

# MEDICAL PHYSICS CHRONICLE

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## *Editorial*

### Career Path Progression and Educational Standard in Medical Physics

Medical Physics is a professional subject which has direct application in medical sector dealing with use of radiation, be it for diagnosis, treatment, evaluation of treatment or a medical procedure. Now-a-days there are at least 17 institutes / universities offering Medical / Radiological Physics courses in the country. Radiation services in India are effectively governed by Atomic Energy Regulatory Board which looks after radiation safety aspect. The quality of medical physics education, evaluation, examination, experimental infrastructure, teachers' eligibility, students' basic qualification at entry level, implementation of syllabus prescribed, availability of proper field training / internship etc. are still open for manipulation as there is no standard laid and monitored by any agency.

Although College of Medical Physics of India (an autonomous body under AMPI) has designed a syllabus for medical physics educational programmes in India its wider circulation, acceptance and incorporation is yet to be accomplished. Health professionals aid to the healthcare industry and hence the later has shown interest in production of quality health professionals with right skill lately. It would help health industry in providing quality services without spending scarce resources on re-training. Federation of Indian Chambers of Commerce and Industry (FICCI) and AERB organised an awareness conference on radiation safety and quality assurance during 4-5 June 2014 at New Delhi and planned similar events in other parts of the country. Similarly, Confederation of Indian Industry (CII) is collaborating with National Skill Qualification Framework (NSQF) under National Policy on Skill Development formulated in 2009. The objective of NSQF is to bring uniformity and quality in various occupational courses in India and make them at par globally. On 1<sup>st</sup> July 2014 NSQF envisaged career progression path of various allied health professionals engaged in service, administration, academic and industry. The details may be accessed at:

<http://www.skilldevelopment.gov.in/content/nsqf-workshop-career-progression-allie-healthcare-sector>. Again, there was a news report (The Hindu, 5<sup>th</sup> Sept 2014) regarding a national board of allied health services which may look after about 130 paramedical studies currently running in India. These steps show that many allied health professionals and their educations which are not covered under any regulation at present are being considered for major overhaul.

Medical Physics subject has been recognised by MCI as Radiological Physics. However, there is no detailed regulation about its educational standard or career path progression. CMPI and AMPI have to secure active partnership with AERB, MCI, UGC and healthcare industries to work towards these goals immediately.

*Pratik Kumar*

## HEALTHCARE SECTOR SKILL COUNCIL (HSSC)

Dr Zainab Zaidi, Director, Healthcare Sector Skill Council, 711, DLF Tower A, Jasola, New Delhi

The Healthcare Sector Skill Council (HSSC) has been created by National Skill Development Corporation (NSDC), Confederation of Indian Industry (CII) and leading healthcare service providers representing both public and private sector in the country. The key objective of the Council is to create ecosystem for quality vocational education in allied health in the country. Our website [www.healthcare-ssc.in](http://www.healthcare-ssc.in) may be referred for further detail regarding HSSC.

In this endeavor, HSSC has been assigned the task of developing the National Occupational Standards (NOS) in healthcare by involving the stakeholders. Market Survey, Occupational Mapping, and Functional Analysis were done to ascertain the type and number of job roles in the unregulated healthcare sector which comprises of more than 60% of the healthcare professionals and are essential for effective delivery of healthcare. One of the important activities of HSSC also includes assessment and certification of students.

NOS for following 27 job roles have been formed and notified in November 2012:

General Duty Assistant	Emergency Medical Technician Basic	Emergency Medical Technician Advance
Medical Laboratory Technician	Phlebotomy Technician	Histo technician
Anesthesia Technician	Operation Theatre Technician	Diabetes Educator
Blood Bank Technician	Cardiac Care Technician	Dialysis Technician
Radiology Technician	Medical Equipment Technician	Vision Technician
Mental Health Counsellor	Home Health Aide	Dietician Assistant
Pharmacy Technician	Medical Records and Health Information technician	Dental Assistant
Speech Language Pathologist and Audiologist	Assistant Physiotherapist	Front Line Health Worker Equivalent to ASHA

Skills and communication are crucial to being an AHP hence the need for skill and competency based training is vital at this hour in the country. HSSC aims at empowering all individuals through improved skills, knowledge and as per National Skill Qualification Framework to enable them to access decent employment, to promote inclusive national growth and to ensure India's competitiveness in the global market.

Now moving ahead in this process HSSC is developing Occupational Standards for Radiation Therapy Technologist. The standards need to be in alignment with the skill based requirement of the country and other stakeholders like industry, AERB etc.

Experts from the field are invited to be part of this initiative and assist us in developing these standards which will be notified as National Occupational Standard.

## IMPORTANCE OF RESEARCH FOR A MEDICAL PHYSICIST: MY EXPERIENCE

Om Prakash Gurjar, Sr. Medical Physicist, Roentgen Oncologic Solutions Pvt. Ltd., Indore. [ominbarc@gmail.com](mailto:ominbarc@gmail.com)

Medical Physicist means Physics scientist in clinical field. And, that is why the Medical Physicists in UK are known and given the post as Clinical Scientist. They do research along with their regular departmental work. Even in most of eastern and European countries Physicists do a good research work. That is why, all kind of protocols (e.g. dosimetric, planning, radiation safety, radiobiology) are developed by them and most of countries including India and other developing countries following their protocols. Even IAEA publishes his documents giving reference of above mentioned protocols and research work of these countries. There are many indexed journals with good impact factor which are published in eastern countries, then why we (geographically 7th largest country and population wise 2nd largest country in the world) do not have even single indexed journal with impact factor  $\geq 1$ . It is because journals in India (e.g. JMP, JCRT, RPE) receive a very less number of articles as almost negligible research is being done in India, most of Medical Physicists believe in doing their regular departmental work only.

We should understand importance of research. If we make research as essential task along with our routine dosimetric and clinical work, we will have following benefits;

**Personal Benefits:** In general most of Physicists do not read and review the literature and research articles, and so with time basic knowledge becomes shaded and then one becomes associated with only routine dosimetric and planning work. And this is one of the main reasons that the hospital management and colleague physicians take us as technical person who play with computer. But when one starts research work, automatically he starts reading literature and research papers with deep interest. It does not only increase knowledge but also build-up academic confidence. When we have good number of research articles then we show-case about number of our research papers, type of our research, scope of research etc. rather than our degrees. When I started my Ph.D. work, that time I had only one motto that any how I have to complete my Ph. D. But now after writing a few research articles I don't have tension and urgency about completion of Ph. D. I am keenly interested to do quality research work which would be appreciated worldwide and which may give some good thing to our society. When I joined at my current institution I did struggle for teaching post and after long time I had

been given the post of Asstt. Professor. But today when I have good number of research papers and presentation in national and international conferences, I have been given opportunity to become Co-Guide of M. D. students. Also, my HOD and management do not have any problem in promoting me to the post of Associate Professor. I have got benefits financial as well as positional. On the other hand, if I could not have done hard work then expecting and getting all these probably would have been a tall dream.

**Benefit to the Institute:** Our research work represents our institution in conferences and in journals which, in turn, gives fame to our institution. It makes the management of our institution values us. The institute becomes willing to meet our research requirements like arranging equipments and materials and allowing us to use other machines (e.g. CT & MRI) free of cost. And all it helps us to do even better research work.

**Benefit to the nation:** If the number of researcher increases in our country, definitely our journals will receive more number of quality research papers resulting in good impact factor for our journals. It will give recognition to our research and journals on the international platform. Also, we can make our own protocols which would be followed in other countries. TRS, TG and AAPM reports have been made by those physicists who do quality research with interest. Why can't we do such quality work? Definitely we can make guidelines and protocols which would be appreciated worldwide.

I would like to request those seniors who may become Ph. D. guide to guide young physicists and help them in their enrolment for Ph. D. and in doing quality research work. The experienced physicists may help the younger lot about registration at Ph.D. course, writing synopsis and publications of research papers. All these would help us in becoming leading researchers in the world.

#### OUR MEDICAL PHYSICS FACILITY

#### MEDICAL PHYSICS DEPARTMENT, CANCER INSTITUTE, ADYAR

*Prof. N. Vivekanandan, Head, Deptt. of Medical Physics, Cancer Institute, Adyar*

The Medical Physics Department, Cancer Institute, Adyar was started in November 1957. Dr. K.S. Chandraseka, PhD was the Head of the Department at that time. Dr. A.V. Lakshmanan, PhD joined the Department in August 1958 and became the Head of the Department in April 1962. He retired in August 2006 as Director (Administration) and continuing his services as Adviser. Dr. I.S. Balakrishnan, PhD joined the Institute in April 1965 and retired as Chairman, Physical Sciences in April 2007 and continuing his services as Consultant Medical Physicist.

Dr. N. Vivekanandan, PhD joined the Institute in July 1993 and presently working as Professor and Head of the Department since May 2007.

At present, eight full time medical physicists and four interns work in the department. During the last 5 years, 15 research papers were published in international peer reviewed indexed journals. The department was the first to start the M.Sc. (Medical Physics) course in South Asia in 1981 in collaboration with Anna University. So far, over 360 students have passed out and well settled in India and abroad. At present 20 students are enrolled per year. So far, 15 students got their PhD Degrees from the department under the guidance of Dr. A.V. Lakshmanan and Dr. N. Vivekanandan. At present 8 students have registered for their PhD Degree under the guidance of Dr. N. Vivekanandan. The annual statistics for 1st April 2013 to 31st March 2014 is as follows; conventional Radiotherapy planning 705, conformal planning 838, IMRT planning 130, Rapidarc planning 53 and HDR brachytherapy planning 509. The department is equipped with Eclipse, Oncentra and ASHA 3D Treatment Planning Systems, two PTW Radiation Field Analysers, PTW Octavius 3D and Octavius 4D Patient Specific Quality Assurance System and QUASAR phantom apart from the necessary dosimetric equipment like ionization chambers. Treatment units include Sidharth, Clinac 600C, Clinac 2100 and Truebeam Linear Accelerator, two microSelectron HDR brachy units, two conventional Simulators and a widebore CT simulator and two tele-cobalt units.



Dr. I.S. Balakrishnan, Consultant Medical Physicist received lifetime achievement award from Cancer Aid and Research Foundation, Mumbai on 16th Nov. 2013

#### MOVERS AND SHAKERS

**Devi Prasad Pandey** joined as Assistant Professor of Medical Physics at Department of Radiotherapy, Shyam Shah Medical College, Rewa in October 2014. Congrats !!!

**Suresh Yadav** joined as Assistant Professor of Medical Physics at Department of Radiotherapy, Gandhi Medical College, Bhopal in October 2014. Congrats !!!

## KNOW OUR MEDICAL PHYSICIST

**MPS Mann** was born on February 1, 1951 in a peasant family of eight brother and sisters in Punjab's Sangrur district to father Zora Singh and mother Bharpoor



Kaur, both devout Sikhs. He tells a story of his mother giving away her favourite sandook received in her marriage, as a dowry for a dalit girl's marriage. The marriage had got stuck as the groom's side demanded a sandook at the last minute. Mr Mann was raised in the backdrop of such values. As a child in his village he befriended a Potter who allowed him to create different shapes with clay on his wheel. The creativity is marked in his personality even today. This was the first his contact with geometry and Physics. As a child, Mann was always seriously interested in science. His models were so creative that these were taken away by the external examiners. He did his B.Sc. Med Technology with distinction in Anatomy and Physiology and stood first. Anything in science would interest him no end. It is in this pursuit that he helped develop the first slow injector for injecting dye into the lymph nodes.

In spite of excellent academic record, he never got a government job which his father wanted him to take up to help the family. His first job in PGI, Chnadigarh earned him Rs. 297 per month for a few months. During this brief period, he was spotted by none other than Dr SJ Supe, a senior scientist from BARC who happened to interact with Mr Mann doing dosimetry of the Cobalt machine. On his suggestion Mr. Mann did his Dip.R.P in 1974 with his project work on integral dose in Radiotherapy and penumbra. Some of his teachers who had immense influence on his mind were Dr SJ Supe, Dr Bisht, Dr IS Sunder Rao, Dr U Madhavnath, Prof. PS Negi and the visiting Dr LH Lanzal. With the not-so-good job market at that time he had to leave India for Iran. It must be said to Mr Mann's credit that he never sat quiet. He joined computer course run by the Department of Advanced Mathematics at Punjab University, Chandigarh. This followed by another Certificate course from IIT Delhi in Project Management. This helped him establish as a versatile physicist who built the building and bunker, installed a 19MeV Cyclotron from IBA in Noida, a first in private sector. In fact, MPS Mann's life has seen the whole evolution in Radiology, Radiation Oncology and Nuclear Medicine. When Mr Mann returned to India after about 5 years stint in the Department of Radiotherapy and Nuclear Medicine at Iran, he was looking for a job and there was none. Soon his name started circulating in companies like Picker and Philips and they

gave him lucrative offers and helped him to learn a lot about commerce and ethics from this segment of his career. Today Mr Mann works as a visiting Consultant and is a corporate resource for Radiation Safety to Max Healthcare. Mr Mann is a celebrated teacher for teaching DNB students of Radiology. He has been involved in the optimization of Radiation Safety of more than three dozens hospitals in NCR and is considered an authority on radiological regulatory issues. He is also a consultant Medical Physicist to Dr BL Kapur Memorial Hospital, New Delhi; Kailash Hospital, Noida and several other Hospitals in NCR. Many people may not know that Mr Mann is a NABH assessor for Medical Imaging standards. He has now founded Institute of Radiological Standards which is a store house of information of Quality in Radiology. He is the author of a regular column "Back to Basics" in Medical Physics Chronicle.

Mr Mann is a simple man at heart. Popular among the Physicist Community as someone who would say couplets from various poets with ease and sense of timing. He is also fond of playing Tabla. We wish he will be amongst us for a long time and active in the subject.

## LETTER TO THE EDITOR

### SOME THOUGHTS ABOUT MEDICAL PHYSICS

*Dr. M.R. Raju, International Cancer Center, Mahatma Gandhi Memorial Medical Trust, PedaAmiram, Bhimavaram, Andhra Pradesh - 534204.*

This has reference to the editorial published in January 2014 issue of Medical Physics Chronicle with the title "7th November: International Day of Medical Physics". It is important that some of AMPI members share their vision with future trainees through popular articles on our professional heritage of dedicated scientists such as Madam Curie and others like L.H. Gray, Herbert Parker, H.E. Johns and several others who left the exciting field of physics at that time and dedicated their lives in alleviating the suffering of cancer patients. Dr. U. Madhvanath who played an important role in establishing AMPI and several others such as P.S. Iyer may be ideal to contribute such articles.

Currently, we are facing the global trends in medicine that is becoming less and less patient-centric and more and more eccentrically money-centric. As a radiation scientist, I often feel that we have studied radiation effects to the core for more than 100 years all over the world. Instead of becoming a good model for safety to other agents, it has become a major addition to the existing fear in our psyche which we have not yet learned to handle. To some extent, this is partly due to over-emphasis on radiation safety issues compared to the less light on general awareness of

its' real benefit committed to a common man. I wish that we put even more emphasis on more frequently occurring really dangerous issues such as public health, road accidents etc. With a hope to contribute to the field of radiation research to improve the human condition, I switched from nuclear physics to radiation research in 1961. I returned to rural India from USA to set up a center for providing appropriate radiation treatment. During my work at the center I find that cancer patients are more scared of radiation than even cancer before the treatment. After the treatment, surprisingly the patients and their families are the best spokes persons for the beneficial effects of radiation.

The current trend in radiotherapy is to go for latest equipment without considering the cost-effectiveness of such treatments. Operating conditions for such equipment like continuous supply of required quality of power supply, ideal temperature and humidity, are mostly unfavorable in India and their operating and the annual maintenance costs are exorbitant. It is disheartening to find that radiation oncologists, medical physicists and radiotherapy technologists in general are unwilling to work in centers that have only cobalt units although they serve adequately to treat a good fraction of patients in a cost effective manner. The most important task before us now is to dispel the fear of radiation among the people and provide appropriate radiation treatment for rural population by setting satellite centers connected to major cancer centers.

### MOVERS AND SHAKERS

**Mr. Birendra Kumar Rout** has joined as Head, Radiation physics at Aditya Birla Memorial Hospital, Pune. Congrats!!!

**Dr Devesh Gupta** has been promoted in April 2014 as Professor, Radiation Physics, Deptt. of Radiotherapy, Dr SN Medical College, Jodhpur. Congrats!!!

**Dr. Radhakrishnan B. Nair**, Sr. Medical Physicist, Apollo Specialty Hospital, Chennai and Member, Board of Trustees, AMPI has been awarded PhD in April 2014 by the Jawaharlal Nehru Technological University, Hyderabad on his thesis titled "Photon Interaction cross sections of biological samples". Congrats!!!

**Dr S. Senthilkumar**, Asstt. Professor, Department of Radiotherapy, Madurai Medical College, Tamilnadu received Best Paper Award at International Conference on Multidisciplinary Management on Breast Cancer, Cochin, Kerala, March 2014 for the paper entitled "Quantification of cold and hot spots

Furthermore, the younger generation may be inspired to resolve these issues by our spiritual and professional heritage and also by living exemplary members of AMPI.

### OBITUARY

*Prof. M. Ravikumar, President AMPI & Head, Department of Radiation Physics, Kidwai Memorial Institute of Oncology, Bangalore, Karnataka.*



**Late Dr Sanjay Sudhakar Supe**

Dr. S.S. Supe, Professor of Radiation Physics, Kidwai Memorial Institute of Oncology, Bangalore passed away in Bangalore on 5th June 2014 following a year long illness due to carcinoma of tongue. He was born in Mumbai on 3rd April 1962. His father Dr.S.J.Supe, our respectful teacher, was a Scientific Officer and Ex-Group Head in BARC, Mumbai. Dr.Sanjay had his primary education in Central School, BARC, Mumbai. Dr.Sanjay completed his B.Sc in 1984 from Mumbai University and M.Sc in 1986 from Dr. Babasaheb Ambedkar University, Aurangabad. He underwent Diploma in Radiological Physics (Dip.R.P) in 1987 from Bhabha Atomic Research Centre and awarded Ph.D (Biophysics) in 1993 from Dr. Babasaheb Ambhedkar University, Aurangabad.

He has started his career as a Medical Physicist in Karnataka Cancer Therapy & Research Institute, Hubli and later joined as a Lecturer in Radiation Physics in 1989 at Kidwai Memorial Institute of Oncology, Bangalore. He was promoted as an Associate Professor in Radiation Physics in 2005 and eventually became Professor of Radiation Physics in 2012. He has more than 50 publications in national and international journals to his credit. Dr.Sanjay used to love attending scientific meetings and had more than 75 presentations.

Dr. Sanjay. S. Supe was a Life Member of AMPI for more than 25 years and served as executive committee member twice. He was a nice colleague, very helpful teacher and academician keen on publications and presentations. He had enviable collection of published articles and presentations which he was always eager to share with students and colleagues. Dr. Supe was very fond of music, cricket and watching movies. He had a wife and two daughters. We have lost a good hearted, simple, humble devoted colleague and Medical Physicist. Let us sincerely pray God to rest the departed soul in peace and give strength to dear one's to bear the loss.

**PUBLICATIONS FROM INDIAN MEDICAL PHYSICISTS  
JANUARY – JULY 2014**

**A Saravanakumar, K Vaideki, KN Govindarajan, S Jayakumar.** Establishment of diagnostic reference levels in computed tomography for select procedures in Pudhuchery, India. J Med Phys. 2014, 39, 50.

**CP Joshi.** Patient safety in an environment of rapidly advancing technology in radiation therapy. J Med Phys. 2014, 39, 61.

**KM Ayyangar, RA Rani, A Kumar, AR Reddy.** Monte Carlo study of MLC fields for cobalt therapy machine. J Med Phys. 2014, 39, 71.

**L Nithya, NAN Raj, A Kumar, S Rathinamuthu, MB Pandey.** Comparative analysis of volumetric-modulated arc therapy and intensity-modulated radiotherapy for base of tongue cancer. J Med Phys. 2014, 39, 71.

**N Gopishankar, RK Bisht.** Verification of Gamma Knife extend system based fractionated treatment planning using EBT2 film. Medical Physics. 2013, 40, 122104.

**OP Gurjar, SP Mishra, V Bhandari, P Pathak, P Patel, G Shrivastav.** Radiation dose verification using real tissue phantom in modern radiotherapy techniques. J Med Phys. 2014, 39, 44-49.

**RA Kinshikar, CM Tambe, K Patil, M Mandavkar, DD Deshpande, R Gujjalanavar, P Yadav, A Budrukkar.**

Estimation of dose enhancement to soft tissue due to backscatter radiation near metal interfaces during head and neck radiotherapy - A phantom dosimetric study with radiochromic film. J Med Phys 2014, 39, 40.

**S Ananthanarayanan.** Use of ultrabook and iPad mini for processing, display, storage and transmission of medical images using MIM software. J Med Phys. 2014, 39, 60.

**S Bahl, SP Lochab, A Pandey, V Kumar, VE Aleynikov, AG Molokanov, Pratik Kumar.** Characterization and luminescence studies of Eu doped Barite nanophosphor. Journal of Luminescence, 2014; 149:176–184.

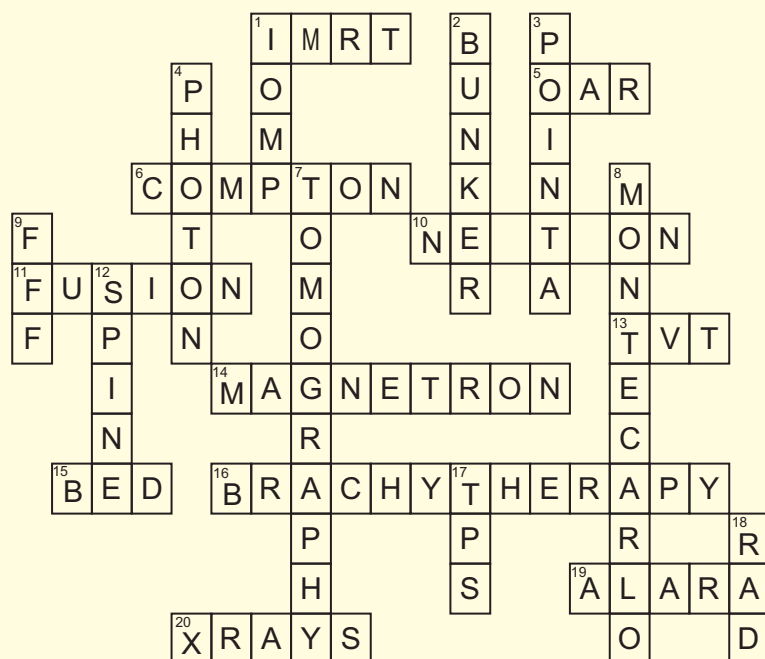
**S Kumar, D Datta, SD Sharma, G Chourasiya, DAR Babu, DN Sharma.** Estimation of distance error by fuzzy set theory required for strength determination of HDR192 Ir brachytherapy sources. J Med Phys. 2014, 39, 85.

**TP Selvam, V Shrivastava, G Chourasiya, DAR Babu.** Monte Carlo-based revised values of dose rate constants at discrete photon energies. J Med Phys. 2014, 39, 4-9.

**VP Singh, NM Badiger.** Effective atomic numbers of some tissue substitutes by different methods: A comparative study. J Med Phys 2014, 39, 24-31.

**ZS Al-Rahbi, R Ravichandran, JP Binukumar, CA Davis, N Satyapal, Z Al-Mandhari.** A Dosimetric Comparison of Radiotherapy Techniques in the Treatment of Carcinoma of Breast. J Cancer Ther. 2013, 4, 10-17.

**SOLUTION OF RADIATION ONCOLOGY PUZZLE (published in Jan 2014)**



**Across**

- 1 Dancing peacock
- 5 Needs protection during irradiation
- 6 Interaction
- 10 Absence of oxygen does not make any difference in treatment
- 11 Images are hand in gloves-CT/MR
- 13 Handy in radiation shielding calculations
- 14 Common in Linac and oven
- 15 Radiobiological dose scale
- 16 Radioactive source is sailing inside the tumor
- 19 Minimum possible radiation

**Down**

- 1 An international organization
- 2 Hiding place-radiation safe
- 3 From Manchester
- 4 Packet of energy
- 7 Sectional imaging
- 8 Treatment algorithm
- 9 True Beam
- 12 Serial organ
- 17 Sun is behind moon
- 18 Absorbed dose

**Congrats: Dr kamlesh Passi & Manimala, Ludhiana; Richa Sharma, Delhi; Dr Raghu Ram K Nair, Thiruvananthapuram**

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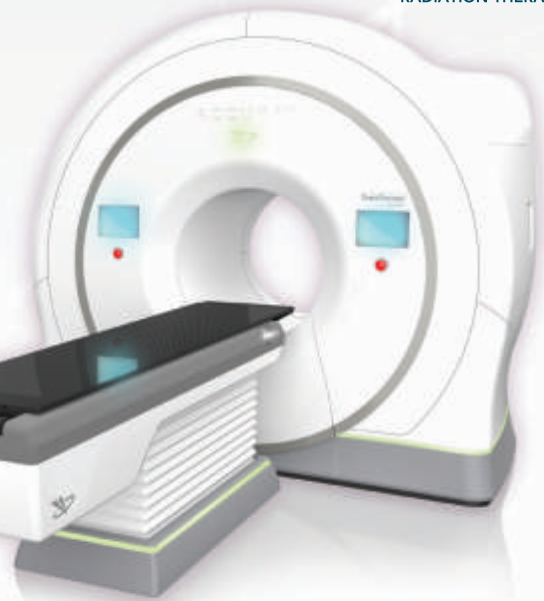
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