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

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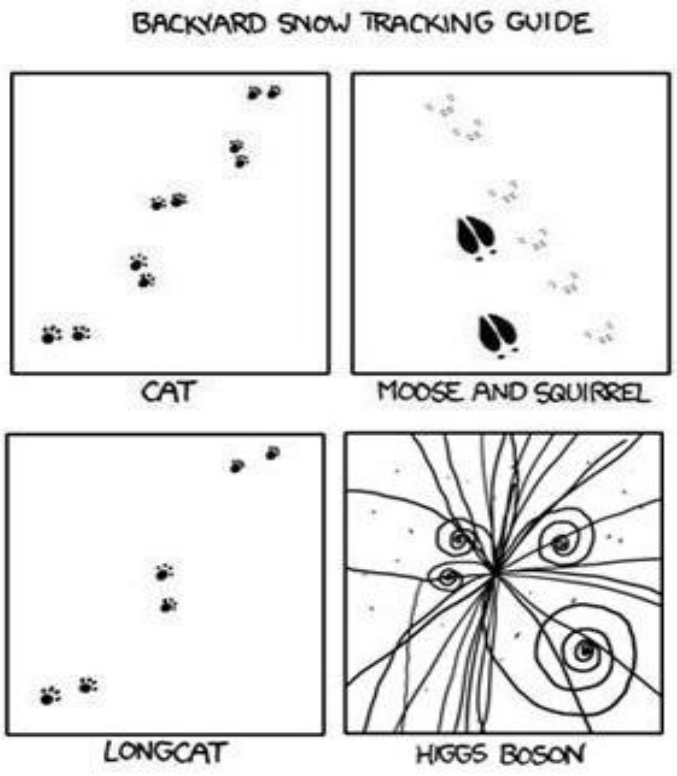

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BULLETIN 73

(February 2011)

Cover image: From "Backyard snow tracking guide"
by Randall Munroe at www.xkcd.com

Editorial

Dear colleagues,

Happy New Year 2011! Already the year is going quickly, with this first Bulletin for 2011 at the end of February instead of at the end of January as planned. The delay means that there is fresh news from the SGSMP board meeting that was held at the start of this month, and from other recent meetings, in these pages.

We've had feedback that there's too much English in the Bulletin. Contributions in English, French, German and Italian are all welcome. You can help redress the balance by sending us your contributions in your favourite language!

Are you curious about what's going on in different medical physics groups around Switzerland? To satisfy these wonderings, there will be a new "Center Spotlight" page starting in the next Bulletin. The objective is to introduce a physics group or centre in each Bulletin in order to learn a bit more about where they are working and what they're doing.

The next Bulletin will come out at the end of June.

Enjoy your Bulletin and we look forward to getting your suggestions.

Sunny greetings from,

Regina Müller and Shelley Bulling

President's letter

Dear colleagues,

Our annual meeting took place in Wabern on the 11th and 12th of November 2010. There's a report about the scientific content of the meeting in this Bulletin and I would like to thank the organizers – particularly Damian Twerenbold, president of the organizing committee and Léon André, president of the scientific committee – for a great SSRMP meeting. We were able to listen to high level presentations in a very friendly environment! Thanks also to the sponsors for their financial support, which, as usual, was essential for the organization of the congress.

As you know, the current hot topic in the professional and political domain is the implementation of article 74, concerning the role of medical physicists in radiology and nuclear medicine. The round table set up by BAG and composed of representatives of the different stakeholders in these fields, has met twice so far. There is general consensus for defining the duties of medical physicists in radiology and nuclear medicine, but the question of responsibility is still an issue. I'm confident that our representatives will defend our profession as the need arises and that the round table can reach a consensus about this aspect too. According to the different deadlines set by BAG, a final draft of a common recommendation for the implementation of article 74 should be available for discussion at the next AMP meeting which will be held on the 2nd of May. Do not miss the chance to express your views on this important topic! Attend the AMP meeting!

Another interesting subject of discussion is proton therapy in Switzerland. As you probably know, the canton health directors' conference (GDK) has the duty of deciding on the direction of "Spitzenmedizin" in Switzerland. In the field of proton therapy, the GDK has decided to keep the status quo until 2013. This means that PSI remains the only proton therapy center in Switzerland, and radiotherapy centers have been asked to support PSI in its task. To promote collaboration between PSI and other centres, two new working groups have been set up. The good news is that SSRMP is officially represented in these two groups, with two physicist representatives taking part in the discussions. This is certainly an important step forward in the recognition of our competence in the field of radiation therapy.

Among the recent decisions taken by the SSRMP board, the new board of the Varian prize has been elected. It is composed of P. Manser, president, M. Ozsahin, M. Pruschy, H.W. Roser and P.-A. Tercier. The rules of the Varian prize can be found in this Bulletin and the deadline for applications is 31st of March 2011.

The board has also responded to the METAS consultation concerning the "Zukunft der Strahlenmetrologie in der Schweiz". The main concern of SSRMP is that METAS has not presented a clear strategy for the future. We expressed our concern about this in two letters sent to METAS last year. Thus, our input to the METAS consultation is a follow-up to these two letters.

2011 will be a good year for continuing education, with a special event planned for later in the year . Starting on the 29th of March, the first part of the continuing education "Wie verbessere ich meine Präsentationstechnik" will take place in Zürich (see the advertisement in this Bulletin). I strongly encourage our young colleagues to take part in this interesting course. Secondly, our annual meeting will be a joint meeting in Vienna with DGMP and ÖGMP. The "dreiländertagung will take place from the 28th of September to the 1st of October. The deadline for abstracts is the 15th of May (http://www.medphyswien2011.org/).

SSRMP will offer a support of Frs 400.- to any member under 35 years of age and who will present a poster or a talk as first author. Lastly, there will be a special continuing education event on the 18th of November in Neuchâtel. I cannot say more right now, except the fact that it will be connected with the general assembly. Stay tuned and save the date!

Our society is involved in many topics in the field of science, education and politics. Behind "our society" are hidden dynamic colleagues who make things go forward. I would like to thank all of them for working continuously to advance the interests of SSRMP. This is important for the future of our profession and the role we want to play in radiology, nuclear medicine and radiotherapy.

I look forward to seeing you in Bern on the 2nd of May for the AMP meeting and in the meantime, enjoy your Bulletin!

Meilleures salutations de Lausanne,

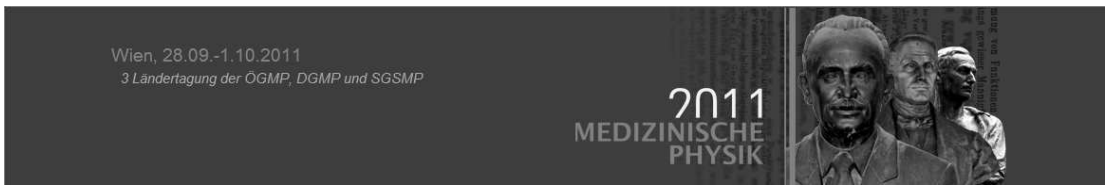
Raphaël Moeckli

Special travel grants for the 2011 three-countries meeting in Vienna

SGSMP members under the age of 35 and who will present a poster or a talk as first author at the three-countries meeting in Vienna will receive a travel grant of CHF 400.-

Applicants should contact directly SGSMP's treasurer

www.medphyswien2011.org



Professional affairs committee news

Due to the reaction of our medical colleagues from radiology and nuclear medicine, BAG proposed to build a parity working group. The aim of the working group is to publish a document on requirements for medical physicists in nuclear medicine and radiology till the beginning of April in order to apply Article 74. This working group met already 2 times and had some fruitful and open discussions. Francis Verdun and Frédéric Corminboeuf are the SSRPM's representatives.

Presently we proposed a catalogue of duties, a medical physicist should be responsible for, with appropriate distinctions between different types of practices.

One question remains open: what will be the medical physicist responsible for? The working group has also to answer this question because a task without responsibility will not ameliorate the practices.

In any case, during the next AMP meeting you will have the opportunity to discuss the draft of the report.

Another open project of the professional affairs committee is to start a new salary survey. The aim is to have a web-based questionnaire. We hope with the new survey to have more answers and also to facilitate the publication of the results.

We have not forget the survey on the position of medical physics in Switzerland but due to the work on the new structure of our society, all board members were very busy and it was not possible to continue the analysis but we have started to analyse the results. We hope you will soon hear something.

Frédéric Corminboeuf

SSRMP Continuous Education 2011

Wie verbessere ich meine Präsentationstechnik? - ein Kurs für Medizinphysikerinnen und Medizinphysiker

Sorry, the course will only be given in German. Depending on its success, there might be a successor course in French and/or …? Nevertheless, everybody is warmly welcome to participate.
Wie der Titel der Veranstaltung schon sagt, soll in diesem zweiteilig durchgeführten Kurs versucht werden, uns Medizinphysikerinnen und Medizinphysikern bei der Präsentationstechnik ein wenig auf die Sprünge zu helfen.

Der gesamte Kurs steht unter der Leitung von Frau Eva Buff Keller. Frau Dr. phil. nat. Eva Buff Keller ist Hochschuldidaktikerin und diplomierte Supervisorin und ist entsprechend in den Bereichen Bildungsberatung, Schulung und Supervision tätig.

Erster Teil des Kurses – "das Aufwärmen"

Dienstag, 29. März 2011, 9.00 Uhr – 12.00 Uhr

Frau Eva Buff Keller und Herr Dr. med. Jörg Bohlender (Leiter der Abteilung Phoniatrie-Logopädie am USZ) und seine Mitarbeiterin Frau Britta Balandat (Logopädin und Sängerin) werden an diesem Morgen eine umfassende Einführung in die Thematik geben. Dabei kommen Themen wie medizinische Grundlagen der Stimme, praktische Übungen zum Stimmgebrauch und allgemeine Grundlagen zum Vortragen und Präsentieren zur "Sprache". Der erste Kursteil ist für bis zu ca. 30 Teilnehmende offen.

Zweiter Teil des Kurses – "das Training"

Montag, 4. April 2011, 13.00 Uhr – 17.00 Uhr
oder
Donnerstag, 14. April 2011, 13.00 Uhr – 17.00 Uhr

Der zweite Teil des Kurses wird auch von Frau Eva Buff Keller geleitet und wird doppelt geführt. Wir können pro Veranstaltung nur 10 Teilnehmende akzeptieren, da nur in einer kleinen Gruppe von Leuten die nötige und zum Teil individuelle Betreuung möglich bleibt. Deshalb haben leider nur 20 Personen die Möglichkeit den gesamten Kurs zu besuchen.

An diesem Nachmittag steht das Vortragstraining im Vordergrund. Die Teilnehmenden werden nach einer kurzen Einführung einen 5-minütigen Fachvortrag halten – verbunden mit Videoaufnahmen und einem Feedback durch die Referentin und unsere Kolleginnen und Kollegen. Praktische Übungen ergänzen und festigen das Gelernte.

Die Kurse werden in Zürich stattfinden und ich werde die entsprechenden Detailinformationen zu gegebener Zeit kommunizieren. Für Mitglieder der SGSMP ist der Kurs kostenlos, die Kosten werden von der Gesellschaft übernommen. Anmeldungen können formlos direkt an mich gesandt werden; dabei gilt leider: "first come, first served". Ich freue mich auf die Veranstaltung, gleichzeitig wird mir aber ein wenig bange, wenn ich an die Video-Feedback-Angelegenheit denke.

Bis bald, auch im Namen der Kursleitung

Hans W. Roser, Basel, hroser@uhbs.ch

AMP Meeting Announcement

It is my pleasure to announce the next AMP meeting. In this meeting, we want to focus mainly on the changes of Art. 74. Key persons of the corresponding working group will report about the results of the currently ongoing discussions. Thus, please, mark your calendar for the next AMP meeting:

May 2nd 2011
13.15-17.15h
University of Bern

Peter Manser, Chair of SSRMP Science Committee and Chair of AMP

SGSMP Research Grant 2011

In order to support and promote the scientific activities of our members in Switzerland active in the all fields of Medical Physics, a research grant is provided by SGSMP. As in 2008 and 2009, 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.

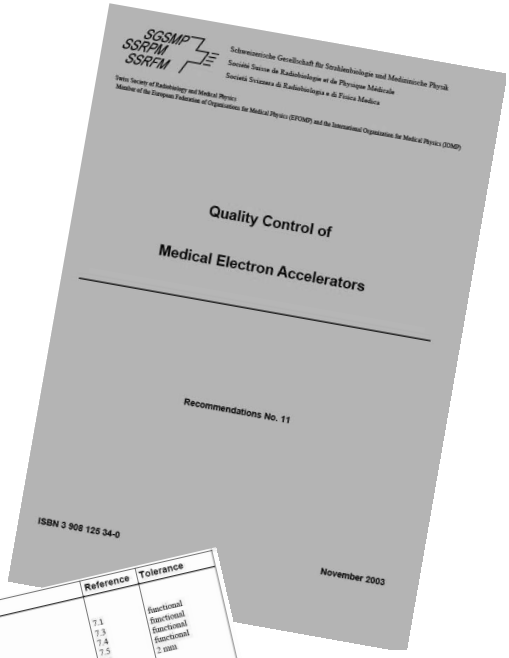
Deadline for submission of proposals is March 31st 2011.

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 to the chair of the SGSMP Science Committee:
Peter Manser, Div. of Medical Radiation Physics, Inselspital, 3010 Bern.

Reactivation of the Working Group of Linac QA (Rec. No. 11)



As discussed at the last AMP meeting in December 2010, it is of general interest that the Recommendation No. 11 on Linac QA is worth being re-evaluated and potentially updated or revised. For this purpose, the Working Group of Linac QA should be reactivated. In a first step, it has to be clarified which QA issues should be revised and which issues are currently not covered but should actually be performed on regular basis.

Of course, the quality of the reactivated working group depends on the quality and quantitiy of the participants. It is of great importance that you are contributing to this working group and give new inputs.

It is my pleasure to announce that Daniel Frauchiger (Inselspital Bern) is willing to set up a first meeting in order to launch this project. The first meeting is planned to take place in March/April 2011 in Bern. If you are interested in participating in this working group, you are welcome to contact

Daniel Frauchiger
Abteilung für Med. Strahlenphysik
Inselspital
3010 Bern
daniel.frauchiger@insel.ch

I would like to thank all participants in advance for their inputs and their work. I am sure that the topic is interesting enough to attract senior, well-experienced medical physicists as well as young people and that the discussions will help the entire community to perform not only high-level QA in 2011 but also in future.

Peter Manser, Inselspital – University of Bern
Chair of SSRMP Science Committee and Chair of AMP

Results of the Certification Exams in Medical Physics (SSRMP)

In the exams for the certification in medical physics SSRMP 2010 (29.10. - 04.11.2010) the following candidates were successful:

Grégory Bolard, Genolier

Lukas Hirschi, KS Winterthur

Andreas Joosten, CHUV Lausanne

Vera Magaddino, CHUV Lausanne

Samuel Peters, KS St. Gallen

Manfred Sassowski, Inselspital Bern

On behalf of the examination committee and the SSRMP board I want to congratulate the candidates for their certification and the new position in the community connected to that.

Stephan Klöck, 04.11.2010, Zürich

Summary of ICRU report 83

The new ICRU report 83 has been published in 2010. It is entitled "Prescribing, Recording, and Reporting Photon-Beam Intensity-Modulated Radiation Therapy (IMRT)". Its aim is to provide the information necessary to standardize techniques and procedures of IMRT, and to harmonize the prescribing, recording and reporting of IMRT. The applicable concepts and recommendations of other ICRU reports concerning radiation therapy (in particular reports 50 and 62) are aimed to be adopted, and extended where required. All aspects of IMRT (physical, technical, treatment planning, clinical) are described "in some detail". Finally clinical examples are given in the appendices.

In this report, the following delivery methods are explicitly mentioned and considered as IMRT:

- Compensators
- Segmental MLC ("step and shoot")
- Dynamic MLC ("sliding window")
- Intensity-modulated arc therapy (IMAT)
- Serial tomotherapy
- Helical tomotherapy
- Robotic radiotherapy

The chapters of the report are:

1.) Introduction
2.) Optimized Treatment planning for IMRT
3.) Special Considerations Regarding Absorbed-Dose and Dose-Volume Prescribing and Reporting in IMRT
4.) Definition of Volumes
5.) Planning Aims, Prescription and Technical Data
Appendix A: Physical Aspects of IMRT
Appendix B: Clinical Examples

Chapter 2 reminds the reader of the main difference between the treatment planning process for three- dimensional conformal radiation therapy (3D CRT) and IMRT. While for 3D CRT the planning process consists in manually changing beam modifiers, and the "optimization" relies mainly on the clinical judgment and experience of the planner, IMRT uses mathematical objective functions and incorporates user-defined dose-volume constraints. An iterative optimization algorithm modifies the beamlet shapes and weights in order to minimize the objective function, and thereby seek an optimal solution. It is however, admitted, that the IMRT optimization process is still reliant on the experience of the planner: it needs insight how a change of constraints affects the dose distribution. Due to the high number of degrees of freedom, the parameter space of solutions is large. A global minimum of the objective function may not necessarily be reachable in due time, and local minima may be accepted. Due to the complexity of the objective function, numerical methods are indispensable. The reader is reminded that there are two main categories of minimization algorithms: deterministic and statistical. The deterministic methods (e.g. least squares or gradient descent methods) are in general faster, but find a local minimum depending on the starting point in the parameter space. Statistical methods (e.g. simulated annealing) need more computing time, but have the potential to escape local minima during the optimization process. The authors furthermore distinguish between beamlet optimization and aperture based optimization. The former discretizes the fields into a grid of equally sized beamlets, and modifies the intensities of the individual

beamlets. This approach is considered suitable for serial tomotherapy, robotic beam delivery, compensators and dynamic MLC deliver. The latter uses a set of more complex aperture shapes, which are created and modified during the optimization process. This is considered a suitable approach for segmental MLC delivery and IMAT. The use of biological optimization is considered to be investigational, as further validation of radiobiological models is needed, and should be restricted to well-defined clinical studies investigating their potential.

Concerning reporting, the report distinguishes three levels, which are explained in the introduction to chapter 3. The minimum standard should be the absorbed doses on the central beam axes. The next level contains what is considered to be state of the art nowadays: 3D imaging, calculation of the 3D dose distribution including inhomogeneity correction and calculation of DVHs. A complete QA program is assumed to be in place. The third optional reporting level applies to research and development activities, and includes e.g. TCP, NTCP, EUD. Obviously, there are no standard reporting techniques yet for this level.

In reports 50 and 62 the ICRU reference point played a central role in prescribing and reporting. The reader is reminded of the main requirements to be fulfilled by the ICRU reference point. Already at the time of writing of those reports, it was perceived that level 1 / "dose-at-a-point" reporting might not always be sufficient for complex 3D CRT. The new report 83 now recommends dose volume based prescription and reporting for IMRT, i.e. stating D_V (absorbed dose that covers a fractional volume V) or V_D (fractional volume that receives at least an absorbed dose D). For the PTV it is recommended to report the median dose $D_{50\%}$ which is considered to correspond best with the previous definition using the ICRU reference point, and which is close to the mean dose D_{mean} if the PTV coverage is fairly homogeneous. However, for the prescription the report does not recommend any particular value of V in D_V. If $V \neq 50\%$ in D_V, then V shall be specified, and $D_{50\%}$ be reported. Furthermore the report recommends reporting a "near minimum dose" $D_{98\%}$ instead of the minimum dose $D_{min} = D_{100\%}$, because it does not rely on a single voxel and is less prone to uncertainties caused by the dose gradient at the edge of the PTV. Similarly, the "near maximum dose" $D_{2\%}$ instead of the maximum dose $D_{max} = D_{0\%}$ should be used, as it reports the maximum dose to a "significant" volume.

For organs at risk (OAR), the dose distribution generally is inhomogeneous, so that $D_{mean} \neq D_{50\%}$. For parallel-like organs, the entire organ is to be delineated. The report encourages reporting more than one dose-volume-specification, and recommends D_{mean} and V_D, where the value of D in V_D depends on the organ in question. For serial-like organs, at least those parts that could receive a high dose should be delineated. Organ-specific guidelines for the delineation should be followed. Like for the PTV, $D_{2\%}$ instead of the maximum dose $D_{0\%}$ should be used. However, great care must be taken when transforming dose constraints from maximum dose to near-maximum dose. For tubular organs, the delineation of the wall is preferred. Most organs are not clearly serial-like or parallel-like, and three dose volume specifications should be reported. The report recommends D_{mean}, $D_{2\%}$ and V_D, where the value of D in V_D again depends on the organ in question.

Concerning the definition of the radio-oncological volumes, which is detailed in chapter 4, the concept using GTV, CTV, PTV (and eventually ITV) is maintained. The reader is reminded that only oncological considerations should be used when defining GTV and CTV, and that those volumes should be independent of the irradiation technique to be applied. The PTV, on the other hand, is a purely geometrical concept, taking into account internal variations and setup uncertainties.

The report recommends clear annotations to further specify volumes, e.g.:

GTV-T	= Primary tumor GTV
GTV-N	= Regional node GTV

GTV-M = Distant metastatic GTV
GTV-T(clin,0Gy) = Tumor GTV evaluated clinically before the start of therapy
CTV-T+N(MRI-T2,30Gy) = CTV (tumor plus regional lymph nodes) evaluated using T2-weighted MRI after treatment with an absorbed dose up to 30 Gy

The aim is to avoid terminology that the authors consider to be "potentially confusing", like "biological target volume", "proliferative target volume", "hypoxic target volume".

In case of proximity or overlap of the PTV with an OAR, it is no longer recommended to compromise the margins for expanding the CTV to the PTV. Instead, either a prioritization in the optimizer should be done, or the PTV should be divided into two sub-volumes containing the non-overlapping and the overlapping part of the PTV, and separate planning aims for each sub-volume should be used. The reporting should however be done for the whole PTV.

Like for the target volumes, it is recommended to add a margin around OAR, leading to a PRV (= planning organ at risk volume). This concept had already been introduced in ICRU report 62. In report 83 it is admitted that the PRV concept is "more clinically relevant" for OAR with serial-like structure.

Finally it is recommended to define a remaining volume at risk (RVR). This is defined as external contour, detracted by the CTV and all explicitly contoured OAR. Monitoring the dose in the RVR helps to avoid unsuspected hot spots outside delineated structures. RVR might also be used for the estimation of risks for late effects.

In chapter 5 the term "planning aims" is introduced, which are the dosimetric goals used to develop the treatment plan. The meaning of the term "treatment prescription" is looked at, given the more complex planning process, and given the fact that the acceptance of a treatment plan "is often based on trade-offs among conflicting aims". The absorbed dose distribution of the treatment plan accepted by the responsible physician is considered to be part of the prescription.

Appendix A gives a short review of dose computation methods, and of commissioning and QA procedures. Virtually on the last pages of Appendix A, another important paradigm change is recommended, namely concerning the accuracy of dose delivery. While report ICRU 50 recommends a 5% accuracy for dose delivery at a reference point, this new report distinguishes between low gradient regions and high gradient regions, the limit being at a relative dose variation of 20%/cm. For low gradient regions, 85% of the target volume should be within 5% of the prescribed dose; for high gradient regions, 85% of the absorbed dose samples should be within 5 mm of the intended position. It is admitted that "in the future, the recommended accuracy criteria might be made more stringent".

Appendix B finally illustrates the concepts of the recommendation with the help three clinical examples (head & neck, lung, prostate).

To conclude, the ICRU report 83 is a useful summary of all aspects of IMRT, including an extensive list of references to original articles. The recommendations for the definition of volumes are mainly unchanged. The main paradigm change concerns the transition from point based to dose volume based prescription, reporting and accuracy definition. PTV reporting should be based on the median dose $D_{50\%}$, the near-minimum dose $D_{98\%}$ and the near-maximum dose $D_{2\%}$. The importance of QA procedures is stressed.

M. Sassowsky, AMS, Inselspital Bern

Draft Physics Tasks for Article 74

In diagnostic radiology, as well as in nuclear medicine, there is a gradation in the use of the units regarding the radiological risk. To simplify the modality of application of Article 74 it is proposed to distinguish two separate categories of radiological practices:

Practices of category A are the ones where physicians use the units in a standard way without modifying the acquisition protocols that have been previously optimized, and having no risk to induce deterministic effect when working in their practices. More precisely for CT: use of standard protocols with a known procedure to vary the acquisition parameters to take into account the weight and the age of the patients; for radioscopy: use of mobile systems with an average fluoroscopy time within 2 to 5 minutes, never exceeding 20 minutes and never recording high quality images (such as cine or DSA). In nuclear medicine, this category could include all practices where no quantitative measurement is performed.

Practices of category B include all others practices where users regularly modify their CT protocols, perform complex procedure under radioscopy (average fluoroscopy time over 5 minutes) or are involved in clinical research activities. In nuclear medicine, this category could include all practices where quantitative measurements are performed to decide the follow-up of a patient.

The level of training and competences required for medical physicists to provide adequate answers to these two types of practices is obviously different. For category A, a certified medical physicist with a regularly updated training is able to give reliable advice aiming the optimization of radiation protection. For category B, the certified medical physicists should not only be adequately trained but he/she should also be involved in the research field of the medical physics of diagnostic radiology and/or nuclear medicine. Proposed duties and frequencies for medical physicist involved in categories A and B centres are summarized in the following table.

Duties for category A practices	Duties for category B practices
General • Adequacy between protocols and DRLs	General • Establishment of the local DRL's and comparison with the national ones • Part of the team that selects the unit to ensure that all aspects will have been considered (especially concerning patient exposure non standard applications). •
CT units • Commissioning of the unit o $CTDI_{vol}$ validation o X-ray beam collimations check o Image quality versus dose analysis o Behaviour of X-ray tube modulation	CT units In addition to the requirements for category A practices: • Take responsibility for acceptance testing with regard on the clinical research protocols that might be implemented; • Establishment of routine quality control that technologist might perform;

○ Protocols adaptation as a function of weight and age of the patient This could be done after the acceptance test of the unit with or without the manufacturer The technologist should be present during the measurements, the radiologist should spend at least one hour to get the summary of the measurements • Training of the technologists ○ Ability to use the unit according to manufacturer's recommendation ○ Ability to verify if adapted protocols remains within the state of the practice (technical parameters) ○ Understand the risk of changing parameters on image quality (maximum mAs setting, pitch, kV ...) ○ How to scan safely pregnant women, and young patients 1.5 day at the installation of a new unit 0.5 day each year	• Work closely with the medical staff to provide technical advices relevant to the execution of the studies; • Work closely with the medical staff to study the advantages and limitations of new image reconstruction strategy (critical regard on what manufacturers claim) • Ensure the right balance between dose and image quality when using protocols that are developed for particular research ; • Perform dose assessment for FOPH or Ethical Committees The involvement of medical physicist here is hard to estimate since one has to take into account the work load. In large centres or university hospital where several CT are used one could propose at least one day per month.
Fluoroscopy units • Commissioning of the unit ○ Skin absorbed dose rates and scatter equivalent doses rate vs modes, thickness of absorber, magnification, frame rate ○ Evaluation of how the staff is protected/monitored 2 hours per unit at the installation of the unit 1 hour per unit each year • Training the user ○ Assessment of dose rates around the unit during representative local procedures et verification if patient and staff dose could be reduced ½ hour per type of at the installation of the unit	Fluoroscopy units In addition to the requirements for category A practices: • Commissioning of the unit ○ Skin absorbed dose rates and scatter equivalent doses rate vs scopy and imaging modes, thickness of absorber, magnification, frame rate ○ Evaluation of how the staff is protected/monitored • Take responsibility for acceptance testing with regard on the research protocols that might be implemented; • Establishment of routine quality control that technologist might perform; • Work closely with the medical staff to provide technical advices relevant to the radiation protection of the patient and the staff; • Monitor the cumulative dose and DAP as a function of the type of examination and complexity. Discuss

	the critical case and implement strategies proposed by ICRP • Characterize dose and image quality in tomographic acquisition modes • Estimate and discuss the dose received by the staff and the patient with the operator • Compare the situation with what is published in the technical literature • Propose strategies to reduce patient and staff dose • Estimate patient dose when dealing with pregnant women, and young patients The involvement of medical physicist here is, as for CT, hard to estimate since one has to take into account the work load. In large centres or university hospital where several unit are used one could propose at least one day per month for unit where interventional procedures are performed. For simpler application 1 day per year might be sufficient.
Gamma camera system General • Adequacy between protocols and DRLs • Commissioning of the unit o Multiple window spatial registration o Intrinsic count rate performance in air o Intrinsic uniformity and spatial resolution at 75k counts per sec. o Collimator hole alignement o For SPECT ▪ Spatial resolution in air + with scatter ▪ Detector to Detector sensitivity This could be done after the acceptance test of the unit with or without the manufacturer The technologist should be present during the measurements, the nuclear medicine physician should spend at least one hour to get the summary of the measurements	Gamma camera system General • Establishment of the local DRL's and comparison with the national ones • Part of the team that selects the unit to ensure that all aspects will have been considered (radioprotection).

PET system General • Adequacy between protocols and DRLs • Commissioning of the unit o Count rate performance o Spatial resolution o Image quality, accuracy of attenuation and scatter corrections o Recovery factors o Scatter fraction, count losses and randoms measurement o Sensitivity o Accuracy: corrections for count losses and randoms (the CT associated with a PET of SPECT should be treated as a normal CT unit) This could be done after the acceptance test of the unit with or without the manufacturer The technologist should be present during the measurements, the nuclear medicine physician should spend at least one hour to get the summary of the measurements • Training of the technologists o Ability to use the unit according to manufacturer's recommendation o Ability to verify if adapted protocols remains within the state of the practice (technical parameters) o How to scan safely pregnant women, and young patients o Radioprotection news 3 day at the installation of a new unit 0.5 day each year	In addition to the requirements for category A practices: • Take responsibility for acceptance testing with regard on the clinical research protocols that might be implemented; • Establishment of routine quality control that technologist might perform for SPECT and PET; • Work closely with the medical staff to provide technical advices relevant to the execution of the studies; • Work closely with the medical staff to study the advantages and limitations of new image reconstruction strategy (critical regard on what manufacturers claim, optimisation of the reconstruction's parameters) • Ensure the right balance between applied activity, time, number of angle for SPECT in regards of the new reconstruction techniques and image quality when using protocols that are developed for particular research or in routine; • Good practices of radioprotection for medical staff and patient (optimisation, dose's reduction …) • Perform dose assessment for FOPH or Ethical Committees The involvement of medical physicist here is hard to estimate since one has to take into account the work load. In large centres or university hospital where several SPECT/PET cameras are used one could propose at least one day per month.

Francis Verdun, Lausanne

The Year of Radiotherapy Awareness – 2011

The year 2011 has been designated in the UK as the Year of Radiotherapy Awareness. This is an initiative of Cancer Research UK (CRUK) and the National Radiotherapy Implementation Group (NRIG). It forms part of the National Radiotherapy Awareness Initiative collaboration between the Department of Health and expert and professional groups across the UK aiming to raise public awareness of radiotherapy. Our UK colleagues in the Institute of Physics and Engineering in Medicine (IPEM), who are partners in the Awareness Initiative, have welcomed the launch and issued a press release that is available on their website [1].

The EFOMP would like to encourage its other Members to promote 2011 as the Year of Radiotherapy Awareness in their own countries. As the IPEM has stated, "Radiotherapy is a good example of the beneficial and often unpredictable spin-offs of fundamental physics research and the investment that underpins it. Without investment in nuclear and particle physics in the twentieth century, we would not have radiotherapy treatments today."

Medical Physicists in Europe are highly qualified for their vital roles in the radiotherapy workforce. They plan radiotherapy treatments for individual patients, ensuring that cancerous tumours receive the prescribed amount of radiation, and that the risk of harm to other organs is minimised. Treatment planning and verification of the complex treatment machine set-ups required for modern radiotherapy are matched to each patient prescription. Medical Physicists ensure that multimillion-euro items of radiotherapy equipment are selected, commissioned, maintained and, that they deliver the correct amount of radiation for each patient treatment, traceable to national standards. Medical physicists also advise on the use of images from different imaging techniques (e.g. nuclear medicine, CT scans and magnetic resonance imaging (MRI)) for accurate, individual treatment planning; and they provide advice and guidance to all hospital staff on the safe use of radiation.

Although it is 100 years since ionizing radiation was first used to treat patients, radiotherapy has developed continuously throughout these years admittedly with the most rapid technological developments in the last 20 or so years with new techniques being introduced on a regular basis. Consequently, there is a continuing need to optimise treatment and so improve outcomes for the 3.2 million new cancer patients diagnosed each year in Europe [2]. For half of these patients radiotherapy is the best cancer treatment. Radiotherapy is more targeted than chemotherapy, less invasive than surgery, and is the most cost-effective method of treating cancer.

In the UK at least, it appears from a survey [3] that the general public has a false perception of radiotherapy as being old-fashioned and dangerous. We need you to explain to the wider public in Europe that modern radiotherapy is much more precise, has fewer side effects and so is even safer than 20 years ago and that cure rates are better than for other forms of treatment [3]. Professor Tim Maughan, a Cancer Research UK funded researcher and consultant clinical oncologist based at the Velindre Hospital in Cardiff, has said: "We hear a lot about chemotherapy and less about radiotherapy which actually has a better cure rate. But most people don't realize that.

"A century after Marie Curie won the Nobel Prize for her work on radium we've seen radiotherapy develop into an incredible tool in treating cancer. It is more precise than ever and contributes to almost half of all cancer cures. Research in the UK has been instrumental in improving the treatment and it's vital that progress is delivered to all patients.

"We must ensure that radiotherapy is properly funded to train more staff and to provide more equipment. If the public understands the value of radiotherapy we can keep up the focus on such an important treatment and help give patients the world class treatment they deserve."

We, in EFOMP, know that Medical Physicists bring together knowledge of radiation physics, understanding of radiotherapy technology, and expertise in the interaction of radiation with the human body so they are able to ensure that the new developments are implemented safely in clinical practice. We need to ensure that this message is promulgated to governments, radiation authorities and most of all to the general public in all our Member states, to promote radiotherapy in each country of Europe.

The EFOMP is developing a leaflet to help you in this campaign and to explain how the EFOMP supports its Members working in the radiotherapy community both educationally and professionally by developing and promoting training programmes, publishing guidance on best practice, publishing a scientific journal, and supporting a regular programme of scientific meetings.

Please help us to help each other and improve the access of safe and precise radiotherapy to all our cancer patients in Europe.
Other important dates: World Cancer Day, 4 February [4]
European Radiology Day, 10 February [5]
Acknowledgements and References:
1. IPEM website : http://www.ipem.ac.uk/
2. GLOBOCAN 2008: http://globocan.iarc.fr/
3. Cancer Research UK: http://info.cancerresearchuk.org/
4. WHO: http://www.who.int and World Cancer Day, 4 February
5. ESR: First European Radiology Day, 10 February

'Medical Physicist' Now Included in The International Standard Classification of Occupations (ISCO-08)

The occupation of 'Medical Physicist' is explicitly included for the first time in the latest version of the International Standard Classification of Occupations (ISCO-08) under group 2111, 'Physicists and Astronomers' (Appendix 1). Although medical physicists are not classified under group 22 Health Professionals, medical physicists working in health services are recognized as such as there is a specific note under group 2111 stating "…..*medical physicists are considered to be an integral part of the health work force alongside those occupations classified in sub-major group 22, Health professionals…..".* There is also specific mention of medical physicists as health professionals under group 22 Health Professionals *"Note. In using ISCO in applications that seek to identify, describe or measure the health work force, it should be noted that a number of professions considered to be a part of the health work force are classified in groups other than sub-major group 22, Health professionals. Such occupations include but are not restricted to: addictions counsellors, biomedical engineers, clinical psychologists and medical physicists"*

Annual meeting of our society in Wabern; Nov 11-12 2010.

This year, our annual meeting was held at the Swiss National institute of metrology (METAS) in Wabern. Its director opened the first day by emphasizing that they were not interested in doing just interesting things. They need to concentrate on useful activities that can be paid by the final users. In other words, if we want to keep the great precision (the best) that we used to have, we have to find the means.

The scientific program was well balanced with many interesting talks in dosimetry, radiation protection and medical imaging. The general organization of the meeting was perfect. Thanks a lot to Léon André and Damian Twerenbold.

The editor of the Bulletin forbade me to write the book of abstracts of the meeting. I will therefore only concentrate on perfectly arbitrary highlights.

Hans Rabus, from PTB, offered a refreshing presentation about nanodosimetry. Counting the number of ionization clusters at the nano-level is linked to the probability of having double-strain breaks of the DNA. In the future, this could lead to a new way of doing dosimetry. This talk clearly showed that we need to keep (or to get) some knowledge about the second "S" of "SGSMP".

George Sgouros, from John Hopkins University Hospital, talked about the need of an adequate dosimetry in nuclear medicine. Medical physicists working in radiotherapy departments clearly see the advantages of being able to estimate the three-dimensional dose delivered to a patient. However, nuclear medicine is much more complex because of the metabolism.

George Sherouse, from New-York, pushed some open doors by showing that there is no single detector that can be used reliably in any situation; especially if you like diodes. His talk was nevertheless very pedagogical with four examples of detectors that made him scratch his head.

Francis R. Verdun, from Lausanne, presented the first results of the 2008 survey about the exposure of the Swiss population by radiodiagnostic. The mean dose to the patient is about 1.5 mSv/year. The main contributors are CT exams, which have increased about 3 times since 1998, and fluoroscopy. Hans Roser, from Basel, took the opportunity to advertise about the ongoing survey in nuclear medicine.

Finally Jean-François Germond, from the third populous city of Romandie, delighted us with a refreshing course about optics and the use of infrared in hyperthermia. He showed us what can happen when a theoretical physicist is also very practical.

François Bochud, IRA/CHUV

International Symposium on Standards, Applications and Quality Assurance in Medical Radiation Dosimetry (IDOS)

9-12 November 2010
Vienna, Austria

http://www-pub.iaea.org/mtcd/meetings/announcements.asp?confid=38093

The IDOS symposium was organised by the IAEA in corporation with 15 other organisations last November in Vienna. I attended this symposium as a representative of UK's Institute of Physics and Engineering in Medicine (IPEM) and gave a talk on the recently published IPEM report 103 on Small field MV photon dosimetry[1]. The programme of the symposium, was separated in plenary sessions, round table discussions and 'poster highlights' and viewing sessions. The main topics covered were on radiation measurement standards and dosimetry for imaging and therapy, internal dosimetry (computational phantoms and radiobiological modelling, patient specific methods), reference and clinical dosimetry for external beam radiotherapy and brachytherapy, dosimetry of small and non-standard fields and external quality audits in radiotherapy and radiation protection. There were contributions by the IAEA, Bureau International des Poids et Mesures (BIPM) and International Commission on Radiation Units and Measurements (ICRU) and delegates from 72 countries. There was no registration fee to the symposium, but the number of participants was restricted (I think up to 500).

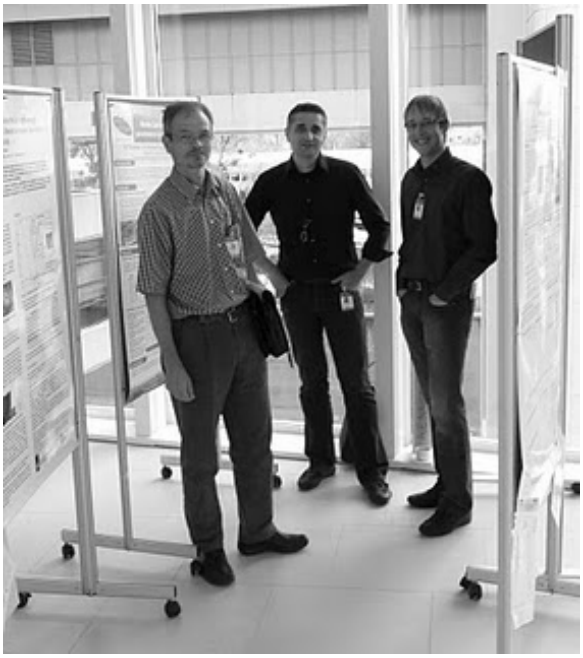
The slides from most scientific presentations of the symposium are available online at: http://nucleus.iaea.org/HHW/MedicalPhysics/IDOS/IDOS_web.pdf This website is part of the IAEA's new portal http://humanhealth.iaea.org [2] which contains useful information on radiation oncology and medical physics. Three morning courses were on offer at 8am each morning: on 'Formalism for Internal Dosimetry in Nuclear Medicine', 'Clinical Dosimetry in Paediatric Imaging' and 'Brachytherapy: Beyond TG43 to Improve Brachytherapy Dosimetry'.

The slides from these courses can be viewed at:
http://nucleus.iaea.org/HHW/MedicalPhysics/IDOS/IDOS_courses.pdf

[1] http://www.ipem.ac.uk/publications/ipemreports/Pages/SmallFieldMVPhoton.aspx
[2] or http://nucleus.iaea.org/HHW/Home/index.html

The standard of the science both of the oral presentations but also of the posters was very high and the topics were addressed at depth. The plenary sessions began with a talk by an invited speaker usually giving a review of the current status and developments on the topic that were to be covered in the session. The topics of the round table discussions were well chosen and particularly interesting because a panel of experts were putting forward initial thoughts, points or questions that prompted the delegates to voice their views. Round table discussions were on 'When Dosimetry Goes Wrong in Therapy and Imaging', 'Dosimetry and Challenges Associated with New Technology', 'Education and Training for Radiation Dosimetry' and 'What does Calibration Traceability mean to you'.

At the end of the meeting there was one and a half hour long session where the organisers organised a summary and presented the main conclusions from the symposium. During this the audience had the opportunity to comment or add to these and this a very good way to close a scientific meeting. Delegates did not disappear towards the end, but almost everyone stayed till the close of the meeting. On the IAEA website and symposium programme the IAEA states that 'no resolutions may be submitted for consideration on any subject; not votes will be taken'. That may have been the case but this was one of those meetings that brought experts of radiation dosimetry together and as a result, there were clear statements on the current status and future directions of medical radiation dosimetry.



Representatives of SSRMP at IDOS; lt to rt: Roman Menz (Uni Basel), Jürgen Besserer (Hirslanden), Roger Hälg (Zürich Triemli)

Mania Aspradakis
Kantonsspital Lucerne, Lucerne
February 2011

Open House at Varian Imaging Laboratory

Saturday, 11 December 2010 Baden-Dättwil

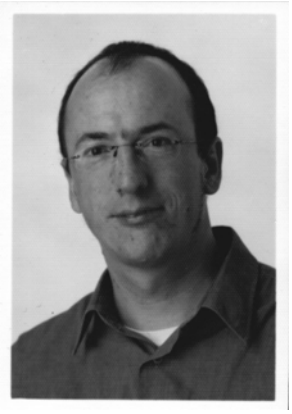
Last autumn, Varian invited the radiooncological professionals to its Imaging Laboratory at Baden-Dättwil. More than 40 participants took advantage of this opportunity, and came on Saturday, 11 December to have a look inside. After the welcome by Stefan Scheib, Martin Amstutz, Director of the Imaging Laboratory, gave an overview of the development and activities of the facility. About 170 employees work here developing and coordinating all of Varian's activities in the field of imaging in radiation oncology. Thereafter, the visitors were guided in several groups to laboratories, offices, and test cells with two new TrueBeam machines. Many thanks to Stefan Scheib and to all of his colleagues for this well organized and impressive insight

Karl L. Rittmann, Chur

P E R S O N A L I A

News from Aarau

Dietmar Marder



Nach dem Studium der Physik an der Universität Freiburg im Breisgau und der Trent University in Ontario/Kanada mit den Abschlüssen Bachelor of Science und Diplom Physik habe ich während der letzten 12 Jahre in verschiedenen Telekommunikationsunternehmen als Netzwerkplaner grösstenteils in der Schweiz gearbeitet. Im letzten Jahr habe ich den MAS Studiengang Medizinphysik an der ETH Zürich, den ich 2008 nebenberuflich begonnen, hatte mit einer Master Thesis am Varian Imaging Laboratory in Baden-Dättwil erfolgreich abgeschlossen.
Seit Januar 2011 arbeite ich als Physiker am Kantonsspital Aarau und strebe die SGSMP Fachanerkennung als Medizinphysiker an. In Aarau werde ich mich in den nächsten Monaten hauptsächlich mit der Einführung einer Qualitätssicherung für das Tiefenhyperthermiegerät und der Planung von Hyperthermie Therapien mit Hilfe des Simulationsprogramms Sigma Hyperplan beschäftigen.

Ngoc Thai

I graduated from Temple University with a Bachelor in Biology and did a one year accelerated medical dosimetry program at Thomas Jefferson University. I started working at Kantonsspital Aarau as a Dosimetrist (treatment planning) on 14.02.2011. I will be taking the CMD board exam this September of 2011.

Stephan Zepter

I studied physics at the Karlsruhe Institute of Technology, Germany with an focus on experimental particle physics and graduated in april 2010. In my Diploma thesis I worked on precisely measuring magnetic fields for the Neutrino mass experiment KATRIN. Since September 2010 I work at the Radio-Onkology departement of the Katonsspital Aarau as a trainee for medical physics with the goal of attaining the SSRMP Professional Certificate. Furthermore I attend postgraduate studies in Medical Physics of the ETH Zürich to get the Master of Advanced Studies degree.

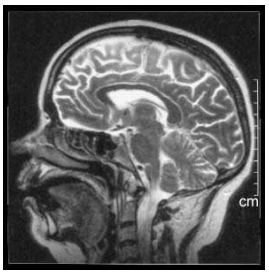
Miriam Gantert

Has left KSA in August 2010 after 1 year as trainee to change her professional field.

– Pressespiegel –

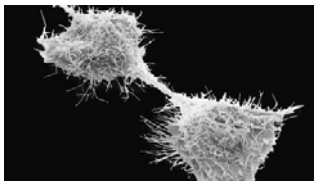
Anmerkung der Redaktion: Hier finden sich interessante Artikel, die an anderer Stelle bereits erschienen sind.

Advances in MRI speed brain scanning



Although MRI has allowed researchers to investigate the function and structure of the brain, the limited speed at which the whole brain can be imaged remains a significant hurdle to furthering our understanding of neuronal network dynamics. Now, by combining two techniques for multiplexing signal acquisition, an international team has developed a method that scans the whole brain up to seven times faster than currently possible, taking functional whole-brain imaging into the sub-second re-gime

Source: http://medicalphysicsweb.org/cws/article/research/45099



Ordnung im Krebs-Puzzle

Die Entzifferung des menschlichen Erbguts bringt die Krebstherapie entscheidend voran. Mit genetischen Tests sollen die Behandlungen künftig möglichst präzis auf die Tumoren der Patienten zugeschnitten werden. Ärzte könnten Krebs in den Griff bekommen, ähnlich wie Bluthochdruck oder Diabetes.
Vor kurzem ist eine Studie zu Ende gegangen, die für die moderne Krebsmedizin von grosser Bedeutung ist. Seit Januar letzten Jahres hatten 338 Patienten mit unheilbarem Hautkrebs ein neuartiges Medikament erhalten. Alle Patienten befanden sich im fortgeschrittenen Stadium der Krankheit, der Krebs hatte sich bereits in verschiedenen Organen des Körpers ausgebreitet. Die Resultate, die nun publik geworden sind, stimmen zuversichtlich: Nicht nur schritt die Krankheit weniger schnell voran, die Patienten lebten auch länger als solche, die eine Standardtherapie erhalten hatten.[…]
]
Personalisierte Medizin heisst die Entwicklung, die erst durch die Entschlüsselung des menschlichen Erbguts möglich geworden ist. Statt wie bisher Medikamente nach dem Prinzip «One size fits all» zu entwickeln, setzen Pharmafirmen auf Therapien, die individuelle genetische Unterschiede berücksichtigen. «Es ist leider eine Tatsache, dass Medikamente heute im Durchschnitt für etwa die Hälfte der Patienten nicht optimal wirksam sind», schrieb Severin Schwan, CEO von Roche, kürzlich in der «NZZ». Mit molekularbiologischen Tests sollen die Therapien der Zukunft möglichst präzise auf die genetischen Besonderheiten der Patienten abgestimmt und damit die Wirksamkeit erhöht werden. […]

Quelle:http://www.nzz.ch/nachrichten/hintergrund/wissenschaft/ordnung_im_krebs-puzzle_1.9607341.html

Datum: 12.11.2010
NEUE LUZERNER ZEITUNG

Krebsklinik unter Beschuss

GALGENEN Braucht es das Protonentherapie-Zentrum in Galgenen? Die Fernsehsendung «Kassensturz» warf diese Frage diese Woche auf.

s. Die Sendung im Schweizer Fernsehen liess kein gutes Haar an der geplanten Krebsklinik in Galgenen. Eine teure Luxuslösung sei der Bau. Die Prämienzahler müssten dafür bluten. Zudem wurde betont, dass der medizinische Vorteil der Protonentherapie gegenüber herkömmlicher Strahlentherapie zur Krebsbekämpfung umstritten sei. Auch die Frage der Verhältnismässigkeit stelle sich – in keinem Land Europas gebe es so viele Bestrahlungsplätze wie in der Schweiz.

«Sollen wir uns auf die Einschätzungen von Politikern verlassen?»
PETER SCHWEGLER

Im «Kassensturz»-Beitrag kam auch Heidi Hanselmann zu Wort. Die St. Galler Gesundheitsdirektorin steht dem Beschlussorgan der hochspezialisierten Medizin der Gesundheitsdirektorenkonferenz vor. Dieses Gremium hatte letzten Mai entschieden, dass eine Protonenanlage im Land ausreiche und einzig das Paul-Scherrer-Institut in den nächsten drei Jahren die Behandlung über die Grundversicherung abrechnen dürfe. Der Vergleich mit Westeuropa zeige, dass in der Schweiz keine Unterversorgung herrsche, sagte Hanselmann vor der Kamera. Trotz dieses Entscheides ist man neben Galgenen auch in Bern daran, ein weiteres Zentrum aufzugleisen.

Private Geldgeber

Peter Schwegler kann die «Kassensturz»-Kritik nicht verstehen. Er ist der Pressesprecher der Galgener Proton Therapy Center Switzerland AG, die das Projekt vorantreibt. Gerade das Kostenargument erachtet er als verfehlt. Die zum Bau notwendigen 320 Millionen Franken würden schliesslich von privaten Geldgebern eingebracht. Und bei den Behandlungen werde man sich in einem normalen Kostenrahmen bewegen – gegen 28 000 Franken. Damit liege man deutlich unter dem Wert, welchen das Paul-Scherrer-Institut veranschlage. Bei der Planung stütze man sich auf internationale medizinische Studien. «Es stellt sich schon die Frage, ob wir darauf abstellen sollen. Oder sollen wir uns auf die Einschätzungen von Politikern verlassen?» In zehn Jahren werde es in der Schweiz 10 000 Patienten jährlich geben, die man mit der Protonenbestrahlung behandeln sollte.

Baubewilligung ausstehend

Gegen 3000 Patienten will man 2014 in Galgenen behandeln können. Bis es soweit ist, muss aber noch eine Baubewilligung erteilt werden. Es bestehen Bedenken wegen des Grundwassers. Schwegler ist zuversichtlich. Die Bewilligung sollte noch dieses Jahr vorliegen.

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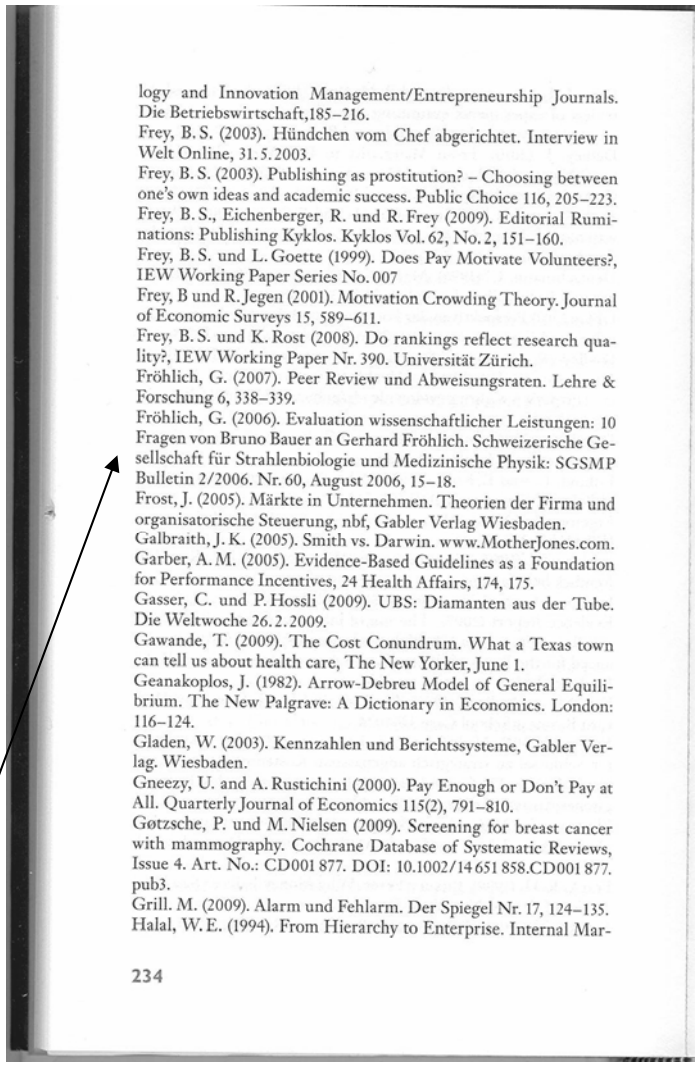

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