed. There were a total of 511 respondents of which 280 [54.8%] were doctors, 207 [40.5%] medical students, 13 [2.5%] laboratory scientists, 4 [0.8%] anesthesia technicians, and 7[1.4%] nursing students. Of the 511 respondents, 19 [3.7%] indicated that radiologists are not medical doctors. Twenty one respondents [5.8%] were not aware that doctors undergo any further*

*training to become radiologists. While 93 respondents [18.2%] considered radiology to be just a money making field, 14 [2.7%] thought that radiology is unimportant. Thirty one [6.1%] indicated that radiologists lacked basic medical knowledge and 15 [2.9%] felt that anybody or any physician can practice as a radiologist. Fifty [9.8%] saw no difference between a radiologist and a doctor turned sonographer while 25 felt that radiologists were one and the same as radiographers. Findings in this study appears to reinforce the perturbing perception that the radiology specialty and the role of its practitioners as invaluable players in the health team is not yet fully appreciated by some, even in a medical community.*

**Keywords:** Radiologist, radiology subspecialties, knowledge, perceptions, medical community

## Introduction

There appears to be a wide gulf of knowledge among the general public with regard to the person and role of the radiologist as a specialist physician [www.radiologyinfo.org; Antioch et al., 2003;Gunderman, Williamson, Fraley, & Steele, 2001]. This becomes a growing concern when viewed against the backdrop that these misconceptions exist even among the medical community [Mulisa, Tessima, & Merga, 2017; Mankad & Bull, 2005; Parekh & Gandhi, 2011]. Modalities of increasing number and sophistication have appeared on the scene since Wilhelm Conrad Rontgen discovered x-rays in 1965 [Parekh & Gandhi, 2011; Pearson, 2006; Margulis & Sunshine, 2000]. This deluge has put increasing demands on the radiologist to increase productivity at least when this is defined in the context of number and rate of images interpreted [Gundermann & Mehta, 2009]. Unfortunately, the consequence of productivity pressures appears to be that radiologists end up looking more at patients' images than the patients themselves, resulting in diminished patient interaction and perception and complaints of reduced visibility [Gunderman, Davilla, Shetty, Galdino, 2005; Borgstede, 2005]. As a consequence many people do not know who the radiologist is or what they do [Gundermann & Mehta, 2009]. This lack of knowledge about radiology and radiologists is not restricted to the general public as seen in a study among US congressional staffers who expressed surprise that radiologists are physicians [Borgstede, 2006].

## Review of Literature

According to the American College of Radiology [ACR], a radiologist is a physician who has specialized training in obtaining and interpreting medical images. This skill which confers imaging expertise is obtained by using x-rays [radiographs, CT, fluoroscopy], or radioactive substances [nuclear medicine], others by means of sound waves [ultrasound] or by using a combination of magnetism and radio-frequency waves [MRI][www.radiologyinfo.org].

Radiologists have the medical knowledge to understand, explain medical problems or symptoms by studying the images obtained in any part of the body. While these images are obtained with the radiology team interacting with the patient using the relevant modality, some authors still insist that

radiologists have little or no contact with the patient [Antioch et al., 2003]. The ACR goes further to explain that the radiologist correlates medical image findings with other examinations and tests, recommends further examinations or treatments, and confers with referring physicians. Radiologists also treat diseases by means of radiation [radiation oncology or nuclear medicine] or minimally invasive, image-guided surgery [interventional radiology]

### **Radiology and Subspecialties**

Radiology has steadily grown to encompass subspecialties. Some of these include: Breast Imaging, Cardiovascular Imaging, Chest Imaging, Emergency Radiology, Gastrointestinal Radiology, Genito-Urinary Radiology, Head and Neck Imaging including Neuroradiology, Musculoskeletal Radiology, Interventional Radiology[Gunderman, Williamson, Fraley, & Steele, 2001], Nuclear Radiology[Mulisa, Tessima, & Merga, 2017] and Radiation Oncology.

In various parts of the world, basic radiology education is introduced from medical school [Mankad & Bull, 2005] and for specialist trainings examinations are streamlined, regulated and certificated by statutory bodies to which the radiologists become affiliates. In Australia and New Zealand for example, Radiologists belong to the Royal Colleges. In America, the American College of Radiology is the apex training, examination and regulatory body. In Nigeria, this function is carried out by West African College of Surgeons and the Faculty of Radiology of the National Post Graduate Medical College of Nigeria.

This paper is a baseline work that seeks to evaluate the knowledge and perception of respondents [within a tertiary medical community in South East Nigeria] concerning the person and role of the radiologist as a specialist within the health care team.

### **Methods**

A structured questionnaire containing unambiguous questions was administered to a total of 600 randomly selected respondents [workers and students] in the University of Nigeria Teaching Hospital, Ituku, Enugu. The responses were thereafter collated and analyzed using statistical package for the social sciences [SPSS] version 18.

### **Results**

Of the 511 respondents, 280 [54.8%] are medical doctors, 207[40.5%] are medical students. Other health workers, 24 [4.7%] accounted for the remainder of the participant population. These health workers comprised 13 [2.5%] respondents; laboratory scientists, 4 [0.8%] were anesthesia technicians, and 7[1.4%] nursing students [Table 1].A total of 146 [28.6%] respondents believe that the Radiologists actually expose the radiographs. [Table 2a].While 11[2.2%] participants are unaware that Radiologists are actually medical doctors, 6 were unsure if Radiologists are actually Medically trained[Table 2b].A total of 426 [83.4%] believe that Radiologists have immense

potentials and [96.9%] know that Radiologists first do a residency training in Radiology [Table 2b]. A total of 24 [4.7%] respondents believe that a Radiologist and a Physician turned sonographer are one and the same [Table 2c/3]. Though 488 [95.5%] respondents were sure that the Radiographer and Radiologist are one and the same, 23 do not know that the Radiologist and Radiographer are not the same [Table 4].

## Discussion

The nature of radiology is no doubt fast changing [Parekh & Gandhi, 2011] while the concept of the radiologist appears to be a shifting paradigm evolving since its inception as a specialty [Gagliardi, 1987; Brown, 1936; Brecher & Brecher, 1969; Skinner, 1950; Christie, 1956; Gagliardi, 1988; Nelson, 1973; Gagliardi, Preston, & Hickey, 1990]. The boom in recent technological advancements have also lent to the expansion in the radiological modalities available today [Pearson, 2006; Margulis & Sunshine, 2000; Hawnaur, 1999]. While it is predicted that by 2020, the number of practicing radiologists will increase by 38%, only superseded by cardiology [Benchley, Walker, Sloan, Hassan, & Venables, 2006], there appears to be a widening gulf of knowledge about radiologists and radiology. In our attempt to 'measure the pulse' of the general public concerning the question of who a radiologist is, the authors carried out a questionnaire-based study within the tertiary hospital community in Enugu [South East Nigeria] with a fair population of radiologists. Responses across the spectrum of the 511 participants in the study were carefully evaluated.

That the Radiologist is a Medical Doctor is perceived correctly by majority of our respondents. Our results show however that a small percentage does not know this. This is significant giving the fact that the survey was carried out in a tertiary hospital community with ten full-time diagnostic radiologists and two radiation oncologists. Radiology often selects the best medical students [USMLE Scores..., 2009; Scrub Notes Medical, 2008; Healthsystem.virginia.edu, 2012] who will then go on to specialize [Scrub Notes Medical, 2008; Healthsystem.virginia.edu, 2012] to become radiologists. While the majority [96.7%] of respondents correctly indicated that the radiologist undergoes specialization in order to qualify to practice, 3.3% of respondents appeared to be oblivious of this [see Table 3]. Although this fraction is relatively small, when considered in the context of the respondents being members of a tertiary community, it becomes worrisome. Laying credence to this are published works which suggest that radiology as a specialty has consistently ranked middle or low in prestige by medical professionals as well as by the public [Schwartzbaum, McGrath, & Rothman, 1973; Shortell, 1974; Sallee, Cooper, & Ravin, 1989; Furnham, 1986; Rosoff & Leone, 1991; Hinze, 1999; Kazerooni, Blane, Schlesinger, & Vydareny, 1997; Creed, Searle, & Rogers, 2010; Album & Westin, 2008] and this is in spite of the fact that radiology is experiencing a golden era [Glazer, & Ruiz-Wibbelsmann, 2011].

Some respondents appeared not to realize that a Radiologist is not the same as radiographer. Both specialties were confused by 4.5% of the respondents. This is not surprising as notable training

institutions arguably do not clarify the differences between the two specialties in their admission information sites [Passaic County Community College, 2007; The Royal Australian and New Zealand College of Radiologists]. The same information clarity is not available in the authors' institution website. Some authors [Patti et al, 2008] have evaluated this dilemma and have concluded that radiologists may be arguably Medicine's least heralded yet one of the most important specialties.

Some authors have expressed worry that the limited contact between patient and radiologist may contribute in the depreciating acknowledgement by patients and the dwindling validation that they are physicians despite the care that they provide [Gunderman & Huynh, 2007]. Ketches and Carlos [2007] stated that the traditional opinion that radiologists are physicians who participate in patient care by generating and interpreting diagnostic images is outdated. Arguing further, the authors opined that radiologists have increased ways by which they add value to healthcare system. Elements of this added value may include economic gatekeeping [financial management], public and political advocacy [Redman, 1989], public health delivery, patient safety, and improvements in the quality of care and information technology. It is apparent that these values have not been made manifest by radiologists in the authors' hospital or have been manifested but unrecognized.

Most radiologists in the authors' city practice in government health institutions where their impact may be diluted out. Few are in private and no group practice exists. Sherry et al. [2010] stated that in the United States, radiologists are affiliated to group practices that are hospital-based. As a result, professional relationships are formed and these are important for successful practice.

Adesola [1978] in a study in Nigeria believes that present day radiologist is armed with modern tools and is a versatile member of the medical team. Duncan et al noted that diagnostic imaging is critical to effective rural health care delivery and still has been neglected by the academia, public and private sectors [Maru, et al, 2010].

While Lee and Basu [Lee & Basu, 2011; Gagliardi, 1995] feel that the tremendous change in radiology landscape are yet to be appreciated and maximized and are of the opinion that the ability of our specialty to continue to thrive will require the presentation of sound evidence showing our added value to patients' overall health and well-being, other authors are of the opinion that advocacy [Thomas, 2006] may be required to address this awareness gap by members of the public concerning who the radiologist is.

## Conclusion

These findings appear to suggest that the field of radiology, the person and role of the radiologist are yet to be fully appreciated even in an enlightened medically conscious community. It may be interesting to test this questionnaire in a multicenter study.

**What is already known on this topic?** The nature of radiology is no doubt fast changing [Parekh & Gandhi, 2011] while the concept of the radiologist appears to be a shifting paradigm evolving since its inception as a specialty.

- The role of the radiology specialty is somewhat clear.

## What this study adds

- There appears to be a wide gulf of knowledge among the general public with regard to the person and role of the radiologist as a specialist physician.
- This becomes a growing concern when viewed against the backdrop that these misconceptions exist even among the medical community.

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## Competing interest

We declare no competing interest

## Authors' contribution

## Results

Of the 600 questionnaires sent out 511 representing 85.2% were returned with answers. Two hundred and eighty doctors of various cadres made up [54.8%] of the total number of respondents, 207 [40.5%] were medical students, 13 [2.5%] were laboratory scientists, 4 [0.8%] were anesthesia technicians, and 7[1.4%] nursing students.

**Table 1 showing the distribution of respondents surveyed**

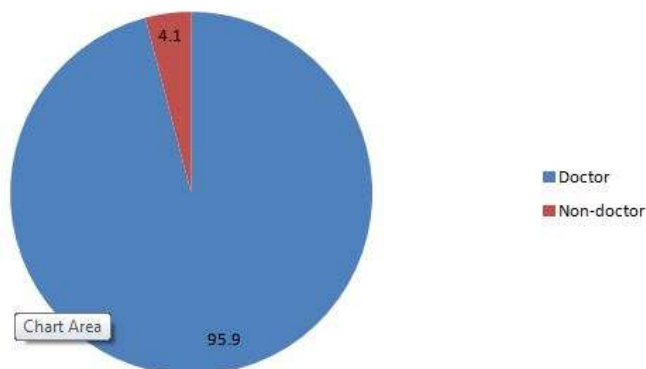
Respondent	Frequency	Percent
Medical officer	67	13.1
Resident Doctor	169	33.1
House Officer	44	8.6
Medical Student	207	40.5
Biochemist	1	0.2
Anesthetic Technician	1	0.2
Nurse Anesthetist	3	0.6
Medical Laboratory Scientist/Technician	12	2.3
Student Nurse	7	1.4
Total	511	100

**Table2 showing the distribution of respondents who fielded answers to the question ‘who is a radiologist’**

	Frequency N = 511	Percent
Medical Doctor	490	95.9
Laboratory Scientist	13	2.5
Technician	6	1.2
No response	2	0.4

As seen in this Table, 19 [3.7%] did not agree that radiologists are medical doctors, while 21 [5.8%] were not aware that doctors are further trained to become radiologists.

**Figure 1: Pie chart showing distribution of respondents' view on the Radiologists medical qualification**



From the pie chart, a minority thinks that the radiologist is non-medically qualified.

**Table 3 showing distribution of answers fielded by respondents to the question: 'Who can practice as a Radiologist?'**

Who can practice as a radiologist?	Frequency		Percent
	N = 511		
Anybody	2		0.4
Any physician	13		2.5
Someone who has completed his/her residency program in Radiology	494		96.7
Don't know	1		0.2
No response	1		0.2

**Table 4 showing the distribution of answers by respondents to the question: Is a Radiographer and a Radiologist one and the same?**

Is a radiographer and radiologist one and the same?	Frequency	Percent
	N = 511	
No	488	95.5
Yes	13	2.5
Not sure	7	1.4
Don't know	2	0.4
No response	1	0.2



Ninety three respondents [18.2%] considered radiology to be a money making field while 14 [2.7%] indicated that radiology is unimportant. Thirty-one [6.1%] indicated that radiologists lacked basic medical knowledge and 15 [2.9%] felt that anybody or any physician can practice as a radiologist. Fifty [9.8%] saw no difference between a radiologist and a doctor turned sonographer while 74 [14.6] felt that radiographers are the same as radiologists.

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