Voice of BMPS

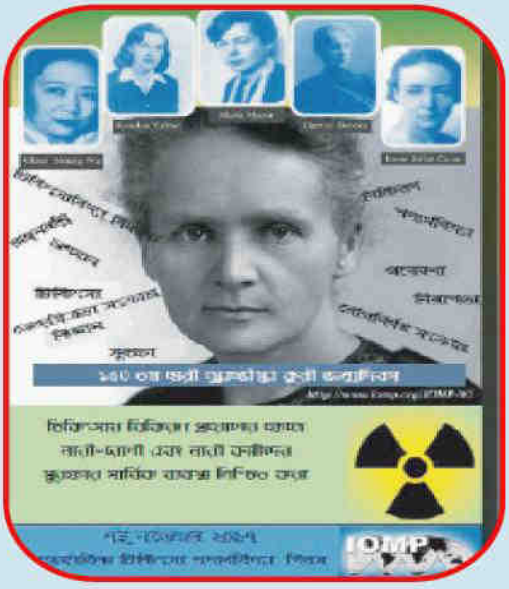
An official Yearly e-Newsletter of BMPS, Issue 5, November 2017

Bangladesh Medical Physics Society

5th International Day of Medical Physics (IDMP)

7th November, 2017

150th Birthday Marie Sklodowska-Curie



Marie Sklodowska-Curie
(7th November 1867 – 4 July 1934)

New Executive Committee,Bangladesh Medical Physics Society (BMPS): 2017-19

Hands on Training of TPS and QC of Imaging

22nd International Conference on Medical Physics 9-12 December, 2016, Thailand: Participation of BMPS Members

Celebration of "Science for Patient Benefit": Slogan, IPEM

3rd INTERNATIONAL CONFERENCE ON MEDICAL PHYSICS IN RADIATION ONCOLOGY AND IMAGING

FIRST ANNOUNCEMENT

www.bnpsbd-icmproi.org/

ICMPROI-2018

10-12 March 2018

Call For Abstract

10th September, 2017

Open For Registration

15th September, 2017

Venue

Bangladesh Institute of Administration and Management (BIAM), Dhaka, Bangladesh

Organizer

Co-organizer

Endorsed by

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Celebration Of
5th International Day of Medical Physics (IDMP)

November 7, 2017

Organizer : Bangladesh Medical Physics Society (BMPS)
Co-organizer : Dept. of Medical Physics and Biomedical Engineering (MPBME), Gono Bishwabidyalay (University), Savar, Dhaka, Bangladesh.

Organizer

Co-organizer

Scientific Writing Contest On:

⌘ **Importance of Medical Physics in Cancer Treatment**

Eligibility : All students with Science background, Oncologists, medical physicist, doctors and engineers.

Writing Guideline

⌘ Word: 300,Title: Arial-14 Point size
⌘ Author: Arial-12 Point size
⌘ Affiliation: 11 Arial Point size
⌘ Keywords: Minimum 6
⌘ Send us by email

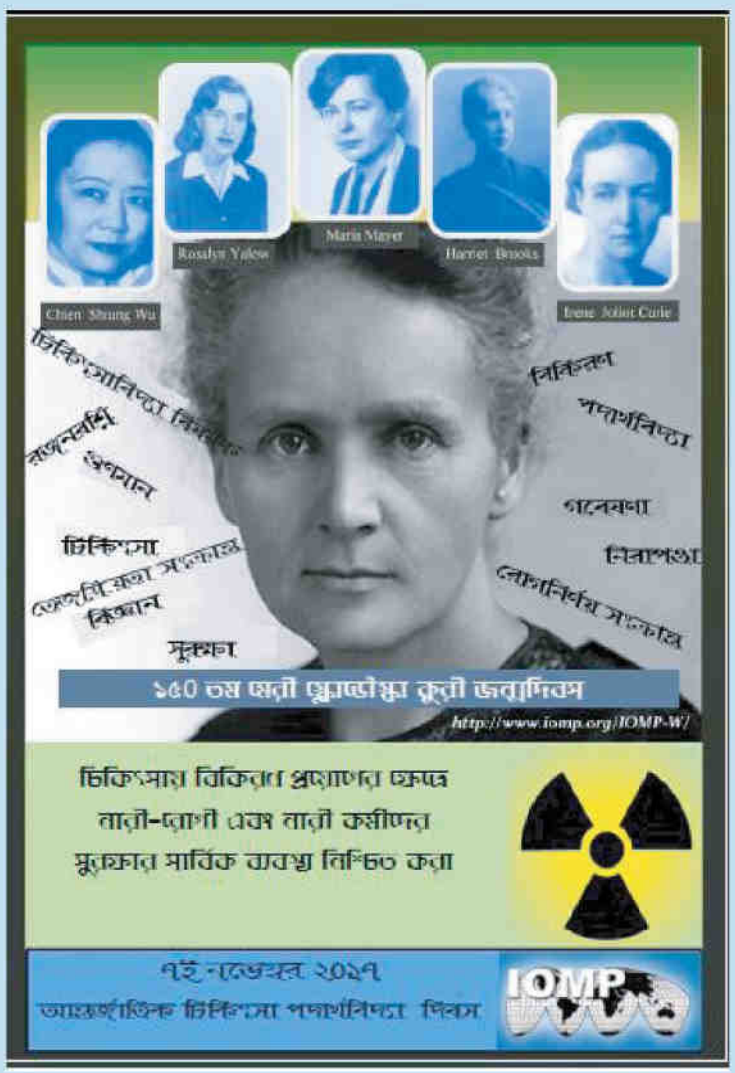
Submission Deadline:

20 September- 20 October 2017

Contest Winner Announcement

25 October 2017

1st Prize 5000 BDT
2nd Prize 3000 BDT



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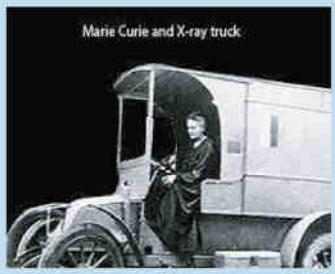
Marie curie


Discovered radioactivity


Experiment on X-ray discovered



X-ray truck


Noble prizes of Marie Curie for physics and chemistry.

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Editorial

Welcome to "Voice of BMPS (Electronic newsletter of Bangladesh Medical Physics Society), Issue- 5, on the occasion of International Day of Medical Physics (IDMP), 7th November 2017".

The theme of this year of IDMP is **"Medical Physics: Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine"**. In developing countries like Bangladesh, advanced technologies in therapy and diagnostics are installed both in government and non-government sectors. However, we are not so much concern about radiation safety which may develop stochastic and deterministic effect of the exposures. Moreover, quality control (QC) program is not well established in Bangladesh. A growing number of women are working in radiation fields (Radiology, Nuclear medicine, radiation oncology) and need concerns about radiation exposure and its effects on pregnancy. Female should be well-informed and explained regarding their work around radiation. A clear understanding of the risk of radiation exposures in prenatal phase, during pregnancy including risk to the fetus, is required. Understanding the magnitude of the risk and mechanisms to limit exposure is necessary as well in order to feel comfortable environment in the workplace. Countries, where rules and regulations are not strictly maintained yet, need to be taken into account, otherwise, it will lead to the harmful effects even death in the long run. The theme of this year is time relevant and it needs to be practised in each radiation working field.

Bangladesh has now a young generation of medical physicists who are concerned to emphasize and maintain radiation protection for their respective fields. Through the arrangement of seminars, posters, meetings and discussions, BMPS is trying to make publicawareness in this aspect. Voice of BMPS has tried to provide an overview of our activities including different scientific and educational programs organized/.participated by the BMPS member during the year from 8 Nov 2016 to 7 Nov 2017 in the home and abroad. Furthermore, scientific and Continuous Professional Development (CPD) activities are also the primary part of BMPS activities. On the basis of that, this issue of newsletter covers particularly CPD programs and experience of Medical Physicists undergone the training program. We hope that the readers will get recent information about the development of medical physics education and profession of Bangladesh in this succeeding newsletter.

Finally, please receive our cordial invitation to the upcoming conference **"3rd International Conference on Medical Physics in Radiation Oncology and Imaging (ICMPROI-2018)",** to be held from 10 to 12 March, 2018 in Dhaka Bangladesh (http://www.bmpsbd-icmproi.org). I would like to request all colleagues from home and abroad to take part in the forthcoming conference.

We are also highly delighted to announce that International Medical Physics Certification (IMPCB) examination which will take place after the conference period.

Please feel free to offer any suggestions for the improvement of our newsletter. If you miss anything there, do let us know, we still can include it on the website editions on various schedules.

Prof. Dr Hasin Anupama Azhari

Prof. John Damilakis

MSc, PhD, FIOMP
EFOMP President
IOMP Education and Training Committee Chair
Professor and Chairman
University of Crete
Faculty of Medicine
Iraklion, Crete, Greece

Message

Dear Colleagues,

To raise awareness of our profession, the International Organization for Medical Physics (IOMP) celebrates annually the International Day of Medical Physics (IDMP) on November 7. The day was chosen in recognition of the pioneering research work on radioactivity of Marie Sklodowska-Curie who, on that day in 1867, was born in Poland. This year we celebrate the 150th birthday of Marie Sklodowska-Curie and the theme is 'Medical Physics: Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine'. There are health problems that are more prevalent in women than in men such as breast cancer and osteoporosis. It is well known that medical physicists have developed imaging and radiotherapy methods that have increased women's length of life and have improved quality of life, for example X-ray mammography for the early diagnosis of breast cancer, dual-energy X-ray absorptiometry for the diagnosis of osteoporosis and brachytherapy methods for gynecologic cancer. Medical physicists not only developed these methods but also play a fundamental role in their application ensuring the quality of procedures while minimizing radiation risks to women patients.

It is with great pleasure that I extend my warmest greetings to the editorial staff and readers of the 'Voice of BMPS'. I would like to congratulate the Bangladesh Medical Physics Society and all colleagues associated with this Newsletter for their remarkable work. I believe that the 'Voice of BMPS' will be very successful in publishing BMPS-related matters providing clarity to the many issues facing our profession in Bangladesh. I offer the 'Voice of BMPS' my best wishes for every success in the future.

Happy International Day of Medical Physics!

John Damilakis, MSc, PhD, FIOMP

Professor of Medical Physics

Nobel Prize laureate Prof. Abdus Salam: A Cosmopolitan and Wonder from the South

Golam Abu Zakaria
Gummersbach Hospital, University of Cologne.

Introduction: The emergence of modern science, its continuous development as well as its systematic application in innovative technologies during the twentieth century has contributed to the creation of enormous wealth in our world. It was also the century in which the income per person increased by seventy percent in the northern hemisphere compared with the southern. The 25% of the world population living in the north own 80% of the wealth in the world.

An important scientist of this century, who emerged from a developing country himself, looked at the problem from a different point of view. He stated:

> "The widening gap in economies and in influence in between the nations of the South and the North is basically the gap in science."

Prof. Abdus Salam, who was considered the science promoter and prospector of the developing countries, died in Oxford on November 21 last year. Thus, the scientific community has lost one of its most senior colleagues and the developing countries one of its best friends and irreplaceable science promoters. Salam not only was a prime example for young scientist from the South, but he also led the continuity of Oriental Scientists like SN Bose (1898-1974), M. N. Saha (1893-1956) and C. V. Raman (1888-1970), the great contributors to the development of physics in the first half of the last century.

In this paper, I have the honor to present the life and work of Professor Abdus Salam to the readers of the Yearbook of African-Asian student promotion in Goettingen, Germany.

Origin and years of study: About 200 km north-west of Lahore, on one of the tributaries of the Indus River lays the small town Jhang. In this remote town in the then undivided Indian subcontinent which is now Pakistan, Salam was born on January 29, 1926 as the son of a village school teacher. From an early age Salam was noticed as a prodigy child by his family and neighbors. Soon the director of the government intermediate college of Jhang, a man with good knowledge of literature, history, philosophy and religion, discovered Salam as an extraordinary student. He promoted and encouraged Salam, so the latter could devote his abilities entirely to his studies.

In 1940, at the age of 14, Salam passed the matriculation examination with the best marks in the province of Punjab. Moreover, he broke all previous records. Two years later he passed the intermediate examination (graduation) with a similar rating. Then Salam entered the Government College of Lahore, one of the best education centers throughout India, where he studied mathematics. Here he was able to successfully prove his legendary prowess and put the B.SC and M.SC tests with unprecedented grades that had never before been registered in the history of the university. He inspired the students of his time like no one else could.

As it was customary at that time, Salam also applied for a job in the high civil service, which promised a good financial and social standing. However, positions had temporarily been suspended because of World War II which demanded other priorities. By chance Salam received a scholarship from the donation money which had been collected to support British soldiers but had become obsolete by the end of the war.

Salam later said:

"On September 3, 1946, I received the good news of the scholarship. And on the same day I got a telegram that a research position was vacated in St. John's College in Cambridge."

In Cambridge Salam studied mathematics and physics and in 1949 he passed both compartments with first division. In 1951, after just one year of research in Cambridge, he got the opportunity to continue his work in Princeton, New Jersey, together with JR Oppenheimer (1904-1967), a giant of the physicist world. In the same year he was elected as member of the St. John College in Cambridge. In 1952, he presented his doctoral examination at the University of Cambridge. With his doctoral thesis, he largely contributed to the development of the quantum theory of electromagnetic force, for which he gained great reputation. During his stay in Cambridge Salam met the nectar of modern physics, P. A. M. Dirac (1902-1984) and worked with famous personalities like N. Kemmer, P. T. Matthews and others who shaped his later life.

Professional life and discoveries: After the completion of his thesis at Cambridge University Salam returned to Pakistan. As the head of the mathematics department, he proceeded with his activities at PunjabUniversity in Lahore. He lectured about higher mathematics and quantum theory. Modern subjects like this one were highly unknown to be taught at his university. Other professors showed no great interest striking in new directions.

Salam therefore was afraid to continue his promising career. He had the choice between his intellectual death and the emigration to the west.

In 1954, Salam returned to England and got a job as assistant of mathematics at St. John'sCollege in Cambridge. Here he remained until the end of 1956. In 1957, at the age of 31, he received the position as professor of Theoretical Physics at the ImperialCollege in London. Until three years before his death in 1996 he remained faithful to this job. For his important contribution in the development of quantum electrodynamics, he was awarded the first International Hopkins Price by the University of Cambridge in 1958. In the same year he received the Adams Prize of the University of Cambridge. By these means he established his reputation as a respected scientist in the professional world. Thereafter, he was elected as the youngest member of the Royal Society of England. His other activities in Trieste concerning his efforts to advance science in developing countries will be presented in detail in the next chapter.

From the fifties until his death in 1996 Salam was awarded more than 50 international honors and awards including the Nobel Prize for Physics, the Einstein Medal of the UNESCO, the Royal Medal of the UK, the Atoms for Peace Medal and Award, the Order of Nishan-i-Imtiaz by Pakistan, the Cavaliere di Gran Croce Order of Merit of Italy for his many pioneering contributions to develop physics and his activities to promotion of science and technology in developing countries.

Many students submitted their doctoral thesis to Prof. Salam at the Imperial College in London, more than half of them coming from developing countries. Salam was also the author of many books. Among them were

1. Balanced Concepts in Modern Physics (1965)
2. Aspects of Quantum Mechanics (1972),
3. Ideals and Realities (1984) and
4. Science, Technology and Science Education for the Development of the South (1990).

In nature, there are four types of fundamental forces - gravity, electro-magnetic forces, strong and weak forces. Forces are what holds the world together and moves it at the same time. Since time immemorial, scientists have been attempting to unite the many forces into one fundamental force. Isaac Newton (1643-1727) discovered the

force of gravity. The knowledge that this force is responsible for both planetary motion and the earthly bodies is perhaps Newton's greatest achievement. With the help of four equations, James Clerk Maxwell (1831-1899) explained how the magnetic and the electric powers unite to an electromagnetic force. The latter is responsible for all electrical phenomena, to the bonding of atoms and molecules. The interaction of strong and weak forces takes place in the nucleus area. All his life Albert Einstein (1879-1955) attempted to relate the electromagnetic to gravitational force, however, he did not succeed. Also Enrico Fermi (1901-1954) failed to connect the electromagnetic and the weak forces.

In the sixties Abdus Salam and Steven Weinberg succeeded to unite weak and electromagnetic forces to a weak-electromagnetic force and called it electro-weak force. Sheldon Glashow also contributed large benefits to this unified field theory. In 1979, all three scientists were honored with the Nobel Prize for Physics for their achievements. With this Salam was the first Muslim scientist to receive a prestigious award such as the Nobel Prize for his innovative achievement. The particles W and Z bosons are carriers of the electro-weak force. These particles predicted by Salam and Weinberg could not be detected because of their incredible short life until the eighties. Under the direction of Carlo Rubia from Italy a group of researchers at CERN in Geneva had already proved the existence of particles, for which Carlo Rubia was awarded the Nobel Prize for Physics in 1983.

Because of Salam's and Weinberg's discovery hence only three fundamental forces are known in today's science. The biggest dream of researchers will always to unite them one day to only one single universal force.

Besides his major discovery, Salam worked in many problems of particle physics to biophysics. This essay is not meant to give a detailed description of all his work

Activities for the developing countries: In the previous chapter we have already mentioned that Salam returned to Europe again after four years of activity in his homeland. This step was not an easy one for Salam as well as for many of his colleagues from developing countries. Salam soon realized that the authority had other priorities in Lahore than releasing funds for research in theoretical physics at the university. He feared about the continuation of his brilliant career. He was afraid to fall in scientific isolation compared to his colleagues in the West, especially as he had the opportunity and ability to compete with the greatest scientists of his field. Finally he decided to return to Cambridge where he had gained fame. This decision was crucial to the subsequent career of Prof. Salam. He had set two ultimate goals for his life. On the one hand he wanted to complete research on a global scale and on the other hand he aimed to find a solution for his fellow scientists from developing countries who were in the same situation as him: either to remain in their home countries with limited progress or to leave. It is almost a legend to learn how Salam, coming from the most basic conditions of a developing country, by means of his enormous talent and unparalleled diplomacy used the time of history to break new ground for the improvement of the scientific situation in the south asia.

In the fifties the world of science developed a great movement to make the West and the East work together in the field of nuclear energy. In 1957 the International Atomic Energy Agency (IAEA International Atomic Energy Agency) emerged under the auspices of the UN in Vienna. Since its inception, the IAEA has understood its tasks in supporting the peaceful use of nuclear energy in general and the use of radioactive isotopes in medicine and in agriculture for the members of the UN.

Formation of IAEA offered ample opportunities to make Professor Abdus Salam's ideas come true. In 1958 Salam participated as a science secretary in an international conference of the UN on the peaceful use of nuclear energy in Geneva, where he met the most famous personalities of the international scene.

In order to perform nuclear research, expensive particle accelerators are needed in addition to nuclear reactors. In 1960 the Rochester Conference suggested to install a non-profit accelerator under the participation of many nations. This proposal provoked a lot of skepticism of many participants. Also being a participant of the conference, Dr. Salam took advantage of the opportunity and spread his own idea: Why not setting up an international centre for this discipline rather than acquire an expensive machine? Such a project seemed more practical than an international accelerator. An international centre could give scientists from developing countries the opportunity to expand their knowledge and to learn about new developments through discussion with experts, so that they could then transmit the acquired knowledge to their home countries. It has become quite common that institutions of developed countries provide research opportunities for scientists from developing countries. However, these options are very limited and only few scientists from even less countries can pass avail for a similar chance. The idea of Abdus Salam was that under the banner of the UNO an international centre would have the advantage of a universal character. Here, the scientists could exercise their research projects without any kind of discrimination.

After his participation in an international seminar on theoretical physics in Trieste in Italy, where he had met Prof. P. Budinich (Co-founder and Deputy Director of the proposed Centre), Prof. Salam, as a delegate of Pakistan, presented his project in the General Conference of the IAEA in September 1960. Salam went one step further than the objective of the IAEA and demanded that the centre should include all directions of nuclear research and that its running costs should be borne by the IAEA. This proposal of a 34-year-young man, who by then had become well known in his field, excited the minds of the delegates. As a young organization, the IAEA still saw room for its actions and instructed the General Director of the IAEA to develop the cost-benefit analysis for Salam's project. A team of renowned scientists met from 21 to 23 March 1961 and released an excellent recommendation for the establishment of the centre with the following objectives:

1) The centre should promote international connections and exchange of ideas between East and West
2) It should help talented theoretical physicists from developing countries and encourage them to continue their research
3) The centre should serve as a "pilot plan" for further international research institutes in the future. The institute should begin with the subjects of Theoretical Nuclear Physics, Nuclear Theory, Theoretical High Energy Physics, Solid State Physics, Plasma Physics and Controlled Nuclear Fusion.

In order to better assess the success of the project, they initially recommended organizing a seminar on Theoretical Physics.

The expected seminar took place at the castle of Miramare, the former residence of Maximilian of Austria in Trieste from July 16 until August 25. The Croatia-born professor of Physics in Trieste, Dr. Budinich, turned out to be a stroke of luck for the realization of Abdus Salam's dream. After the division of Europe as a result of the Second World War the city of Trieste had lost its hinterland and thus its former importance. Due to its location on the Italian-Yugoslav border Trieste could play a pioneering role in the realization of the scientific cooperation between East and West. Budinich's idea had already tempted a group of politicians, managers and scientists for quite some time. Salam and Budinich did everything to make this seminar a success. Salam had the approval of the participants due to his professional competence, integration and factual moderation. The participants of the seminar, including reputable scientists and senior officials of IAEA were convinced of the importance of the centre. This seminar was crucial for the realization of Salam's dream.

After completing the necessary formalities and more concrete studies, the IAEA gave its go-ahead. Among the three candidates Vienna, Copenhagen and Trieste for the location of the centre, the offering of the Italian government - as expected - appeared the most generous and interesting one. Thus, the dream of Prof. Budinich

was fulfilled and Trieste became the location of the centre. The International Centre for Theoretical Physics (ICTP-International Centre for Theoretical Physics) could begin its work in July 1964 under the patronage of the UN. Prof. Salam became its first director and Prof. Budinich his deputy.

Over the last 30 years Prof. Salam and his colleagues from around the world have developed the centre into a shining example of international scientific cooperation with the participation and cooperation of the IAEA, the UNESCO and the Italian Government. Upon requests and demands by scientists from the South. Salam could enhance the activities of the ICTP to a wide range of areas like physics, mathematics and chemistry. In recent time the ICTP has become a starting point for about 4,000 scientists per year, of which three quarters come from developing countries. Here the scientists have the opportunity to do research from 40 to 120 days per year within the ICTP or in an Italian Institute linked with the ICTP.

Contracts between scientists and the ICTP are signed for three years. Here, the participant is obliged to return to his home country after the completion of his stay in the host institution. The ICTP offers the graduates the opportunity of support in the form of information material, literature and seminars. Furthermore, the ICTP annually organizes about 40 conferences in Trieste and 60 more seminars in developing countries. Numerous Nobel Prize winners from around the world regularly visit the ICTP or belong to various scientific committees of the Centre.

The creation of this unique facility ICTP - is undoubtedly the masterpiece of Abdus Salam. And this is not Salam's only achievement of this kind. Under the chairmanship of Salam, a group of prominent scientists from the South founded the Third World Academy of Sciences (TWAS- Third World Academy of Sciences) in Trieste in 1983. The objectives of the Academy are, among others:

a) Recognition, support and promotion of excellent pieces of research from the south,
b) offering research opportunities to talented researchers from the south, so that they can progress their work,
c) the promotion of South-South contacts between individual scientists and institutes,
d) the establishment of relations between institutions from the North and South, and
e) Promotion of research with particular reference to the problems of developing countries.

The Academy now has 330 members (fellows) from 59 countries of the South and 81 associated members (associate fellows) from nine northern countries. This institution took the task as the front speaker of science for developing countries due to the tireless work and dynamic leadership of Salam and his friends. Since 1991, the UNESCO has taken over the financial cost of the TWAS and thus the TWAS can now promote research in over 90 developing countries.

Salam used the TWAS for establishing another important organization. In 1988 he founded the Third World Network of Scientific Organizations (TWNSO-Third World Network of Scientific Organizations), as an umbrella organization which now consists of 140 scientific organizations. These include science and technology ministries, science academies and scientific organizations in developing countries. Salam knew from experience how important it is to assist governments and scientific institutions of the South to solve their local problems.

In 1988 he founded yet another organization in Trieste. The International Center for Science and High Technology (ICS-InternationalCenter for Science and High Technology) should play the same role as ICTP for sciences. Salam knew all about the poverty of the South. He also saw the relationship between the wealth of a nation and its command of science and technology. Salam made a difference between simple technology and

high technology. To ensure survival, you need simple technology, whereas high technology creates prosperity and the welfare state.

By establishing ICTP centers (training of scientists and the Advancement of Science), the ICS (similler as ICTP but for technology and organizations), the TWAS (bringing the science leadership under one roof) and the TWNSO (bringing together the Ministries of Science and Technology), Prof. Salam, then known as "the Wonder of the South", wanted to spark a revolution in science and technology and enhance their reach and expansion in the South. It is not easy to convince leaders of the developing countries from the fact that no one can develop and master technology without funding basic research in natural sciences. Salam visited many countries and made clear that more funds for the promotion of science and technology should be raised in the planning of the budgets of governments. It is the irony of history that developing countries spend about the same amount of money on military as industrialized countries, but their expenditures on research are lower by a multiple.

For Salam, it was clear that his institutions in Trieste alone were not able to solve all problems of developing countries right away. Therefore he developed a project planning to establish 20 similar centers such as the ICTP in Trieste which should contribute to solve the problems of our time around the world in various fields. In 1991, he presented his plan for financing to the World Bank. He found no positive response as the officials there only had a short-term vision.

Therefore, he formed a commission of heads of states or governments from the South in order to support his project. Chaired by the government of Pakistan, the first conference of the commission was held in Islamabad in 1994. The conference was attended by 19 heads of states or governments. Because of his poor health Salam could not attend himself, but participants praised his unparalleled work for the developing countries and decided to do everything to establish such institutions.

As a devout Muslim, Salam knew the scientific problems of Muslim countries. He had studied the history of science very carefully. The once flourishing science in Muslim countries had become stunted due to the lack of democratic institutions and tolerance. No science can develop in a society where critical expression and the freedom of any kind of experiment are denied. Therefore, in addition to more money for scientific research, the freedom of ideas should be crucial to all societies.

In contrast to the demand of fundamentalists his message was clear. Science is uniform and universal. Its problems and perspectives are international. There is no Muslim or Christian or Jewish or Hindu or other religious or racial science. In the course of human history each civilization has left its contribution to the emergence and development of science and technology. Science is the common heritage of all nations. Salam once said:

"By the discovery of the truth - I as a devout Muslim and Weinberg as skeptic Jew - we never had any problems to perform a harmonious cooperation."

In order to preserve peace in this world we all need to work together regardless of our faith or ideology.

Salam was the only scientist member of the South commission, which was set up at the G77 under the chairmanship of the former President of Tanzania, Dr. J. Nyerere. The other members were prominent economists, planners and social scientists. In the famous report of the commission Salam tirelessly highlighted and underlined the importance of developing science in the South. After Salam's death Nyerere wrote:

"Abdus Salam was a special kind of man who combined duty with the sense of responsibility to advance science for the people in developing countries. The report of the South commission has gained great importance unmistakably through his contribution. In endless discussions and suggestions he drew attention to the

importance for the promotion of science and technology in the south."

A friend from Pakistan once asked:

"What has Salam done for his own country?"

The same question had already been asked on the great Bengali poet Rabindranath Tagore (1861-1941). The answer was:

"What has the sun done especially for one country?"

By their deeds Salam as well Tagore have changed our world, especially the South.

Conclusion: In the coming century we shall benefit from the opening of the borders for everyone. The word globalization is in the game. Some experts warn against it saying that the strongest nations are the promoters of globalization, because it provides the strong with the possibility to play the weak against the even weaker. The development of satellite communication and global data flow reduce the cost of transportation of information, goods and people, just to name a few, show that globalization is unstoppable. In the global era, the influence of private firms will expand further so that the lion's share of research will be carried out by their funds. The access to research and its results will be more difficult for developing countries. International organizations will become more necessary than ever in order to maintain the world-class experts and scholars from the South or their institutions. Salam had realized not only the need for organizations like the ICTP, but also the need for their lifetime support, long before the word globalization became popular in public. On the threshold of the 21st century, we need creative critics, but we also need more people like Salam seeking alternative solutions and thus contributing to the development of the lives of disadvantaged people and , by these means, helping to shape the peace in our world. The young generation of scientists will remember Prof. Abdus Salam for his outstanding contribution to the development of physics, the society and his extraordinary sense for human solidarity.

References:

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- Harun ar Rashid: Some scientists from the subcontinent (Bengalish), Dhaka 1991
- TWAS Newsletter - Vol.8 No.4, October-December 1996

Editor's Comments: This article was first published in 1997 (German Language) in the year book of African-Asian-Student promotion in Gottingen, Germany. Recently the ICTP has introduced the application of physics in medicine (Medical Physics) in their programme .

Cancer is Curable if Detected Early

Kailash Chandra Mishra
Dept. of Radiation Oncology, Apollo Hospitals Dhaka, Bangladesh

1.Introduction:

Cancer constitutes an enormous burden on society without any social or geographical boundaries. In 2010, about six hundred thousand (6 lacs) Americans, and more than 7 million people around the worldwide died of Cancer. In US one in three women and one in two men will develop cancer during their lifetime. A quarter of all American deaths, and about 15% of all death worldwide will be attributed to cancer. In future cancer will surpass heart disease to be the most common cause of death. The occurrence of cancer is increasing because of increase in aging population, as well as an increasing prevalence of established risk factors such as smoking, overweight, physical inactivity, and changing reproductive patterns associated with urbanization and economic development. About 14.1 million new cancer cases were registered and 60% of them died worldwide in the year 2012.

Less developed countries like Bangladesh account for 65% of cancer deaths worldwide, in spite of their relatively larger share of the population 160 million. Cancer is not just a disease but combination of many diseases. We call them all "Cancer" because they share a fundamental failure: the abnormal growth of cell. Cancer is a type of disease where cells grow out of control, divide and invade other tissues. In most tissues, healthy cells divide in a controlled way and copy themselves to create new healthy cells. With cancer, this normal process of cell division goes out of control. A cancer is a particularly threatening type of tumor. There are two kind of tumors: 1) Benign tumor 2) Malignant Tumor. Malignant tumors (cells) grow and expand uncontrollably, and these uncontrolled growth phenomenon of cells is known as cancer. Cancer can occur in any organs, except hair and nails. Cancerous cells feed on nutrient and minerals from our body and grows exponentially and resist natural function of an organ or the entire body functions.

2.Types of Cancer:

There are 13 to 15 lakh cancer patients in Bangladesh, with about two lakh patients newly diagnosed with cancer each year. As an overview, following are the most common cancer in Bangladesh:
Lung cancer, Colorectal cancer and mouth-oropharynx cancer rank as the top three prevalent cancers in males. Other types of cancers are esophagus cancer and stomach cancer. In women, cancer cervix uteri and breast cancer are most common. Other cancer types, which affect women, are mouth and oropharynx cancer, lung cancer, and esophagus cancer.

3.Causes of Cancer:

Cancer in an individual can be naturally occurring, due to the environment and atmosphere we live in, excessive unhealthy or chemically processed food consumption, and also surprisingly by prolong exposure to the sun! But as per records in Bangladesh, cancer patient in our country tends to be dominated by tobacco smoking, irregular food habit, prolong and untreated infections, poor hygiene, and reproductive history among females. Cancer can also occur due to obesity, that tend to run in families and influence cancer risk. 5% to 10% of all cancers result directly from gene defects (called mutations) inherited from parents.

4. Signs & Symptoms

No matter at what age you are or even if you are enjoying good health, it's better to know the signs and symptoms of cancer. Cancer symptoms are similar to many other diseases. There are 7 warning Signs of Cancer

that is termed as "C.A.U.T.I.O.N."

1. Change in bowel or bladder habits
2. A Sore that does not heal
3. Unusual bleeding or discharge
4. Thickening or lump in the breast testicle or elsewhere
5. Indigestion or difficulty in swallowing
6. Obvious changes in size, color, shapes or thickness of moles or warts
7. Nagging cough or harshness

& the 8th one is S – Swelling in neck in any age group.

This is how C.A.U.T.I.O.N. became C.A.U.T.I.O.N.S. The signs and symptoms will depend on where the cancer is, how big it is, and how much it affects the organs or tissues. If a cancer has spread (metastasized), signs or symptoms may appear in different parts of the body.

5.Treatment:

The modalities available for cancer treatment are as follows:

1. Surgery,Chemotherapy&Radiation Therapy
2. Targeted Therapy
3. Immuno Therapy
4. Hormone Therapy
5. Pain &Palliative Care
6. Terminal Care.

6.Prevention:

It is better to prevent cancer than to treat cancer. Cancer could be cure if detected in an early stage. Possibilities of cell becoming cancerous could be diagnosed by proper early investigations.

However, Preventive measures in lifestyle can also keep someone harms away from cancer. Or at least reduce the possibilities by preventing or reducing consumption of tobacco and alcohol, change of dietary habit and reduced food adulteration, ensuring reproductive hygiene, increased physical activity, and reduced occupational hazard.

6D Treatment Couch for Modern Advanced Radiotherapy Treatment

K. M. Masud Rana

Department of Radiation Oncology, Apollo Hospitals Dhaka

The patient positioning during radiotherapy is critical to the success of the treatment. To get this into the account the 6D treatment couch is recently introduced in radiotherapy which will support us in the exact patient positioning and repositioning for each additional radiation treatment sequence.

High radiation doses improve the effectiveness of the radiation therapy. However, the higher the intensity of the radiation treatment, the more important patient positioning becomes - only in this way the surrounding tissue and vital organs can be protected. The 6D couch integrated with the position of the patient and checks the current location on the basis of predetermined parameters. By minimum rotational and tilt movements, the system balances locational changes and positions of the patient optimally. The likewise integrated documentation covers all data, stores them and makes them available for further radiation treatment sequences of the patient.

This couch is guided by an infrared-camera that enables sub-millimeter patient positioning accuracy in six degrees of freedom – correcting translational errors (x, y, z) and rotational errors (roll, pitch, yaw). The result is improved with clinical workflow and increased clinical confidence. Accurate and remote geometric corrections of any misalignment detected by state-of-the-art image guidance systems are enabled by the Integrated System, yielding precise corrections in six coordinates for IMRT, IGRT, VMAT, SRT and SRS tumor targeting.

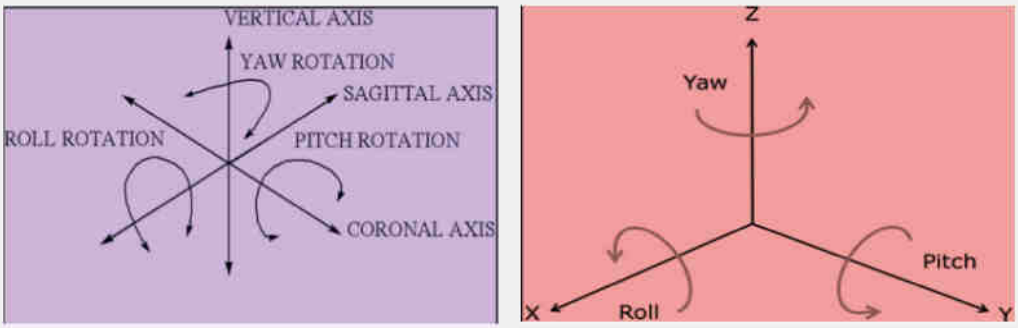


Figure: Rotational degree of freedom for 6D Couch.

The following advantages we can achieve by 6D Couch:

- Improved patient access with lower loading and unloading height
- Computer-controlled robotic treatment couch top
- Six degrees of freedom (x, y, z, roll, pitch, yaw)
- Remote positioning correction
- Achieves sub-millimeter positioning accuracy with no additional manual corrections zero fiddle factor
- Remote controlled computerized graphical user interface is easy to use and self-explanatory
- Specifically designed for IMRT, IGRT, volumetric modulated arc therapy (VMAT), SRT and SRS.

Post Visit Report On Visit of MIST Faculty Members to Germany and Sweden

Dr. Md. Ashrafuzzaman
Military Institute of Science and Technology (MIST)

Introduction

Military Institute of Science and Technology (MIST) is in the way of connecting globally and domestically with other esteemed universities to accelerate different exchange programme and facilities. In achieving that, MIST has signed Memorandum of Understanding (MoU) for exchange faculty/students, joint research program, seminars, conferences and publications with many institution/university/academy of India, Srilanka, Malaysia, China, Australia, Canada, Russia, UK and USA. Nuclear science and Engineering and Biomedical Engineering department of MIST have also completed few seminars, workshop and visit on recent issues to promote related studies. In connection to this, a team of faculty members from MIST visited different reputed universities of Europe and gathered knowledge which will help to enrich the MIST education system.

Purpose of the Visit

In order to establish more collaboration, cooperation, and share and exchange of students, faculties with esteemed universities/organizations, a five member delegation of MIST has visited4 x Universities and 4 x Nuclear Power Plant Infrastructures (Germany & Sweden) between 16 - 28 June 2016 to acquire knowledge on their university, syllabus of undergraduate and postgraduate level, etc. During the visit, the team participated in an International Conference in Germany (17-19 June 2016) and one Workshop (20-22 June 2016) in Sweden. The visited universities and institutions are:

a. Heidelberg University, Germany
b. Heidelberg University Medical Center, Mannheim, Germany
c. Uppsala University, Sweden
d. Forskmark Nuclear Power Plant, Sweden
e. SKB Nuclear Waste Management Infrastructures, Sweden
f. Anhalt University of Applied Sciences, Germany
g. Institute of Nuclear Technology, Stuttgart University, Germany
h. AREVA, a Nuclear Leading Company, Germany

Aim of the Report

The aim of this report is to apprise on the visit to different universities and institutions at Germany and Sweden, by the MIST team.

Members of the Delegation Team

TThe composition of the visiting team are as under:

a. Colonel Abu Zafor Mohammad Salahuddin
b. Colonel Md. Hasan Uz Zaman, afwc, psc
c. Lt Colonel Md. Jahangir Hossain, te, sigs.
d. Major MdAltab Hossain, EME, PhD
e. Major Md Ashrafuzzaman, EME, PhD

Coordinator of German Collaboration

There is an MoU between MPBME GB and MIST. Germany plays a major role for development of Dept of MPBME through collaboration with Heidelberg university. Prof. Dr. G A Zakaria, coordinator of german

collaboration arranged a visit for a group of Faculty members, MIST to Anhalt university of Applied Sciences, Mannheim Campus of Heidelberg University. During this period MIST delegates also attended German Radio-Oncology Society (DEGRO) Conference, Germany. The visit includes as follows:

Heidelberg University, Germany

The team had visited Department of Radiation Oncology, Heidelberg University and the activities took part are as follows:

Morning conference as a major part of the film- and paperless workflow in the whole department at Department of Radiation Oncology, University Medical Centre Mannheim, Heidelberg University, Presentation of workflow, application of special treatment techniques, e.g. CT, MRI, PET Infrastructure, etc. conducted by Dr. Molina, Medical Physicist, Department tour of Nuclear Medicine Treatment Facility and Medical Data Management & IT Infrastructure for Radiotherapy have been conducted by Dr. Jannke, Medical Physicist, Presentation of principles on Radio Oncology and Radiation Therapy, and special questions regarding Brachytherapy in Heidelberg University conducted by Dr. Josef Burkelbach, Medical Physicist.

The visit team had discussions to collaborate touching on the following aspects with Heidelberg University and its medical center at Mannheim:

a. Discussion on existing faculties, laboratory establishments and capacity building.
b. Discussion about the MoA (Memorandum of Agreement) for the faculty development, Student exchange at B.Sc, M.Sc and PhD programme.
c. Detailing the mutual benefit under the MoA with DAAD program and MIST.
d. Special interest and discussion on laboratory development and Radiation Oncology Training Center establishment.

The mutual benefit from the visit are as following:

a. One student at M.Sc and One student at PhD program can be selected under strategic MoU with DAAD (DeutscherAkademischerAustauschdienst), The German Academic Exchange Service Program and GONO University, Bangladesh.
b. 3 to 6 month training on Radiotherapy and Brachytherapy for the Faculties and graduate students.

German Radio-Oncology Society (DEGRO) Conference, Germany

The team had participated on an International Conference (DEGRO) and the important issues discussed are as follows:

a. New laboratory equipment specially rerated to Biomedical Engineering have been found out from the conference exhibition conducted by Prof. Dr. Style, President of the Conference.
b. International Seminar on Position of BME / Medical Physics in the 3rd world countries conducted by Prof. Dr. Zakaria, Medical Physicist and Clinical Engineering.
c. Colonel Abu ZaforMohamamd Salahuddin, Dean, Faculty of Science & Engineering, MIST, was also nominated as panel speaker in one of the session of the conference.

Anhalt University of Applied Sciences, Germany

Following important activities took place during the visit to this University:

a. Presentation conducted by Dr.Habil, Director, International Relation Affairs.
b. Visited to BME Lab- Electro-medical lab, I & C Lab, etc.
c. Visited to CSE Lab- Media Tech Lab, Studio Lab, and ICT Lab.
d. Visited to EEE Lab- Energy System Lab, Modeling & Simulation Lab, DSP Lab

e. Meeting with Prof. Dr. Chemelosky (Russian) for Double Degree Program
f. Roundtable Discussion with Director, International Relation Affairs

Stuttgart University, Germany

Following important activities were held during the visit to this University:
a. Presentation on overview of current research topics in the department "Thermo-Fluid Dynamics" conducted by Prof.Dr. Lauren, Deputy Director, Institute of Nuclear Technology, University of Stuttgart.
b. Overview on current research topics in the department "Energy Conversion and Heat Transfer" conducted by Dr. Kulenovic.
c. Overview on current research topics in the department "Reactor Safety" conducted by Dr. Buck.
d. Function of the SUR100 zero-power reactor conducted by Dr. Schmidt.

Uppsala University, Sweden

The outcomes from the meeting are as follows:

a. NE potential sources
b. Knowledge & learning
c. BSc Exchange Program in Nuclear Engineering at Uppsala University is possible.
d. MSc (1+1) Year at Uppsala University
e. Post Doc / PhD in collaboration with Uppsala University
f. Faculty Development Program at Uppsala University
g. Short Course at Uppsala University.

Following important activities were held during the visit to AREVA:

a. Presentation onAREVA GmbH and Overview conducted by Dr. SMITCH, Holger, Head, Division of AREVA Technical Center.
b. Presentations on facilities of AREVA's Technical Center by Dr. Markus PÖHLMANN.
c. Overview of AREVA's capabilities of thermal hydraulics and component testing.
d. Few facilities have been visited with Dr. SMITCH, Holger and Dr. Markus PÖHLMANN such as Reactor Assembly Lab, Turbine Lab, Heat Transfer Lab and AREVA Training Center for Specialized Training and Higher Education

The outcomes from the visit are as following:

a. Joint supervision is possible with self-finance but for scholarship, more discussions are required.
b. Test Facilities will be given for the students.

Visit to Sweden

Visit to Germany

Report On "Day Long Seminar and AGM of Bangladesh Medical Physics Society (BMPS)-2017"

N Karmaker[1], H A Anupama[1], G A Zakaria[1,2]

[1] Dept. of Medical Physics and Biomedical Engineering, GonoBishwabidyalay(University), Savar, Dhaka, Bangladesh.

[1,2] Dept. of Medical Radiation Physics, Gummersbach Hospital, Academic Teaching Hospital University of Cologne, Gummersbach, Germany.

In this year BMPS has organized a **"Day Long Seminar and AGM of Bangladesh Medical Physics Society (BMPS)-2017"**on 04 August, 2017 at Institute of Nuclear Medicine and Allied Science's (INMAS), Dhaka Medical College Campus, Dhaka.

Day long seminar was a complemented program for sequence of BMPS activities which consists of spot registration, inaugural ceremony, scientific session, panel discussion , poster session and award ceremony, annual general meeting (AGM) of BMPS, and closing ceremony.

Co-organizers

- Department of Medical Physics & Biomedical Engineering (MPBME), Gono Bishwabidyalay.
- Institute of Nuclear Medicine and Allied Science's (INMAS), Dhaka Medical College Campus.

Purpose of this day long seminar:

- To motivate the young scientists and researchers in education, training, scientific workshops and seminars.
- To professional development of medical physicist.
- To inspire women in medical physics study
- To increase public awareness for quality control of radiotherapy in Bangladesh and reduce the radiation accident.

Target groups:200 participants from different universities, hospitals and industries.
Foreign delegates: India and Germany.

Scientific Session

Scientific session divided into oral and poster session. Oral session comprised by different topics in medical physics such as "New approach for the microstructure control biomaterials for hard tissue engineering"; "On Line Dose reconstruction based on EPID and EDose software"; "Machine Specific Quality Control (QC) of Three Dimensional Conformal Radiotherapy (3DCRT) Technique for Linac: A Practical Proposal for Radiotherapy Centres in Bangladesh"; "3D Digital Human Body"; "Patient Specific Quality Control (QC) for IMRT and VMAT Techniques: A Practical Proposal for Radiotherapy Centre's in Bangladesh", "Dosimetric Comparison between Tomotherapy and VMAT for the WBRT with Adjuvant Boost in Brain Metastasis Sparing Hippocampus", "Scope of Research and application: Biomedical Engineers and Medical Physicists".

Poster session comprised by" Source Design and Calculation of Air-kerma strength of the new Isoseed ® model I25"."S17 125I Interstitial Brachytherapy Seed Using EGSnrc Monte Carlo modeling"; "Lung Dose Verification in Different 3DCRT Planning Techniques During Brest Irradiation", "Determination of Effective Dose of the Thyroid Gland in Nuclear Diagnostic During Thyroid Scan", Study of Organ Motion and GTV variation using different mode of Computed Tomography" and other medical physics and biomedical engineering related topics.

Inaugural Programme

At first **Mr. Safayet Zaman** addressed the session as the secretary of BMPS. This program inaugurated by the Chief Guest, **Prof. Dr. Shahana Afroz**, member, Bangladesh Atomic Energy Regulatory Authority (BAERA) (on the behalf of **Prof. Dr. Naiyyum Choudhury**, Chairman, BAERA). **Prof. Dr. Hasin Anupama Azhari**, founder president of BMPS, **Dr. Kumaresh Chandra Paul**, President of BMPS, **Prof. Dr. Sanowar Hossain** (Patron of the seminar), Director of INMAS, **Prof. Dr. Md. Moarraf Hossen** (special guest), Director, National Institute of Cancer Research & Hospital (NICRH); **Prof. Dr. Molla Obaidullah Baki** president, Bangladesh Cancer Society, **Prof. Dr. Golam Mohiuddin Faruque** (special guest), General Secretary, Bangladesh Society of Radiation Oncologists (BSRO) was delivered their speech on day long program. **Prof. Dr. Golam Abu Zakaria** (Special guest), Germany was present as the keynote speaker. **His specch was on "Preventing Accidental Exposures from new External Beam Radiation Therapy Technologies".**

Panel Discussion

Mr. Taposundar Majumdar, Application Specialist, EMEA Clinical Helpdesk, Varian Medical Systems International (India) presented the **"Technology Customization? How its beneficial for Bangladesh"** in panel Session. The Panel members were eminent radiation oncologists & medical physicists from: Dhaka Medical College Hospital (Assoc. Prof. Aliya Shahnaz), Khulna Medical College Hospital (Assoc. Prof. Mukitul Huda), Bangladesh Atomic Energy Commission (Dr. Razada Khatun), Military Institute of Science and Technology (Major Dr. Ashrafuzzaman), Combined Military Hospital (Dhaka) (Lt. Col. Dr. Yousuf Ali), Square Hospital Limited (Prof. Dr. Syed Akram Hussain), Enam Medical College Hospital (Dr. Somnath dey), Apollo Hospitals Dhaka (Dr. K C Mishra). In the panel conversation, the demand of current technology according to the need of Bangladesh are thoroughly discussed among the participants and the panel discussants.

Poster Competition and award ceremony

The goal of BMPS is to inspire young medical physicist. A poster session was arranged for young medical physicists. Eleven posters were displayed and the judges had evaluated the posters. They selected three posters out of them, in which the first, second, third one were on ("Design and development of a Microcontroller Based Floor Radiation Monitor" by Moshiur Rahman), ("Study of organ motion and GTV volume variation using different mode of computed tomography" by Abbas Ali), and ("Internal Dosimetry of Human Brain Using 99mTc pertechnitate and 131-I (NaI) for Thyroid Scan and Treatment in Nuclear Medicine" by Abu SaifTahsin) respectively. Then judges distributed the prize and certificate to the three winners.

Annual General Meeting (AGM), BMPS

All the BMPS members were present in the AGM. The President, secretary, treasurer have presented last two years activity report. New executive committee has been selected for the year 2017-2019. The honorary members and founder president have expressed the valuable speech. New proposals from EC considered by general members. Past president welcome the new president and new EC members.

Closing Ceremony

Prof. Dr. GolamAbu Zakaria, father of Medical Physics in Bangladesh and **Prof. Dr. Hasin Anupama Azhari**, had discussed the overall progress of the situation of medical physics in Bangladesh, and outcome of day long seminar. BMPS also announced the **"3rd International Conference on Medical Physics in Radiation Oncology and Imaging (ICMPROI)-2018"** , which will be held from 10-12 March 2018 at Bangladesh Institute of Administration and management (BIAM), Dhaka, Bangladesh. **Dr. Kumaresh Chandra Paul**, president of BMPS delivered the closing speech.

Acknowledgement

We are thankful to our all BMPS members, participants, colleagues, contributors, organizing committee members, co-organizers, sponsors, scientists, researchers, students and all other people for their support in the day long seminar and AGM of BMPS.

"Marie Sklodowska Curie Poster Presentation-First Experience"

Jhinuk Akter, Rehana Akter Lina, Shamima Afroz Zisly
Department of Medical Physics & Biomedical Engineering,
Gono Bishwabidyalay,Savar, Dhaka, Bangladesh

On 24th January, Bangladesh Medical Physics Society (BMPS) organized a **"Poster Presentation Competition on Marie Curie"** at Department of Medical Physics & Biomedical Engineering, Gono Bishwabidyalay Gono Bishwabidyalay, Savar, Dhaka.

I am one of the members of BMPS since 2014. As a member I was attending most of the program arranged by BMPS. For the female students, this year BMPS announced a poster presentation competition on Marie Curie. 20 female students participated in the competition. Eagerly, I also participated on that competition. Me and my colleagues tried our best to complete poster. The competition gave me the opportunity to know about the biography of Marie Curie as well as her contribution in medical physics.

Marie curie was the first among the women who have an important role in the era of medical physics by discovering radioactive elements which are Polonium and Radium. She also found the use of radioactive elements in health treatment and diagnosis. During the First World War, she developed mobile radiography units to provide X-ray services to field hospitals. She was famous for her honesty and moderate life style. Her great mind and her works made her a legendary scientist.

The competition was judged by **Prof. Dr. Golam Abu Zakaria, Prof. Dr. Hasin Anupama Azhari, Asst Prof. Dr. Kumaresh Chandra Paul, Mr. Aktaruzzamam, Mr. Rashed Al Amin, Ms. Nupur Karmaker**. All judges observed cordially all the posters and asked some questions about it. At last the time had come to announce the winners' name as first, second and third position. At that moment my heartbeat was running so fast and felt anxious about the result. When my poster title was announced as the winner, I became astonished. This winning made me very happy and also glorious. It was my first poster presentation and the experience learned from the competition will make me confident for the future.

The titles of first, second and third posters were"Biography of Marie Curie and her Contributions for Medical Physics" **(Lubaba Azad Tasin, Jhinuk Akter and Zarin Tasnim Chowdhury),** "Biography of Marie Curie" **(Rehana Akter Lina and Shamima Afroz Zisly)** and "The life of Marie Curie and the Science of radioactivity" **(Jannatul Ferdous)**.

I convey my sincere gratitude to my respected teacher **Prof. Dr. Hasin Anupama Azhari**, Head of the Department of Medical Physics & Biomedical Engineering and Dean, Faculty of Physical & Mathematical Science, Gono Bishwabidyalay. Special thanks to our coordinators **Ms. Nupur Karmaker** and **Mr. Rashed Al Amin** to give their valuable time, advice and guidance. Finally, I would like to thank BMPS for arranging such competition and giving me the opportunity to participate on this.

VMAT Radiotherapy Treatment Using Monte Carlo Algorithm by ELEKTA LINAC in Bangladesh.

Md. Mostafizur Rahman
Radiation Oncology Department, Enam Medical College Hospital

Introduction

With the development of high-end radiotherapy treatment technique for the cancer cure in Bangladesh it has been observed that most of the curative cases give better response by using IMRT, IGRT, VMAT, SRS, and SBRT techniques in comparison with traditional treatment. Some algorithm show more accurate results from the statistical uncertainties of the dose distribution, like Monte Carlo which is able to calculate the interaction of random number (RN) probabilities for the photon or Electron Energy incident on infinite (water) phantom. I planned an H& N case for VMAT delivery using Monaco (version 5.11.01) TPS. Basically this is an X-ray Voxel Monte Carlo (XVMC) and Finite Size Pencil Beam (FSPB) based method for the calculation of dose distribution for treatment planning (~1% compared to EGS). It optimizes the calculation by Pencil Beam algorithm (1st stage) & Monte Carlo algorithm (2nd stage).

This method follows the path of individual representative particles through accelerator, beam modifiers, patient to determine dose, fluence, and other distributions in patients and phantoms. True dose distributions are now practical and affordable with Monte Carlo simulations of radiation transport accuracy in all materials, modalities, anatomic geometries, devices. It can simulate the ACTUAL beam delivery (moving MLC's, dynamic wedges, etc).
It also accurately characterizes the linac's radiation production, beam modulation, and account for patient contours and inhomogeneities.

In the Radiation Oncology Department under the Enam Medical College Hospital we have treated our first VMAT delivery on 25.07.2017 which is briefly described as follow:

Case Details

Diagnosis:	Ca Left Buccal Vestibule	**Age:**	50 Y
Histology:	Squamous cell Carcinoma	**Sex:**	Female
Treatment Site:	Head & Neck	**Total Dose:**	7000 cGy by 35 fractions (5 days/week)

Planning Details

Treatment Orientation:	Head First Supine	**Treatment Unit:**	LINAC1
Pixel Size (mm):	0.10	**Modality:**	Photon
Grid Spacing (cm):	0.30	**Energy:**	6.0 MV
Calculate Dose Deposition to:	Medium	**Gantry (deg):**	180.0/360.0
SSD (cm):	93.57	**Collimator (deg):**	0.0
Couch (deg):	0.0	**Isocenter Location:**	At the center of PTV
Number of segments:	125	**Setup technique:**	SAD
Statistical Uncertainty (%) per calculation:	1.00		

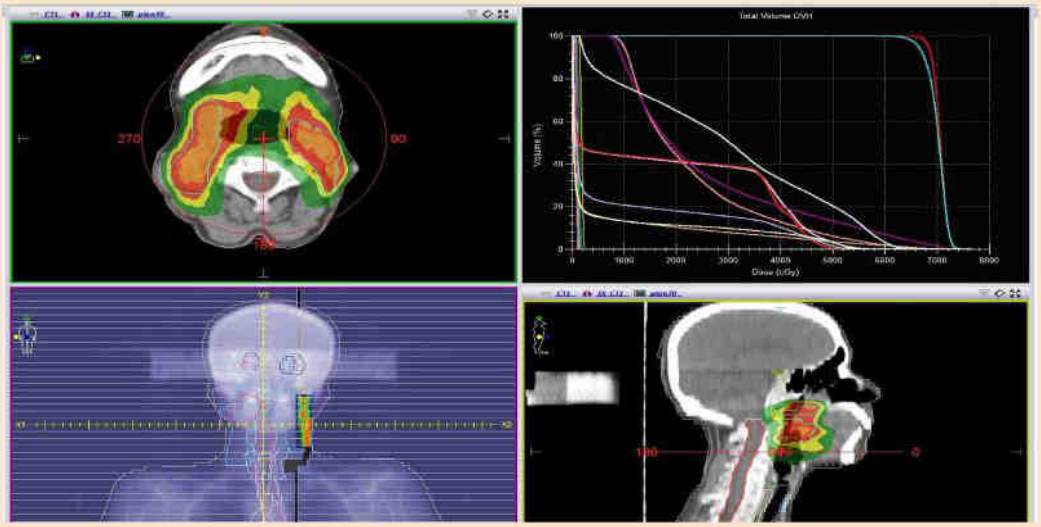


Figure- 1: A VMAT planning details (Dose distribution, DVH and Beam Eye View)

Above figure shows the one arc VMAT planning using Monaco TPS. The patient has prescribed for 7000 cGy. Dose distribution for 107%, 100%, 95% and 50% of the prescribed dose is shown in transverse view and sagital view. Segmented field by the dMLC is shown in BEV window. We have contoured two targets as PTV A in red color & PTV B in cyan Color and 24 Organ At Risk (OAR) as Brain Steam in gray color, PRV Brain steam dark gray color, Left Eye in 40% light gold color, Right Eye 40% light green color, Left Lens 25 % dark gold color, Right Lens 25% dark green color, Left Optic Nerve purple color, Right Optic Nerve green color, PRV Left Optic Nerve 50% purple color, PRV Right Optic Nerve 50% green color, Optic Charisma gold color, Left Cochlea 50% blue color, Right Cochlea 80% blue color, Mandible 50% cyan, Larynx white color, Thyroid 30% cyan color, Trachea 30% purple color, Esophagus light yellow color, Spinal cord Yellow color, PRV Spinal cord dark yellow color, Patient's skin orange color. All the DVH curve for both targets & OARs shown in statistics window, in accordance with ICRU 50, ICRU 62, RTOG - 0418, 0126, 0619, 0522, 0920, QUANTEC,& EMAMI.

VMAT QA

Treatment Plan QA done by using OCTAVIUS II phantom and 2D Array detector and VeriSoft® Patient Plan Verification Software.

The Phantom has:

- A 2D Array with 729 vented ionization chambers on 27 cm x 27 cm
- Large field coverage - cubic detector design, uniform detector spacing (5 mm edge-to-edge)
- Clinically validated solution for rotational IMRT QA
- Unique chamber & phantom geometry: Superior directional response at different gantry angles without gantry angle corrections
- Flexible positioning for measurements in the clinically relevant direction and PTV
- Pioneering ionization chamber technology

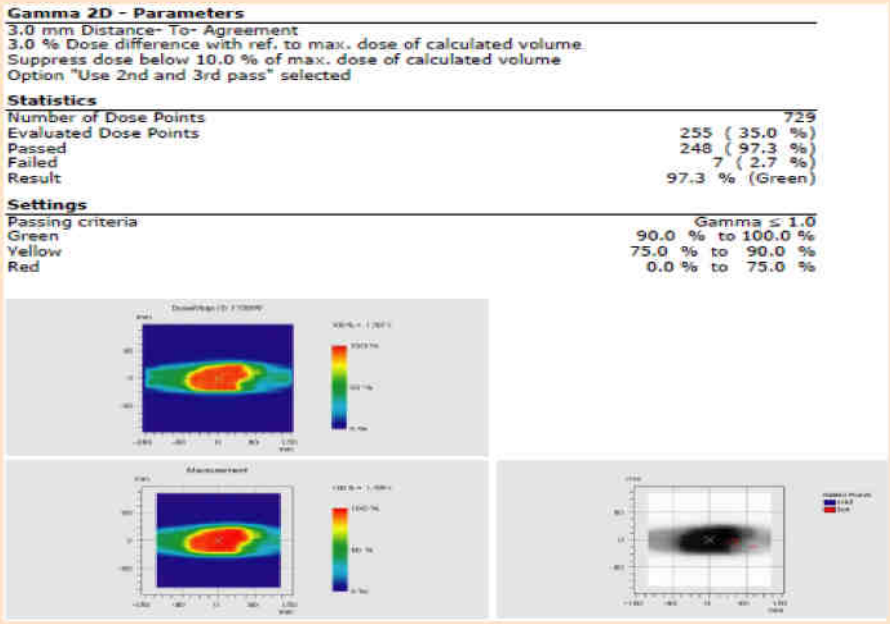
Figure-2: Plan QA using IMRT QA phantom & 2D array

We have done the Plan QA with the above phantom and detectors which is shown in figure-2. Before starting QA we have sat some setup criteria like, SSD 84 cm, Field Size 24 x 24 cm2 for detectors' warm-up, 10x10 cm2 for reference measurement, 200 MU for detectors' warm-up and 310 MU which was calculated on that Phantom by TPS for reference measurement under certain temperature (0C) & pressure (hpa). We also reset the each gantry angel by coronal position of the phantom. We have maintained some setup recommendation like couch position (lateral, sagital, vertical), gantry angle, collimator angel by "Zero".

After the setup we have verified the patient plan along with "VeriSoft®" Software which is a versatile, easy-to-use platform for the patient plan verification and OCTAVIUS systems that provides a wide range of standard and advanced tools for dose comparison - from basic visual comparison to detailed quantitative evaluation.

This software gives:

- Verification of VMAT/IMRT deliveries including also non-coplanar beams, off-axis beams & large fields up to 48 cm
- Profile and dose distribution overlays
- Dose-difference distributions
- Gamma histograms
- 2D/3D Gamma Index analysis with multiple options
- Composite or control point analysis
- DVH analysis in patient anatomy based on measured data independent from TPS Loading/Saving verification studies as projects.



Gamma 2D - Parameters

3.0 mm Distance- To- Agreement
3.0 % Dose difference with ref. to max. dose of calculated volume
Suppress dose below 10.0 % of max. dose of calculated volume
Option "Use 2nd and 3rd pass" selected

Statistics

Number of Dose Points	729
Evaluated Dose Points	255 (35.0 %)
Passed	248 (97.3 %)
Failed	7 (2.7 %)
Result	97.3 % (Green)

Settings

Passing criteria	Gamma ≤ 1.0
Green	90.0 % to 100.0 %
Yellow	75.0 % to 90.0 %
Red	0.0 % to 75.0 %

Figure-3: QA results of Y evaluation by Verisoft software

Plan Verification

To acquire a 3D set-up error we have used stereoscopic MV portal images and bony (landmark) anatomy, image guided radiotherapy by cone beam CT (CBCT) and the XVI application. XVI (R4.5) supports a dual-registration technique in which we can register the reference CT study to the pre-treatment CBCT using bony landmark anatomy, hence establishing the set-up error, followed by registration to the target itself (the tumor or organ motion). The values of calculated translations are the data required for margin input. Conversion of rotations to translations and applying them as patient (couch) shifts, or applying the calculated rotations using the treatment console unit.

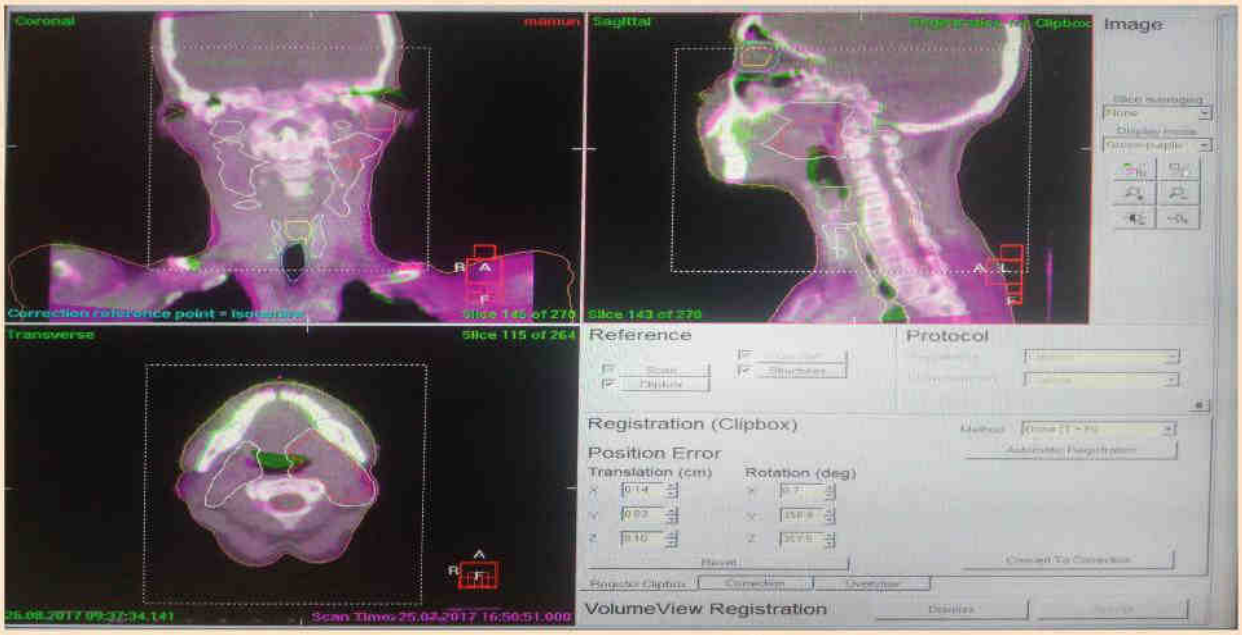


Figure-4: 3D patient setup error verification by CBCT

Treatment Delivery

- After confirming all data set we have delivered the treatment properly.
- Total treatment time including patient setup was less than 5 min.
- Gantry rotated as Clock Wise (CW)
- There was no interlock during treatment.
- We have recorded the treatment details both in Softcopy form & Hardcopy form.

Figure- 5: Finally the VMAT delivery to the patient

Conclusion

It was a great effort of us including Radiation Oncologists, Medical Physicists & Radiotherapy Technologists to successfully deliver a VMAT technique. The patient was periodically reviewed by the Radiation Oncologists which reported that the patient's condition has better increased rapidly. We have also observed the benefit of using high-tech radiotherapy among the patient's there after this trial.

Report on Clinical Training in Germany under DAAD Scholarship

Safayet Zaman
Dhaka Medical College Hospital, Dhaka, Bangladesh

This is a comprehensive report about the three months clinical practical training experience in Radiotherapy, Diagnostic Imaging, Nuclear Medicine and of different hospitals in Germany. The training included quality assurance, quality control, treatment planning, treatment delivery, diagnostic imaging and radiation protection at the department of radiation oncology. I have learned some of the advanced planning techniques in radiotherapy such as IMRT, RapidArc, Stereotactic Radio surgery, Interstitial Brachytherapy. I have also learned QA of some of the diagnostic imaging modalities such as Mammography, gamma camera and therapeutic imaging with the help of OBI, ExacTrac, EPID. I have mainly carried out my training in two different hospitals in Frankfurt and Augsburg but I have also visited some other hospitals and institutes for the training.

Krankenhaus Nordwest

The department of radiation oncology of Krankenhaus Nordwest has the latest Varian Truebeam Linac with Stereotactic facility and a Varian Clinac 2100 Linac, one Varian Gammamed Plus HDR brachytherapy machine, one Zeiss IORT machine and a Siemens CT simulator. The whole patient management process is done by the Varian Aria system and treatment contouring and planning is done by the Varian Eclipse and BrainLab iPlan systems. There are eight medical physicists in the team. In Germany, it a law to have one medical physicist for each radiotherapy machine and one medical physicist for each modality of radiotherapy treatment.

Figure-1: At Krankenhaus Nordwest

In Krankenhaus Nordwest they follow the IAEA Handbook chapter 12 and Varian tolerance guide for the Truebeam linac QA and its tolerances. For treatment volumes, less than 4 cm they use iPlan software as Eclipse does not have integrated system for smaller fields. For most cases like head & neck, prostate, lung and cervix they do IMRT and for boost cases they do RapidArc. For breast cases, they do 3DCRT as they feel it delivers less dose to the soft tissues whereas IMRT may deliver high exit dose to the soft tissues. During the first treatment of every patient there is a team of radiotherapy technologists (RTT), medical physicist and radiation oncologist is present to make sure the exact treatment is verified and delivered as planned. In this hospital, very few RTT do some 3DCRT planning as well.

Klinikum Augsburg

Klinikum Augsburg is a government hospital. The Radiation Clinic has the latest Varian Truebeam Linac and two Elekta Synergy linacs, one Nucletron HDR brachytherapy machine, one Zeiss IORT machine and a Siemens CT simulator. The nuclear medicine department has two PET CTs and three gamma cameras - one with SPECT and two with CT facility. In the nuclear medicine department, the medical physicists make sure the radiation protection is maintained with all treatments with radioisotopes. They have the responsibility to check all the rooms and surfaces for any radioactive contamination. There is a nuclear waste management system underground. The waste water from toilets and washing machines from the nuclear medicine patients is treated with acid and stored in the large shielded tanks for a period of time to have the radioactivity decreased to a tolerance level. After this the water is discharged to the regular drainage system.

Figure-2: At Klinikum Augsburg

In radiotherapy department, the treatment contouring and planning is done by the Philips Pinnacle system. The patient management is done by the Mosaiq. They have been using these softwares for a long time and all the clinic staffs are confident and use to the system. But now they are planning to upgrade the whole treatment planning and patient management systems within the next two years into the different vendor or version that may be quite different from the present ones. As there is no pinnacle system in Bangladesh so it has been not so helpful for me to learn the system. But I still have seen different techniques of planning in this system. The medical physics team consists of eight persons.

Markus Krankenhaus, Frankfurt

The department of Radiological Institute in Markus Krankenhaus consists of radiation oncology, diagnostic imaging and nuclear medicine. They have two Elekta Synergy linacs with Monaco TPS, Nucletron HDR Brachytherapy machine, two CT simulators, two MRI machines, two mammography machines, two gamma cameras - one single head and one dual head. There are six medical physicists in the group.

Eckert & Ziegler, Bebig, Buch Campus, Berlin

The visit to Bebig campus in Berlin was a nice experience. I am using a Bebig Co-60 HDR Brachytherapy machine in my hospital in Bangladesh. I have got hands on application training from their senior expert trainer Mr. Antonious Spiller. He has explained me the Bebig HDR plus planning system in details and taught me the safety issues and some troubleshooting for the machine. He has described the formalism, the TPS uses. I have learned some of the tips and tricks for this planning system. I will be able to use my TPS more easily and can explain better to the students and some persons I have trained myself with this system.

Charite Medical University, Virchow Campus, Berlin

It is one of the best hospital in Germany. The department of Radiotherapy has two Varian linacs, one Novalis Stereotactic Radiotherapy machine, one tomotherpy and one Accuray Cyberknife. This department has five medical physicists and the hospital has separate imaging department and there is another group of medical physicists working there. I had the chance to learn breast IMRT technique, tomotherapy planning and to do Novalis machine couch rotation QA.

Renecker Proton Therapy Centre, Munich

I had the opportunity to visit this heavy ion center in Munich during my stay in Augsburg. It is a big center with a massive proton generator with four treatment heads. The senior medical physicist showed us the inside of the machine where there is a very strict protocol to follow for both security and radiation hazard. Inside nobody is allowed to stay much longer as there is high radiation dose near proton generator. I have stayed there for about twenty minutes and my dedicated TLD showed an increased reading by one micro Sievert. There are four treatment heads that is situated in four different treatment rooms. The maximum energy is 245MeV. The whole facility requires an enormous shielding. There is one head dedicated to treat only eyes and the other heads can treat any site. The great achievement of treating with proton is that the energy lost by proton is inversely proportion to the square of its velocity and so it delivers significantly less dose to the healthy tissues and much higher dose to the target volume as seen by the Bragg Peak curve. Great achievement comes at a cost. The facility is very expensive to run and for example I am briefed that the monthly electric bill alone is about two hundred thousand euros, that explains the high cost of proton therapy.

Helmholtz Centre, Munich

It is personal dosimeter measurement center. There are three of these centers across Germany. This center gets all the personal dosimeter from different hospitals and institutes from nearby region and measures the amount of radiation dose each person has been exposed to. The current version of the Thermoluminescent Dosimeter (TLD) is the Film badge. These films are developed and analyzed to measure the dose that each person received within the last period of having this TLD. If there is a higher dose, then this particular reading is sent to the relevant hospital to take necessary measure to make sure this person does not cross the annual limit. The film badges are then sent back to the hospitals with new films inside the badges.These TLDs are being replaced by Optically Stimulated Luminescence (OSL) in Germany and by 2020 these will be completely replaced. The OSL is the latest and most accurate type of personal dosimeter where electrons are trapped between the valence and conduction band in the crystals inside. When exposed to ionizing radiation the trapped electrons make electron-hole pair. Then light is introduced to the OSL and the electrons are escaped emitting light which is collected by the photomultiplier tube, which calculates the amount of radiation dose the OSL has received.

University Medical Centre, Mannheim

I have attended a DAAD workshop on E-learning, structural requirements in University Medical Centre, Mannheim on 18 November 2016. Prof. Dr. Golam Abu Zakaria has delivered the introduction speech and Prof. Dr. Hasin Anupama Azhari has talked about the requirements of virtual learning system like Moodle and the IT infrastructure required for this. Several students from the collaboration program between Gono University and Mannheim University were present in the scientific workshop. We have exchanged our ideas and views from different perspectives. It was a fruitful seminar. Later I had the chance to visit the city of Heidelberg, which is a very old and nice town with very significant scientific importance in the field of cancer treatment. The German Cancer Research Centre (DKFZ) is located in Heidelberg.

Figure-3: At University Medical Centre, Mannheim

In Germany, the medical physicists follow well established DIN protocols for every check for quality assurance and control. If there is no protocol from the DIN, very soon they try to develop a protocol for that particular test and in the meantime, they follow other international protocols such as AAPM, IAEA, IPEM and the vendor supplied protocol and tolerance which is approved by the higher authorities. They make record of all the documents. There are audits going on every year from the government. We are following most of the checks we have learned in this training but the frequency or check list is not up to the standard of Germany. If Bangladesh government tries to establish similar protocols, I think there would be a rapid change in the quality of QA and QC that are practiced now in our hospitals. There has to be serious radiation safety protocols and strict implementation of that.

In this section of my report I would like to share some of my opinion about this training. Prof. Dr. Golam Abu Zakaria has been a great Academic Supervisor, he has been working for the Medical Physics in Bangladesh for a very long time. He supervises and coordinates all the students and trainees in different hospitals and institutions in Germany. He has been looking after every single students and trainees academically with greatest effort. This effort has pulled the Medical Physics of Bangladesh to this present level. He has an amazing power of having a positive solution to every problem. During my visit to Germany he has organized and supervised the whole training both academically and with practical suggestions. He has also managed me visits at different vendor facilities and institutions to gather practical knowledge. I would like to sincerely thank my Head of the Department of Medical Physics and Biomedical Engineering of Gono University, Prof. Dr. Hasin Anupama Azhari to select me as one of the two clinical trainees to have this training in Germany for the year 2016.I had the chance to visit the IAEA headquarter at Vienna, Austria to meet the Head of Medical Physics division and update him about the current status of medical physics in Bangladesh. It was my privilege to visit IAEA with Prof. Dr. Hasin Anupama Azhari.

Germany is such a country that is ideal to be followed in order to achieve improvements and innovation. They are one of the most developed countries in the world with highest standard. A developing country like Bangladesh can learn a lot to improve them. I admit that I have learned so many things here, not only the things relevant to my field of medical physics. This training has given me a chance to learn different aspects of medical physics such as diagnostic imaging, quality control, quality assurance and treatment delivery at German standard. The history of German Medical Physics is quite old and they have established protocols and yearly audits that provide quality treatment with highest standard. The medical physics in Bangladesh is at a developing stage now and I would like to play a vital role in establishing a similar standard with my learning that I have achieved through this training. I believe if I can deliver a good part of the knowledge of the QA and QC of the radiotherapy machines and imaging equipment, I can contribute a lot in the field of medical physics in Bangladesh. This intensive training has surely increased my potential to do better quality treatments and optimization of the equipment in my hospital. I believe I would be able to deliver better examples and explanations to my students at Gono University.

Training Report on Clinical Medical Physics Internship in Germany under German Academic Exchange Service (DAAD) Scholarship, 2016

Md. Abdus Sabur
Northeast Cancer Hospital, Sylhet, Bangladesh

This report provides the details about aim, activities, progress & achievement of my training on Quality Assurance (QA)&Quality Control (QC) for diagnostic machine and all radiotherapy machines, QA Equipment (QA Equipment such as PTW, IBA, Sun Nuclear) and advance treatment planning like 3DCRT, IMRT, Rapid Arc, Stereotactic irradiation and HDR Brachytherapy at different hospitals in Germany. This training has been achieved under the supervision of Dr. Stiefel Simone and Mrs. Renate Walter.

Introduction: I am working at radiotherapy department of private hospital in Bangladesh as a Sr. Medical Physicist. The department is equipped with a modern Linear Accelerator (Clinac IX), Brachytherapy HDR after loader (GammaMed Plus IX) and commutated tomography (CT) machines.
Radiation therapy requires accurate localization of the tumor. Computer Tomography (CT) & nuclear radioactive medicine are used to allow accurate delineation of the target region(s) and any surrounding normal structures. After delineation of the tumor volume by oncologist we have to make a plan how we can deliver prescribed dose into the tumor and minimum dose to the surrounding normal tissue and critical structures. We should verify every plan before delivering into the patients. Finally, according to the established protocol, we must ensure quality control and maintain quality assurance programs for all machines, treatment planning and delivery systems.

Interstitial Brachytherapy Planning in TPS: After the reconstruction of the needles and putting the catheters in the plan, the rest of the planning is same as the general HDR planning. I have practiced reconstruction of 3 to 22 catheters in different plans. Sometimes the needles are parallel to each other and sometimes they are crossing.

Figure-1: Brachytherapy Planning.

Hospitals Overview

KrankenhausNordwest: KrankenhausNordwest is a founder hospital. The Radiotherapy department has the latest Varian TruebeamLinac and one Varian Clinac 2100 DHX linac, one Varian GammaMed plus HDR brachytherapy machine, one Zeiss IORT machine and a Siemens CT simulator. In radiotherapy department, the contouring is done by the Aria system and treatment planning is done by the Eclipse system, version 13.5 and Plan Receiving & Treatment Verification System are used by the Aria system.

Figure-2: At Krankenhaus Nordwest, Frankfurt

Charite Hospital:Charite Hospital is a government hospital. The Radiotherapy department has the latest Tomo-Therapy machine, two Varian Clinac 2100 DHX linac, one Novalis Stereotacticlinac, one Cyber knife machine and a Siemens CT simulator.In radiotherapy department, the contouring is done by the Aria system and treatment planning is done by the Eclipsesystem, version 11.0 and Plan Receiving & Treatment Verification System are used by the Aria system.

Figure-3: At Charite Hospital, Berlin

Klinikum Augsburg: Klinikum Augsburg is a government hospital. The Radiotherapy department has the latest Varian TruebeamLinac and two Elekta Synergy linacs, one Nucletron HDR brachytherapy machine, one Zeiss IORT machine and a Siemens CT simulator.In radiotherapy department, the contouring and treatment planning is done by the Philips Pinnacle3system, version 9.8 and Plan Receiving & Treatment Verification System are used by the Mosiaq system.The nuclear medicine department has two PET CTs and three gamma cameras - one with SPECT and two with CT facility. In the nuclear medicine department, the medical physicists make sure the radiation protection is maintained with all treatments with radioisotopes.

Figure-4: At Klinikum Augsburg, Augsburg

Mannheim Medical Center: Mannheim Medical Center is a government hospital. The Radiotherapy department has the latest Elekta Versa HD Linac and three Elekta Synergy linacs, one LeksellGamma knife Icon machine. I have attend DAAD workshop in "E-learning, Structural requirements" Mannheim. It was a wonderful scientific day we have spent together.

Figure-5: : At Mannheim Medical Center, Mannheim

RPTC-Rinecker Proton Therapy Center: RPTC-Rinecker Proton Therapy Centeris a private hospital. The Radiotherapy department has the latest Varian cyclic accelerator Cyclotron with five Treatment room and a Siemens CT simulator.In radiotherapy department the contouring and treatment planning is done by the CMS Xiosystem, version 4.8 and Plan Receiving & Treatment Verification System is used by the Mosiaq system.

Figure-6: At RPTC-Rinecker Proton Therapy Center, Munich

Discussions: Prof. Dr. Golam Abu Zakaria has organized my training in different hospitals in Germany.He has looked into the progress of my training time to time. He has also organized my visit to Bebig Facility in Berlin to learn Brachytherapy application. He has also organized other visits for practical knowledge. He has been working for Medical Physics in Bangladesh for a long time. He has been supervising all the trainees to ensure advancement of Medical Physics with quality.

I express my deepest thanks to Prof. Dr. Golam Abu Zakaria, Co-ordinator International Cooperation of this project, for taking part in useful decision and giving necessary advices and guidance and arranged all facilities to make the training easier. I choose this moment to acknowledgment his contribution gratefully.

I knowwell about some QA program what they do at regular interval in KrankenhausNordwest, Frankfurt andalsoat Klinikum Augsburg.I have seen some QA programs in both centers which are new to me but it is useful for treatment planning & verification and will be improve machine performance as usual as ensure precious patient treatment. They have given their documents and shown me the whole procedures of measurement. I have seen the uses of Excel program which will make my work easy in our country & I shall compare all the data history of each QA to maintain a standard level.

I am honestly writing here, we have a lacking of QA tools in our center. I shall discuss about my training experience with administration and head of the department after go back and will inspire them to buy some QA tools. Also, I will try to implement this knowledge to ensure QA program and improve QC program of planning, verification and machine of diagnosis and therapy.

I have seen advance treatment planning like IMRT &RapidArc in Eclipse, Stereotactic irradiation (SRS) in Brain Lab Planning System and IMRT planning in Tomotherapyplanning system in Charite Hospital, Berlinand I have seen advance treatment delivery like TBI in Novalis Stereotactic machine, Stereotactic irradiation (SRS) in Cyber knife machine in Charite Hospital, Berlin and IMRT in Proton therapy machine in Rinecker Proton Therapy Center, Munichwith different machine QA. They showed the planning steps and gave me some important tips which should remember during making a plan like optimization, normalization, priority setting, help volume impotency, use of Boolean operator, objective adding etc. At the end of my training in this center I made prostate RapidArc and IMRT plan of Head & Neck, Breast and cervix and 3DCRT plan of Rectum, lung and brain plan which was not so bad according to head physicist of this center. I am grateful to all physicists in this center because they were sincere about teaching me. If I could spend more than a month in this center I could learn more about this advance planning.

The last month of my training I worked in Klinikum Augsburg. I am so happy in this center to learn Brachytherapy planning, source calibration, quality control of planning & machine and personal safety program and EBRT planning and some machine QA. They have shown me in Brachytherapy how to reconstruct the catheters, dwell position activation, step size selection, reference line and basal point setting, normalization, local & global optimization setting etc. They have given some important documents, CT images and pictures regarding planning and quality control. I also learned the export system from TPS to TCS. I have observed several cases and now I am able how to make Interstitial, Intracavitary plan on CT and Films images. I also visit Nuclear Medicine Department in this hospital and I saw lot of things for the hunt of knowledge and I enjoyed it.

Conclusions: I think and believe that it was a very fruitful and effective internship program. This Scholarship program is developing our knowledge in medical physics to work in a clinical environment confidently and we are becoming capable to provide a good physics support for the wellbeing of the cancer patients. Experience in Germany

It is very surprising for me; obviously I got a different way of experience and enjoyment. I saw different geographical location and people. I have visited Klinikum Frankfurt Hospital, Markus Krankenhaus, Frankfurt, Charite Hospital, Berlin, Eckert & Ziegler BIBIG GmbH, Berlin, Rinecker Proton Therapy Center (RPTC), Munich, German Research Center for Environmental Health, Munich for the hunt of knowledge and I enjoyed it. Every people are more co-operative and helpful. For some people, I feel good and I cannot forget them. When I came to Germany every day I prayed, when will I see snow. Finally, I saw little snow fall in Augsburg first time in my life and I was very excited. I tested different delicious food especially different types of bread, pasta and little cheese. I saw lot of things in Germany.

Acknowledgement

I would like to sincerely thank Prof. Dr. Golam Abu Zakaria and Prof. Dr. HasinAnupamaAzhari to select me as one of the two clinical training candidates to have this training in Germany for the year 2016.

I would like to show my gratitude to the fullest to Chief Physician PD Dr. med. Michael van Kampen, Medical Physicists Dr. Stiefel Simone and other colleagues from KrankenhausNordwest, Frankfurt and Mrs. Renate Walter and all other colleagues in Klinikum Augsburg,who have been with me for the last three months to help me through this training.

My sincere thanks to Mr. Volker Steil who has been the coordinator of this program and has taken a great care of all the official formalities since the beginning of my training.

Workshop on AMPLE: September 2017

Md. Mostafizur Rahman James
Enam Medical College hospital, Dhaka, Bangladesh

Workshop emphasis on: "Strengthening the Effectiveness and Extent of Medical Physics Education and Training".

Since August 2016, IAEA has started an e-learning clinical training program under the RCA-RAS6077 project for the clinical Medical Physicist in Bangladesh. The programme aims to produce independent practitioners committed to life-long learning who work unsupervised at a safe and highly professional standard. It established on the IAEA's learning management system, the Advanced Medical Physics Learning Environment (AMPLE) area acts as an online central hub for those involved in the clinical training programme.

This course designed for two years to enhance the medical physics training, through organizing resources and administration, tracks one's progress and archives individual's achievements in one centralized place. Providing opportunities for discussion and recourses sharing, it facilitates communication and networking with peers and clinical supervisor which helps strengthen the learning experience.

During workshop of AMPLE at NINMAS, BSMMU

On 22 September 2017 there was a workshop on AMPLE among the supervisors and residents from different hospital in the country which conducted by Bangladesh Atomic Energy Commission (BAEC) at National Institute of Nuclear Medicine & Allied Sciences (NINMAS), Block-D, BSMMU campus, Shahbag, Dhaka, Bangladesh.

The workshop emphasized by the discussion of previous one-year progress report from the all resident's and supervisors. Some of residents have presented their PPT on radiation protection, incidental accidents in RT, challenges of Brachytherapy practice and VMAT QA. It wrapped-up by giving the feedback from AMPLE users, discussions on questionnaire, assessment update and future timeline.

Internship Training in China: April 2017

Mohaimenul Islam and Ashanul Karim Hawladar
Department of Medical physics & Biomedical engineering (MPBME) of
Gono Bishwabidyalay (University)

We, Mohaimenul Islam and Ashanul Karim Hawladar are the two M.Sc. student of department of Medical physics & Biomedical engineering (MPBME) of Gono Bishwabidyalay (University) went to Zhejiang Cancer Hospital, Hangzhou, China for completing our master degree thesis with three months internship program, under the collaboration between Dept. of MPBME, Gono Bishwabidyalay and Dept. of Radiation Physics, Zhejiang Cancer Hospital Zhejiang Cancer Hospital is a government-run nonprofit cancer hospital located in Hangzhou, China. Zhejiang Cancer Hospital offers medical services to cancer patients from Zhejiang province and nearby regions. The hospital was established in 1963 as one of the four earliest cancer hospitals in China. The hospital also houses the Zhejiang Cancer Research Institute, where scientists and cancer clinicians perform research to find methods for curing cancer. In Zhejiang cancer hospital there are 10 linear accelerators, three remote afterloader brachytherapy unit and one tomotherapy unit which is installed recently. Everyday average 500 patients are treated. I Mohaimenul Islam have done thesis work on "On line dose reconstruction based on EPID & EDose software" and Ashanul Karim Hawladar have done thesis work on "Dosimetric Comparison BetweenTomotherapy and Rapid Arc for the WBRT with Adjuvent Boost in Brain Metastasis Sparing Hippocampus". The thesis work co-supervised by senior medical physicist Dr. Wang Binbing and Dr. Yangshuangya. The whole work and training program was supervised by Shan Gouping who is the MD of radiation physics department. During our internship program, we learned treatment planning included 3DCRT, IMRT, VMAT, SBRT for lung, and also tomotherapy. We also learn CT simulation and diagnostic x-ray procedures which help us to gather a lot of knowledge and clinical experience.

Figure 1: Zhejiang Cancer Hospital, Hangzhou, China

Figure 2: Working in Zhejiang Cancer Hospital

We did dosimetry and QA procedure during our internship program. We two stayed in hospital dormitory, which is well decorated. The hospital authority did as much as they could for our safety and security. They made arrangement in the hospital canteen for our meals. We complete our thesis work nicely with their co-operation. We represent our country and culture and University there. They felt very excited about us and likes our activity. After completing three months training they give us training certificate. Hangzhou is a very beautiful place for visit and we found that the people of Hangzhou are so helpful to foreigner. Finally, the MOU was signed by the hospital authority, which is very proud for us. Now the opportunity is open for all the M.Sc. student of MPBME to visit Zhejiang Cancer Hospital for thesis purpose and also internship program.

Training on Quality Control (QC) of 3DCRT, IMRT and VMAT Techniques Sanjoy Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS) Lucknow, India

Md. Abu Kausar, Nupur Karmaker
Department of Medical physics & Biomedical engineering (MPBME).
Gono Bishwabidyalay (University)

Cancer is predicted to be an increasingly important cause of morbidity and mortality in Bangladesh in the next few decades. There are 13 to 15 lakh cancer patients in Bangladesh, with about two lakh patients newly diagnosed with cancer each year. To fight against cancer burden, education and awareness are very important. Therefore, to create the manpower in this field as well as development of medical physics education in Bangladesh, Department of Medical Physics and Biomedical Engineering (MPBME) was started at Gono Bishwabidyalay (University), Savar, Dhaka in 2000 with collaboration of Germany, India and China. Till now this department is working very actively to achieve the goal.

Two faculty member of MPBME department visited Department of Radiotherapy, SGPGI, Lucknow India

In this consequence, two faculty member Md. Abu Kausar and Ms. Nupur Karmaker of MPBME department visited Department of Radiotherapy, SGPGI, Lucknow India as part of the continuous development from 10 February to 9 March 2017. These two members are also working as a General Secretary and Treasurer of Bangladesh Medical Physics Society (BMPS). The aim of the training was to develop such a standard guideline from different international protocol of machine specific QC of 3DCRT technique and patient specific QC of IMRT and VMAT techniques so that it will be followed by the physicist in all radiotherapy centers of Bangladesh. This department has the facility of two linear accelerator, one high dose rate brachytherapy unit and CT simulator. In period of training they have been trained practically about the QC of linear accelerator that included performing of QC test, different tools that they use to perform the QC and to verify the action and tolerance limit according to a standard protocol. Also they have been trained about patient specific QC of Intensity Modulated Radiotherapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT) for different cases using electronic portal imaging devices and ionization chamber array (I'matriXX). There was also a discussion with the member of College of Medical Physics of India (CMPI) regarding accreditation of medical physicists of Bangladesh. They are interested about medical physicists accreditation in Bangladesh and also to enhance further cooperation with MPBME department and BMPS.

CMPI endorsed course in India: April 2017

Ms Kazi Towmim Afrin
Department of Medical Physics & Biomedical Engineering (MPBME) of
Gono Bishwabidyalay (University)

The Association of Medical Physicists of India was founded in 1976 with objective of encouraging the application of physics in medicine.Currently AMPIarranged a workshop program in Apollo Gleneagles hospitals, Kolkata, India, comprising of physicists, radiation oncologists, radiologists and engineers. From the beginning Bangladesh Medical Physics Society has a good relation with The Association of Medical Physicists. In cooperation between these twosocieties, one of the executive members MS KAZI TOWMIM AFRIN of BMPS has attended the TWO DAYS TEACHING COURSE IN LINAC QA & DOSIMETRY AT KOLKATA. The course name was College of Medical Physics (CMPI) Endorsed Course on: "QA, Advanced Dosimetry, Treatment Planning and Verification for External Beam Therapy in April 15 - 16, 2017 atApollo Gleneagles Hospitals, Kolkata, India.The Patron was Lt. Gen. (Retd)Dr.Saibal Mukherjee and the chairman was Mr V. Poopathi.National Teaching Faculties were Dr M Ravi Kumar, Dr Thamar Ganesh, Mr V.K Sathiyanarayanan, Mr SujitnathSinha, and MrRaghavendraHolla. Teaching ProgrammeincludedQuality assurance and performance tests of high end Linac as per AERB protocol, Advanced Dosimetry of Linac for large field as well as for small field for flattened as well as for FFF beam, Configuration of Treatment Planning system with measured data, QA for KV and MV imaging system, QA for treatment verification system, Portal Dosimetry system, Details of IMRT planning with latest verification technique as well as Set Up technique. (Offline review and online verification technique), Details of IGRT planning with all available motion management technique and latest verification technique,Electron beam treatment planning technique along with Electron Arc Therapy, details of SRS/SRT and SBRT with flat and unflat beam. The outcome of the course was very effective. We have updated knowledge for QA and Commissioning of High End Linear Accelerator and review advanced techniques of IMRT, IGRT and Stereotaxy. We are enable to practically implement the concepts for dose verification in advanced external beam therapy.

Figure-1: Attending in AMPIEC

"Hands on Training of Radiotherapy Treatment Planning and Quality Control of X-ray Imaging"

Nupur Karmaker, Abu Kausar, Kumaresh Chandra Paul, Hasin Anupama Azhari
Dept. of Medical Physics and Biomedical Engineering(MPBME), Gono Bishwabidyalay (University)(GB), Savar, Dhaka, Bangladesh.

Introduction

MPBME, GB and BMPS has arranged a practical training workshop on treatment planning in MPBME, GB and Quality Control (QC) of X-ray Imaging devices (X-ray, Mamography and Fluroscopy) in different diagnostic centers.

The purpose of this training program was to gain knowledge on new methods of treatment planning and to introduce the quality control tests of imaging equipment. In our country there is still no protocol for maintenance and quality of these imaging techniques. Also these QC kits are imported for first time in Bangladesh and TPS are installed for the first time to serve the academic purpose in MPBME, GB. The department will liaison with different diagnostic centers and Bangladesh Atomic Energy Commission (BAEC) to establish quality control protocol in our country by following international recommended guidelines. Thereby we can assure diagnostic accuracy as well as protect the public from radiation hazards.

This training program was conducted by Prof. Dr. Golam Abu Zakaria, Chairman, Department of Medical Radiation Physics, Gummarsbach Academic Teaching Hospital of Cologne, Germany and Md. Akhtaruzzaman, Medical Physicist, The Maria Sklodowska Curie Memorial Cancer Hospital, Warsaw, Poland.

In general, based on the interest of participants, two groups are formed having 15 persons each for training purpose. This training program was divided into different parts such as theoretical, practical, group discussion, examination and certification. These training activities were arranged into two parts: Pre-training and Final Training. In pre-training two groups (one for TPS and another for QC of imaging) are assigned for two weeks before final training. Each group comprises of faculty members, students, hospital physicists and technicians.

Pre-Training on TPS

The coordinator and his group did their planning in Eclipse (AREA 13.6 version) planning system on different cases in advance of a real training period through social media like WHAT'S app and Skype. Also, the trainer sent different reading materials in this regard. In this way the group had shared the knowledge and performed the activities (Fig: 1a).

The main goal to train the core members, they will train the large group members later by using local facilities. Another concern was to use potentials of Bangladeshi people who have a wide range of knowledge in medical physics and are willing to disseminate their knowledge to the young generation.

Pre-Training on QC of Imaging Equipment

For the pre-training program a 'QC team-Discussion' was formulated in WHAT'SAP and Skype social media. Training on QC of X-ray, Mammography, Fluroscopy had been organized in different hospitals (28 December 2017: Padma Diagnostic Center; 5 January 2017: Gonoshasthaya Samaj Vittik Medical College & Hospital, Savar; 9 January 2017: Gonoshasthaya Hospital Barobaria, Dhamrai; 14 January: Gonoshasthaya Nagar Hospital, Savar). During the training procedure the real-time problems were posted by the team from the clinic and discussion was carried out on the topic accordingly for the solutions. Also through e-learning method Prof. Zakaria shows all the procedures (Fig: 1b) and at the same time the team members do the same according to the protocol. After that results were sent to the trainer for further follow up. After a visit of each center, detailed discussion regarding their experiences, strengths, weaknesses and tentative solutions had been carried out by the QC team members, the training of participants and the trainer was proposed. Then a QC sheet was sent to the trainer.

(a) (b)

Figure-1: Pre-training of training program on (a) TPS and (b) QC of Imaging (From Germany Trainer shows the procedure, same was done in Bangladesh.)

Final Training

Opening ceremony

On January 30, 2017 an opening ceremony of main training was held with all the students, trainers. There was a formal discussion about the training goal and outcome which was clearly elaborated by the team coordinators. Then whole procedure of the program was defined by the trainers. After that assigned students were divided for each program.

Figure-2: Opening Ceremony

TPS Training

On January 30–31, 2017 at MPBME, Gono Bishwabidyalay (University), TPS training was organized. Trainers delivered their valuable presentation about basic treatment planning systems and different cases studies such as breast, lung and prostate. Students discussed and shared their knowledge with one another.

Fifteen students from MPBME, University of Dhaka, Nepal were divided into five small groups having three members in each group for the workshop (Fig: 2a). In each small group, the leading member sat in front of the treatment planning system and made 3DCRT, IMRT treatment plans with their hands for the above-mentioned cases. Participants learnt how to import patients, make treatment plans and plan evaluation. In addition, attendees also learnt about contouring. After planning of each treatment case, there was an interactive session conducted by experts for plan evaluation and QA. Trainers discussed all cases individually with the participants. On the last day, participants exchanged their views, knowledge, experience and ideas among themselves. Then participants attended a short examination for the assessment followed by distribution of the certificate.

Training on Quality Control of X-ray, Fluoroscopy and Mammography

There was a formal training program inaugurated at MPBME on January 30 and on January 31 a practical session on QC took place at Emam Medical College and Hospital, Savar Dhaka (Fig: 2b). Then on February 4 at Ibna sina Diagnostic center a second training was carried out. IBA diagnostic QC complete kit was used for the whole procedure. Finally, all trainees and participants were given the certificates issued by the Chairman of MPBME, Prof G A Zakaria and President of Bangladesh Medical Physics Society (BMPS) Dr. Kumaresh Chandra Paul.

(a) (b)

Figure- 03: Training Program in TPS and QC of Imaging

Outcome of the Training

Participants gained theoretical and practical knowledge on treatment planning and on QC of X-ray, Fluoroscopy and Mammography through this workshop that made them motivated and confident. This will definitely enhance their conceptual skills that could be implemented in clinical practice. All participants completed a short examination and they achieved very good scores. In this way these students will disseminate their knowledge to others. In a broader sense, they gathered competence and knowledge that will help to establish QC protocol in Bangladesh through BMPS. Also, this type of workshop will improve quality of work force, enhance employee growth and increase both theoretical and clinical knowledge.

Closing Ceremony

The closing ceremony (Fig 04) was presided over by the father of Medical Physics in Bangladesh (Prof. Dr. Golam Abu Zakaria) and founding president of BMPS (Prof. Dr. Hasin Anupama Azhari) and they discussed the overall progress of the situation of medical physics and the results of the training program.

Figure-4: Closing Ceremony

Acknowledgement

We are thankful to our colleagues, contributors, coordinator, Team members, students and all other people who provided Expertise for their assistance in the training program. Special Thanks to University Grant Commission (UGC), World Bank and Bangladesh Government, through which MPBME Purchased the TPS and QC kits of imaging equipment.

Training program in Medical Physics, Kolkata, India

Md. Hafizur Rahman, Md. SadmanShahriar, Sankor Bala

Dept. of Medical Physics and Biomedical Engineering(MPBME), Gono Bishwabidyalay (University), Savar, Dhaka, Bangladesh.

To increase our theoretical and practical knowledge, three students from Gono Bishwabidyalay of Bangladesh, has got chance in this year to go Saroj Gupta Cancer Centre and Research Institute of India as an observer on Radiotherapy and Nuclear medicine.

The collaboration between Gono bishwabidyalay and Saroj Gupta Cancer Centre and Research Institute was started since 29 Nobember, 2011. That's why after passing B.Sc, some students can join in this training program every year and recently we three students went to Saroj Gupta Cancer Centre and Research Institute in kolkata, India for this observation training program. After reaching in Saroj Gupta Cancer Centre and Research Institute, we have met our trainer Mr. Rajdip Mitra. He introduced himself as chief medical Physicist in Saroj Gupta Cancer Centre and Research Institute. He also introduced us with other medical physicists,consultant of physicist Mr. Dibyendu Sen and head of the radiotherapy technologist. Radiotherapy technologist introduced us with other technologist in different sections like cobalt-60, linac and brachy therapy. Then we started our training in different sections.

Figure-1: Participants in Training program

During this training period we have gathered knowledge on Dosimetry and Quality assurance of Linear Accelerator, Tele cobalt machines and Microselectron HDR Brachytherapy machine. We have also familiar with conventional simulator, CT simulator, treatment planning of 3DCRT and Remote after loading Brachytherapy.Every technologist of RT department were very helpful and friendly. They had helped us how deliver treatment to patient and communication with patient. We were changed from one section to another after 15 days. During this observation our trainer Mr. Rajdip Mitra took some classes on TPS and Shivshakti took some classes on radiation protection, radiation biology and Brachytherapy. He is the medical physicist who came from tamilnadu. During ourtraining, we went to Chittaranjan National Cancer Institute by the help of consultant physicist Mr. Dibyendu Sen. It is a goverentment hospital of India.

At that time their Linac machine was updated into true beam. Our trainer Raj Dev Mittra has gave us information on nuclear medicine department. That's why we were introduced with Dr Shantanu Ganguly who is head of the nuclear medicine department. Dr Shantanu Ganguly gave us opportunity to receive training from his department for 15 days. We were introduced with Samarendu Sinha and Amit Mitra who were RSO in department of nuclear medicine. The trainer of nuclear medicine showed us dual head gamma camera, Hot lab, RIA laboratory, thyroid uptake. In dual head gamma camera machine, we observed whole body scan, renogram uptake. We went thyroid uptake room and we observed how to take uptake from uptake machine. We also went to PET-CT machine room, MRI machine room.

Figure-2: During work in training

Finally, we have got training and certificate from the Goverment of India, under the department of Atomic Energy, variable energy cyclotron center on the following sectors:

I. Nuclear imaging on Gamma camera of various organs with Tc-99m based Radiopharmaceuticals.
II. Tc-99m extraction and preparation of Radiopharmaceuticals in Radio-pharmacy.
III. I-131 thyroid uptake by uptake probe.
IV. I-131 therapy of thyrotoxicosis and Carcinoma of thyroid.

We also went to Boss institute of kolkata by the help of Dr. Shantanu Ganguly and observed the laboratory of Jagadish Chandra Bose. He is the man who first invented radio. We also observed some other certificates, awards of Jagadish Chandra Bose and Basuvigyanmandir.

After completing nuclear medicine training, we again came back RT dept. Our chief physicist showed us simulation machine and its operation. During our holiday we have traveled Jadavpuruniversity, Presidency university,Coffee house, Science city, Victoria memoril, Shantiniketan bolpur, Jorasankor thakurbari, Kolkata museum.

We also went to see the IPL cricket match (KKR VS SRH) in Eden garden where our Bangladeshi players Sakib Al Hasan and Mustafizur Rahman (the Fizz) played one against and KKR won the match.

During our training time, we visited Apollo Gleneral cancer Hospital, Kolkata and met with Poopathi Venkatararman who is the chief medical physicist of this hospital. He showed us HDR-BT and linac machine. We were introduced other medical physicists and radio therapists inApollo Hospital. This hospital has two Linac machines that was update in true beam and energy was 6MV and 15 MV.

Finally, we have completed our course and learnt a lot from this training program in different branch of medical physics. We are pleased with the behaviors of all medical physicists and radiotherapists of India. We think, we will be highly benefitted and we can do better in our future life for this observation training program.

NEWS AND EVENTS

Visit to Bangladesh Atomic Energy Commission (BAEC): October 2017

Bangladesh Atomic Energy Commission is a scientific research organization and regulatory body of Bangladesh. Its main objective is to promote the use of atomic energy for peaceful purpose. It was established on 27 February 1973, after the liberation of Bangladesh. Dr. Dilip Kumar Saha has taken over the charge as new chairman of Bangladesh Atomic Energy Commission (BAEC). On 03 October, 2017 the honorable President Mr Anwarul Islam, General Secretary Md. Abu Kausar, Joint Secretary Ms Kazi Towmim Afrin and other Executive members of BMPS visited newly elected chairman, BAEC. There were fruitful discussions between them for training of medical physicists.

BMPS Executive Members Congratulating New Chairman of BAEC

German Society for Medical Physics (DGMP): September 2017

A combined Jahrestagung der Biomedizinschen Technik (DGBMT) und Dreiländertagung der Physik DGMP , OGMP, SSRMP 2017 was held in Dresden, Germany from 10 -13 September. 1300 participants were attended the conference. There were 62 scientific sessions, 83 poster presentations and 28 mini symposiums. A mini seminar

BMPS Honorary Member at DGMP

program titled ' Medical Physics and Biomedical Engineering in the developing countries: Education and Profession" is chaired by Honorary member of BMPS Prof. Dr. G A Zakaria. Eight papers were presented from different countries like Qatar, Bangladesh, Sweden, Ghana, Vietnam, Indonesia, Jordan etc.

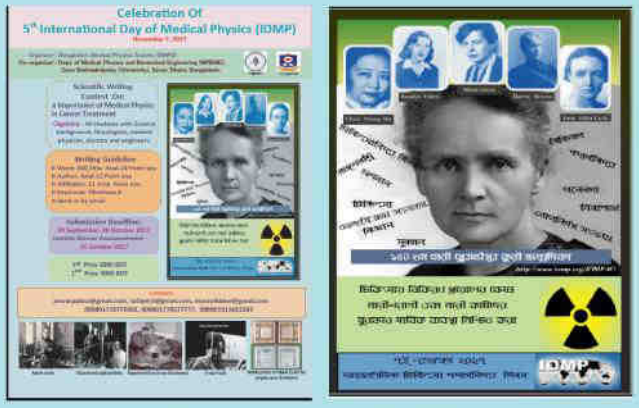
Sheikh Fazilatunnessa Mujib Memorial KPJ Specialized Hospital (SFMMKPJSH): September 2017

On 11th September a group of faculty members of Dept of Medical Physics and Biomedical Engineering (MPBME), Gono University (GB) visited Sheikh Fazilatunnessa Mujib Memorial KPJ Specialized Hospital and discussed with CEO Ms Zaiton Binti Sulaiman and CFO Nuradilah Binti Shuib. CEO warmly welcomes the delegates.Many issues were discussed with them such as arrangement of practical classes for the students in SFMMKPJSH, establishment of MoU between MPBME, GB and Dept of Radiology, SFMMKPJSH.

Visit to SFMMKPJSH

Online Scientific Writing Contest, IDMP: September 2017

To celebrate 5th International Day of Medical Physics (IDMP), BMPS organized an online scientific writing contest on "Importance of Medical Physics in Cancer Treatment". It was a great opportunity for the participants to know about the medical physics and its significance in cancer treatment. The participants also would be able to learn the hazardous effect of ionizing radiation. Such kinds of contests would play an important role in medical physics for patient treatment.



Online Scientific writing Contest

BMPS New EC Meeting: September 2017

A first EC meeting was held at BMPS office with new selected members. The new president for the tear 2015-2017 presided the meeting. The new EC members discussed thoroughly regarding the goal of BMPS and the future activities in the year 2018. A detailed plan was chalk out for the coming conference in March 10-12,2018 and also activities were distributed for ICMPROI 2018 to the members.

Meeting of New EC members

Gonoshasthaya Dialysis Centre (GDC): August 2017

GDC promising low-cost healthcare services to the kidney patients.The 100-bed non-profit center is providing free dialysis services to the extremely poor patients. dialysis center for the first time in Bangladesh offer intensive care unit and a separate ward for the patients of infectious diseases. Three biomedical engineers graduated from the Dept. of Medical Physics and Biomedical Engineering (MPBME) , Gono university are working in GDC who are also BMPS member. Recently a group of faculty members from, MPBME and some members of BMPS visited the dialysis center GDC to discuss with the biomedical engineers regarding their activities. This year one of BME has been selected for training in Germany for 3 months.

BMPS Honorary Member and BMPS founder president visited GDC

Women's Innovation Camp: August 2017

A "Women's Innovation camp -2017" was held on office of Prime Minister, Bangladesh on 24th August, 2017. jointly with the Ministry of Women and Children Affairs and the Department of Women Affairs, had organized Women's Innovation Camp. The purpose of this camp is to identify women related problems in the society and bring feasible solution through an open competition. This year's Women's Innovation Camp 2017 had the slogan 'Women's Innovation to Solve Women's Problems'. Prof. Dr. Hasin Anupama Azhari and Ms. Nupur Karmaker (Treasurer, BMPS) had participated in the programe. Prof. Azhari evoked to all the women to increase their contribution in different sectors especially in medical sector

Participation in Women's Innovation Camp

Military Institute of Science and Technology (MIST): August 2017

On 06 August 2017, Prof. Dr. Golam Abu Zakaria and Founder President Prof. Dr. Hasin Anupama Azhari visited Dept. of Biomedical Engineering, MIST. They met with the Faculty members and discuss about the current issues related to Medical Physics and Biomedical Engineering. The institute and BMPS agreed to collaborate with each other to develop the academic and professional skill.

Visit to MIST

Bangladesh Cancer Society (BCS): June 2017

Prof. Dr. G A Zakaria visited the Bangladesh Cancer Society (BCS) on 30 June, 2017. He met Prof. Dr. M. A. Hai, Prof. G. M. Faruque and other members of the society. BMPS has organized many conferences with BCS. BCS and BMPS will arrange combinedly CME and CPD program for the oncologists and medical physicists in future.


Meeting with BCS Members

Second International Conference on Advances in Radiation Oncology (ICARO-2): June 2017

The International Atomic Energy Agency (IAEA) organized it's second International Conference on Advances in Radiation Oncology (ICARO-2), at the IAEA Headquarters, Vienna, Austria from 20th to 23rdJune 2017.The conference was organized to meet the following specific objectives:

- To review the current role and future potential of technological, medical physics and molecular/biological innovations for clinical use in radiation oncology.
- To explore the applications of improved imaging tools in treatment planning.
- To review the current status of evidence based recommendations for the treatment of common cancers.
- To review the latest developments in medical dosimetry and dose auditing procedures for new radiotherapy techniques.
- To review the current status of comprehensive audits in radiotherapy.
- To review resource sparing approaches in clinical radiotherapy practice.
- To exchange information on the current advances and implementation challenges in the field among leading experts.
- To define future challenges and directions in the clinical use of radiotherapy.

The conference was comprised of plenary session, panel discussion, invited lectures, oral and poster presentations. Numerous number of scientific papers including 330 E-posters from different aspects of radiation oncology were presented in this congress. An abstract entitled "Present status of Medical Physics Education in Bangladesh" by Nupur Karmaker, faculty member of the Department of Medical Physics and Biomedical Engineering, Gono was accepted for poster presentation. On behalf of the presenting author Md Akhtaruzzaman, presented that paper.

The platform was a great opportunity to upgrade knowledge through meeting with the eminent scientists around the world. The conference became grand successful.

Oral Presentation Session

Poster Presentation Session

CPD Meeting in Germany for MP in Bangladesh: May 2017

Germany is playing a pioneer role for medical physics education as well as continuous professional development (CPD) for medical physicists in Bangladesh. On 5th May 2017, a discussion meeting was held for chalk out the CPD program for the year 2018 at Mannheim Medical Center, Germany. From Germany the discussants were Ms Renate Walter, Diplo-Ing Mr. Volker Steil, Dr. Frank Hensley, Prof. Dr. G A Zakaria, Dr. Flavia Molina (joined through webex) and Prof. Dr. Hasin Anupama Azhari from Bangladesh.

CPD Meeting in Germany

Participation in JRC- 2017: Japan: April 2017

Dr. Kumaresh Chandra Paul, President of BMPS has been awarded for the best presentation among the members of Asian Federation of Medical Physics (AFOMP) in Japan Yokohama on 13-16th April 2017 at the "113th Scientific Meeting of Japan Society of Medical Physics-JRC2017"conference. He presented a paper on "The Shift of The Effective Point of Measurement and Displacement Perturbation Factor at Cylindrical Chambers in High Energy Photon Beams".

Receiving Best Presentation Award

International Centre for Theoretical Physics (ICTP): March 2017

From 25 March to 25 April, ICTP; Prof. Dr. Hasin Anupama Azhari had visited ICTP as an associate member. She had attended several meetings with the group of "Physics without Frontiers", Director ICTP, Director of Federal Association Scheme.

Being an executive member of Asia & Pacific Region, OWSD, she had a meeting with the program director OWSD (organization for women in developing countries).

During that time she had attended a school on medical physics on radiation therapy. One of our BMPS member Md Nazrul islam also attended as a participant. He had presented a poster on " A New Approach of 3D Treatment Planning using Plaster of Paris for Breast Carcinoma' .Prof Dr. G. A. Zakaria was one of the foreign teaching faculties of the school.

Visit to ICTP

Training by Varian Medical System International India: March and July 2017

BMPS president, Md. Anwarul Islam participated training program of Varian Medical System International India, from 06-10 March 2017. The training title was "Varian Advanced Techniques Clinical School (IMRT and RapidArc)".

He also attended another training program entitled "Varian Advanced Techniques Physics IMRT/RA Course" at Cham, Switzerland from 04-07 July 2017.

The both training programs were organized by Varian Medical System International AG. These courses are designed to provide training for medical physicists responsible for the initial system commissioning and configuration of Varian's Intensity Modulated Radiotherapy techniques. The participants had gained a good understanding of the treatment technique process, the quality assurance tasks and the treatment planning strategies. Having completed the course the attendees will be able to implement IMRT/ RapidArc® and Portal Dosimetry into the clinical routine. The training includes the following:

- Overview of the IMRT/ RapidArc® process and workflow.
- Demonstration of the treatment unit configuration to learn how to set-up all treatment machines for IMRT and Rapid Arc®.
- Coverage of additional beam data acquisition for the optimization algorithms to know how to measure all relevant data for the treatment technique's commissioning.
- Configuration of the optimization algorithms in order to implement the system into clinical routine.
- Explanation of the purpose and working of the Leaf Motion Calculator (LMC).
- Presentations of the IMRT and RapidArc® optimization algorithms as well as of the new Photon Optimizer to gain an understanding of the optimization process.
- Configuration of the Portal Dose Image calculation algorithm in order to implement the system into clinical routine.
- Coverage of the different quality assurance tasks and options including Portal Dosimetry for IMRT and RapidArc® treatment planning verification.
- Live beam demonstrations on Portal Dosimetry, Machine and Patient QA for IMRT/ RapidArc® at a reference site.
- Demonstration of the IMRT/ RapidArc® treatment planning process and practical treatment planning exercises of clinical use cases.

Training in India

Training in Switzerland

Training in India: March 2017

To ensure the quality treatment on radiotherapy patient it is mandatory to advance the practical skill by comprehensive training. As per organization skill development program executive member, BMPS, Md. Mostafijur Rahman was selected to participate in an interactive training in India. The training was held on 13th to 19th March, 2017 at India. The training was conducted by Elekta Medical Systems India.

During the training with other participate at GURUKUL (Elekta training center)

Training Title: Hands-on training on High-end radiotherapy treatment planning technique using Monaco TPS 5.11

Training emphasis on:

1. IMRT, IGRT, VMAT, SRS & SBRT treatment technique
2. CBC, PBC & Monte Carlo planning algorithm.
3. Hospital visit & understanding practical challenges.

Enam Medical College Hospital (EMCH): February 2017

A team of Prof. Hartmut Baerwolff and Prof Dr. G A Zakaria (German Professors), and Prof. Azhari (Dean, Gono University) had visited the Radiotherapy department of Enam medical College Hospital (EMCH). A meeting was held with the Honorable MP Dr. Md Enamur Rahman (Founder of the EMCH) and Dr Md Anawarul Quader Nazim (Director, Management and Planning), regarding collaboration between MPBME, Gono University and EMCH for training, internship program.

Meeting with Founder of EMCH

Alumni Meeting of BMPS: February 2017

Bangladesh Medical Physics Society (BMPS) arranged a meeting with the alumni of the Dept. of MPBME, GB on 3rd February, 2017. Medical physicists from different centers were attending in this meeting. Basically, this meeting was held to know about their professional life in hospital. All alumni share their experiences gained from their occupation. They also provide their valuable advice to overcome the problems in future.

BMPS Alumni Meeting

Seminar in Dhaka University: February 2017

A seminar was presented by Dr. Kumaresh Chandra Paul, President, BMPS on 19th February 2017. The speech was on Title: "Effective point of measurement and displacement perturbation factor in high energy photon and electron beams". It was arranged by Md. Abdul Kadir, Chairman of the department of Biomedical Physics and Technology, Dhaka University. The participants were Professor Dr. S K Rabbani (Ex-chairman of the department), Medical Physicists from Dhaka Medical College Hospital, scientific officers from Bangladesh Atomic Energy Commission and students from Dhaka University and MPBME, Gono University. It was very interactive session indeed. Many interactive questions were raised by the audience to the speaker.

Seminar in Dhaka University

Bangladesh Medical Association (BMA): January 2017

On 30 January, founder a delegation of BMPS had visited Bangladesh Medical Association (BMA) and meet with the President of Bangladesh Medical Association (BMA Dr. Mustafa Jalal Mohiuddin; Treasurer Dr. Mohd. Zahid Hussain, Dr. Purobi Rani Debnath, Cultural & Entertainment Secretary and others were also there. The main issue was to create medical physicist post in each public hospital.

Meeting with BMA members

Poster Presentation Competition on Marie Curie: January 2017

A poster presentation Competition was held on 24th January 2017 at Department of MPBME, GB organized by Bangladesh Medical Physics Society (BMPS). Prof. Dr. Golam Abu Zakaria was present as special guest and act as a judge along with two EC members. The main purpose of the competition was to know about biography of Marie Curie and her contribution in Medical Physics. Finally, prizes are distributed to the winners.

Poster Presentation Competition

Participation in BCS International Cancer Congress (BCSICC): January 2017

Bangladesh Cancer Society organized a International Cancer Congress Health Fair 2017 (BCSICC) on 26th and 27th January 2017 at the Bangabandhu International Convention Center (BICC) and the Krishibid Institution Bangladesh. In the inaugural session, Prof. Dr. G. A. Zakaria, Honorary member of BMPS was present as a special guest. The others were Prof. Dr. Golam Mohiuddin Faruque, Prof. Dr. M. A. Hai, Prof. Dr. Abul Kalam Azad, Prof. Dr. M. Iqbal Arslan, Dr. Mostafa Jalal Mohiuddin, Mr. Md. Sirazul Islam, Prof. Brig. (Rtd) Dr. Abdul Malik, Mr. Zahid Malik, MP, Mr. A K M Mozammel Haque, MP, Prof. Dr. Mollah Obayedullah Baki and Mr. Sultan Mahmudur Rahman. About ten presentations were delivered from BMPS members in different medical physics session. BMPS arranged Dr. Michael Ehmann (Germany) to participate in the conference.

Inaugural Session

Combined Military Hospital (CMH), Dhaka: January 2017

Prof. Dr. Zakaria had been invited to visit CMH on 22 January 2017. CMH is planning an excellent cancer center. A meeting was held between Prof. Dr. Zakaria and the higher authority of CMH, where the discussion was on the training of oncologists, medical physicists and nurses. A possible MoU between GB & CMH were also discussed.

BMPS Honourary member with Major Dr. Anwarul Islam (CMH)

Participation in BICoBS: December 2016

An International Conference for Biomedical Students & Young Doctors (BICoBS) was organized by Asian Medical Students' Association Bangladesh (AMSA Bangladesh) in cooperation with Department of Biomedical Engineering, MIST, Dhaka, on 24-25 December 2016. The theme of the conference was "Integrating Every Bit of Cancer Research: Prevention and Treatment and Cure and Biomedical Research for bringing quality to life: Disease prevention, diagnosis, treatment and cure". The main aim was to providing opportunity for participants to increase their capability on competing professionally, motivating participants to improve their knowledge & skills in biomedical field, making the bridge between medical and biomedical professionals to conduct collaborative research in order to improve overall health condition in Bangladesh and to creating bond among participants in order to broaden their networks nationally and internationally. About 50 BMPS members attended the conference and exchanged their knowledge with the speakers and participants.

Participation in BICoBS

Seminar on "Implication of Imaging and Image Guidance in the Development of Modern Radiotherapy Treatment Planning and Delivery": December, 2016

On 29th December 2016, a seminar was organized jointly by Bangladesh Medical Physics Society (BMPS) and Department of MPBME, GB. The speaker was Dr. Mamun Haque (Senior Medical Physics Specialist, Department of Radiation Oncology, Chris O'Brien Lifehouse, Australia). On the seminar, he discussed about the availability of sophisticated imaging techniques and its application in treatment planning and beam delivery.

Closing Ceremony of the Seminar

Celebration "Science for Patient Benefit", IPEM: December 16

A slogan on behalf of International Institute of Physics and Engineering in Medicine(IPEM) had been practiced by the members of BMPS and a seminar was done to make them understand the key role of a medical physicist and biomedical engineer. During the 22nd International Conference on Medical Physics in Bangkok Prof. Zakaria and Prof. Anupama Azhari met with Dr. David Brettle (President, IPEM) and Mr Hugh Wilkins(Vice President, IPEM). Excellent posters were handovered for seminar and discussion in Bangladesh.

Celebrating "Science for Patient Benefit"

International Conference on Medical Physics (ICMP), Thailand: December 2016

The 22nd International Conference on Medical Physics 2016 was held on December 9-12, 2016 at the Shangri-La Hotel, Bangkok, Thailand. The Theme of the Conference is "Medical physics propelling global Health. On behalf of Bangladesh Prof Dr Hasin Anupama Azhari was the one of the member of the science committee. The other members were Dr. Eva Bezak, Australia, Dr. Lalit Mohan Aggarwal, India, Dr. Shinji Kanamura, Japan, Dr. Zhihui Hu, China, Dr. Challapalli Srinivas, India Dr. Hajime Monzen, Japan. She was also invited as an invited speaker on " Medical Physics Education in South Asia: Problems and Perspectives" in a Mini Symposium, "Women in Medical Physics: Education and Profession". Also Honorary member, BMPS, Prof Dr G A Zakaria had delivered a talk on Current trends of medical physics in radiotherapy and imaging, as an invited speaker of mini symposium arranged by IOMP school.

Participation in ICMP

Workshop on "TG 100: Application of Risk Analysis Methods to Radiation Therapy Quality Management": November 2016

A Pre-Conference (SFO) workshop on "TG 100: Application of Risk Analysis Methods to Radiation Therapy Quality Management" jointly organized by Oncology Club Bangladesh and United Hospital Ltd (UHL), Dhaka was held on 18th November 2015 at Department of Radiation Oncology, United Hospital, Dhaka. The teaching faculty in this workshop was the author of Task Group 100. Prof. Saiful Huq, Director of Medical Physics Division, UPMC, Pittsburgh, USA. In this workshop a broad view of complexity of modern radiation therapy planning and delivery challenges, traditional prescriptive quality management (QM) methods included in guidelines were thoroughly described. Also in the workshop it has been emphasized that many errors that occur in radiation oncology are not due to failures in devices and software; rather they are failures in workflow and process. The other guests were Karthick Raj Mani, Consultant Medical Physicist, UHL, Dr. A F M Kamal Uddin, Int affairs and Secretary of Oncology Club, Dr. Sadiq R. Malik, Chief Radiation Oncology Physicist, & Head of Physics Department, Delta Hospital Limited.

About sixteen BMPS members, students of DU and Gono University and medical physicists of different public and private hospitals attended the workshop.

Workshop at United Hospital Ltd

SFO Conference: November 2016

11th SAARC Federation of Oncologists International Cancer Conference (11th SFO ICC) & 3rd Bangladesh Cancer Congress (3rd BCC)-2016 was organized by Oncology Club at Army Golf Club, Dhaka, from 19-20 November 2016. A group of BMPS members attended the conference and also present the paper.

Attending in SFO Conference

IAEA, Austria: November 2016

The founder President of BMPS Prof. Dr. Hasin Anupama Azhari and then Secretary BMPS Mr. Safayet Zaman visited the IAEA laboratory at Seibersdorf, Austria in November 2016 and met with Dr. Joanna Izewska, Unit head of dosimetry laboratory. We were briefed on the audit program of the IAEA for the radiotherapy centers around the world.

The BMPS members also visited IAEA Headquarter in Vienna, Austria and met with Dr. Ahmed Meghzifene, Head of Dosimetry & Medical Radiation Physics Section, Division of Human Health. BMPS informed him about the current status of Medical Physics in Bangladesh and its progress. They had discussed about the Accreditation of Medical Physicists of Bangladesh and future cooperation in different Projects of IAEA.

Visit to IAEA Headquarter

Visit to Technical Institute, Austria: November 2016

Prof. Dr. HasinAnupama Azhari and Mr. Safayet Zaman had visited the Technical Institute in Vienna, Austria. They had observed the VERT System. It is a virtual education system which provides virtual environment of a radio-therapy treatment room. It reflects live visualizations of radiotherapy machines which is very good for training to students and other radiotherapy team members.

Observing VERT System

BMPS EXECUTIVE COMMITTEE
2017-2019

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BMPS EXECUTIVE COMMITTEE
2017-2019

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Ashima Barman	Member	M.Sc. Medical Physics Department of Medical Physics & Biomedical Engineering (MPBME), Gono Bishwabidyalay (University) Savar, Dhaka. Email:ashimabarman2002@gmail.com	

Upcoming Events

3rd International Conference on Medical Physics in Radiation Oncology and Imaging (ICMPROI) -2017
10-12 March 2018
Dhaka , Bangladesh
www.bmpsbd-icmproi.org

25 – 27th January 2018
Moffitt Cancer Center Radiation Oncology conference
Tampa, FL, USA
www.Dawn.Gintz@moffitt.org

1-3th February, 2018
The international conference on Molecular Imaging and Theranostics in Prostate Cancer Valencia, Spain
http://focusmeeting.eanm.org

10 – 15th February, 2018
SPIE Medical Imaging Meeting
Houston, Texas, USA
http://spie.org

15th February 2018
DGMP/DPG-Webinar von Theresa Werner der TU Dresden: Prompt gamma-ray imaging in proton therapy
Berlin, Germany
http://www.dgmp.de

12-16th March, 2018
Technical Meeting on Methodologies and Approaches to Address the Legacy Waste Challenge
Vienna, Austria
www.iaea.org

30-31th May, 2018
ICROMP 2018: 20th International Conference on Radiation Oncology, Radiobiology and Medical Physics.
Kyoto, Japan
www.waset.org

1-2 June, 2018
Workshop on Imaging in Radiation Oncology
Dhaka , Bangladesh
www.bmps-bd.org

3-8th June 2018
The World Congress on Medical Physics and Biomedical Engineering IUPESM
Prague, Czech Republic
www.iupesm2018.org

07-13th July 2018
Monte-Carlo Summer School
Einführungskurs in EGSnrc
Gießen, Germany
http://www.dgmp.de

9-10th August, 2018
5th International Conference on Medical Physics and Biophysics
Madrid, Spain
medicalphysics.conferenceseries.com

23-25th August 2018
2nd European Congress of Medical Physics
Copenhagen, Denmark
http://ecmp2018.org/

01 – 05th October 2018
International Symposium on Communicating Nuclear and Radiological Emergencies to the Public
Vienna, Austria
www.iaea.org


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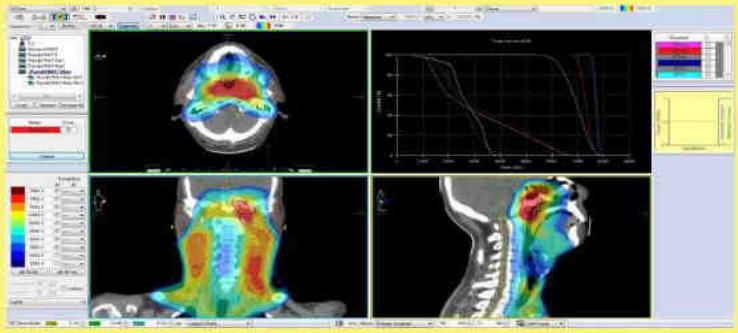

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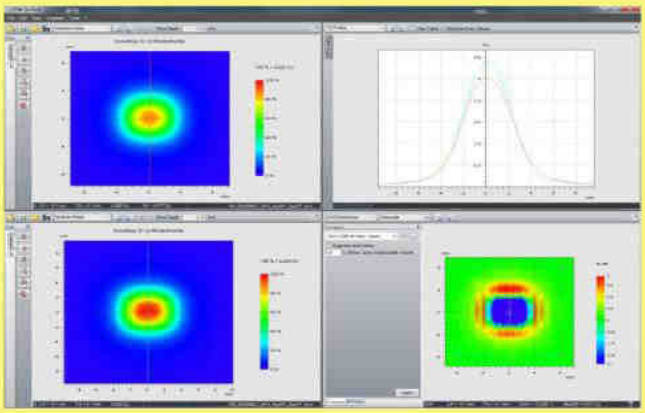

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