Schweizerische Gesellschaft für Strahlenbiologie und Medizinische Physik
Société Suisse de Radiobiologie et de Physique Médicale
Società Svizzera di Radiobiologia e di Fisica Medica

SGSMP
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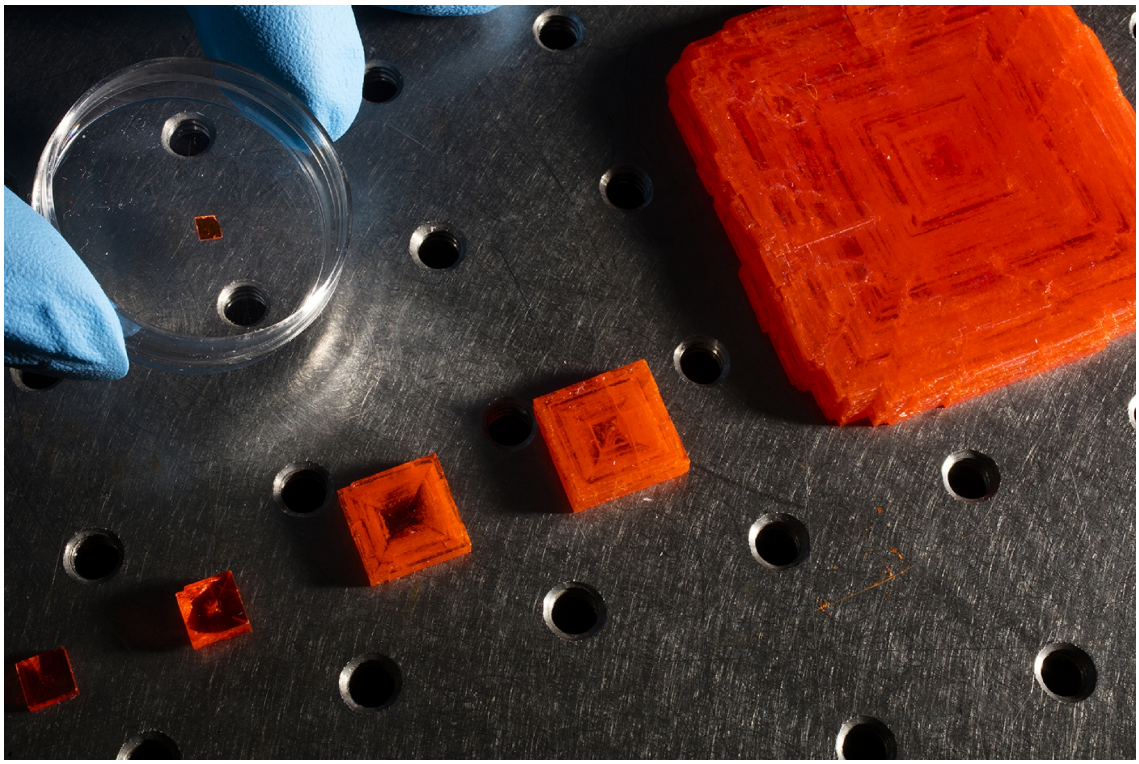


BULLETIN
1/2016

Nr. 85 April 2016

Online Bulletin: http://www.sgsmp.ch

BULLETIN 85

April 2016

Cover images:

Photo of perovskite methylammonium lead tribromide crystals that are currently being developed for low dose x-ray detection. These crystals will drastically reduce the doses necessary in medical imaging.

Read more:

Online article: http://physicsworld.com/cws/article/news/2016/mar/22/medical-imaging-could-benefit-from-new-x-ray-detector
Nature paper: http://www.nature.com/nphoton/journal/vaop/ncurrent/full/nphoton.2016.41.html

LETTER FROM THE EDITORS

Dear Colleagues,

The new year is in full swing! And so are things here at the Bulletin…

We hope that you enjoy this year's first issue of the Bulletin that we have prepared. There are some very nice contributions that were sent in by our society's members. Furthermore, there is an important report on the professional status of medical physicists working in radiodiagnostics in Switzerland. Please take the time to read this well-written report.

A big thank you goes out to everyone who continues to contribute to the Bulletin's success.

Cheers!

Nathan Corradini, Shelley Bulling, and Francesca Belosi

Dear Candidates to SSRMP certification of medical physics,

On behalf of the certification commission of SSRMP (Swiss Society of Radiation Biology and Medical Physics), we briefly want to inform you about the exam 2016 procedure.

Attention: all the **communication** from the exam committee is done via **e-mail**. So please make sure that your announced e-mail address is still valid in the year of the exam!

End of May, each candidate who is fulfilling the conditions to sit the exams for the current year will receive an email from the chair of the exam commission, Stephan Klöck, with the application form and an invitation to register for the exams.

The candidates have to register **till 1st of July**. Exact times and places of the exam will be organized in several doodle polls with experts and candidates and communicated **until mid-July**. If you want to postpone your exam to another year, please let us know by e-mail.

ATTENTION: Without receiving any feedback from you, we will not contact you in the following year, and you will be removed from our list of candidates.

Please check whether you still have to submit parts of the following documentation. It has to be done **by July 1st**:

- All annual mentor reports
(candidates with a foreign certification do not have to submit mentor reports)

- The written "diploma work" or equivalent publication - not required in case of a foreign certification or MAS in Medical Physics (ETH)

- A copy of the certificate of attendance of the required radiation protection course
(in case of a foreign radiation protection course, the equivalence to a Swiss course has to be confirmed by BAG)

Whether only an oral exam or an additional written exam has to be passed is dependent on the qualifications of a candidate: a colleague with a Master of Advanced Studies (MAS) in Medical Physics (ETH), or a certification issued in another country do not have to sit the written exam.

The **fees** have to be paid by **end of September**. The treasurer will send out payment slips in July. You will receive the topics of the oral exam **at least six weeks prior to your oral exam date**. The written exam will be **on end of October** and possible dates for the oral exam are **during the first week of November.**

We encourage each candidate to read the new guidelines and exams rules, which can be found directly on SSRPM's website (http://ssrpm.ch/certification-for-medical-physicists/rules/)

On behalf of the certification commission of SSRMP,

F. Corminboeuf
Chair of Education Committee
f.corminboeuf@lasource.ch

S. Klöck
Chair of Exam Committee
Stephan.kloeck@usz.ch

Invitation to SSRMP Education Course on "Medical physics in Nuclear Medicine"

April 2016

Dear Colleagues,

SSRMP is going to offer a 2-day course for medical physicists involved or getting involved soon in medical physics in the field of nuclear medicine.

The aim of the course is to review the physics of nuclear medicine to ensure that the education of the SSRPM-certified medical physicists complies with article 74.7 of the Swiss Radiological Protection Ordinance requirements. It will define the scope of tasks, duties and responsibilities that should be performed by a SSRPM-certified medical physicist to give the required support in nuclear medicine applications.

Please take note that only a limited number of places (15) per course will be available.

Subject: Nuclear Medicine

- Quality assurance relating to patient dose of a gamma camera and PET systems:
  - Level of image quality produced for a given activity
  - Correlation between algorithms and image quality
  - Adequacy of the imaging protocols with DRLs

- Patient dose estimation and verification:
  - Phantom measurements
  - Dose modeling
  - Analyzing individual patient dose protocols and comparison to DRLs
- Patient and staff dose optimization
- Legal aspect of radioprotection.
- Task of medical physicist in nuclear medicine.
- Practical exercises.

Venue: **Zürich, UniSpital**
Date and Time: **6th – 7th of June 2016**
Fee: **700 CHF**

Please do not forget to fill in the registration form and send it back **before 23rd May 2016**.

We are looking forward to seeing you in Zürich.

Registration

SSRMP Education Course on "Medical physics in Nuclear Medicine"

Title: *	○ Dr. ○ Ms. ○ Mr. ○ Prof. ○ Prof. Dr.
Name: *	_____
First name: *	_____
Institution/company:	_____
Department:	_____
Address: *	_____
	_____
Zip: *	_____
City: *	_____
Phone:	_____
Fax:	_____
Mobile:	_____
E-mail: *	_____
Signature :	

Please return by mail, fax or E-mail as soon as possible.

Address: Centre de Radio-Oncologie La Source
Av. De Vinet 30
Corminboeuf Frédéric
CH – 1004 Lausanne

E-mail: f.corminboeuf@lasource.ch
Tel: +41 21 642 70 11
Fax: +41 21 642 70 09

CALL FOR ABSTRACTS

WELCOME TO THE 2nd

SASRO
Scientific Association of Swiss Radiation Oncology

20th ANNUAL MEETING

SGSMP
SSRPM
SSRFM

50th ANNUAL MEETING

JOINT MEETING !

WHEN: August 25th-27th, 2016
WHERE: Campus Sursee

Registration and
Abstract submission open!

"HIT THE TARGET"

ONLINE REGISTRATION

1st March to 1st August, 2016, via www.sasro.ch/2016

ABSTRACT SUBMISSION

1st March to 1st June, 2016 (final deadline), via www.sasro.ch/2016

MAIN SCIENTIFIC TOPIC

'Hit the target'

LANGUAGE

Oral presentations / Posters: English
No simultaneous translation provided

Tomotherapy dosimetry intercomparison 2015

Hans Schiefer, Konrad Buchauer and Simon Heinze; Kantonsspital St.Gallen, 9007 St.Gallen

It was the aim of the Tomotherapy dosimetry intercomparison of the year 2015 to check the absolute dosimetry and to perform an end-to-end-test. The cheese phantom setup, as established in the 2014 dosimetry intercomparison, was applied for both tests (Schiefer H, Buchauer K, Heinze S, Henke G, Plasswilm L, "Design and implementation of a "cheese" phantom-based Tomotherapy TLD dose intercomparison", Strahlenther Onkol. 2015 Nov; 191(11):855-861. Epub 2015 Jun 19). All Tomotherapy sites in Switzerland participated in the intercomparison.

1. Materials and Methods

If the 2014 scan of the "cheese" phantom was still available, no further scan was needed. Similar as in the 2014 intercomparison, the helical calibration plan with the high dose area in the centre of the phantom - field width 2.5 cm – was used. No further planning was therefore needed.

The individual plan was calculated on the basis of the in house CT scan of the cheese phantom. The dose constraints were linked to two concentric cylinders in the middle of the phantom: "PTV High-Dose" and "PTV Low-Dose". The dose level for the inner cylinder had to be as next as possible to 1.5 Gy/fraction. The dose in the outer cylinder had to be as next as possible to 2.5 Gy/fraction. Figure 1 shows the planning structures in the cheese phantom.

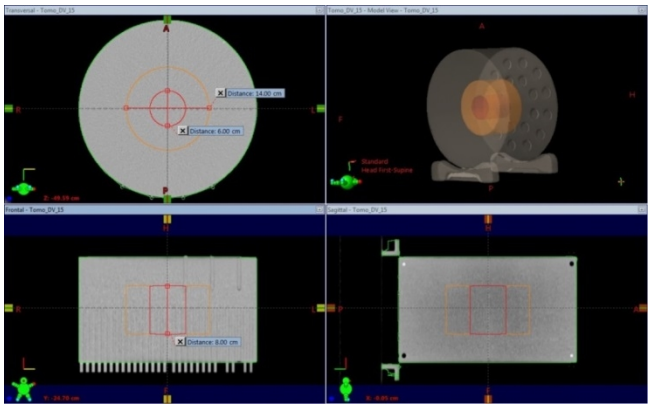


Fig. 1. Planning structures in the cheese phantom

Figure 2 shows the TLD and ionisation chamber measurement positions in the cheese phantom for the calibration plan and the individual plan. The doses in the calibration plan are in the range of 2.00 Gy.

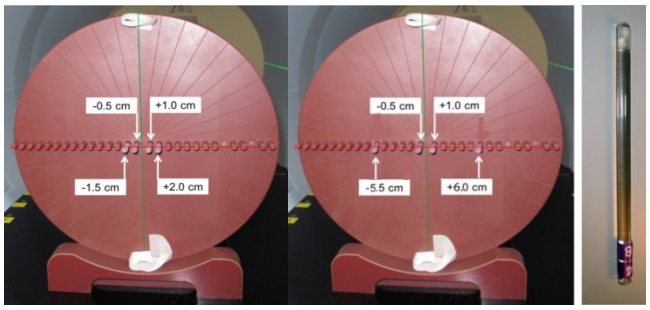


Fig. 2a,b,c. TLD and ionisation chamber measurement positions in the cheese phantom. a: For the calibration plan. b: For the individual plan. c: TLD stick containing 5 TLD discs.

For each institution, 50 TLDs were used for eight TLD sticks (40 TLDs) and 10 TLDs for the reference irradiations performed by PTW Freiburg, Germany. The Harshaw 5500 reader (Harshaw-Bicron, Solon, OH, USA) is capable to evaluate 50 TLDs in one single run. Additionally to the TLD calibration established for measurements in water, a cheese phantom specific factor was applied. It was defined in the 2014 Tomotherapy intercomparison and amounts to 1.0083.

EBT3 film measurements (Ashland Inc. Covington, KY, USA) were performed in the center plane perpendicular to the plane with the TLD sticks (Figure 3).

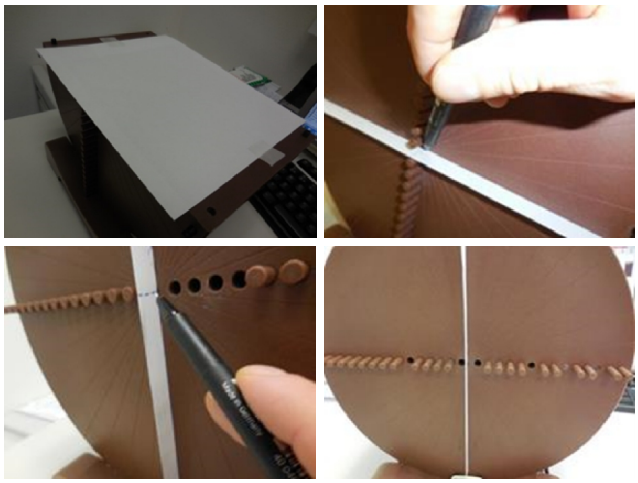


Fig. 3. Film placement in the cheese phantom

It was therefore possible to perform the TLD (or ionisation chamber, if requested) and film measurement at the same time. A dose point evaluation is specified as a good result when the calculated stated (Ds) and the measured (Dm) doses coincide within 3%. It is satisfactory when the coincidence is better than 5%.

2. Results

a. TLD and Ionisation Chamber Measurements

Altogether five Tomotherapy machines were checked. One individual plan was irradiated in a wrong setup and excluded from the evaluation. 36 measurements were therefore evaluable for the TLD and ionisation chamber setup.

With both measurement techniques, all dose point evaluations except one single ionisation chamber measurement led to a good result. Figure 3 shows the Dm/Ds values for the TLD as well as for the ionisation chamber measurements. The corresponding mean values are 1.006 ± 0.009 and 1.004 ± 0.010.

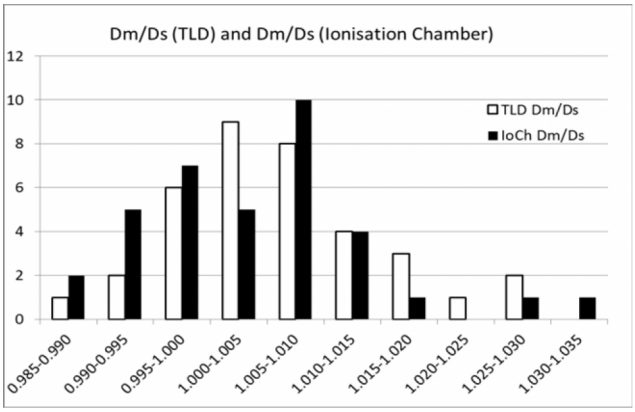


Fig. 4. Dm/Ds ratios for the TLD and ionisation chamber measurements (n=36).

When only the ratios for the calibration plans are considered, the mean values are 1.001 ± 0.006 (TLD) and 1.002 ± 0.007 (ionisation chamber), respectively. (Remember that the phantom specific calibration factor was defined in 2014 on the basis of the same calibration plans as used in 2015. The expected mean values should therefore be 1.000.) The corresponding values for the individual plans are 1.013 ± 0.008 and 1.006 ± 0.012.

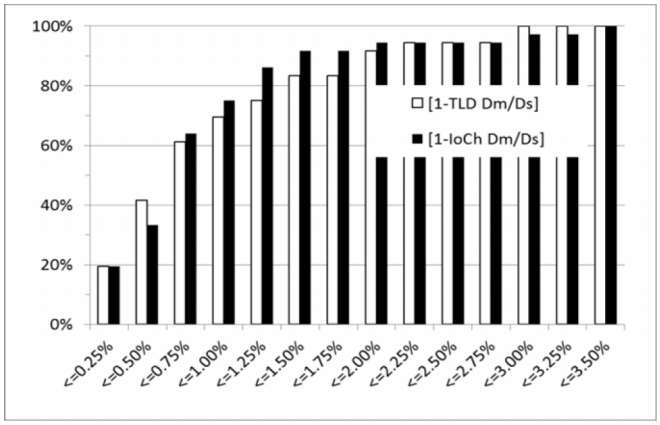


Fig. 5. Cumulative percentage of the relative difference between measured and calculated dose.

Figure 5 shows the cumulative percentage belonging to the data in figure 4. More than 90% of all measurements show an agreement with the stated doses of better than 2.0%, 70% of them are better than 1.0%.

b. EBT3 Film Measurements

To establish a film calibration curve of the same dosimetric quality as used for the TL-dosimetry turned out to be crucial and not easily possible. The evaluation was therefore performed as follows: The readings of the individual TLD measurements were used to define the absolute film calibration of each institution. A gamma pass rate of 94.4% ± 2.33% [3 %, 3 mm, 1σ, N=4] was achieved in that way. Further studies are needed to find a more consistent film evaluation procedure.

3. Discussion and Conclusion

The TLD and ionisation chamber measurements show two remarkable properties: As hopefully expected, the dosimetry for these measurement techniques are in very good mutual agreement, when the calibration plan is considered (about 0.1% difference). Additionally, the measured doses coincide very well with the stated doses (0.6% and 0.4% difference).

The ratio between measurement and calculation seems to be slightly larger in the individual plan (1.013 ± 0.008 and 1.006 ± 0.012). Since the errors of the mean values are in the range of the measurement value, a clear statement cannot be given.

This dosimetry intercomparison has proven the high dosimetry level in all Swiss Tomotherapy

sites when an end-to-end test is performed: All checked measurements show good or even excellent results. This finding serves as a strong indicator that the cheese phantom setup developed in St.Gallen is also capable to check the dosimetry of complex end-to-end tests.

Thanks

We thank all the participants for their participation in this intercomparison. A special thank goes to Dr. C. Pychlau, PTW Freiburg, and his co-workers for the irradiation of the reference TLDs. Thank you also to Dr. G. Henke for his invaluable background job.

Konrad Buchauer, Simon Heinze, and Hans Schiefer
Klinik für Radio-Onkologie, Kantonsspital St.Gallen

Dear Colleagues,

As each year, all medical physicists, belonging a SSRMP medical physics certification, have to send his/her continuing education points. If you have not yet done this task, please send per post or email your points directly to me.

You will find all the necessary information and documents directly by our website (http://ssrpm.ch/certification-for-medical-physicists/appendices/).

It is important for us that you send your points every year, so it will make our life easier when you will have to renew your certification. The renewal happens every five years.

Each colleague concerns by this procedure has been contacted individually.

For further question do not hesitate to contact me.

In behalf of the specialization commission,
F. Corminboeuf (Centre de Radio-Oncologie, Clinique de la Source, Av. de Vinet 30, 1004 Lausanne, f.corminboeuf@lasource.ch)

Next Applied Medical Physics (AMP) Meeting

June 22, 2016,
University of Bern, Main Building

Raphael Moeckli

SGSMP Research Grant 2016

In order to support and promote the scientific activities of our members in Switzerland active in all fields of Medical Physics, a research grant is provided by SGSMP. As in the last years, a financial grant of maximum 7'000 CHF is offered for research projects fulfilling proper eligibility criteria.

The projects should:
- be promoted by at least one regular member of SGSMP
- be conducted entirely in Switzerland in one of the private or public institutes active in the field
- preference will be given to projects involving more than one institute aiming to a trans-linguistic and trans-cultural cooperative model
- be strictly linked to a field of interest of SGSMP
- be completed within the time span of one year from grant assignment

The group that will be awarded with the grant will have to provide the SGSMP Science Committee with a detailed report (inclusive of costs justification) at the end of the one-year period and will guarantee the publication of a scientific report in the SGSMP Bulletin. The scientific report should be, pending scientific committee's review and approval, submitted for oral contribution to the annual SGSMP meeting.

Deadline for submission of proposals is June 30th 2016.

Proposals should not exceed four A4 pages and should contain:
- project title, duration and financial request
- principal investigator's and co-investigator's names and responsibilities in the project
- short description of the scientific background
- short but detailed description of the project
- short description about current state of the art in the field

Proposals should be submitted (preferably via email) to the chair of the SGSMP Science Committee:

Raphaël Moeckli, Institut de Radiophysique, Rue du Grand Pré 1, 1007 Lausanne,
raphael.moeckli@chuv.ch

WANTED

NEW SSRMP BOARD MEMBERS

On this year's general assembly, which is taking place at the joint meeting between SSRMP and SASRO in Sursee, a new SSRMP board is to be elected. It is already known that some of our current board members will step down, and that's why this call for new SSRMP board members is of great relevance.

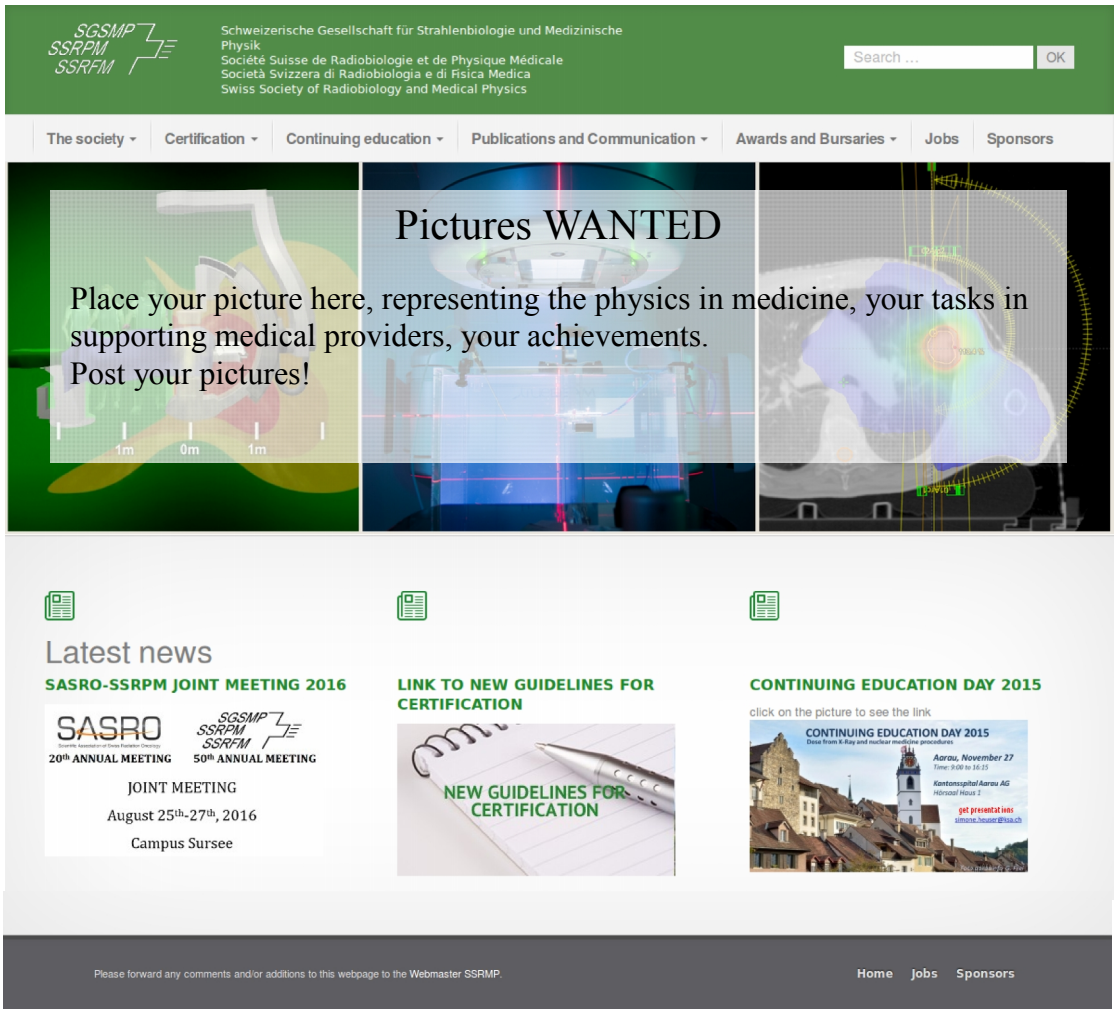
The elections and the board positions are open to every SSRMP member.

In order to prepare the elections, it is appreciated if you could state your willingness before mid of June 2016.

Thus, if you are willing to be a candidate, please send an email to Peter Manser (peter.manser@insel.ch) or to any of our current board members.

Web Editor WANTED

Website http://ssrpm.ch/ - http://sgsmp.ch/



The editor team has been working intensively pursuing website development along with regular improvements. Unfortunately, Mauricio Leick had to focus on other priorities and stepped down as web editor. Thank you, Mauricio, for your commitment and we hope to eventually see you come back soon.

As a consequence, the committee for professional affairs looks for a new enthusiastic volunteer to once again strengthen the editor team. If you are interested in a role to support the new website, please get in touch! The website has been professionally developed and looks great.

We are looking for someone to keep the webpage content up-to-date and to participate in its continuing development.

The Bulletin, the website and the mailing list of SSRMP are the main modes of communication with its members and the outside world. Please let us know your comments and ideas on how to make these platforms attractive and useful.

On behalf of the editor team,

Jean-Yves Ray, Chair of the committee for professional affairs

A professional status survey

Survey results: Medical physicists in radiodiagnostics

Authors: Elina Samara[1], Robert Schöpflin[2], Stefano Presilla[3]
[1]Hôpital du Valais, [2]Kantonsspital St.Gallen, [3]Ente Ospedaliero Cantonale

"Soft skills are necessary for our profession"

Medical physicists (MP) in radiodiagnostics (radiology and nuclear medicine) started officially working in Swiss hospitals in 2012, final date imposed by the Swiss law (art.74, al.7). A survey was conducted in the end of 2015 to examine the current situation of the medical physicists working in radiodiagnostics and gather the opinions about the future of our profession. All MP working in radiodiagnostics in the country were asked to participate to the survey. The survey was conducted using the Google forms and the statistical analysis was made by means of the MedCalc software, v. 14.12.0.

Twenty-two physicists took part in the survey. The majority of the MP that took part in the survey work in public hospitals (73%), 23% work in private hospitals and only one participant reported to be self-employed. Half of the institutes reported that they provide external services of MP to thirds.

The activity rate between the different modalities is presented in Figure 1 (Some MP seem to work more than 100%, either did their respond concern more than one MP or simply a mistake was introduced. The original data are presented here with no corrections.). Radiology tasks concern almost all MP with a rate between 10% and 80%. MP with no responsibilities in diagnostic radiology, work either exclusively in radiation therapy or nuclear medicine. Nuclear medicine, on the other hand, has very low rates of occupation, between 10% and 30%. As expected, radiation therapy MP work primarily in this domain, for instance participants 4, 5, 9, 10, 11, 21 and cover the needs of their institution for radiodiagnostics and typically do not provide external services. Only one person (participant 20) reported an occupational rate balanced between all modalities.

Very interestingly, almost all MP have tasks related to radiation protection. This may be officially written in their job description or simply required by their everyday work. Moreover, to the question "*Are you involved in the radiation protection policy of your hospital*?", 81% of the MP answered positively with one participant specifying that this task is "not official".

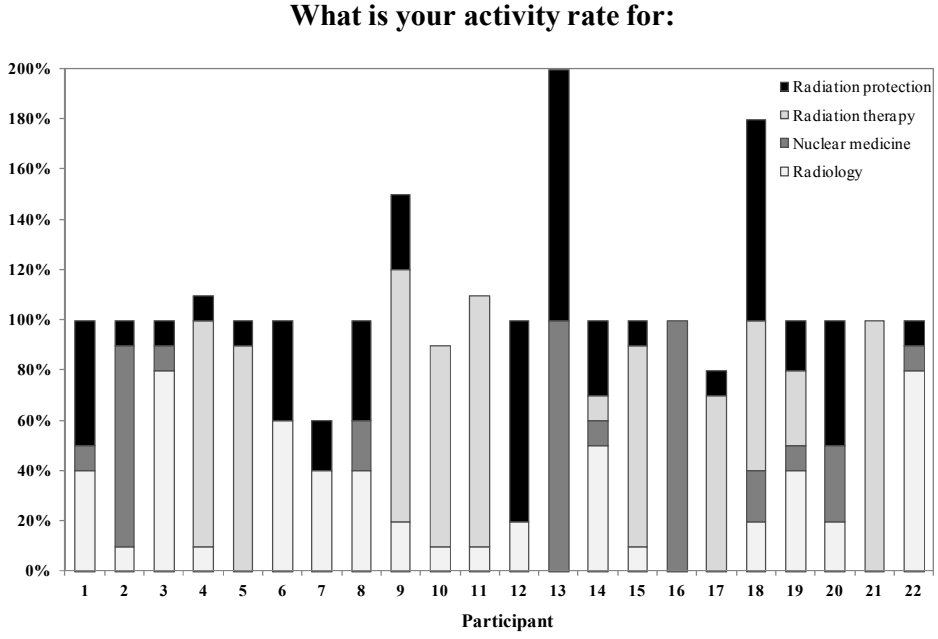


Figure 1: The activity rate of MP in radiation protection, radiation therapy, nuclear medicine and radiology

According to the "Guidelines and recommendations for application of the radioprotection ordinance Article 74", published in 2011, the tasks of the MP include i) quality controls of radiological equipment, ii) optimization of protocols and techniques used for patient and personnel safety and iii) training of the personnel in medical physics matters. The results of this survey showed that MP are concentrated to the training and coaching of the personnel (Figure 2). Optimization comes second, while quality controls are rarely performed by MP. Other tasks related to radiology and nuclear medicine may include IT activities or research in the field, but they only occupy a small amount of time.

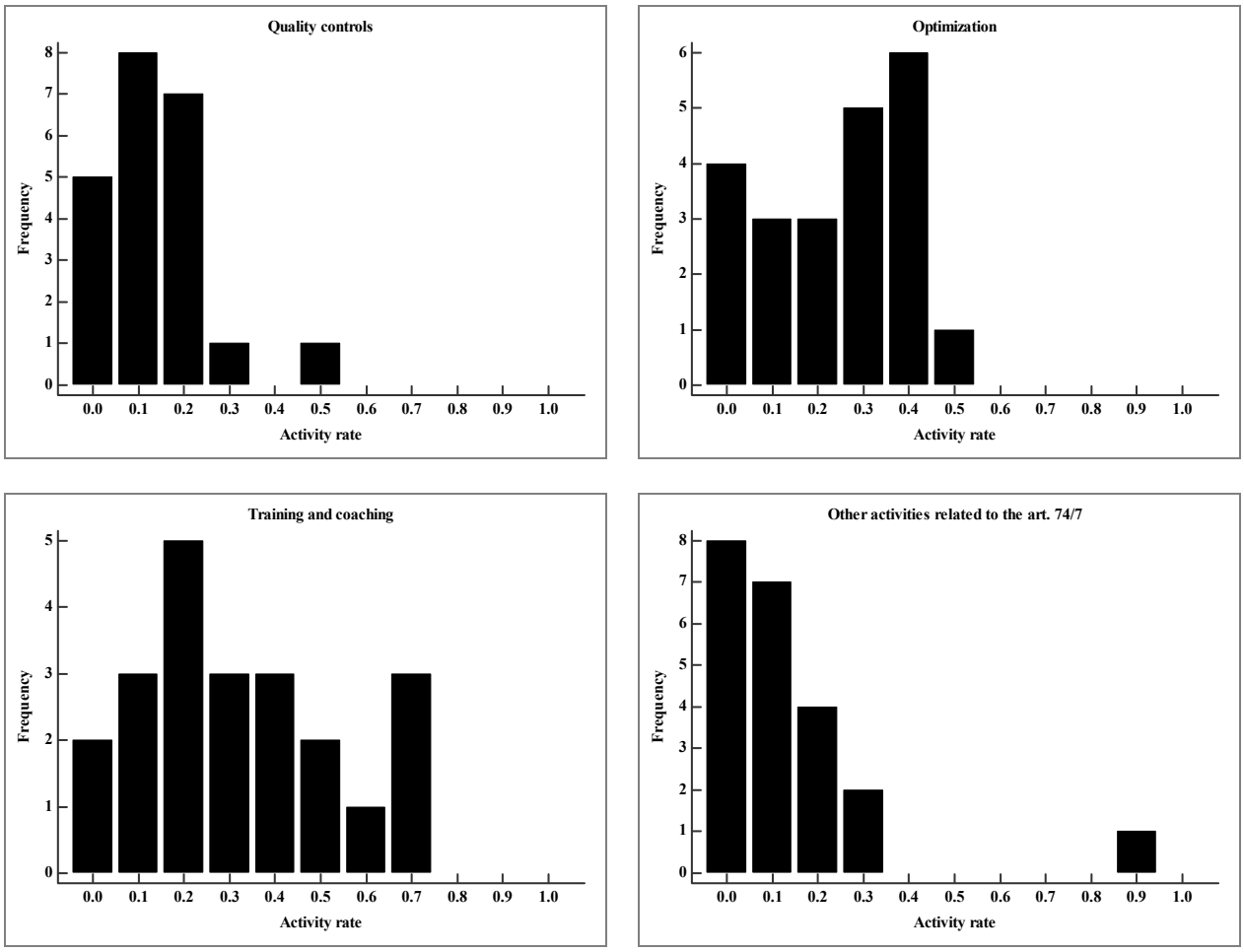


Figure 2: The activity rate of the tasks of MP working in radiology and nuclear medicine

The majority of the MP working in radiodiagnostics believes that their work should be oriented towards the management of the radiation instead of quality controls of the radiological machines, as depicted in the Figure 3. This comes to no surprise as the current activities in radiodiagnostics already include only few quality controls. Moreover, the colleagues mentioned that a MP should:

- consider radiation dose optimization taking into account other clinical factors, such as contrast agent
- analyze the clinical practice for avoidable risks
- be consulted from the purchase of the radiological equipment to its end-of-life
- be active in the field of medical informatics as it becomes an every-day tool for our work.

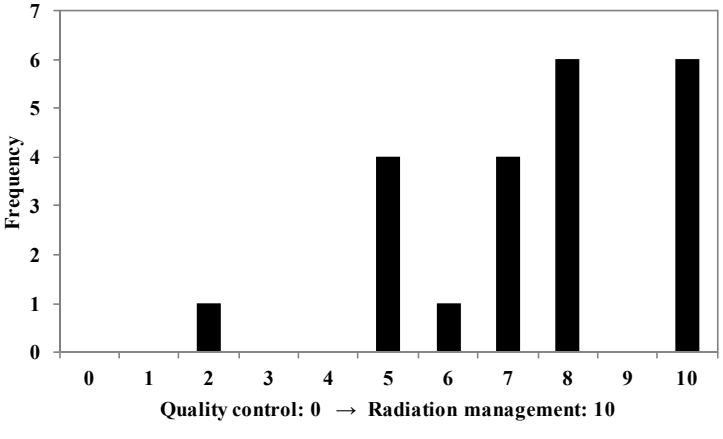


Figure 3: Answers to the question "*Should the work of the MP-74/7 be more quality-control oriented or radiation management-oriented?*"

A positive and motivating point for the profession of MP in radiodiagnostics, which remains an open field at least in Switzerland, is that MP feel that their responsibilities and tasks have evolved and continue to evolve according to Figure 4.

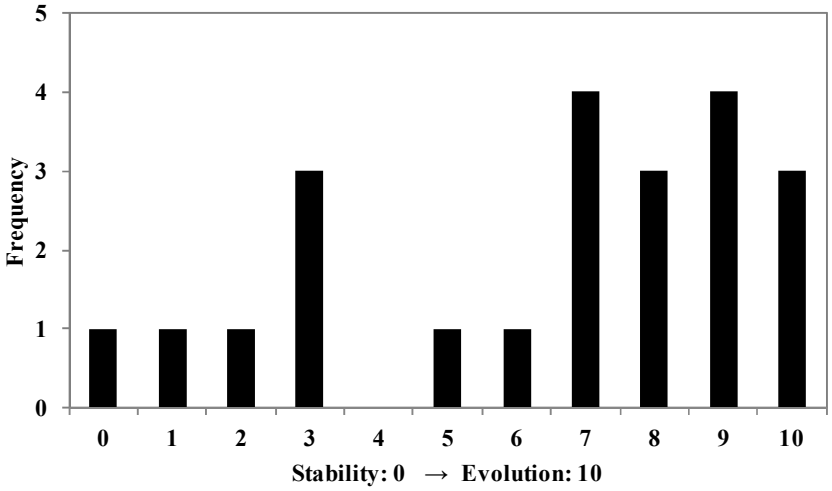


Figure 4: Answers to the question "*Do you feel that your responsibilities and tasks have been evolving with time or do you feel that they have been stable since the day you started in radiology and/or nuclear medicine?*"

The same positive perspective is also depicted in Figure 5 that gives the answers about the motivation of the MP to continue working in the field (A) and motivate younger MP to consider careers in radiology and nuclear medicine (B). It is interesting to remark here that all four MP that noted very low scores in both questions work principally in radiation therapy (participants 5, 11, 15, and 21).

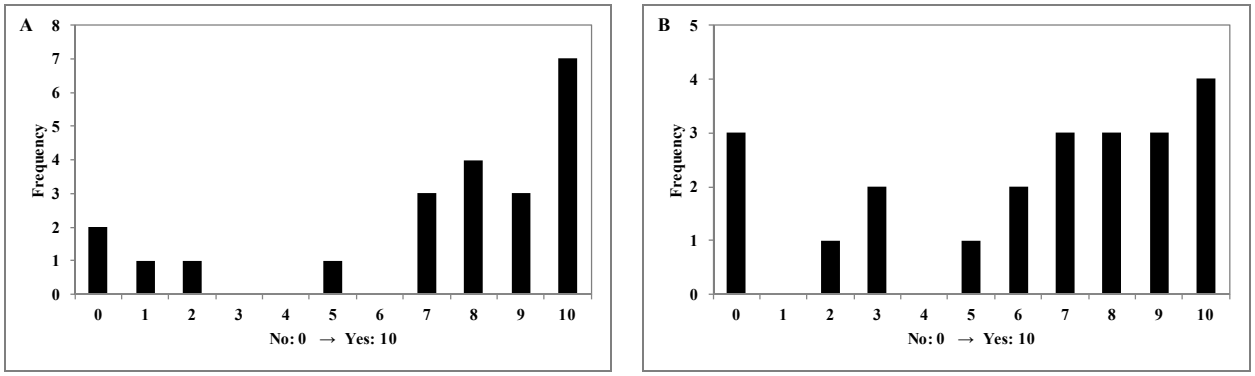


Figure 5: Motivation of the MP to continue working in the field (A) and motivate younger MP to consider careers in radiology and nuclear medicine (B)

This frustration may be related to the equivocal responsibilities of the MP in radiology and nuclear medicine according to the Swiss legislation or in the institute where they work (Figure 6). The approval towards the definition of the responsibilities of the MP in the institutes, where they work, is higher than the one in the Swiss legislation (mean values for institute definition was 5.7, while the mean value for the Swiss legislation definition was 4.3, p-value=0.006 for paired T-test).

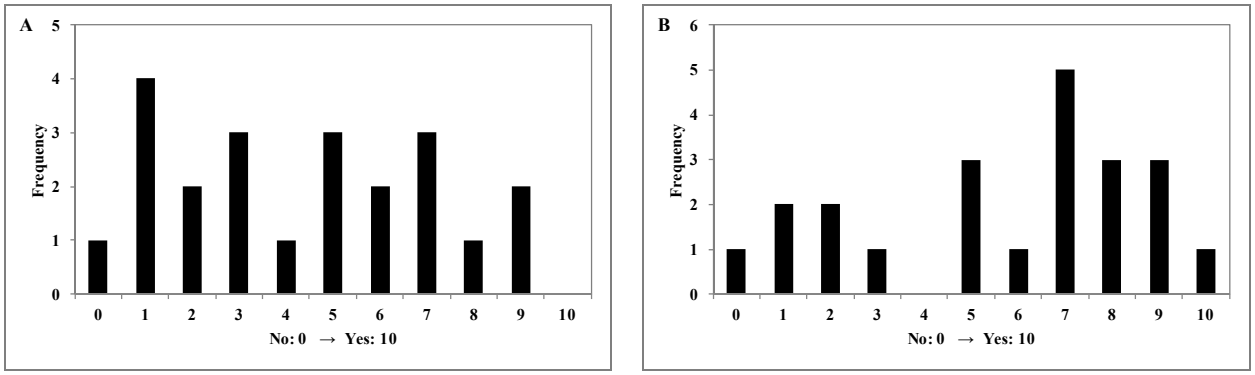


Figure 6: Answers to the question "*Are you satisfied with the definition of your responsibilities in radiology and/or nuclear medicine according to the Swiss legislation (A) and within your hospital (B)?*"

Figure 7 shows a correlation between the motivation of the MP to continue working in the field and the definition of their responsibilities in their hospital. A clearer definition of responsibilities is related to higher motivation of the personnel as one may observe. The fact that MP in radiation therapy have limited time to determine the needs and develop a concept for radiodiagnostics tasks may also explain this finding. Medical physics in radiology and nuclear medicine is a quite young profession in Switzerland and time was and may still be necessary to clarify our responsibilities.

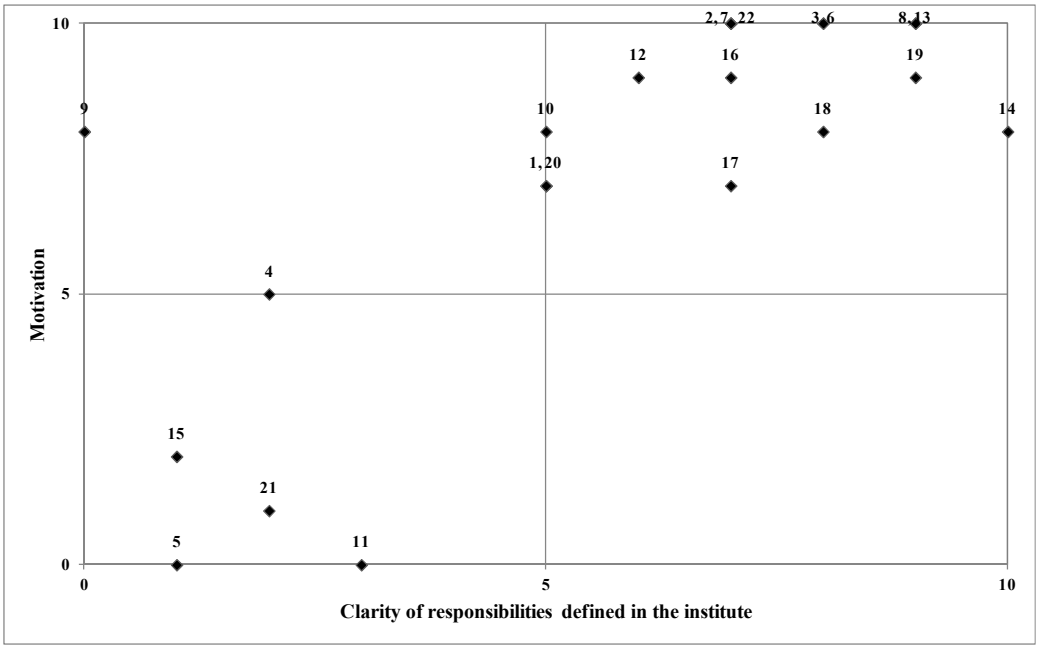


Figure 7: Correlation between the motivation of the MP to continue working in the field and the definition of their responsibilities in their hospital. The data labels correspond to the participant number.

Two questions concerned the feeling of the MP about the recognition of their work, one towards their direct colleagues, i.e. medical physicists and one their colleagues with different occupation (radiologists, technologists, etc.). Of particular interest is the fact that for both questions the mean score was equal to 6 (Figure 8) with no significant difference. However, lack of recognition of a MP's work in his/her institute does not necessarily mean lack of recognition among other colleagues (no correlation was found between the two answers of the participants). The fact that we may feel that our work is not recognized by colleagues with different background is understandable and we should work hard to better communicate the importance of our work. However, it is urgent, in our opinion, to improve the esteem of MP's work in radiology and nuclear medicine at least among medical physicists that work in radiation therapy.

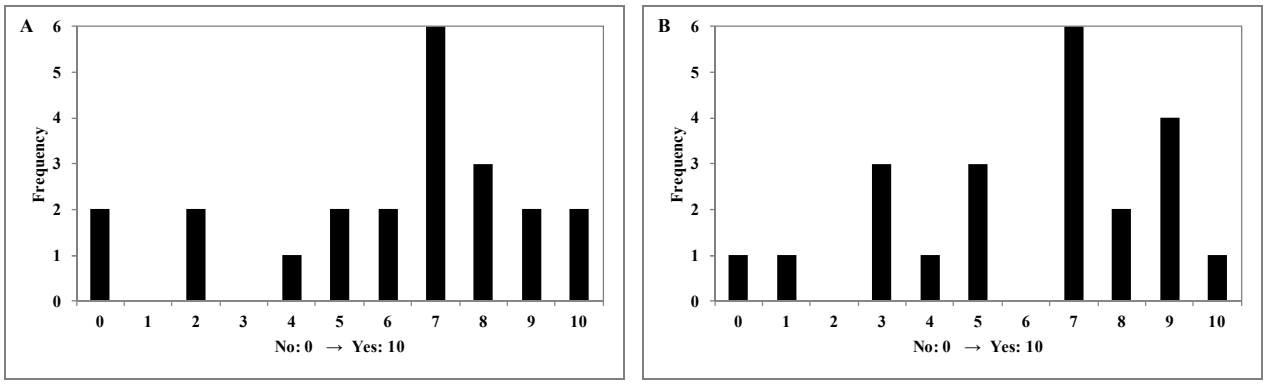


Figure 8: Answers to the question "*Do you feel that your work is recognized a) among your colleagues (medical physicists) and b) in the hospital (physicians, radiographers, etc.)?*"

An open question about any recommendation to improve our profession was asked and a summary of the proposals of our colleagues is presented here:

- Definition of the role of the MP in radiology and nuclear medicine
- Definition of the responsibilities of the MP in the Swiss legislation
- Strong communication about the role of the MP to other professionals and the related importance and impact in the clinical workflow.
- Reasonable hiring times of MP according to institute activities and needs
- Realistic funding of medical physics activities.

The next question concerned the collaboration of the MP with the physicians, radiographers and manufacturers in order to optimize radiation protocols. The general feeling is encouraging as showed in Figure 9. Furthermore, the participants described the collaboration as satisfying (32%) and mentioned that "it is changing with time towards the best" (55%), while no one mentioned the contrary. One more positive aspect is the mutual collaboration in radiation protection matters, where people feel free to express to MP their own ideas (46%) and apply the propositions of the MP (32%). Naturally, there are cases where the collaboration is described as difficult or that it should be closer, as mentioned by 27% of the participants or that there are still people that do not know what an MP does in radiodiagnostics.

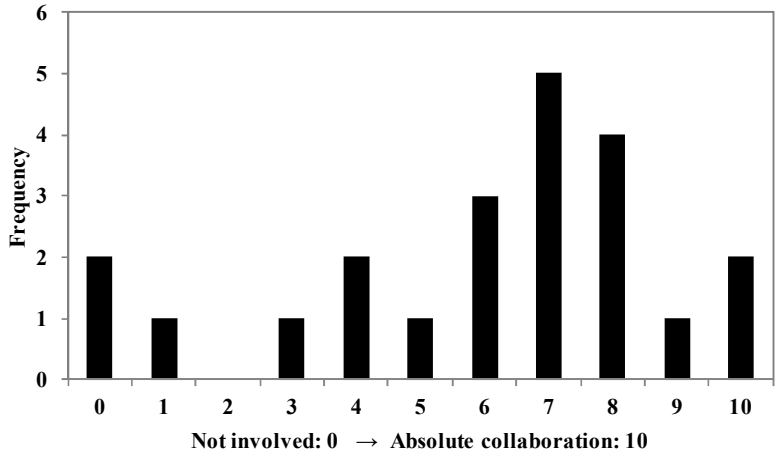


Figure 9: Answers to the question "*How closely do you work with physicians, radiographers and manufacturers in order to optimize radiation protocols?*"

Lastly, soft skills are necessary to our profession (Figure 10). We need to teach and train in medical physics people with different background, we need to convince people to change their habits in order to protect effectively their patient and themselves, we need to prove to the institute management that we provide good service and improve the quality of the institute where we work. As shown from the previous questions, we also need to improve the collaborations with our partners.

Figure 10: Answers to the question "*Do you feel that the medical physicist has to develop skills other than scientific in order to work in radiology and/or nuclear medicine (for example effective communication, dialogue, management, decision making, teaching, etc.)?*"

In conclusion, the survey showed encouraging results about the future of medical physics in radiodiagnostics. MP actually working in the different institutes are highly motivated to work in this field. Most of MP agree that the work in radiodiagnostics should evolve towards radiation management. We need to define our mission and responsibilities as MP in radiology and nuclear medicine in order to develop our profession. This will improve our every-day work in terms of collaboration with other professions and raise our personal satisfaction.

Report from Clinical Education Course

21.01.2016 Bern

Brain tumors and brain metastases

The first continuing education day of 2016 for the candidates to the SGSMP Fachanerkennung took place in the UniS Bern, on January the 21st. The course was put together jointly in collaboration with the SRO. Temperature and pressure outside were -2.2° and 956.5 hPa respectively (k_{TP}=0.979: it's always useful to know it). The main topic was brain tumors and metastases. The entire course (from 9:00 to 12:00) was totally (and well) covered by PD Dr. Markus Gross.

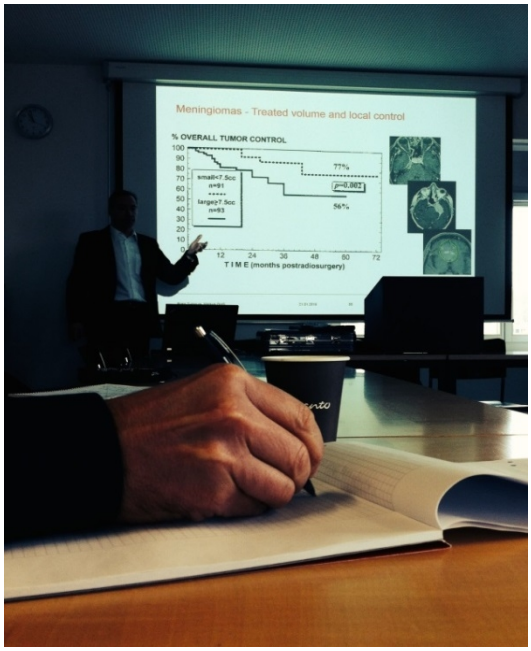
The lecture started with general remarks on the topic: the distinction between benign and malignant brain tumor, WHO classification by histology, risk factors, symptoms and principles of treatment (surgery, radiotherapy, chemotherapy/immune therapy, combined treatment and supportive care). And this was only the warm up!

Since the available time was relatively short, "only" three families of brain tumors were discussed in details: gliomas, meningiomas, brain metastases and finally an overview of the rare brain tumors.

So, let's start!

Glial brain tumors (30-40 % of primary intracranial neoplasm) were introduced and distinguished in low and high grade gliomas: for each group the prescribed dose, the challenges related to treatment planning, the different kind of imaging information (for example for the low-grade gliomas the IMT-SPECT shows the tumor that is hardly detectable in T1w-sequence), tumor recurrence, and several studies regarding the overall survival were discussed. Several questions from the audience led to stimulating and interesting discussions. PD Dr. Markus Gross also recommended some studies from the literature. Always useful as material and hints for a personal follow-up on the topic.

Short coffee break and it's time for meningiomas: second most common primary intracranial neoplasm (account for 20%). They originate in the arachnoidal cells, initially considered benign, but then slowly grow with an approximate growth rate of 1mm/year. Treatment volume shrinkage, local control and toxicity were discussed in details.



Thereafter, PD Dr. Markus Gross taught us how to recognize a benign meningioma from a malignant anaplastic meningioma WHO II and III (really useful hints and tips). Moreover an extremely interesting and exemplar clinical case was presented.

Successively, brain metastases were examined listing the main characteristic: typical shape (spherical), well-demarcated, localized within gray matter or close to the g/w matter junction and necrotic. Prognostic factors were further listed and the different irradiation techniques (WBRT, SRS) compared, also with different fractionation schemes. As a last topic, the rare brain tumors: medulloblastoma, pineoloblastoma and chordoma.

12:02. The course is over. It was a very good review of some already known (and seen) cases and an excellent input for many new ones.

Now it's time to go back... first train, direction PSI.

(P.S. before leaving Bern, temperature was -0.8°, pressure was 957.6 hPa: k_{TP}=0.983…you never know…)

Lorenzo Placidi, PSI

Reports from ICTR-PHE

Report 1:

The 2016 International Conference on Translational Research in Radio-Oncology and Physics for Health (ICTR-PHE) took place between 15th and 19th of February 2016 in Geneva at the Centre International de Conferences Geneve (CICG) and covered a number of different topics ranging from nuclear medicine and radiotherapy to biology and new technologies.

Although being an international conference, Switzerland was well represented by posters and presentations from different centres (CERN, HUG, Inselspital, PSI, CHUV and Kantonsspital Aarau) and different members of the SGSMP.

Some notable highlights of the Conference included discussions on whether to use LQM where doses per fraction are superior to the conventional 2-3 Gy per fraction and the use of a fixed RBE in proton therapy. New trends in theranostics and detector developments were also presented.

There was a lively debate on the use of LQM or a modified version in dose escalation strategies, which was supported by the presentations of Dr. Brenner (Columbia University Medical Center) and Dr. Mansoor (US National Cancer Center) who defended and challenged, respectively, the use of the conventional LQ Model for high doses in fitting cell survival.

Prof. Kevin Price (Queen's University Belfast) also presented his work on the effect of a variable RBE along the SOBP in proton therapy, which contrasted with the presentation from Tony Lomax (PSI) who contended that the addition of a modelled RBE would only introduce uncertainties owing to the limited knowledge in RBE dependencies.

During the Nuclear Medicine sections, Wim Oyen (Institute of Cancer Research & The Royal Marsden Hospital) and Dr. Michael Lassmann (University of Würzburg) demonstrated the importance of molecular imaging and its role in theranostics. Theranostics assesses whether it is possible to develop preventive or therapeutic care specific to a patient's characteristics in relationship to a given drug. Both presenters outlined research on current and prospective molecular therapy isotopes which aims to challenge the existing mindset that molecular therapy should mainly be used for palliative care, rather than a more widespread personalised curative treatment option.

Overall, the conference was a great success and offered a valuable opportunity to debate and discuss a variety of interesting ideas and concepts. The conference blog can be found at the conference website (https://ictr-phe16.web.cern.ch/content/conference-blog), which contains a more in-depth description of some of the presentations given during the Conference.

Thiago Lima, KSA

Report 2:

The International Conference on Translational Research in Radio Oncology (ICTR) joined with the Physics for Health in Europe (PHE) welcomed chemists, physicists, radiobiologists, computer scientists and physicians for the 3rd edition of the ICTR-PHE, which took place at the CICG in Geneva from the 15th of February (2016) until the 19th. The conference was chaired by Dr. Jacques Bernier (Genolier and Geneva) and Mrs. Manjit Dosanjh (CERN). Participants came from all over the world contributing with a total of 102 posters (6 posters were selected as the best and presented orally on Friday afternoon) and 141 abstracts for oral presentations. To further enrich the program, about 50 invited speakers.

Public Seminar in the main auditorium.

The program of this multidisciplinary conference covered a wide range of topics: biology, nuclear medicine, clinical strategies, detectors and imaging, new technologies and radiotherapy (of course parallel sessions were needed). A great mixture: to explore a bit outside the personal field of expertise and to discover the interconnectivity with other fields of research; to exchange views and to create new connections. Indeed this opening of the mind and widening interest on several different topics should be why we physicists have been educated since the first year of university. On top of it: the very fascinating public seminar of Tuesday evening, Sound for Health, given by Domenico Vicinanza. The seminar was about the exploitation of music and sound for scientific investigation, from astronomy to biomedical science.

Finally the extremely refined, sophisticated and tasty Galà Dinner of Wednesday night at the 5-star Hotel Intercontinental, helped to cheer up, collect energy for the incoming days and strengthen the new connections under the positive influence of good wine and special food.

As new entry in the particle therapy field I couldn't help to be mainly questioned by the many talks concerning the open issue of in-vivo range measurements, the different attempts to detect, image and quantify the DNA damage generated by particles as the travel through biological tissue, and the so controversial topic of the constant value for protons RBE. Thomas Bortfeld (MGH, Boston) gave a brief summary of the current methodologies for in-vivo range measurements and presented their new approach with a Compton camera. The unsolved question *constant RBE 1.1 or variable RBE?* was dealt by many speakers both from the clinical and the physical side. Is it safer to use a constant RBE even knowing that we might underestimate the biological effectiveness of our dose distribution? Especially where organs at risk are located. Should we use a variable RBE knowing that the available biological models are full of limitations (i.e. assuming a linear dependence of the RBE with the LET and the dose, using inconsistent data or alfa/beta ratios etc.)? Or as Tony Lomax (sorry for my bias) pointed out, do we actually need to know the exact RBE? Realistically, will we ever be able to know in-vivo RBE given the complexity of its dependencies upon the different radiosensitivity of each organ and of each single patient, the choice of the complication of concern for a particular organ, the interplay between RBE itself and tissue's architecture, and its complex dependence upon the dose and the dose per fraction? Wouldn't it possibly be better to find a relation between tissue complications and physically measurable quantities such as dose or LET?

Very interesting talks took place also during the session dedicated to detectors and imaging: detectors for tracking DNA damage, TOF PET with monolithic scintillators (back to the future?), thermos-acoustic emissions measurements for range verification, fast beam profile monitors for Microbeam RT (Microbeam radiation can be generated using synchrotron radiation), prompt gamma rays detection, and many others. The nuclear medicine session: targeted therapy for kidneys with 161-Tb as a more effective alternative to 177-Lu, due to the Auger e- emission, relationship between DNA damage and electron dose in radionuclide therapy, and again, many many others.

The results of many clinical trials conducted in Germany and in Japan were presented: what are the indications for treating with protons instead of photons? Toxicity observed with particle therapy? Is it

actually worth investing such huge amounts of money in C-12 ion therapy, i.e. is it adding a real significant advantage with respect to proton therapy? An important question, given the increasing number of C-ion facilities in the last few years.

For a more complete overview on the topics and presentations, here's a link to the abstract book:

http://ictr-phe16.web.cern.ch/sites/ictr-phe16.web.cern.ch/files/downloadables/Abstract%20book%20ICTR-PHE-2016-version%20final.pdf

Finally, since the physicist's mind is by education a mind open to all aspects of life, a small note on the conference's venue: the CICG, so close to the Unites Nations palace. A few steps and you can have a guided tour through the rooms were the most important worldwide decisions are taken and discussed; 10 minutes by public transport and you can walk along the lake of Geneva with the incredible view of the Alps and Mont-Blanc; or you can walk through the old, tiny, peculiar streets downtown ending up suddenly in front of the St. Pierre Cathedral; and as a cherry on the cake, only half an hour away from CERN .. we couldn't help but take a visit there as well.

From the left to the right: the lateral entrance of the United Nations Palace, the fountain in the lake of Geneva, a typical corridor for physicists' offices at CERN

A big thanks goes to the organizers and the scientific committee for the organization, the time invested and for giving to the scientific community such an opportunity.

Francesca Belosi (PSI)

CALENDAR 2016

29th April-3rd May, Turin, IT	ESTRO 35 *http://www.estro.org/congresses-meetings/items/estro-35*
29 May-3 June Vienna, AT	ESTRO School: Advanced Brachytherapy Physics *http://www.estro.org/school/*
1-3rd June Nancy, FR	55èmes Journées Scientifiques de la SFPM *http://sfpm-js2016.sciencesconf.org/*
18-22nd July Bamberg, DE	4th International Conference on Image Formation in X-Ray Computed Tomography *http://www.ct-meeting.org/*
31st July-4th Aug Washington, USA	AAPM 58th Annual Meeting *http://www.aapm.org/meetings/default.asp*
25th-27th August Sursee, CH	**SSRMP 50th Annual Meeting and SASRO 20th Annual Meeting Joint Meeting 2016 *www.sasro.ch/2016***
1-4th September Athens, GR	1st European Congress of Medical Physics *https://www.ecmp2016.org/*

And please, if you participate in any conference or meeting, think of writing a few lines or sending a picture for the Bulletin.

THANK YOU!

St. Claraspital

Radiation Oncology at Claraspital

The Claraspital, founded in 1928, is a privately run acute-care hospital in Basel with approximately 1200 employees. Claraspital consists of two centres, the abdominal centre and the tumour centre. It is a reference centre for obesity and is specialized in chest medicine, urology, cardiology and orthopaedics. In addition you will find an IPS and a palliative station at Claraspital.

The radiation oncology department at Claraspital is a relatively new department. It was built on the "green meadow" in 2008. After completion of the Radiation Oncology department the green meadow was replanted, however, a few meters higher than before.

As far as we know our department is the most northern radiation oncology centre in Switzerland. It is located on the right Rhine bank, close to the German border.

Paperless Department:

Right from the start, our goal was to organize the department, so that all patient-related processes would be paperless. Thus, in our department you will not find any hard copies of medical records, prescriptions or treatment plans. All incoming paper documents are scanned and imported into the ARIA ROCIS system (Varian ARIA 13.0). There are only three printers in our department: One printer in located in the secretariat and two printers are available for the physicists. Our philosophy is: The need to walk further will reduce the number of printouts.

Or in other words: Our goal is to have more accelerators than printers.

Technical Equipment:

So far, we have not reached this goal, since we just have two accelerators right now: A Varian Clinac iX and a Varian TrueBeam machine. Both are equipped with a Millennium 120-leaf MLC, gating option and MV-, kV- and optical imaging modalities. Photon energies of 6 and 18 MV are available on both accelerators. Additionally the Truebeam offers the FFF mode (6 and 10 MV) and RapidArc radiotherapy.

In 2015, more than 55% of our patients were treated using IMRT or RapidArc. Our department is a strong believer in the benefits of CBCT for IMRT and RapidArc treatments. For example, daily CBCTs are a must a prostate patient. Up to now, no brachytherapy has been established at Claraspital.

Our Team:

Our team consists of three medical physicists (SGSMP-certified), three radiation oncologists, seven RTTs and five secretaries (not all are full-time employed). Altogether we have 230% of 3 full-time physicists (however we have a 50-hours working week), so that is why our philosophy is that every physicist can do everything, but at the same time has topics where he/she is specialized in. At Claraspital there is also a nuclear medicine, a radiology department and an administrative section for radiation protection, which are taken care of by our physicists according to the radioprotection ordinance Article 74.

Projects and Activities:

Currently, we are preparing for the ISO-certification of our department. Furthermore our radiation oncology department will take part in the certification of the abdominal and pancreatic centres at Claraspital.

As a further project in 2016 the evaluation of the VARIAN Smart Segmentation tool is planned.

Since we are very interested in inter-departmental collaborations – let us know, if you are interested….

The reception area of the Radiation Oncology Department

The Physics team: Maria Dolores Herraiz Lablanca, Anja-Carina Schulte and Karl-Heinz Grosser

WELCOME !

Paolo Colleoni

Since February 2016 I have been working at the Medical Physics Service of Ente Ospedaliero Cantonale in Bellinzona where our team is involved in radiotherapy, medical imaging, nuclear medicine and radiation protection. I graduated in Nuclear Physics at Università degli Studi di Milano where I also attended Medical Physics Specialization. I worked as a Medical Physicist at Ospedale Papa Giovanni XXIII in Bergamo (Italy) where I was involved in the setup of a new hospital opened in 2013. My major work interests include radiotherapy, nuclear medicine and radiation protection. Throughout my working activity I have always given great importance to training and continuous professional development regarding new technologies and clinical research. I would welcome the opportunity to use the knowledge and experience I have gained during my previous working activities to contribute to our multidisciplinary environment.

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Diego Gaudino

I graduated in Physics at the Università degli Studi di Roma “La Sapienza” after a 12-month internship at the Cellular membrane laboratory in the same university focusing my research in study of cationic liposome-polyelectrolyte complexes and liposomes-prostasomes complexes. In 2004 I worked as a consultant at ENEA (National Agency for Energy and Environment) for dosimetric calibration of solid state detectors with a low energy beta source and on making a remote control system using Labview programming language. During period 2004-2005 I worked as a consultant at the University Campus Biomedico di Roma on linac commissioning and quality assurance, treatment planning and research activity. In 2007 I graduated in Medical Physics at the Università Cattolica del Sacro Cuore di Roma. From 2007 to 2016 I worked at University Campus Biomedico di Roma as a medical physicist. I joined the Medical Physics Service of EOC in February 2016 and I am very grateful to be part of this excellent team.

Thanks and best regards,

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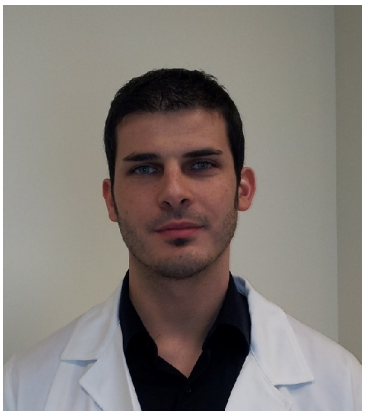
Denis Panizza



I graduated in Physics at the Università degli Studi di Pavia after a 12-month internship at the European Institute of Oncology in Milan focusing my research in proton magnetic resonance spectroscopy. In 2011, I joined the Medical Physics Unit of the Maugeri Foundation in Pavia for my specialization training. I mostly worked on quality assurance and patient radioprotection aspects in the radiology department and on advanced techniques in magnetic resonance imaging. Afterward I had the opportunity to move to the National Centre of Oncological Hadrontherapy in Pavia and I stayed there for almost 3 years, working on commissioning and quality assurance of synchrotron-based proton and carbon ion beam lines, treatment planning, and optimization of protocols and procedures.

I joined the Medical Physics Service of EOC in November 2015. I am truly grateful to be part of this excellent team because I am growing both at a personal and professional level.

Thanks and best regards,

Denis Panizza
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denis.panizza@eoc.ch

Francesco Pupillo

Starting from 2011, the drafting of my Master's degree thesis at the University of Genoa, together with my four-year specialization training at the San Martino - National Institute for Cancer Research University Hospital in Genoa have allowed me to acquire knowledge and to gain a wide experience mainly in the radiotherapy planning and dosimetry field. Here I had the opportunity to work with advanced radiotherapy techniques, ranging from helical tomotherapy to intra-operative radiotherapy as well as brachytherapy, dealing even with paediatric radiotherapy and also elaborating a dosimetric comparison of helical tomotherapy and proton therapy plans for selected paediatric brain tumours. I achieved in 2015 the specialization in Medical Physics at the University of Genoa.

Afterwards I had the occasion to move in Switzerland and join the Medical Physics Unit of Ente Ospedaliero Cantonale in Ticino. The opportunity to work here represents a professional chance that will allow me to definitely deepen my knowledge in all the medical physics aspects and undertake a stimulating career.

IMPRESSUM

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CALL FOR AUTHORS

Also, you are invited to participate in the construction of our bulletins. Of desirability are all contributions that could be of interest to members of our society, such as

- ✓ Reports of conferences, working group meetings, seminars, etc.
- ✓ Reports on the work of various committees and commissions
- ✓ Succinct results of surveys, comparative measurements etc.
- ✓ Short portraits of individual institutions (E.g. apparatus equipment, priorities of work, etc.)
- ✓ Reports on national and international recommendations
- ✓ Short Press Releases
- ✓ Photos
- ✓ Cartoons & caricatures
- ✓ Announcement of publications (E.g. books, magazines)
- ✓ Announcement of all kinds of events (E.g. conferences, seminars, etc.)
- ✓ Short articles worth reading from newspapers or magazines (if possible in the original)
- ✓ Member updates (E.g. appointments, change of jobs, etc.)

The easiest way to send your document is as a MS Word document via email to one of the editor addresses above.

Deadline for submissions to Bulletin No. 86 (02/2016) : 07.2016

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