InterACTIONS

CANADIAN MEDICAL
PHYSICS NEWSLETTER
Le BULLETIN CANADIEN
de PHYSIQUE MÉDICALE

SOCIAL MEDIA AND COMP

PUBLICATIONS MAIL AGREEMENT
NO. 40049361

RETURN UNDELIVERABLE
CANADIAN ADDRESSES TO:
COMP/CCPM Office
PO Box 72024
Kanato North RPO
OTTAWA, ON K2K 2P4
CANADA

COMP OCPM

A publication of the Canadian Organization of Medical Physicists and the Canadian College of Physicists in Medicine

http://www.medphys.ca

ISSN 1488-6839

THE CANADIAN COLLEGE OF PHYSICISTS IN MEDICINE

LE COLLÈGE CANADIEN DES PHYSICIENS EN MÉDECINE

58 (1) janvier/January 2012

LUCY 3D QA PHANTOM

Stereotactic QA Made Simple

Streamline your end-to-end stereotactic program. Perform image transfer, dosimetry and machine QA within the exact coordinate system of stereotactic head frames and frameless mask systems.

Precise QA Throughout the Imaging Chain
The Lucy® 3D QA Phantom quantifies variances by measuring cumulative uncertainties, from imaging to dose delivery, within 0.1mm. This confirms accurate recreation of CT/MRI/Angioscans and image fusion within the TPS.

SRS Patient Dosimetry and Radiation Alignment QA
Obtain absolute, relative and point dose dosimetry measurements at isocenter and at exact positions off isocenter. Quickly carry out comprehensive evaluation of geometric accuracy and CBCT and MV/kV isocenter alignment.

Easily Locks into SRS Frames
Position the Lucy 3D QA Phantom within manufacturers' exact coordinate system.

HIGH PRECISION END-TO-END STEREOTACTIC QA

STANDARD IMAGING.

for more info visit
www.standardimaging.com

COMP OCPM
THE CANADIAN COLLEGE OF PHYSICISTS IN MEDICINE
LE COLLÈGE CANADIEN DES PHYSICIENS EN MÉDECINE

InterACTIONS

Volume 58, Number 1 – janvier/January 2012

Contents

Cover Image

Social Media and COMP - See page 24.

COMP BOARD

President:
Peter McGhee, Ph.D., FCCPM
Thunder Bay Regional HS Centre
Thunder Bay, ON
Tel: (807) 684-7325
mcgheep@tbh.net

Past President:
Jason Schella, M.Sc., FCCPM
Nova Scotia Cancer Centre
Halifax, NS
Tel: (902) 473-6011
Jason.schella@cdha.nshealth.ca

President Elect:
Luc Beaulieu, PhD
CHUQ—Hôtel-Dieu de Québec
Québec, QC
Tel: (418) 525 4444 ext 15315
beaulieu@phy.ulaval.ca

Secretary:
Isabelle Gagné, PhD, MCCPM
BC Cancer Agency
Vancouver Island Centre
Victoria, BC
Tel: (250) 519-5500 ext 693783
imgagne@bccancer.bc.ca

Treasurer:
Crystal Angers, MSc, MCCPM
The Ottawa Hospital Cancer Centre
Ottawa, ON
Tel: (613) 737-7700 ext 70030
cangers@ottawahospital.on.ca

Councillor for Communications:
Tony Popescu, Ph.D., MCCPM
BC Cancer Agency — Vancouver
Vancouver, BC
Tel: (604) 877-6000 ext. 2046
tpopescu@bccancer.bc.ca

Councillor for Professional Affairs:
Craig Beckett, MSc, FCCPM, dABR
Allan Blair Cancer Centre
Regina, SK
Tel: (306) 766-2682
craig.beckett@saskcancer.ca

Councillor for Quality Assurance and Radiation Safety Advisory:
Jean-Pierre Bissonnette PhD, MCCPM
Princess Margaret Hospital
Toronto, ON
Tel: 416.946.4501 ext: 2151
jean-pierre.bissonnette@rmp.uhn.on.ca

Councillor for Science & Education:
Marco Carlone PhD, MCCPM
Princess Margaret Hospital
Toronto, ON
Tel: 416.946.4501 ext: 2409
marco.carlone@rmp.uhn.on.ca

CCPM BOARD

President:
David Wilkins, Ph.D., FCCPM
The Ottawa Hospital
Ottawa, ON
Tel: (613) 737-7700 ext 70010
dawilkins@ottawahospital.on.ca

Vice-President:
Matthew G. Schmid, M.Sc., FCCPM
BC Cancer Agency — Southern Interior
Kelowna, BC
Tel: (250) 712-3917
mschmid@bccancer.bc.ca

Registrar:
Darcy Mason, M.Sc., FCCPM
Durham Regional Cancer Centre
Oshawa, ON
Tel. (905) 576-8711 ext 2816
damason@lakeridgehealth.on.ca

Chief Examiner:
Robert Corns, Ph.D., FCCPM
BC Cancer Agency, Fraser Valley Centre
Surrey, BC
Tel: (604) 930-4055 ext 654558
rcorns@bccancer.bc.ca

Deputy Chief Examiner:
Boyd McCurdy, Ph.D., FCCPM
CancerCare Manitoba
Winnipeg, MB
Tel: (204) 787-1966
boyd.mccurdy@cancercare.mb.ca

Secretary-Treasurer:
Glenn Wells, PhD, FCCPM
Ottawa Heart Institute
Ottawa, ON
Tel: (613) 798-5555 ext 18175
gwells@ottawaheart.ca

General Board Members:
Sherry Connors., M.Sc., FCCPM
Cross Cancer Institute
Edmonton, AB
Tel: (780) 432-8775
sconnors@ualberta.ca

Horacio Patrocinio, MSc, FCCPM
McGill University Health Centre
Montreal, QC
Tel: (514) 934-8052
Horacio.patrocinio@mcgill.ca

COMP/CCPM Office
P.O. Box 72024
Kanata North RPO
Ottawa, ON, K2K 2P4 Canada
Telephone:(613) 599-3491
Facsimile: (613) 435-7257
E-mail: admin@medphys.ca
Website: www.medphys.ca

The Canadian Medical Physics Newsletter, which is a publication of the Canadian Organization of Medical Physicists (COMP) and the Canadian College of Physicists in Medicine (CCPM) is published four times per year on 1 Jan., 1 April, 1 July, and 1 Oct. The deadline for submissions is one month before the publication date. Enquiries, story ideas, images, and article submissions can be made to:

Idris A. Elbakri, Ph.D., MCCPM
CancerCare Manitoba
675 McDermot Ave
Winnipeg, MB, R3E0V9
Email: Idris.Elbakri@cancercare.mb.ca
Phone: (204) 787-2856
Fax: (204) 775-1684

Members of the Editorial Board include:
Tony Popescu
Boyd McCurdy
Parminder Basran

Please submit stories MS Word or ASCII text format. Images in Tiff format at 300 dpi resolution are preferred.

ADVERTISING (both corporate and job)
Enquiries can be made to:
COMP/CCPM Office
P.O. Box 72024
Kanata North RPO
Ottawa, ON, K2K 2P4
Canada
Telephone:(613) 599-3491
Facsimile: (613) 435-7257
E-mail: admin@medphys.ca
Website: www.medphys.ca

Job Advertising Options

OPTION 1 ($240): Job posting on COMP/CCPM website only (active for 2 months)
OPTION 2 ($360): Job posting on COMP/CCPM website AND in InterACTIONS (single page)
OPTION 3 ($400): Job posting is immediately e-mailed to COMP/CCPM members (no website or InterACTIONS posting)

Message from the COMP President

As has been tradition for some time now, the semi-annual Board meetings of COMP and the CCPM were held at the end of November in Toronto. Amongst such exciting activities as policy approval and budget development, there are a few initiatives particularly worthy of comment. Spearheaded by Jason Schella, the details of the requirements for the award and the process for identifying recipients have been established. The process is now being engaged and the first Fellow of COMP (FCOMP) awards are to be announced at the next Annual General Meeting (AGM). Jason and Jean-Pierre Bissonnette are continuing with their efforts on the Steering Committee of the Canadian Partnership for Quality Radiotherapy (CPQR). The first two Technical Quality Assurance documents, prepared through COMP and ratified by the CPQR, are about to be formally posted as complete, and a number of new documents are about to be issued for public review. I strongly encourage you to participate in the review process for those documents that are relevant to your practice. While these are deemed to be "living" documents that will evolve with time, primarily on the basis of anticipated ongoing feedback from the medical physics community, there is every indication that they will ultimately be broadly adopted by cancer treatment facilities. The closer to the mark these initial postings are, the better for all so please take the time to review and provide relevant feedback as they become available. Another initiative that is gradually coalescing is the development of better communications with the Canadian Nuclear Safety Commission (CNSC). The CNSC is proving to be quite receptive in this regard and has expressed desire to improve the overall engagement with the medical physics community. To that end we will likely be looking for support from those of you who do respond to the CNSC requests for consultation and participate in activities such as being interveners at public hearings. If you have an interest in working with COMP on this initiative, please do not hesitate to let us know. Continuing on the topic of recruitment, we have for some time now been striving to establish a list of experts who would be willing to act as a resource for COMP. Those efforts are going to be reinvigorated in the coming months so, if you are approached, please say "yes" or, if you feel offended that you have somehow been inadvertently ignored (apologies in advance), just let us know of your interest. Very limited workload is anticipated to be associated with being on this list but it would be of significant benefit for COMP in expediting response to time sensitive issues requiring expert opinion. And, of course, I cannot leave this topic without noting that there are upcoming vacancies on the Board as of the next AGM. Please consider nominating candidates or even stepping forward yourself. I continue to believe that it is better for COMP if candidates are willing to stand for election, establish positions, and provide members with real choices. Stimulating a bit of constructive debate and discussion is always a healthy thing.

Speaking of debate, I would like to draw attention to a new feature in

Dr. Peter McGhee

InterACTIONS: Point/Counterpoint. This format has been quite successfully established in other publications so we thought we would give it a try. Probably more pertinent is that the topic for debate has been a source of significant discussion of late amongst members of the Board so it was deemed sufficiently contentious to bring broader attention and consideration to bear. The hope is that this will indeed get you thinking and perhaps inspire some to submit responses and opinions to the debaters or, even better, InterACTIONS. Such feedback will be particularly relevant as it will be incorporated into the Board's deliberations regarding how to proceed as this particular situation continues to evolve. A further ramification is that this specific instance has contributed to recent consideration of directly soliciting feedback from the membership as how best to, in general, engage initiatives related to regulation and/or

continued on page 41

Message from the CCPM President

After four years as Secretary/Treasurer of CCPM, Sherry Connors has finished her term and is stepping down. She will remain on the Board until the AGM in Halifax in July 2012, but Glenn Wells will take over the Secretary/ Treasurer position as of 1 Jan 2012. Coincidentally, the COMP treasurer Bill Ziegler is also stepping down, replaced by Crystal Angers.

Sherry has brought considerable skill and experience to the CCPM Board. She served as President of COMP in 1994-95, so she has an excellent understanding of the long history of cooperation and mutual support between CCPM and COMP. That experience has been valuable over the past few years, as CCPM manages the significant costs associated with translating exam documents, and COMP and CCPM continue the efforts of clarifying mandates and financial relationships.

The COMP Board, with some representation from CCPM, recently undertook a strategic planning exercise in conjunction with the mid-year board meetings in Toronto. The CCPM was pleased to be able to assist COMP in setting its direction for the next few years. The strategic planning was preceded by a membership survey (e-mailed to COMP members in the fall), which had excellent participation and resulted in many useful comments.

A number of members made positive survey comments about the finances of COMP and CCPM, indicating that they felt the organizations were prudent and provided good value for the membership fees. This should be taken as a compliment by Sherry Connors and Bill Ziegler, who have continued a tradition of sound financial management and respect for the members' money. In my 5.5 years on the Board of CCPM, and my experience on the COMP Board in recent years and a decade ago, I have been consistently impressed by the care taken to ensure that the limited financial resources of these organizations brings maximum value to the membership. Initiatives which benefit the membership often require investment and some financial risk, however COMP and CCPM are careful about considering the value of initiatives and minimizing this risk. Members should feel comfortable that both COMP and CCPM are on a sound financial footing, and that any request for increases in fees are taken very seriously by the boards.

COMP and CCPM continue to share some aspects of their financial structure. In order to preserve its independence and integrity, the examination process of CCPM is self-funding, with costs covered by exam fees. Non-exam related CCPM costs are relatively small – some administrative costs for operation of the organization, and modest travel costs for mid-year meetings of the Board. These costs are drawn from the joint treasury, which is funded by the single COMP membership fee. The requirement that CCPM members must be members of COMP in good standing ensures a constant and stable pool of members for COMP. In fact, CCPM members make up 75% of COMP Full Members (excluding student and associate member categories). There is currently no plan to change this membership requirement, although it does come up for discussion regularly.

Dr. David Wilkins

Discussion of the financial structure of COMP and CCPM, and the details of spending by both organizations, have been a constant feature of the Board meetings that I have attended. This discussion is healthy and productive, promoting scrutiny of expenditures and a questioning attitude of financial processes: How can we do things better? How can we ensure the best value for members? We have recently streamlined the budgeting process, clarified the approval process for non-budgeted expenses, and revisited some of the areas of financial overlap between COMP and CCPM. While these issues can be seen as arcane and of little interest to most members, they are important to smooth functioning and help to engender confidence in the financial operation of the organizations.

The Board of CCPM, on behalf of all members, wishes to thank Sherry for her hard work and dedication in service of the College as Secretary/Treasurer. Thanks also to Bill Ziegler for his excellent work as COMP Treasurer.

Message from the Executive Director of COMP/CCPM

As both Peter McGhee and David Wilkins mentioned in their articles, COMP held a strategic planning session in conjunction with its midyear Board meeting this past November. As you know, this is the second time that COMP has undertaken strategic planning and we went into it feeling positive about what we accomplished from the 2007-2010 exercise knowing that there is always room for improvement.

The process of strategic planning often gets a bad rap and conjures up images of documents sitting on shelves collecting dust. In my experience working with a variety of professional associations, the key to success is to follow a process that engages both the members and the leadership of the organization, that encourages the participants to think "boldly" but that is practical in that it can be implemented, measured and adjusted as required. The following process was followed for session:

1. All COMP members were invited to provide input via an online membership survey. Responses were received from 181 members for a response rate of 28 percent. It should be noted that this rate exceeds typical response rates of 15 to 20 percent for national professional groups. The results of this survey will be shared with members in the April issue.
2. The Board invited other key stakeholders to participate in the planning session: **Joe Hayward**, former Board member and Councilor for Communications, **Parminder Basran**, Communications Committee member and former Editor of InterACTIONS, **Stephen Breen**, Winter School Chair, **Nadia Octave**, Student Council Co-Chaire, **Colin Field**, President of the Alberta Medical Physics Association, **Janelle Morrier**, former COMP member from Quebec, **Kavita Murthy** from CNSC, **David Wilkins**, CCPM President, **Matt Schmid**, Incoming President of CCPM and **Glenn Wells**, Incoming Treasurer of CCPM and also a member in the imaging sub-specialty.
3. COMP engaged the services of a professional facilitator and held a 1.5 day in-person session with the following agenda:

a. Review of Current Situation
- Review the member survey results
- Review 2007 – 2010 Strategic Plan progress
- Review strategy of other related organizations
- Review external and internal environmental information & identify priorities

b. Review of the Preferred Situation
- Reflection on the preferred future situation
- Review of existing strategic statements and future desired outcomes
- Adjust strategic statements, if required

Ms Nancy Barrett

c. Develop Strategies to Close the Gap
- Generate and choose strategies based on priorities
- Establish performance indicators for strategies
- Discussion on implementation of strategies

Four key priorities were identified and the plan will outline strategies for each priority that can be measured so that success can be evaluated. The plan will be reviewed by the Board and once it is finalized and approved will be shared with COMP members along with the results of the membership survey.

I would like to take this opportunity to thank each of the participants in the session (particularly those who are not on the COMP Board) who volunteered their time to provide an important perspective. It was an energetic and engaged group which bodes well for the future of COMP.

I am looking forward to this year's Winter School that will be taking place in Whistler, BC. The organizing committee should be commended for its commitment to building on and improving the program each year. The 2012 program is sure to be an excellent continuing education opportunity.

As well the ASM will be here before we know it. Halifax is a beautiful destination in July and we look forward to welcoming you there. Again the conference committee is working hard on your behalf and has carefully considered the feedback received on the survey conducted in August.

Watch for more Continuing Education opportunities this year!

In closing, I would like to thank my colleague, Gisele Kite for all of her work behind the scenes to help COMP (and CCPM) run smoothly. As always, please feel free to contact me or Gisele or at any time with your feedback and suggestions.

COMP Strategic Planning Meeting

CNSC Feedback Forum

Change in CNSC's Regulatory Policy on Particle Accelerators

Abridged version of bulletin issued by the CNSC on November 24, 2011

Kavita Murthy

Director | Directrice
Accelerators and Class II Facilities Division |
Division des installations de catégorie II et des accélérateurs
Canadian Nuclear Safety Commission |
Commission canadienne de sûreté nucléaire

Following a recent review of the Class II Nuclear Facilities and Prescribed Equipment Regulations and policies relating to accelerators, the Canadian Nuclear Safety Commission (CNSC) is changing its policy concerning the regulation of particle accelerators.

The CNSC will now begin to exercise its regulatory authority with respect to all particle accelerators operating at a beam energy of 1 (one) MeV or greater. Accelerators operating at or above 1.5 MeV beam energy are capable of producing nuclear energy and therefore subject to the Nuclear Safety and Control Act (NSCA) and the regulations made under the Act. Accordingly, the facilities where these accelerators are used must meet the requirements of the NSCA and the applicable regulations, and must operate under an appropriate Class I or Class II nuclear facility licence. Furthermore, in accordance with Section 10 of the Class II Nuclear Facilities and Prescribed Equipment Regulations, particle accelerators that meet the definition of Class II Prescribed Equipment must be certified by the CNSC. For ease of application, the CNSC will use 1 MeV, rather than 1.5 MeV as the cut-off beam energy.

The CNSC already licences and inspects particle accelerators capable of operating at or above 10 MeV. The decision to now include low energy particle accelerators (i.e., those operating at or above 1 MeV) will ensure adequate, uniform and consistent regulatory oversight for all Class II accelerators. To ensure the safety of the public and workers, CNSC staff may take regulatory action where necessary to address immediate safety concerns at facilities with accelerators at or above 1 MeV.

The CNSC will be issuing additional documentation with detailed information by

April 2012 to further explain the change in its regulatory oversight regarding low-energy accelerators, and to provide details on the implementation plan for this change. The documentation will offer information on the regulatory requirements for this equipment, along with guidance to explain how these requirements can be satisfied.

You may submit any questions or concerns you have on this matter to the email address Electronaccelerator-Accélérateurdélectron@cnsc-ccsn.gc.ca.

Changement de politique réglementaire de la CCSN visant les accélérateurs de particules

Version abrégée du bulletin émis par la CCSN le 24 novembre, 2011

Pour donner suite à une étude récente du Règlement sur les installations nucléaires et l'équipement réglementé de catégorie II et des politiques relatives aux accélérateurs, la Commission canadienne de sûreté nucléaire (CCSN) modifie sa politique sur la réglementation des accélérateurs de particules.

Dorénavant, la CCSN exercera son pouvoir réglementaire à l'égard de tous les accélérateurs de particules dont le faisceau a une énergie de 1 (un) MeV ou plus.

Les accélérateurs dont l'énergie de faisceau est de 1,5 MeV ou plus peuvent produire de l'énergie nucléaire et sont donc assujettis à la Loi sur la sûreté et la réglementation nucléaires (LSRN) et à ses règlements d'application. Par conséquent, les installations qui utilisent ces accélérateurs doivent se conformer aux exigences de la LSRN et à ses règlements et exploiter ces accélérateurs en vertu d'un permis approprié d'installation nucléaire de catégorie I ou II. En outre, conformément à l'article 10 du Règlement sur les installations nucléaires et

continued on page 39

COMP OCPM

GOLD MEDAL AWARD

Call for Nominations

The COMP Gold Medal will be awarded to a member of COMP (or retired former member) who has made an outstanding contribution to the field of medical physics in Canada. An outstanding contribution is defined as one or more of the following:

1. A body of work which has added to the knowledge base of medical physics in such a way as to fundamentally alter the practice of medical physics.
2. Leadership positions in medical physics organizations which have led to improvements in the status and public image of medical physicists in Canada.
3. Significant influence on the professional development of the careers of medical physicists in Canada through educational activities or mentorship

The Gold Medal is the highest award given by the Canadian Organization of Medical Physicists and will be given to currently active or retired individuals to recognize an outstanding career as a medical physicist who has worked mainly in Canada. It will be awarded as appropriate candidates are selected but it will not generally be given more than once per year.

Nominations for the 2012 medal are hereby solicited. Nominations are due by January 27th, 2012 and must be made by a Full Member of COMP. Nominations must include:

1. the nominator's letter summarizing the contributions of the candidate in one or more of the areas listed above;
2. the candidate's CV;
3. the candidate's publication list (excluding abstracts) which highlights the candidates most significant 10 papers;
4. additional 1 to 2 page letters supporting the nomination from three or more members of COMP.

The applications will be made electronically to Nancy Barrett at the COMP office (preferably in pdf format, nancy@medphys.ca) and authorship of the submission e-mail will be verified by the COMP Office.

A committee of COMP members appointed by the COMP Board will consider nominations and recommend award winners to the COMP Board by March 30th, 2012. The COMP Board makes the final decision and the recipient will be notified by April 20th, 2012 to give time to arrange to be at the COMP annual meeting in Halifax.

Candidates selected for the medal will be invited to attend the COMP Annual Scientific Meeting where the award will be presented by the COMP President. Travel expenses will be paid for the medal winner. The medal winner may be asked to give a 30 min scientific presentation at the COMP meeting in addition to a short acceptance speech when the medal is presented.

Contributions to the HE Johns Fund

CCPM wishes to recognize and thank the following members for their 2011 donations to the Harold Johns Travel Award. The list below has been updated to reflect all contributors this year. For many years the HE Johns Travel Fund has been awarded to young medical physicists to support their travel to another center so that they may gain further experience in their specialty. With the economic downturn, investment return is minimal. Donations to the fund have to sustain the annual expenditure in the current economic environment. Please consider donating to the fund this year so that we may continue this legacy of education. Further details on the award can be found on the CCPM website.

The 2011 HEJ winner Emilie Soisson Ph.D., of McGill University Health Center in Montreal, Quebec. She will attend the Paul Scherrer Institute Winter School on proton therapy in Zurich Switzerland, January 2012.

HE Johns – Officer of the Order of Canada, Ph.D., LL.D., D.Sc., Emeritus University Professor and Professor Emeritus in the Department of Medical Biophysics and Radiology, University of Toronto.

Dr Johns was born of missionary parents while in West China. During his scientific career, he published over 200 peer-reviewed papers, trained over 100 graduate students, many of whom hold key positions in the field of Medical Physics across Canada and around the world. He has won many prestigious awards and has published four editions of "The Physics of Radiology", the premiere textbook in the field.

His developments in the late 1940s of the Cobalt 'bomb' led to a new career in the pioneering field of Medical Biophysics. This in turn led to international reputation among scientists. His many awards and accolades reflect the respect and admiration in which he was held by academics and scientists around the world. He was inducted into the Canadian Medical Hall of Fame in 1998. Dr. Johns passed away on August 23, 1998.

THE CANADIAN COLLEGE OF PHYSICISTS IN MEDICINE

LE COLLÈGE CANADIEN DES PHYSICIENS EN MÉDECINE

Harold E. Johns Fund Donors for 2011

Ismail	Aldahlawi	Leszek	Hahn	Terence	Riauka
John	Andrew	Elizabeth	Henderson	David W.	Rogers
Crystal	Anger	Michelle	Hilts	Russell	Ruo
William	Ansbacher	Dimitre	Hristov	Jason	Schella
Clement	Arsenault	Paul	Johns	Matthew	Schmid
Alistair	Baillie	Narayan	Kulkarni	John	Schreiner
Parminder	Basran	Thomas	Mackie	Daryl	Scora
Jerry	Battista	Darcy	Mason	Peter	Shragge
Craig	Beckett	George	Mawko	Katharina	Sixel
Wayne	Beckham	Boyd	McCurdy	David	Spencer
Paule M	Charland	Jim	Meng	David	Spencer
Kenneth	Chu	Abdel Salam	Mesbah	Alasdair	Syme
Sherry	Connors	Randall	Miller	Michael	Tassotto
Robert	Corns	Vitali	Moiseenko	Christopher	Thompson
Jean-Charles	Côté	Thalat (Tara)	Monajemi	Heather	Thompson
Timothy	Craig	Maryse	Mondat	Jacob	Van Dyk
Gavin	Cranmer-Sargison	Michel	Moreau	Shuying	Wan
Cupido	Daniels	Catherine	Neath	Bradley	Warkentin
Cheryl	Duzenli	Peter	O'Brien	R Glenn	Wells
Michael D.C.	Evans	Horacio	Patrocinio	Ellen	Wilcox
Tony	Falco	Ervin	Podgorsak	David	Wilkins
Isabelle	Gagné	Ioan (Tony)	Popescu	Conrad	Yuen

Harold Johns Travel Award Announcement
Deadline for Application: 13th April 2012

The Board of the Canadian College of Physicists in Medicine is pleased to honour the Founding President of the College by means of the Harold Johns Travel Award for Young Investigators. This award, which is in the amount of $2000, is made to a College Member under the age of 35 who became a member within the previous three years. The award is intended to assist the individual to extend his or her knowledge by travelling to another centre or institution with the intent of gaining further experience in his or her chosen field, or, alternately, to embark on a new field of endeavour in medical physics.

The H. E. Johns Travel Award is awarded annually by the Canadian College of Physicists in Medicine to outstanding CCPM Members or Fellows proposing to visit one or more medical physics centres or to attend specialized training courses such as the AAPM summer school. The applicant should not have previously taken a similar course or have spent a significant amount of time at proposed institutions. The award is for $2,000 and will be paid upon receipt of a satisfactory expense claim. The deadline for application this year is April 13, 2012.

All applicants must have passed the CCPM membership exam within the previous three years. Applicants may travel either inside Canada or elsewhere.

Applicants must supply a one page proposal indicating the course they wish to attend or the name(s) of the institutions they would visit and the reasons for their choice. They should also supply an estimate of the costs involved and letters from their present employer indicating that they are in agreement with the proposal. . If their proposed expenses exceed the value of the award, then they should also indicate the source for the additional funds required. For a visit to an institution the candidate must have the institution write to the Registrar in support of the visit. The candidate should also provide their curriculum vitae and the names and phone numbers of two references whom the Awards Committee can contact. No reference letters are required. The awards Committee reserves the right to contact additional individuals or institutions.

The award is intended both to assist the individual in their medical physics career and to enhance medical physics practice in Canada. Recipients are therefore expected to remain in Canada for at least one year following their travel. Applicants should be working in Canada but need not be Canadian citizens.

Successful candidates will have two years after their application deadline to complete their travel. They will be required to submit a short report to the InterACTIONS newsletter. The award recipient will be chosen by a committee consisting of the Chairman of the Examining Board, The Registrar and the President of the College. Their choice will be based upon 1) the written proposal submitted by the candidate, 2) references obtained by the committee and 3) membership exam results. The award will be announced at the Annual General Meeting of the College.

Unsuccessful candidates in any one year who are still eligible in subsequent years may have their applications considered again by writing to the Registrar and providing any necessary updated information.

Applications should be sent to:

Mr. Darcy Mason
Registrar, Canadian College of Physicists in Medicine
c/o Durham Regional Cancer Centre,
1 Hospital Court, Oshawa, ON L1G 2B9
damason@lakeridgehealth.on.ca

Results of a survey to assess the current status of *in-vivo* dosimetry in Canada

Gabriel O. Sawakuchi,[1,*]
Louis Archambault,[2]
Andrew Scullion[1] and
Joanna E. Cygler[3]

Abstract: This work presents the results of a survey of Canadian cancer clinics on the use of *in-vivo* dosimetry, which was supported by the Canadian Organization of Medical Physicists (COMP). This survey followed the format of a survey published in the UK by Edwards et al. Br J Radiol., 80:1011-4 (2007). It was performed between July-September 2010 using a free online survey system. The survey was sent to 39 cancer centers. It was composed of 16 questions including questions on the use of *in-vivo* dosimetry as well as demographics of the centers. A total of 34 out of 39 centers completed the survey. The provinces of Ontario and Nova Scotia have the largest average number of staff per clinic (99 and 75, respectively). However, the province of Alberta and Manitoba have the largest average number of medical physicist per clinic (15 and 12, respectively). Most of the centers answered that they perform *in-vivo* dosimetry to some extent (27 out of 34). However, none of the centers perform daily or weekly *in-vivo* dose measurements for individual patients, except for TBI and TSI treatments. Most centers (14 out of 19) reported that they use a tolerance level of 5% or higher in their *in-vivo* dosimetry programs. In the majority of the centers the in-vivo dose measurement is performed by a medical physicist (23 out of 27). As pointed out by the centers, the major drawbacks and difficulties involved in the use of *in-vivo* dosimetry included increased treatment and staff time. The results of this survey will serve as a documentation of the current status of the practice of *in-vivo* dosimetry in Canada. Then, in the future, such results will serve as a reference to assess further changes, developments and improvements in the field of *in-vivo* dosimetry in Canada.

Key words: in-vivo dosimetry; survey; radiotherapy; cancer clinics demographics

PACS: 87.53.Bn; 87.55.N-; 87.55.Qr; 87.56.Fc

Introduction

Technological advances in radiotherapy equipment have provided ways to prescribe and deliver very conformal dose distributions to the tumor volume. Prescription and delivery of radiotherapy treatment involves a chain of complex events. Each link in this chain is prone to errors. The errors could be of human nature or/and equipment malfunction. To minimize such errors quality assurance (QA) programs composed of many dosimetric and mechanical checks are clearly defined. These QA programs are performed prior to treatment and generally they do not include steps to detect errors that may occur *during* treatment delivery.

In-vivo dosimetry is the direct monitoring of the dose delivered during the radiotherapy treatment. It allows a quantitative comparison between the prescribed and actual delivered doses, providing an important additional QA check performed *at the treatment level.* A comprehensive QA program should include checks throughout the entire chain of events involved in radiotherapy treatments. Throughout this work we define *in-vivo* dosimetry as dose measurements performed during the treatment with dosimeters placed on the surface of the patient. *In-vivo* dosimetry detectors can be readout during beam delivery (real-time measurements) and/or immediately after beam delivery (immediate measurements).

*Corresponding author: Carleton Laboratory for Radiotherapy Physics, Department of Physics, Carleton University, 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada; e-mail: gsawakuc@physics.carleton.ca

[1]Carleton Laboratory for Radiotherapy Physics, Department of Physics, Carleton University, Ottawa, Ontario K1S 5B6, Canada

[2]Département de Radio-Oncologie, Hôtel-Dieu de Québec, Centre Hospitalier Universitaire de Québec, Québec, Québec G1R 2J6, Canada; and Département de Physique, de Génie Physique et d'Optique, Université Laval, Québec, Québec G1K 7P4, Canada

[3]Department of Medical Physics, The Ottawa Hospital Cancer Centre, Ottawa, Ontario K1H 8L6, Canada; and Department of Physics, Carleton University, Ottawa, Ontario K1S 5B6, Canada

[a]Presented at the Annual Meeting of the American Association of Physicists in Medicine, Vancouver, British Columbia, Canada. Gabriel O. Sawakuchi, Louis Archambault, Andrew Scullion and Joanna E. Cygler, Results of a survey to assess the current status of in-vivo dosimetry in Canada, Med. Phys. 38, 3544 (2011).

In-vivo dosimetry aims to check doses delivered during the treatment of an individual patient. In a practical situation, dosimeters are placed on the patient's skin or in natural body cavities during a treatment session and the doses are reported during or after the session. These doses are then used as a complement for the QA procedure that is performed prior to the treatment. Moreover, *in-vivo* dose measurements can be appended to a patient medical record as a proof that the treatment was delivered as planned. *In-vivo* dose measurements can detect errors that may not be possible to detect prior to the treatment. *In-vivo* dosimetry can be performed to detect errors for individual patients, evaluate the quality of a specific treatment and evaluate doses where the dose calculation is possibly inaccurate (e.g. total body irradiation or organs at risk) (Yorke *et al.,* 2005; Dam and Marinello, 2006; Essers and Mijnheer, 1999).

A study in Europe found that out of 10,300 patients monitored with *in-vivo* dosimetry, 120 treatments were detected to have errors in the delivered dose exceeding 5% of the prescribed dose (Yorke *et al.,* 2005). Major errors do occur and can cause dramatic consequences to individual patients, such as failure of tumor control or/and normal tissue complications. *In-vivo* dosimetry can be justified to prevent the severe consequences of such major errors. Given the importance of *in-vivo* dosimetry, the European Society for Therapeutic Radiology and Oncology (ESTRO) (Dam and Marinello, 2006) various institutes and agencies in the United Kingdom (RCR/SCOR/IPEM/NPSA/BIR, 2008) and the American Association of Physicists in Medicine (AAPM) (Yorke *et al.,* 2005) published guidelines and recommendations concerning the use of *in-vivo* dosimetry. Various European countries have made in-vivo dosimetry mandatory (RCR/SCOR/IPEM/NPSA/BIR, 2008). A successful *in-vivo* dosimetry program relies on the accuracy of the dosimetry system in use. Dosimetry systems must satisfy several requirements including stability, accuracy, robustness, reliability and practicability. To fulfill these requirements using the current dosimetry systems clinics need to implement a costly labor-intensive dosimetry program, which usually requires additional staff for implementation, maintenance (frequent calibration), measurements and evaluations (Yorke *et al.,* 2005; Dam and Marinello, 2006; Lanson *et al.,* 1999; Essers and Mijnheer, 1999; Mijnheer, 2008).

The objectives of this work is to perform a survey throughout the Canadian cancer clinics to assess: i) current use of *in-vivo* dosimetry and ii) major drawbacks faced by the clinics on the use of *in-vivo* dosimetry systems. The results of this survey will serve as a documentation of the current status of the practice of *in-vivo* dosimetry in Canada. Then, in the future such results will serve as a reference to assess further changes, developments and improvements in the field of *in-vivo* dosimetry in Canada.

Material and Methods

This survey closely follows the format of a survey published in the United Kingdom by Edwards *et al.* (An update survey of UK *in vivo* radiotherapy dosimetry practice. Br J Radiol., 80:1011-4, 2007) (Edwards *et al.,* 2007).

This survey was performed between July-September of 2010 using a free online survey system (KwikSurveys, http://www.kwiksurveys.com/).

The survey was sent to 39 cancer centers in Canada and it was composed of 16 questions including questions on the use of *in-vivo* dosimetry as well as demographics of the centers. Table 1 lists the questions that were included in the survey.

The Canadian Organization of Medical Physicists (COMP) distributed the survey to the chief medical physicist of each clinic.

Table 1: ***Questions from*** **in-vivo** ***dosimetry survey. IMRT: intensity modulated radiation therapy; TBI: total body irradiation; TSI: total skin irradiation; TLD: thermoluminescence detectors; MOSFET: metal-oxide semiconductor field-effect transistor; EPID: electronic portal imaging device.***

Question	Option
1. Your clinic's name and province.	N/A
2. Please specify how many permanent staff your department currently has.	Medical physicists Physics residents Physics assistants Dosimetrists Therapists Others (please specify)
3. Please specify which type of external beam treatments that are performed by your clinic. (Select all that apply)	Static fields IMRT TBI TSI Other (Please Specify)

(continue)

Table 1 ***(Continued)***

4. Does your department perform *in-vivo* dosimetry during external beam radiotherapy? If not, do you intend to start in-vivo dosimetry in the next 1-5 years? (go to question 16.)	Yes No	
5. If your department performs *in-vivo* dosimetry, please specify for each treatment modality the number of patients for which *in-vivo* measurements are performed per year.	Static fields IMRT Other (Please specify)	TBI TSI
6. For an individual patient, how often does your department perform *in-vivo* dosimetry?	Daily Weekly Once during the course of treatment Other (please specify)	
7. If your department performs *in-vivo* dosimetry, what type of measurements are performed? (Select all that apply)	Entrance dose Exit dose	
8. If your department performs *in-vivo* dosimetry, what type of dosimetry system do you use for your *in-vivo* dose measurements? (Select all that apply)	Diode TLD Diode and TLD (simultaneously) Others (please specify)	MOSFET EPID
9. When measuring *in-vivo* doses, do you apply any correction factors for change in the sensitivity of your detection system?	No Yes (please specify)	
10. If your department performs *in-vivo* dosimetry, what tolerance level do you use and why? (Tolerance level is the range of discrepancy between the expected and measured values beyond which clinical action must be taken)	N/A	
11. Does your department measure *in-vivo* critical organ doses outside the main treatment field? If not, do you intend to start *in-vivo* dosimetry in the next 1-5 years? (go to question 16.)	No Yes	
12. For an individual patient, how often does your department perform *in-vivo* critical organ dose measurements outside the main treatment field?	Daily Weekly Once during the course of treatment Other (please specify)	
13. If your department performs *in-vivo* critical organ dose measurements outside the main treatment field, what dosimetry system do you use? (Select all that apply)	Diode TLD Diode and TLD (simultaneously) MOSFET Other (please specify)	
14. When measuring *in-vivo* critical organ doses do you apply any correction factors for change in the sensitivity of your detection system?	No Yes (please specify)	
15. Please specify which personnel perform positioning and evaluation of the *in-vivo* dosimeters. (Select all that apply)	Medical physicist Physics resident Physics assistant	Dosimetrist Therapist
16. What are the major issues related to the implementation of an *in-vivo* dosimetry program in your department? (Select all that apply)	Equipment cost Overall cost Difficulty to implement Difficulty to use Difficulty to maintain Increased treatment time Increased physicist time Current detectors are unreliable Other (please specify)	

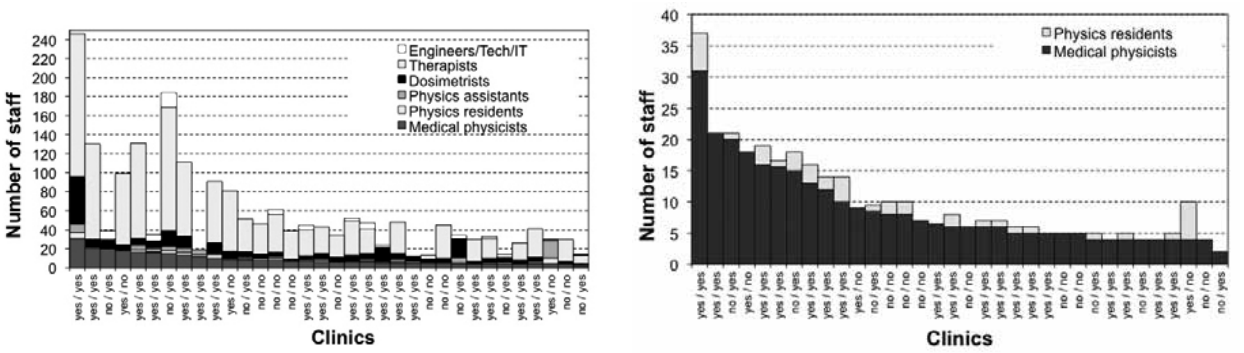


Figure 1: *Average number of staff with physics or engineer education and therapists that work in the Canadian cancer centers. The centers that measure* in-vivo *doses in-field and out-of-field have the label with "yes / yes", respectively. Top figure: the average total number of staff by category. Bottom figure: only medical physicists and physics residents.*

Results and Discussions

Out of 39 centers, a total of 34 centers completed the survey. Two centers did not complete the survey because they were new clinics and were not treating patients at the time they received the survey.

Figure 1 and Figure 2 show the demographics of the centers. The average number of medical physicists in the centers varied from 2 to 31. The average total number of staff per center with physics and engineering education as well as therapists varied from 12 up to over 240. The provinces of Ontario and Quebec have the largest average number of medical physicists and total staff followed by British Columbia and Alberta. Alberta has the largest average number of medical physicists per center. These data complements the results of a Canadian survey recently presented in this newsletter (Clark and Battista, 2011).

Figure 3 shows the external beam modalities in which the centers treat cancer patients. These data show that in Canada there is a very large spectrum of clinics in terms of average number of staff.

A total of 27 centers answered that they perform (to some extent) *in-vivo* dose measurements. From these 27 centers, 21 and 24 centers answered that they perform in-field and out-of-field *in-vivo* dose measurements, respectively. In Figure 1 we labeled with "yes / yes" the centers that measure *in-vivo* doses in-field and out-of-field, respectively. Figure 3 shows the treatment modalities in which *in-vivo* dosimetry are performed for. A total of 21 out of 34 centers perform in-field *in-vivo* dose measurements for static fields. From the 31 centers that treat using intensity modulated therapy (IMRT), 15 perform *in-vivo* dose measurements. For total body irradiation (TBI) treatments, 7 out of 9 centers perform *in-vivo* dose measurements and for total skin irradiation (TSI) treatments, 2 out of 3 centers.

Figure 4 shows how frequently the centers perform *in-vivo* dose measurements during the entire course of the treatment

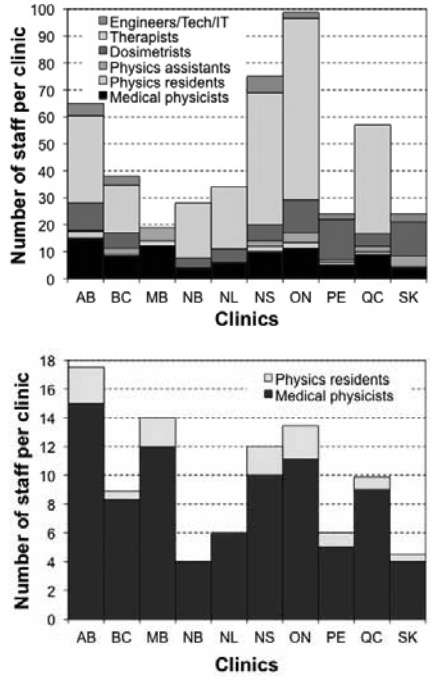


Figure 2: *Average number of staff per clinic. These data were obtained by dividing the average total number of staff from each province by the number of clinics.*

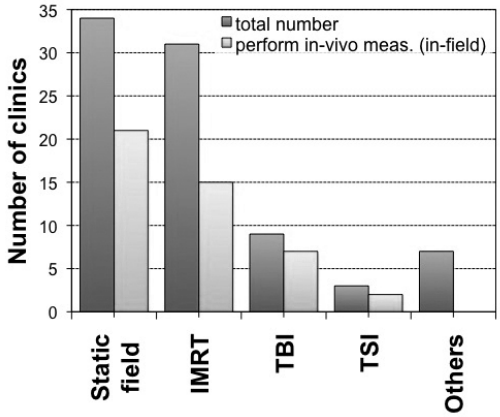


Figure 3: *External beam radiation therapy modalities in which centers measure in-field* in-vivo *doses.*

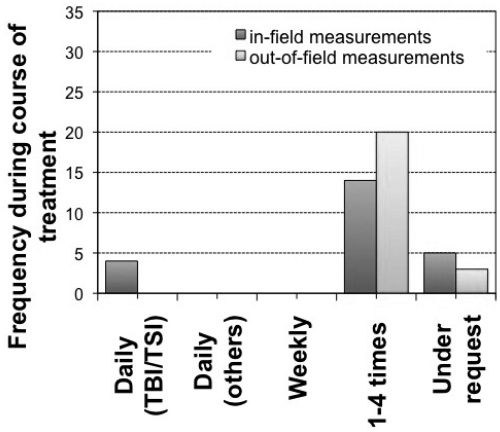


Figure 4: *Frequency that centers perform* in-vivo *dose measurements during the entire course of the treatment for an individual patient.*

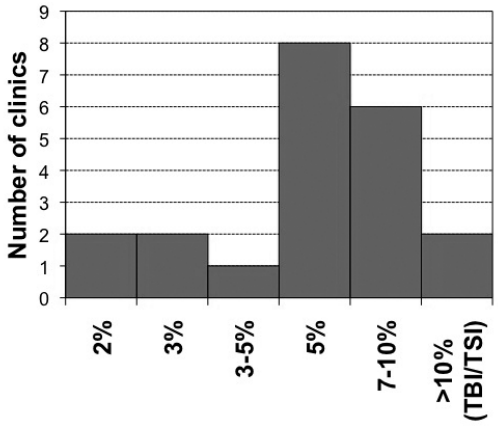


Figure 5: Tolerance levels that clinics apply in their in-vivo *dosimetry programs.*

for an individual patient. TBI and TSI treatments are the only treatments in which centers use *in-vivo* dosimetry on a daily basis. Most centers that have an *in-vivo* dosimetry program answered that they perform *in-vivo* dose measurements 1-4 times during the course of the treatment for individual patients. Some centers perform *in-vivo* dose measurements only for specific cases or under request by the radiation oncologist.

Figure 6 shows types of detectors that the clinics use for in-field and out-of-field *in-vivo* dose measurements. The majority of the centers use thermoluminescence dosimeters (TLDs) and metal-oxide semiconductor field-effect transistor (MOSFETs). Other types of detectors that are used in the centers include electronic portal imaging devices (EPIDs), ionization chambers (IC); and EBT gafchromic films.

Tolerance level is the range of discrepancy between the expected and measured values beyond which clinical action must be taken. The tolerance level depends on many factors including the accuracy of the detector, tumor site (e.g., consideration of motion) and accuracy of the dose calculation algorithm. Figure 5 shows the tolerance level (as reported by the centers) in which clinical action is taken in their *in-vivo* dosimetry programs. We point out, however, that a tolerance level below 2-3 % is very low for routine clinical use. This is because of limitations of the dosimetry systems.

Figure 8 shows the type of staff who performs most of the *in-vivo* dose measurements. In most centers (23 out of 27), the medical physicist is the one who performs the measurements. In an appreciable number of centers therapists and physics assistants also perform the measurements (14 and 13, respectively).

Figure 7 shows major drawbacks and difficulties involved in the use of *in-vivo* dosimetry as pointed out by the clinics. Increased treatment and staff time were the major difficulties involved in *in-vivo* dosimetry programs. The centers also pointed out that *in-vivo* dosimetry programs are difficult to use and implement. These indicate that there is a lack of documented guides, protocols and procedures for the use of *in-vivo* dosimetry.

Conclusions

We presented the results of a survey assessing the current status of *in-vivo* dosimetry in the Canadian cancer clinics. This survey was

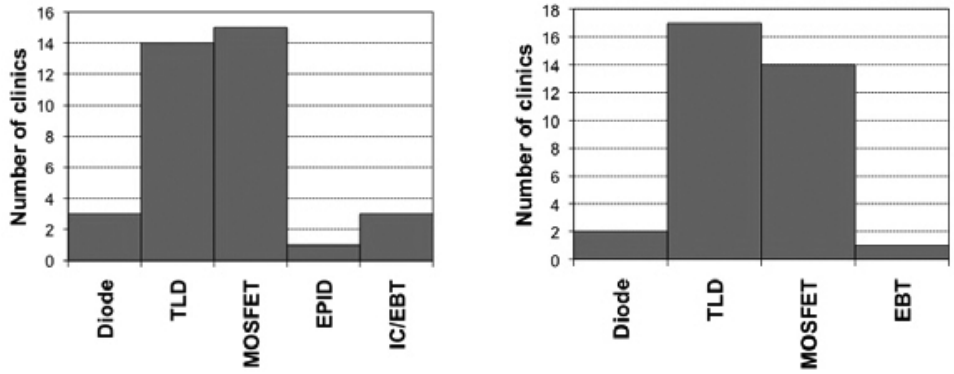


Figure 6: *Types of detectors that centers use for* in-vivo *dose measurements. Left side figure: in-field dose measurements. Right side figure: out-of-field dose measurements for organs at risk. TLD: thermoluminescence dosimeter; MOSFET: metal-oxide semiconductor field-effect transistor; EPID: electronic portal imaging device; IC: ionization chamber; EBT: gafchromic film.*

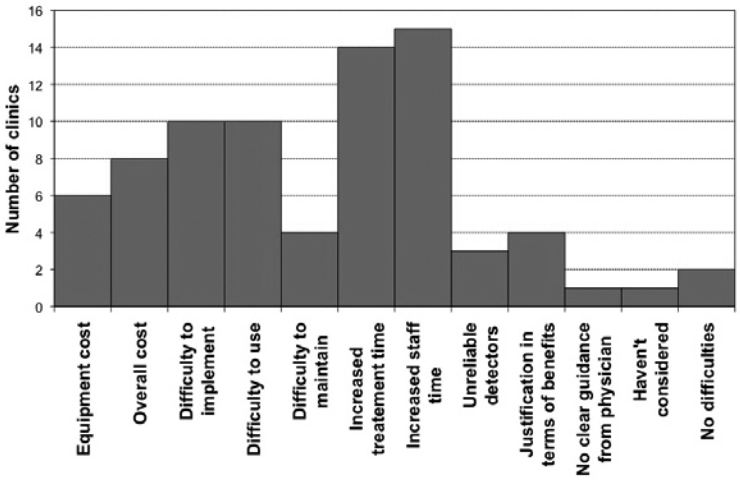


Figure 7: *Major drawbacks and difficulties that clinics pointed out on the use of in-vivo dosimetry.*

performed between July and September of 2010. The survey was composed of 16 questions covering the use of *in-vivo* dosimetry as well as demographics of the centers. A total of 34 out of 39 centers completed the survey showing that Canada has a broad range of centers in terms of average numbers of staff with physics and engineering education (12 up to over 240 staff). The results of the survey also showed that the provinces of Ontario and Nova Scotia have on the average the largest number staff per clinic (99 and 75, respectively). However, the province of Alberta and Manitoba have the largest average number of medical physicists per clinic (15 and 12, respectively). Most of the centers answered that they perform *in-vivo* dosimetry to some extent (27 out of 34). However, none of the centers perform daily or weekly *in-vivo* dose measurements for individual patients, except for TBI and TSI treatments. Most centers (14 out of 19) reported that they use a tolerance level of 5% or higher in their *in-vivo* dosimetry programs. In the majority of the centers the *in-vivo* dose measurement is performed by the medical physicist (23 out of 27). As pointed out by the centers, the major drawbacks and difficulties involved in the use of *in-vivo* dosimetry included increased treatment and staff time.

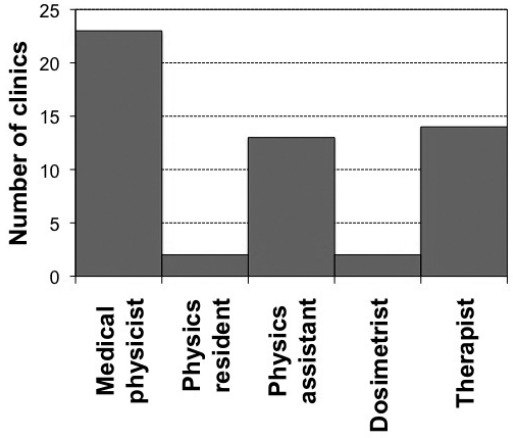


Figure 8: *Type of staff who performs the* in-vivo *dose measurements.*

Acknowledgements

The authors deeply appreciated the participation of the cancer clinics in this survey. We also thank the support from COMP. We thank Dr. J. E. Hayward from Juravinski Cancer Centre and Nancy Barrett and Gisele Kite from COMP for helping on the distribution of the survey through COMP. This work was partially supported by the Natural Sciences and Engineering Research Council of Canada.

References

Clark B G and Battista J J 2011 Canadian medical physics staffing for radiation therapy Interactions, *Canadian Medical Physics Newsletter* **57** 99-103

Dam J V and Marinello G 2006 Methods for in vivo dosimetry in external radiotherapy *European Society for Therapeutic Radiology and Oncology*

Edwards C R, E E H, Mountford P J and Moloney A J 2007 An update survey of UK *in vivo* radiotherapy dosimetry practice *Br. J. Radiol.* **80** 1011-4

Essers M and Mijnheer B J 1999 *In vivo* dosimetry during external photon beam radiotherapy *Int. J. Radiat. Onc. Biol. Phys.* **43** 245-59

Lanson J H, Essers M, Meijer G J, Minken A W H, Uiterwaal G J and Mijnheer B J 1999 *In vivo* dosimetry during conformal radiotherapy: Requirements for and findings of a routine procedure *Radiother. Oncol.* **52** 51-9

Mijnheer B J 2008 State of the art *in vivo* dosimetry *Radiat. Prot. Dosim.* **131** 117-22

RCR/SCOR/IPEM/NPSA/BIR 2008 Towards Safer Radiotherapy. (London: The Royal College of Radiologists)

Yorke E, Alecu R, Ding L, Fontenla D, Kalend A, Kaurin D, Masterson-McGary M E, Marinello G, Matzen T, Saini A, Shi J, Simon W, Zhu T C and Zhu X R 2005 Diode in vivo dosimetry for patients receiving external beam radiation therapy *AAPM Task Group #62 Radiation Therapy Committee*

CURRENT CORPORATE MEMBERS

Best Medical Canada

Phone: 1-877-668-6636
www.bestmedical.com

Contact: Linda Bols
lbols@teambest.com

CSP Medical

Phone: 1-800-265-3460
www.cspmedical.com

Contact: Steve Gensens
sg@cspmedical.com

Donaldson Marphil Medical Inc

Phone: 1-888-933-0383
www.donaldsonmarphil.com

Contact: M. Michel Donaldson
md@donaldsonmarphil.com

Elekta Canada

Phone: 770-670-2592
www.elekta.com

Contact: Doris AuBuchon
Doris.AuBuchon@elekta.com

Harpell Associates Inc.

Phone: 1-800-387-7168
www.harpell.ca

Contact: Ron Wallace
info@harpell.ca

IBA Dosimetry

Phone: 901-386-2242
www.iba-group.com

Contact: Chuck Lindley
chuck.lindley@iba-group.com

Landauer Inc

Phone: 708-755-7000
www.landauerinc.com

Contact: Amy Cosler
sales@landauerinc.com

LAP of America

Phone: 561-416-9250
www.lap-laser.com

Contact:: Trent Van Arkel
tava@lap-laser.com

Modus Medical Devices Inc

Phone: 519-438-2409
www.modusmed.com

Contact: John Miller
jmiller@modusmed.com

NELCO

Phone: 781-933-1940
www.nelcoworldwide.com

Contact: Amy Dragani
adragani@nelcoworldwide.com

Nucletron Corporation

Phone: 443-545-2207
www.nucletron.com

Contact: Victoria Younes
Vicki.younes@us.nucletron.com

Philips Healthcare

Phone: 1-877-744-5633
www.philips.com/healthcare

Contact: Leanne Buck
Leanne.Buck@philips.com

PTW

Phone: 516-827-3181
www.ptwny.com

Contact: Diana Borja
Diana@ptwny.com

Standard Imaging Inc

Phone: 1-800-261-4446
www.standardimaging.com

Contact: Ed Neumueller
ed@standardimaging.com

Sun Nuclear

Phone: 321-259-6862 ext 275
www.sunnuclear.com

Contact: Konstantin Zakaryan
konstantinzakaryan@sunnuclear.com

TomoTherapy Inc.

Phone: 608-824-2839
www.tomotherapy.com

Contact: Kristi McCarthy
kmccarthy@tomotherapy.com

Varian Medical Systems

Phone: 702-938-4748
www.varian.com

Contact: Lucy Huerta
lucy.huerta@varian.com

CALL FOR PAPERS

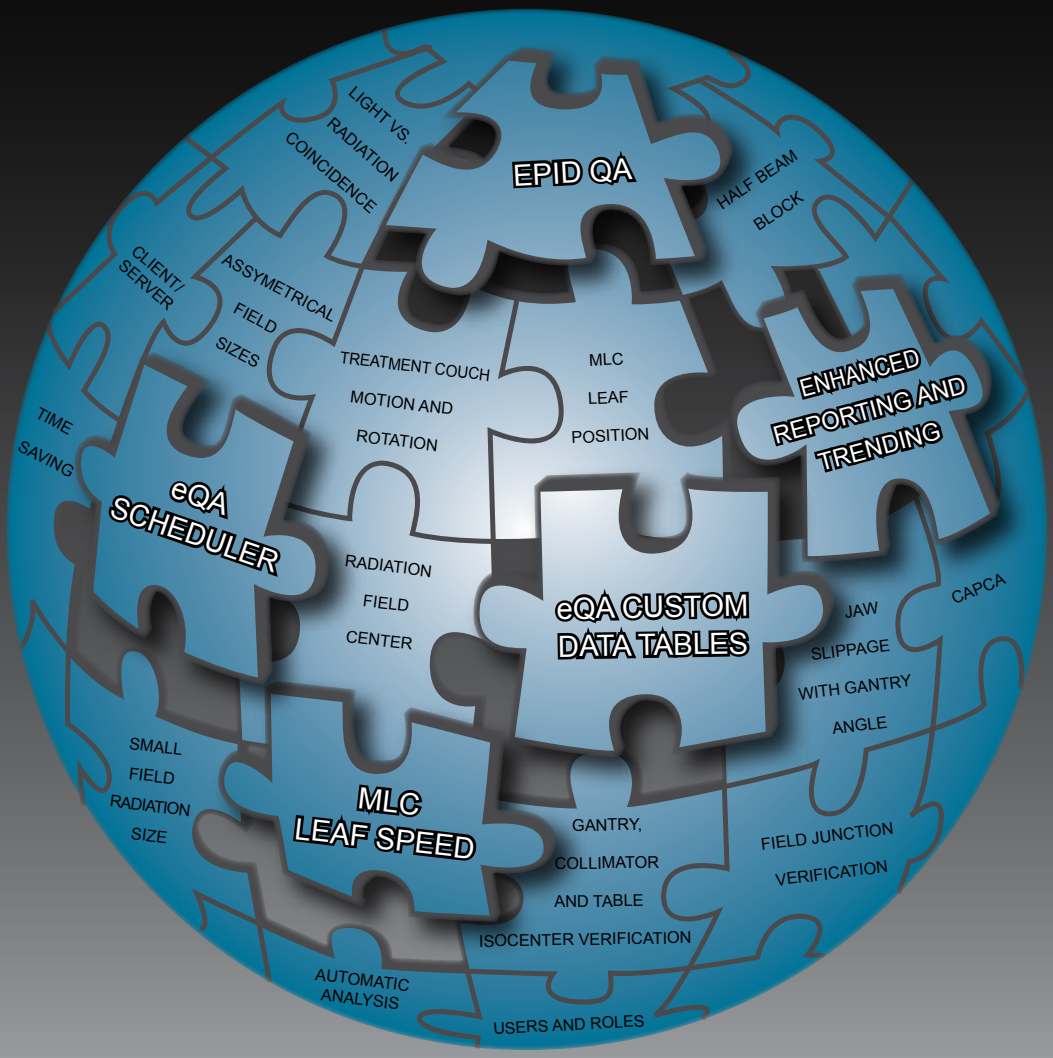
58TH ANNUAL SCIENTIFIC MEETING OF COMP

FEBRUARY 13TH, 2012	EARLY REGISTRATION BEGINS
FEBRUARY 13TH, 2012	ONLINE ABSTRACT SUBMISSION BEGINS
APRIL 1ST, 2012	END OF ABSTRACT SUBMISSION
APRIL 30TH, 2012	END OF EARLY REGISTRATION

DETAILS OF THE SUBMISSION PROCESS WILL BE AVAILABLE ONLINE JANUARY 16TH, 2012

eQA 2.0

AUTOMATE, SIMPLIFY AND NOW EXTEND YOUR LINAC QA



Call us at 1-866-862-9682
or visit us at www.modusmed.com

Sign up for a web demo

modusQA
Accuracy. Confidence.™

Hall-Of-Fame Papers in Canadian Medical Physics

Michael S. Patterson

Juravinski Cancer Centre and McMaster University, Hamilton, Ontario

Regular readers of *Interactions* will be familiar with my annual attempt to identify the Canadian medical physics paper that was published ten years previously and has been cited most often since. This exercise naturally raises the question: what are the most cited Canadian medical physics papers ever published? In answering this question I have applied the same rules as in my annual article. These are simple and similar to those established for the Sylvia Fedoruk Award: the work must have been performed mainly at a Canadian institution, only papers in peer-reviewed journals are considered, review or popular articles are not eligible, and the paper must be "medical physics" – for example, articles dealing with clinical application of a mature imaging technology are not included, even if medical physicists are co-authors. Data were obtained from the Web of Science on November 2, 2011. There are a number of interesting observations to be made about the ten papers in the hall-of-fame list below:

- Only one of them originates from the centre of the universe (Toronto).
- While a large range of subject matter is covered, six of the papers were published in Medical Physics.
- None of the papers won the Sylvia Fedoruk Award.
- None of the papers was written by a COMP gold medalist, but one was co-authored by an Olympic gold medalist.
- Four of the papers have the term "Monte Carlo" in the title.
- I estimate the number of Canadian medical physics papers published at about 10,000, so each of these is in the top 0.1 %.
- Most of the authors are well-known medical physicists – special recognition goes to Brian Wilson whose name appears not once, not twice, but three times in the hall-of-fame.

And here is the list of the top ten …

Title: AUTOMATIC 3D INTERSUBJECT REGISTRATION OF MR VOLUMETRIC DATA IN STANDARDIZED TALAIRACH SPACE
Author(s): COLLINS DL; NEELIN P; PETERS TM; et al.
Source: JOURNAL OF COMPUTER ASSISTED TOMOGRAPHY Volume: 18 Issue: 2 Pages: 192-205 Published: MAR-APR 1994
Times Cited: 1,395 (from All Databases)

Title: TIME RESOLVED REFLECTANCE AND TRANSMITTANCE FOR THE NONINVASIVE MEASUREMENT OF TISSUE OPTICAL-PROPERTIES
Author(s): PATTERSON MS; CHANCE B; WILSON BC
Source: APPLIED OPTIC Volume: 28 Issue: 12 Pages: 2331-2336 Published: JUN 15 1989
Times Cited: 1,129 (from All Databases)

Title: BEAM - A MONTE-CARLO CODE TO SIMULATE RADIOTHERAPY TREATMENT UNITS
Author(s): ROGERS DWO; FADDEGON BA; DING GX; et al.
Source: MEDICAL PHYSICS Volume: 22 Issue: 5 Pages: 503-524 DOI: 10.1118/1.597552 Published: MAY 1995
Times Cited: 690 (from All Databases)

Title: A DIFFUSION-THEORY MODEL OF SPATIALLY RESOLVED, STEADY-STATE DIFFUSE REFLECTANCE FOR THE NONINVASIVE DETERMINATION OF TISSUE OPTICAL-PROPERTIES IN VIVO
Author(s): FARRELL TJ; PATTERSON MS; WILSON B
Source: MEDICAL PHYSICS Volume: 19 Issue: 4 Pages: 879-888 DOI: 10.1118/1.596777 Published: JUL-AUG 1992
Times Cited: 568 (from All Databases)

Title: MEASUREMENT OF SIGNAL INTENSITIES IN THE PRESENCE OF NOISE IN MR IMAGES
Author(s): HENKELMAN RM
Source: MEDICAL PHYSICS Volume: 12 Issue: 2 Pages: 232-233 DOI: 10.1118/1.595711 Published: 1985
Times Cited: 490 (from All Databases)

Title: PRESTA - THE PARAMETER REDUCED ELECTRON-STEP TRANSPORT ALGORITHM FOR ELECTRON MONTE-CARLO TRANSPORT
Author(s): BIELAJEW AF; ROGERS DWO
Source: NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B-BEAM INTERACTIONS WITH MATERIALS AND ATOMS Volume: 18 Issue: 2 Pages: 165-181 Published: JAN 1987
Times Cited: 399 (from All Databases)

Title: AUTOMATIC 3-D MODEL-BASED NEUROANATOMICAL SEGMENTATION
Author(s): Collins DL; Holmes CJ; Peters TM; et al.
Source: HUMAN BRAIN MAPPING Volume: 3 Issue: 3 Pages: 190-208 DOI: 10.1002/hbm.460030304 Published: 1995
Times Cited: 356 (from All Databases)

Title: ACCURATE CONDENSED HISTORY MONTE CARLO SIMULATION OF ELECTRON TRANSPORT. I. EGSNRC, THE NEW EGS4 VERSION
Author(s): Kawrakow I
Source: MEDICAL PHYSICS Volume: 27 Issue: 3 Pages: 485-498 DOI: 10.1118/1.598917 Published: MAR 2000
Times Cited: 353 (from All Databases)

Title: A MONTE-CARLO MODEL FOR THE ABSORPTION AND FLUX DISTRIBUTIONS OF LIGHT IN TISSUE
Author(s): WILSON BC; ADAM G
Source: MEDICAL PHYSICS Volume: 10 Issue: 6 Pages: 824-830 DOI: 10.1118/1.595361 Published: 1983
Times Cited: 351 (from All Databases)

Title: A CONVOLUTION METHOD OF CALCULATING DOSE FOR 15-MV X-RAYS
Author(s): MACKIE TR; SCRIMGER JW; BATTISTA JJ
Source: MEDICAL PHYSICS Volume: 12 Issue: 2 Pages: 188-196 DOI: 10.1118/1.595774 Published: 1985
Times Cited: 340 (from All Databases)

Social Media and COMP[1]

Parminder S. Basran, PhD FCCPM

BC Cancer Agency –
Vancouver Island Centre

If it isn't you staring at your smart-phone at the dinner table, it is probably your kids. And if they're not texting what they're eating to a friend, they're probably checking out what their friend is eating through Facebook. Today, social networking accounts for over 1/5 of all time spent online in the US.[2] Facebook seems to be taking up the share of it.[3] But it is not just kids. More businesses are using social network sites for establishing market presence. I thought it helpful to put some of all this social media stuff into some perspective. The purpose of this article is to provide a broad overview in the use of Social Media and, hopefully, make some connections with our Medical Physics community.

Before Social Media

Shortly after the demise of the dinosaurs, Marshall McLuhan, a Canadian and University of Toronto professor, published his best-selling "Understanding Media: The Extensions of Man" (1964). McLuhan argues that the medium of content is just as important, if not more, than the content itself: **The medium is the message.** However, a few years earlier, McLuhan speculated on the future surge of 'electronic interdependence' which would replace standard methods of visual communication. Further, this interdependence would foster a different type of social organization, which he coined as a **'global village'.** These words seem prophetic particularly since he could not have possibly conceived of smart-phones, Web 2.0 or iPads in the 60s. There can be no greater embodiment of 'electronic interdependence' than the presence and utility of 'social media' today.

Definition of social media:

Broadly speaking, social media is social interaction through the creation and exchange of user-generated content, now possible with web-based and mobile technologies. It is not simply *communication,* but social *interaction* between individuals, communities, and (relevant here) organizations. The "medium" depends on both hardware and software, and thus it can take on different forms.

Early forms of social media

The earliest methods of exchanging user-generated content predated the world-wide web, principally via newsgroups and document retrieval applications like Gopher. Later, electronic mailing-list applications (ex: listserv) became popular and continues with heavy usage in medical physics via medphys@lists.wayne.edu and listserv@hermes.gwu.edu (latter for diagnostic imaging exclusively). Having ready access to e-mail, medical physicists have been early and aggressive adopters of listserv groups, creating our own little 'village'. But while e-mail groups provide an opportunity for *communication,* they do not easily provide a forum for *interaction.* Ideas and commentary can be easily exchanged through text, but sharing and interacting with data or applications is more challenging. Having said this, it is also fair to say that physicists have been early adopters of *data* communication and interaction. It were physicists at CERN (and not Al Gore) who created the internet after-all.[4] But getting back to the topic, over the last several years, new web-based tools have really expanded, permitting a much broader level of information sharing.

Web 2.0

To function, social media types, or applications, need newer web-based technologies. The phrase Web 2.0 expresses the modern era of the world-wide web (I'm not sure whether Web 2.1 has, or is about to, begin) which builds applications that facilitate information sharing, collaboration between users, while permitting users create and design their interfacing and content. The idea here is

[1] I was going to call this article "Twitter-Shmitter" or "Facebook-Smaishbook", but that would sound too cynical.

[2] See http://blog.nielsen.com/nielsenwire/global/social-media-accounts-for-22-percent-of-time-online/

[3] See http://www.socialnomics.net/2011/08/16/social-network-users-statistics/

[4] One of my favourite pictures of all time is here: http://en.wikipedia.org/wiki/File:First_Web_Server.jpg . (OK, I'm a nerd).

to shift web-development from simply 'content' to 'collaboration' and permit easy exchange of content. Characteristics of Web 2.0 include interactive data, an emphasis on standardization, scalability, and a more enhanced user-experience. This is permitted by more sophisticated web technologies and programming, such as JavaScript/Java, XML, Adobe Flash and most recently, HTML5. An important feature of Web2.0 is that the web-based applications themselves become content-generating: in essence, the social medium which holds the content can become content itself (sound familiar?). A nice feature of Web2.0 is the development of RSS feeds, which is a simple and standardized way for users to syndicate content automatically. A website can broadcast an RSS feed which can then be read by software (an RSS reader, aggregator). The software can be web-based, desktop based or even mobile-based, which provides a unparalleled accessibility. An RSS feed button looks like this: 

Social Media

The anatomy of a given social media type is varied and specifically tailored for the type's application. Social media types can be broadly classified as 1) collaborative projects (Wikipedia, Google Docs), 2) blogs and micro-blogs (Blogger, Twitter), 3) content communities (YouTube, SoundCloud); 4) social networking sites (Facebook, LinkedIn). Let us look at some of these in more detail.

Social Media Types

1) Collaborative projects

There are a variety of collaborative tools with various scopes. Broadly speaking, these tools can be categorized as follows, but many listed below serve multiple functions.

- group communication;
- private social networking platforms (ex: GoogleGroups, Yahoo Groups);
- document sharing/wikis (GoogleDocs/Sites, MS SharePoint, file sharing (Dropbox, youSendIt);
- more sophisticated group / team collaboration workspaces; web presenting and multimedia presentation; electronic whiteboards (Google Drawings, Twiddla);
- co-browsing (Twiddla);
- virtual 3D collaboration tools; webinars (WebEx, Microsoft Live Meeting); web conferencing (WebEx, Microsoft Live Meeting);
- screen sharing/remote control; voice over internet conferencing, or VOIP (Skype);
- instant messaging (AOL IM, Yahoo Messenger, Google Chat/ Video) ;
- internet chat (TinyChat, Google Wave);
- video conferencing;
- event scheduling (Doodle, GCalendar); project management (project.net);
- collaborative writing (Buzzword);
- collaborative visual viewing; mind-mapping/diagramming (Pimki).

2) Blogging and micro-blogging

Blogging, or web-logging, is essentially an electronic journal. Many websites now offer free web space, or hosting, and also assist in creating, designing, and publishing blogs. Features such as templates and traffic monitoring have made it extremely easy for novices to start blogging. Some of the more popular blog sites include Blogger and WordPress. Such sites make it easy to not only write blog-posts, but opportunities to insert links, tags, images and other multimedia, as well comments, questionnaires and other forms of feedback. And best of all, you can do a lot for free.

Micro-blogging is blogging but at a much faster and succinct pace. Micro-blogging sites such as Tumblr have become increasingly popular, by providing a space to record short messages, typically through another social media site, such as Facebook or Twitter. The benefits of micro-blogging is that it permits flexibility for users to generate and easily display content unrestrictive of length and complexity. Sometimes, a picture is worth a thousand words – sometimes, not.

3) Content Communities

Content communities are essentially web sites that permit users to upload or share content. Readers may be familiar with YouTube, Vimeo and Soundcloud which permit users to share video and audio. Note that copyright infringements may come into play here. Other types of content communities include software applications, programs, mobile applications, many of which are open-source. There are large libraries of publically-contributed materials, such as presentation, electronic Books and Magazines (CreativeCommons, SlideShare to name a few). In many ways, physicists are well-accustomed to the idea of creating sharing spaces. Perhaps one of the largest content communities is Wikipedia, an encyclopaedic site that exploits many features of Web2.0.

4) Social networking sites

Social networking refers to collating and building social relations or networks among individuals who share a common interest, activity or circumstance. Social networking sites permit individuals to share personal or professional interests, ideas, and/or activities to a community of similar interests, ideas and/or activities. These sites permit the opportunity to engage in dialogue within their network, share content and links. Because only an internet connection is required, they can provide a means of communicate in lieu of traditional methods such as mail, phone, and even email.

These sites can be loosely categorized as personal and professional social networking sites, which constitute the bulk of the 'hype' over social media. Sites like Facebook and LinkedIn remain two of the more popular social networking sites that have persisted

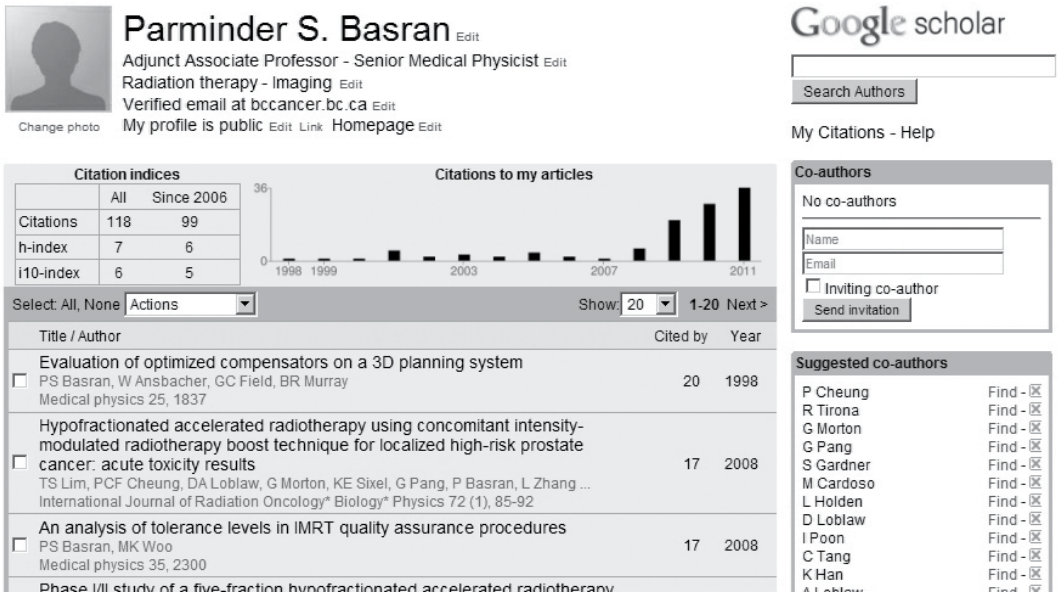


Figure 1: *Setting up this Google Scholar page took me about 30 minutes after I set up my Google Account. The page can be public or private. I've currently placed mine as public for now. You can access the page here: http://scholar.google.ca/citations?user=FsILf4UAAAAJ&hl=en*

the (often troublesome) first several years of existence. There are some social networking sites which provide opportunities for both personal and professional networks (ex: Google+); social networking sites such as Facebook and LinkedIn are now finding ways to organize various types of relationships (personal, academic or professional) within their sites.

With respect to COMP, there are a variety of social network sites that center on academics, research, and teaching. Sites such as academia.edu provide access shared manuscripts and data in addition to the community itself. Some academic sites provide bibliographic and citation tools, shared access to imported papers which can be helpful for collaborative research (ex: Mendeley). Finally, there are many social media teaching sites that can assist new teachers in creating and sharing teaching plans, projects, as well as discussion boards and access to articles (see teachers.net and LinkedIn for example). Google recently created a powerful scholar tool -Google Scholar- which, after obtaining a Gmail account, can easily build an academic webpage (See Figure 1). In many ways, this tool is more powerful than many of the traditional search engines commonly used in academic libraries.

Social Media and the Workplace

There certainly is no shortage of tools and sites that could be used at the workplace. In fact, some social media sites, such as Wikipedia, have become helpful (but sometimes deceptive)[5] tools in our everyday work. However, while there may be advantages for using such technologies, access can become an issue. Some institutions do not permit access to common social media sites, such as Facebook, YouTube, whereas others might permit -and even encourage- the use of social media types in the workplace.

Social media and the workplace can be a particularly touchy when patient-confidentiality is a concern. Such topics are becoming relevant in our profession, as indicated with a dedicated session at the ASTRO2011 AGM[6] focusing on the use of social media in medicine. Panel members suggested that, in general, it is *not* a good idea to 'Friend' a patient, and certainly *not* a good idea to tweet or post any information that could possibly identify a patient (common sense you would think). Clearly, institutions must develop clear policy statements on the use of social media at the workplace. Examples of good social media practices would include:

- the expectation for employees to use good judgement if accessing and using social media websites;
- statements that existing institutional policies remain in force (ex: harassment) if using such sites for work-related activities;
- non-disclosure of confidential, proprietary or business information, including photographs of co-workers;
- prohibitions against defamatory comments to the institution, it's employees or patients;

Social Media and Medical Physics

AAPM has been actively pursuing the use of social networks for communicating with their membership for several years. This has

[5]See, for example, my Editorial, **COMP Archives to Wikipedia to Bobo the Ninja,** InterACTIONS 53(4) 2007, pg 132

[6]See Educational Session 312, http://www.astro.org/Meetings-and-Events/2011-Annual-Meeting/Meeting-Program/Schedule-of-Events.aspx?eventID=12345

been done by establishing, promoting, and using social media types such as Facebook, Twitter, and LinkedIn, and also RSS (Really Simple Syndication) for broadcasting data to their membership from their website.

These methods provide efficient ways for AAPM members to stay up to date with AAPM related issues as well as job-postings, conference announcements, etc. Since 2006 the AAPM has used (albeit sparingly), an electronic bulletin board system which consists of a number of discussion forums with user-specific threads for communicating messages. But similar to the medphys listserv collaborative tools are minimal.

Similar professional organizations such as @ASTRO_org, @RSNA, @SNM_MI are also embracing the use of social networks and media by promoting Twitter, Facebook and LinkedIn accounts.

One attempt to provide data sharing and collaboration is through a non-AAPM sponsored website www.medphysfiles.com. This website permits users to access and download files submitted by other physicists, for the purpose of supplementing existing medical physics resources. It contains software, images, and a large number of useful documents. The website permits users to write reviews of uploaded content. See Figure 2 for a snapshot of medphysfiles.com along with arrows describing features.

Software and hardware manufacturers are constantly seeking ways to engage existing and potential users through user-group communities and expanded their presence on social networks and internet sites. Sites like www.auntminnie.com, and medicalphysicsweb.org have embraced social media by providing RSS and Twitter feeds, as well as providing educational, forums, and career placement tools on their websites.

What's next for COMP?

Trends in social media are fast, fleeting and sometimes ruthless. Because of this, non-profit organizations, like COMP, who largely rely on volunteers, can struggle with staying relevant. There are a few important features that such organizations -including COMP- should strive for. First, COMP should ensure that deployment of any social media *expands* its reach within our members. Social media provides a unique opportunity for communicating, different from traditional 'top-down' hierarchy. Second, we should be improving upon our accessibility within and outside our membership. This should be relatively easy to achieve given many of the social tools available are free or of little cost. Furthermore, very little skill is required to *participate* in these types of activities; however, the same may not be true for its *administration.* Third, we should be exploiting these tools for providing time-sensitive material for the general public and our membership. Clearly, this would need to be developed alongside current COMP communication strategies. Finally, we should be using social media as a means for evolving our practice through, for example, evolving documents or discussion. Whereas conventional media is generally a uniquely defined one with a date/stamp/signature, it does not need to be with these new social media tools. The use of web-based collaborative tools should greatly facilitate the generation and evolution of working documents relevant for the COMP membership.

As for the future, Medical Physicists are certainly not equipped to foretell what social media type will win, loose, rise to the top, or become a standard operating tool (flipping a coin is likely more accurate than words from social media pundits … or economic forecasting for that matter). All we really should be doing is listen

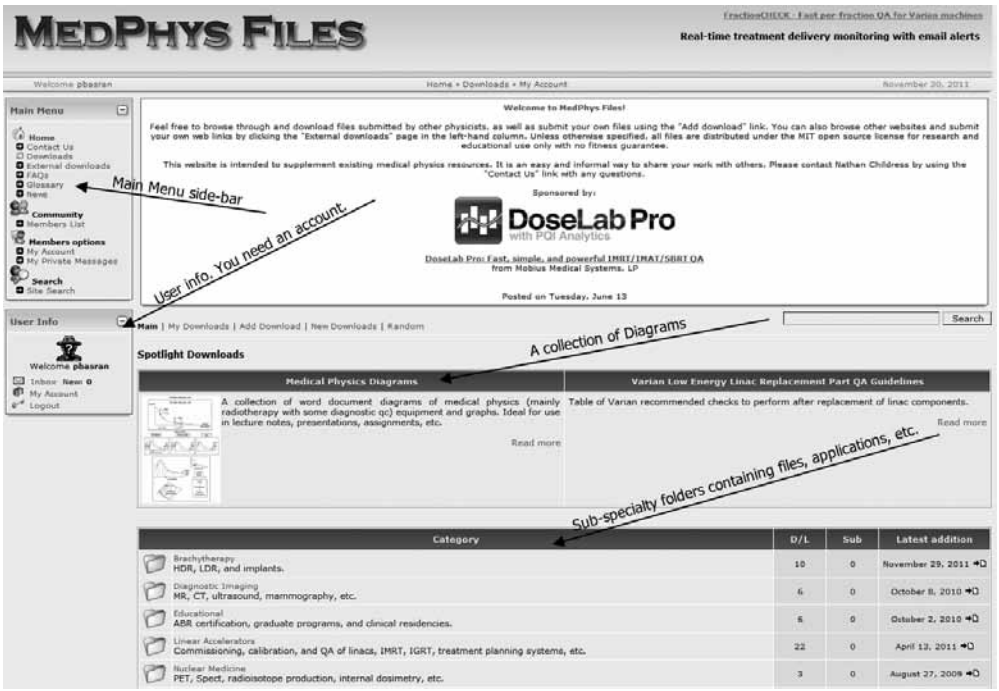


Figure 2: *Screenshot of medphysfiles.org. See arrows on the figure for various descriptions.*

to our members and do the best we can with what we've got. With the support of the communications committee, COMP is striving to ensure that membership is relevant and accessible.

COMP is always striving to improve communication between COMP members, executive, and administration. Social media is one of many powerful tools we can use to improve and facilitate this dialog. Therefore, COMP is excited to announce, formally, presence on Twitter, Facebook and LinkedIn.

COMP's new Forum and Twitter

COMP is always striving to ensure our membership is engaged with COMP activities. Over the several months, COMP will be exploring the use of social media and other web-based technologies to improve our communication within and outside our membership. Stay tuned for more on the website and in future editions of Interactions.

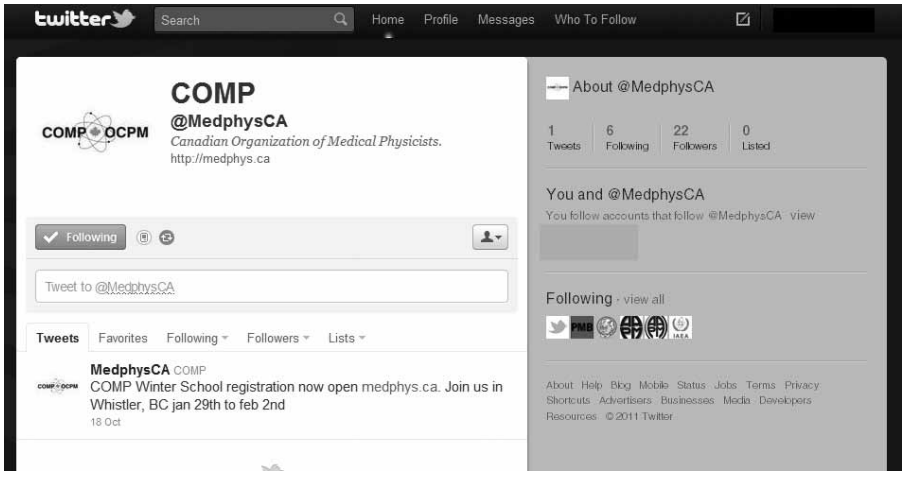
COMP's Medical Physics Forum

COMP is pleased to announce a new forum available for COMP membership only. Login with your COMP login/password, and you will see yourself "Logged In As:" and then find Forum. Click on it and you will see several new Forums created exclusively for the COMP membership (see above). Just click on the View button and you can start accessing the forums. At the moment, the are organized as shown, but can be changed or modified. Give it a try and tell us (the communications committee) what you think!.

twitter

@medphysca http://twitter.com/#!/MedphysCA

Twitter is a social networking and micro-blogging service that permits users to read and send small text postings (tweets) no longer than 140 characters. Think of Twitter as text messaging except anyone can read your tweets (and fortunately, you can delete your own tweets!). In order to view and respond to tweets, you need to create an account (called a handle) at twitter.com. Once you've created a handle, then search twitter.com for COMP's twitter handle, @medphysca , and start 'following'. Twitter is great for communicating information rapidly, but not practical for protracted discussions. You can access your twitter account with standard web-browsers or mobile applications. For more information on how to use twitter, see http://twitter.com/about. Other interesting handles: @aapmHQ , @iaeaorg , @aapmEnews



BOARD MEMBERS NEEDED
CALL FOR NOMINATIONS

A number of Board positions are coming up for open nominations. This is a great opportunity to help shape the future of Medical Physics in Canada.

This year we have a wide range of positions opening up: **President, Councillor for Communications, Councillor for Science and Education, and Councillor for Quality Assurance and Radiation Safety Advisory**. A brief description of each is listed below.

Nomination forms are available on the COMP website at www.medphys.ca

NOTE: Nominations must be made by two (2) COMP members and signed by the nominee.

PRESIDENT (6-YEAR TERM)

- This is a three-part job – *President-Elect, President, and Past-President* – with each part lasting 2 years (6 year total term).
- *The terms run from 2012-2014 (Pres-Elect), 2014-2016 (Pres), and 2016-2018 (Past-Pres).*
- Job description can be found at https://www.medphys.ca/media.php?mid=2737

COUNCILLOR FOR COMMUNICATIONS (3-YEAR TERM)

- Chairs the Communications Committee and is ultimately responsible for the newsletter, website, publications and all matters falling within the terms of reference of the Communications Committee.
- *The term runs from 2012 to 2015*.
- Terms of Reference for committee are at https://www.medphys.ca/media.php?mid=2046

COUNCILLOR FOR SCIENCE AND EDUCATION (4-YEAR TERM)

- Chairs the Science and Education Committee and will be responsible for ensuring that the committee carries out its mandate. S(he) should advise, counsel and report matters relating its mandate to the other Board Members.
- *The term runs from 2012 to 2016.*
- Terms of Reference for committee are at https://www.medphys.ca/media.php?mid=2094

COUNCILLOR FOR QUALITY ASSURANCE AND RADIATION SAFETY ADVISORY (4-YEAR TERM)

- Chairs the Quality Assurance and Radiation Safety Advisory Committee and will be responsible for ensuring that the committee carries out its mandate. S(he) should advise, counsel and report matters relating its mandate to the other Board Members.
- *The term runs from 2012 to 2016.*
- Terms of Reference for committee are at https://www.medphys.ca/media.php?mid=2092

Nominations close FEBRUARY 28th, 2012

All terms begin and end at the Annual General Meeting of any given year.

Point/Counterpoint

Marco Carlone, PhD, MCCPM
Department of Medical Physics, Princess Margaret Hospital, Toronto, Ontario
Tel: 416-946-4501 x. 2409;
e-mail: marco.carlone@rmp.uhnn.on.ca

Joseph E. Hayward, PhD, MCCPM
Department of Medical Physics, Juravinski Cancer Centre, Hamilton, Ontario
Tel: 905-387-9711 x. 67040;
e-mail: joe.hayward@jcc.hhsc.ca

Moderator: Peter L. McGhee, PhD, FCCPM

Marco Carlone

Joseph E. Hayward

Proposition

COMP had a responsibility to participate in the Joint Engineering and Natural Science Task Force and the development of a recommended process for arbitration of disagreements that may arise as a result of removal of the natural sciences exemption clause in the Ontario Professional Engineers Act.

Background

Numerous jurisdictions within Canada have purview over a variety of legislation that can impact the ability of properly qualified natural scientists to practice in their identified field of competency. Legislation that restricts the activities associated with such practice to those with specific competencies is introduced with excellent intentions, one common example being protection of the public. The challenge is to establish required evidence of competency that will not permit individuals lacking sufficient qualification to practice in a given field without inadvertently denying the privilege to those who are in fact appropriately qualified.

To be more specific, a recent example is a situation that arose with Bill 68 of the Government of Ontario. With the passing of the Bill and Royal Assent to the Professional Engineers Act on October 25, 2010, the words "but does not include practising as a natural scientist", which existed in the previous 1984 version of the Act, were removed from the definition of the practice of professional engineering. A number of national professional organizations representing natural scientists then approached Professional Engineers Ontario (PEO) to express concern with respect to the deletion of the explicit exemption. The result was the creation of a Joint Engineering and Natural Science Task Force that had a mandate "to establish a means to achieve the intent of the Engineers Canada 1996 companion clause and report recommendations to PEO Council at its February 2011 meeting." Explicitly, that companion clause states "... engineering Acts in Canada should not unintentionally restrict the practice of natural science while at the same time ensuring that engineering is practiced by qualified individuals." While COMP was in fact a participant on this task force, there is ongoing discussion with regard to whether this was indeed appropriate. Given that COMP should always act in the best interests of the profession of medical physics in Canada, there is clearly value in examining this particular instance more closely and, hence, the proposition to be debated.

Arguing for the proposition is Joseph E. Hayward. Dr. Hayward obtained his B.Eng. in Engineering Physics from McMaster University in 1984, specializing in Lasers and Electro-optics. After working as a Member of Technical Staff at Bell-Northern Research for two years, he returned to McMaster University and obtained, in 1993, his Ph.D. in Engineering Physics. Dr. Hayward is currently a medical physicist at the Juravinski Cancer Centre in Hamilton, Ontario, and a Member of the Canadian College of Physicists in Medicine. He is an Associate Professor in Radiology and Medical Physics & Applied Radiation Sciences as well as an Associate Member of Engineering Physics and Biomedical Engineering at McMaster University. Dr. Hayward has been a member of the Professional Affairs Committee of COMP since 2004 and was the Councillor for Professional Affairs from 2007 to 2010.

Arguing against the proposition is Marco Carlone, Ph.D. Dr. Carlone holds a B.Sc. Eng. in Engineering Physics, and an M.Sc. and a Ph.D. in Medical Physics. He also continues to maintain his Engineering license, first obtained in 1995, which, for eight years prior to entering the field of Medical Physics, allowed him to practice engineering in Ontario while working in industry. In addition to his responsibilities as a Medical Physicist at the Princess Margaret Hospital, he also leads the quality assurance and linear accelerator service group at the Credit Valley Hospital located in nearby Mississauga. He is currently the COMP Councillor for Science and Education and is on the editorial board of the Journal of Applied Clinical Medical Physics. He has diverse research interests, including clinical radiobiology, quality management, and linear accelerator – MRI integration.

Opening Statement For the Proposition: Joseph E. Hayward, PhD, MCCPM

To provide the proper context for this discussion, it is important to realize that the Professional Engineers Act of Ontario currently defines the "practice of professional engineering" as "any act of planning, designing, composing, evaluating, advising, reporting, directing or supervising that requires the application of engineering principles and concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment, or the managing of any such act". Unfortunately, "engineering principles" are never defined in the legislation. Hence, without a natural science exclusion clause, it is left up to the PEO Council and ultimately the courts to determine whether or not a practitioner is using engineering principles and thus practicing engineering without a license.

> **12. (1) No person shall engage in the practice of professional engineering or hold himself, herself or itself out as engaging in the practice of professional engineering unless the person is the holder of a licence, a temporary licence, a provisional licence or a limited licence. R.S.O. 1990, c. P.28, s. 12 (1); 2001, c. 9, Sched. B, s. 11 (16).**

In addition, the legislation is quite clear as to the consequences of practicing professional engineering without a licence:

> **40. (1) Every person who contravenes section 12 is guilty of an offence and on conviction is liable for the first offence to a fine of not more than $25,000 and for each subsequent offence to a fine of not more than $50,000. R.S.O. 1990, c. P.28, s. 40 (1).**

Since a number of us are in fact engineers, we are well aware that there is potentially much overlap between engineering principles and the principles of natural science. Some, including myself, would go so far as to say that engineering principles are a subset of the principles of natural science.

Given this unfortunate definition and the resultant penalties that can be imposed if the law is deemed broken, the natural science community in general and the medical physics community in particular are left with an uneasy feeling regarding possible interpretation of the law. In particular, medical physicists are, or should be, concerned about the wording of the act since the definition of professional engineering "concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment, or the managing of any such act."

Most of us, regardless of medical physics discipline, are intimately tied to the health care setting and thus the natural science principles that we use in our day-to-day working lives often directly impact life, health, the public welfare and the environment.

Since there are obviously many instances where there is potential overlap of "engineering principles" and the practice of medical physics, COMP must advocate for its membership and participate as actively as possible in any discussion which would have impact on its members. Clearly, removal of the exemption clause is a glaring example.

I would also like to argue that COMP has a responsibility to the greater natural science community to assume a leadership role in discussions with engineers. COMP members are uniquely positioned to offer advice to other natural science organizations whose members affect the public welfare in their professions. Canadian medical physicists have a comprehensive credentialing process through membership in the CCPM (including 5 year mandatory recertification) as well as Code of Ethics and Scope of Practice documents. Hence, COMP can be seen as a leader to those societies thinking of initiating credentialing processes for their members. A lack of participation in these important issues is an insular stance.

Finally, one needs only to look at the plethora of programs available to graduates at Canadian universities to realize that the demarcation between fields is becoming increasingly blurred. At McMaster University, for instance, one can take courses in Medical Physics, Biomedical Engineering, Biomedical Sciences, Computational Engineering & Science and Medical Visualization to name just a few. Many of these courses cover similar material. As one looks into the future and areas such as nanotechnology, it is difficult to know what the medical physics profession will look like in say 20 years. I choose 20 years because this is the period between the last set of substantive changes in the Professional Engineers Act of Ontario. COMP has a responsibility to look strategically to the future of the medical physics profession and engage in any process that ensures that medical physicists can practice without the fear of potential litigation now and into the future.

Opening Statement Against the Proposition: Marco Carlone, PhD, MCCPM

Recently, the Ontario Legislature passed Bill 68, which updated many laws in Ontario. One of the laws updated was the Professional Engineers Act, where the definition of Engineering was updated and no longer includes an exemption for "natural sciences." The COMP Professional Affairs Committee has been involved in a public consultation process that advocates for the interests of natural scientists given this new legislation. This process involves sitting on the Joint Engineering and Natural Science Task Force (re http://www.medphys.ca/announce.php?annon=51.) I do not believe that COMP should involve itself in the Ontario Joint Engineering and Natural Science Task Force; instead I believe we should be advocating to define our profession rather than participate in a process that can at best only define what is not part of another profession.

Briefly, my reasoning is as follows:

(1) In a legal context, we medical physicists should be identifying ourselves as a health profession, not a scientific one. As such, PEO, which has no mandate over professions in the medical domain, has no jurisdiction over what COMP members do.

(2) Involvement in the Ontario Joint Engineering and Natural Science Task Force would identify COMP in the eyes of Ontario's Attorney General (the chair of this task force) as a scientific organization. I will argue this could have a significant impact on COMP's aspirations for eventual licensure of medical physics in the province of Ontario, and thus possibly in Canada as a whole since Ontario is Canada's most populous province.

PEO has a mandate to regulate the practice of professional engineering and governs those individuals and organizations that PEO licenses in order "that the public interest may be served and protected". It does this in several ways: it enforces Ontario's Professional Engineers Act; it is responsible for licensing and disciplining engineers in Ontario; it sets standards for education for engineers; it regulates the use of the term "engineer," and "P.Eng."; and it determines which individuals and companies may offer engineering services to the public by issuing Certificates of Authorization. (Please see http://www.peo.on.ca/ and click on "What is PEO?" for a complete description.) Regulation 941 of the Professional Engineers Act prescribes a *Code of Ethics* that all engineers must adhere to and which PEO is legally required to enforce. The fifth item in this code says that it is the duty of the practitioner to act at all times with competence in the performance of any professional engineering services that are undertaken.

I argue that PEO could never attempt to impose jurisdiction over the practice of medical physics since doing so would contravene its own rules and regulations. The most important of these is its *Code of Ethics* that says that engineers should be competent in the services that they offer. In order for an individual to be competent, it is a requirement that they possess certain skills or knowledge that can be demonstrated by education and certification. Competence in medical physics can be demonstrated by CCPM certification. Despite the CCPM not operating under a legislative mandate, there are many good reasons (for instance similar practices in other countries) for PEO to accept it as demonstration of competence. As well, a large component in the determination of competence would fall to demonstration of education.

To my knowledge, there are no engineering programs in Canada that offer medical physics education or courses. This is an important distinction since it speaks to what defines engineering methods. Medical physics education is done through two avenues in Canada. The traditional model is through a physics department offering graduate degrees in medical physics within the Faculty of Graduate Studies. More recently, the trend is for medical physics to be offered through the Faculties of Medicine and in Departments of Oncology (e.g., the University of Alberta), or Medical Biophysics (e.g., Universities of Western Ontario and Toronto). McGill has a mixed model where the M.Sc. is offered through the faculty of Medicine and the Ph.D. through the department of Physics. I believe that the trend is even stronger for medical physics to be taught in Faculties of Medicine in the United States. Furthermore, the knowledge that makes up medical physics (research) is published in journals that are associated with the medical profession, and are searchable in medical databases such as PUBMED. Faculties of engineering and engineering journals, on the other hand, are not known for teaching or publishing in the area of medical physics. Biomedical Engineering yes, but medical physics no.

In order for PEO to successfully impose itself as a regulator of medical physics in Ontario, I believe it would be required for it to prove that medical physics employs engineering methods or principles. Given the medical nature of our field and the methods by which people are educated and judged for competency, I suspect that this could never occur and that even PEO, if asked, would agree. Therefore COMP does not need to be worried about PEO imposing itself as a regulator of medical physics in Ontario.

One of my colleagues asked me once while we were discussing this issue: "What is the harm in COMP being involved in this task force? If there is no downside, why wouldn't COMP be involved in this task force?" I believe that there is considerable risk in participating in this committee. The risk is that COMP will be identified in the eyes of Ontario's Attorney General as a

society of natural scientists. If COMP is ever to be successful in advocating for medical physicist to be a regulated profession, in my opinion it will be because the public interest is best served. Fields whose services are directly or nearly directly used by the public are generally the ones that governments take an interest in and are willing to devote legislation to. Lawyers, doctors, radiation therapists, nurses, optometrists, architects, some engineers, and many other professions deal directly with the public. Natural scientists, on the other hand, do not interact directly with the public, except for rare occasions. The work of natural scientists usually has many layers between it and the public. If a natural scientists' work is ever used by the public, it will have been peer-reviewed, then commercialized into a product, which is manufactured and then sold to the public by a company, store, or distributor. The public has many levels of protection, and regulation of the natural scientist is not needed for the public interest.

Medical physics, like many professions, is complicated, and it is difficult to define it with a single idea or message. I would suggest, however, that we must define ourselves in as simple a way possible if we are ever to effectively advocate for licensure. We can either portray ourselves to government as natural scientists or health professionals, but not both. The choice is ours, and I believe that we must make this choice in a way that is consistent with the best interest of our profession, and that is for eventual licensure.

To close my arguments, I would like to offer a real example of another profession where the natural science exemption could lead to an issue with PEO, but is hardly likely given the proper professional context. Optometrists use the principles of physics every day in their duties. They use lenses, they measure optical properties of the eye, and they make recommendations to their clients about vision based on these measurements. Furthermore, they manipulate and adjust devices that are directly used by their clients. At face value, given the natural sciences exemption, PEO may claim this to be engineering work. I do not believe that anyone in our society would ever confuse optometry with engineering. Are the optometrists worried about changes in the Professionals Engineers Act in Ontario? I hardly think so; PEO could not convince a court that Optometrists practice Engineering, and I believe that the same easily applies to medical physicists, despite optometry being a regulated profession. To ensure that the practice of medical physics is always regulated by medical physicists, I believe COMP should be lobbying for regulation of medical physics rather than engage in a territory protection exercise with another professional group. It is true that the numbers of medical physicists in Ontario, and Canada, is not large. I would argue though that we have large numbers of patients. By explaining that we provide our services principally to patients, medical physicists do not have to worry about what Professional Engineers Ontario does, and we have a good argument to Government to regulate our profession.

Rebuttal For the Proposition: Joseph E. Hayward, PhD, MCCPM

Dr. Carlone argues that COMP should strive for regulation as a health care profession rather than a scientific profession. I agree with my colleague that COMP should be advocating for regulation of medical physicists, however the pragmatic side of me realizes that our numbers are too small to convince provincial bodies that it is in their best interest to regulate our profession. Medical physicists have come up against this numbers roadblock in a few provinces already and it is time to change tactics. Perhaps engaging in discussions with other learned societies in the natural sciences with similar interests could shepherd us into a regulatory framework.

My learned colleague indicates that natural scientists do not interact directly with the public. This could not be further from the truth and is the exact reason why the JENSTF was established in the first place. Scientists from such diverse areas as chemistry, meteorology and even statistics advise, manage and report in areas that have direct impact on public and economic interests. For instance, the software created by researchers in meteorology reports the likelihood of adverse weather conditions that could result in a requirement for evacuation or something as simple as the public avoiding driving during whiteout conditions. In another example, statisticians may be responsible for designing epidemiological studies to assess the efficacy of a drug. Are these examples really that different from a medical physicist deeming a linear accelerator or an MRI acceptable for use on patients? All these examples have direct and profound impacts on the public.

At this point in time, the PEO executive is collegial and is well aware of the challenges associated with the current definition of professional engineering. Hence they are willing to engage natural science organizations in dialogue to address these issues with an eye toward a possible future federal solution. This may not always be the case and I think COMP should be involved in the discussions now rather than rely on ambiguous provincial legislation and the competency of counsel should these issues wind up in court. Statements such as "PEO could never attempt to impose jurisdiction over the practice of medical physics" is baseless and subject to interpretation since there is simply no legislation that guarantees this.

Just as the Ontario Regulated Health Professionals Act lists those professions that have achieved their own defining Acts, optometry included, I believe that a Professional Scientists Act could provide a similar defining framework and help medical physicists achieve licensure. I agree with my colleague that nobody "in our society would ever confuse optometry with engineering." The only reason that confusion does not exist is that the practice of optometry is very well defined in the Ontario Optometry Act. As I previous indicated, various provincial

continued on page 40

2012 Sylvia Fedoruk Prize in Medical Physics

The Saskatchewan Cancer Agency is pleased to sponsor a competition for the 2012 Sylvia Fedoruk Prize in Medical Physics. This award is offered annually to honour the distinguished career of Sylvia Fedoruk, former Lieutenant-Governor of Saskatchewan and previously physicist at the Saskatoon Cancer Centre.

The prize will comprise a cash award of five hundred dollars ($500), an engraved plaque and travel expenses to enable the winner to attend the annual meeting of the Canadian Organization of Medical Physicists (COMP) and the Canadian College of Physicists in Medicine (CCPM), which will be held from July 11th to July 14th, 2012 in Halifax, NS.

The 2012 Prize will be awarded for the best paper on a subject falling within the field of medical physics, relating to work carried out wholly or mainly within a Canadian institution and published during the 2011 calendar year. The selection of the award-winning paper will be made by a panel of judges appointed by COMP.

Papers published in Physics in Medicine and Biology and Medical Physics, which conform to the conditions of the preceding paragraph, will automatically be entered in the competition and no further action by the author(s) is required. All other papers should be submitted electronically to:

Nancy Barrett
Executive Director
Canadian Organization of Medical Physics
E-mail: nancy@medphys.ca.

Each paper must be clearly marked: "Entry for 2012 Sylvia Fedoruk Prize" and must reach the above address no later than **Monday, February 27th, 2012**.

The award winners from the last five years were:

Frédéric Tessier and Iwan Kawrakow, "Effective point of measurement of thimble ion chambers in megavoltage photon beams", *Medical Physics, **37**(1), 96-107* (2010).

B. Gino Fallone, "First MR images obtained during megavoltage photon irradiation from a prototype integrated linac-MR system", *Medical Physics **36** (6), 2084-2088* (2009).

Karl Otto, "Volumetric modulated arc therapy: IMRT in a single gantry arc", *Medical Physics **35**, 310-317* (2008).

Magdalena Bazalova, Luc Beaulieu, Steven Palefsky, Frank Verhaegen, "Correction of CT artifacts and its influence on Monte Carlo dose calculations", *Medical Physics **34**, 2119-2132* (2007)

Brian Nieman, Ann Flenniken, S. Lee Admanson, R. Mark Henkelman, John G. Sled, "Anatomical Phenotyping in the Brain and Skull of a Mutant Mouse by Magnetic Resonance Imaging and Computed Tomography", *Physiol Genomics **24**, 154-162* (2006)

Dr. Ervin Podgorsak –
Winner of the CAP-COMP Peter Kirkby Memorial Medal

Dr. Ervin Podgorsak Winner of the CAP-COMP Peter Kirkby Memorial Medal for Outstanding Service to Canadian Physics

The Canadian Organization of Medical Physicists (COMP) and the Canadian Association of Physicists (CAP) are pleased to announce that the 2011 CAP/COMP Peter Kirkby Memorial Medal for Outstanding Service to Canadian Physics has been awarded to Ervin B. Podgorsak, Ph.D., FCCPM, DABMP, FAAPM of Montréal Québec, for his outstanding service to Canadian Physics reflected, in particular, by his leadership in developing and enhancing the Medical Physics profession at the national and international level. Known for his kindness and hospitality, he has served his community with wisdom, enthusiasm and integrity. The award was conveyed to Dr. Podgorsak earlier this summer at the CAP Congress in St. John's, Newfoundland.

Dr. Podgorsak is an outstanding leader and champion of professionalism for clinical medical physicists. He has been active within the Canadian College of Physicists in Medicine (CCPM), the American Board of Medical Physics (ABMP), and the Commission on Accreditation of Medical Physics Educational Programs (CAMPEP).

As Director of the McGill University Medical Physics Unit, 1991-2008, Ervin Podgorsak headed both a leading clinical service and an academic program. As an accomplished researcher, he built a strong research team at McGill. Dr. Podgorsak led both the McGill medical physics graduate program and the clinical residency program to be the first such Canadian programs to be internationally accredited, by CAMPEP.

Throughout his career, Ervin Podgorsak strived to improve health care in Québec and Canada. His long service to the CCPM, particularly in its early development, assured improved health services by setting standards for education and certification of the medical physicists active in patient care. He has been an outspoken voice for funding of health care in Québec and in Canada. As the physics leader one of the larger radiation oncology treatment services in Québec, Dr. Podgorsak was able, through active intervention with hospital and government officials, to trigger significant improvements in operational and equipment funding for cancer centres in the province.

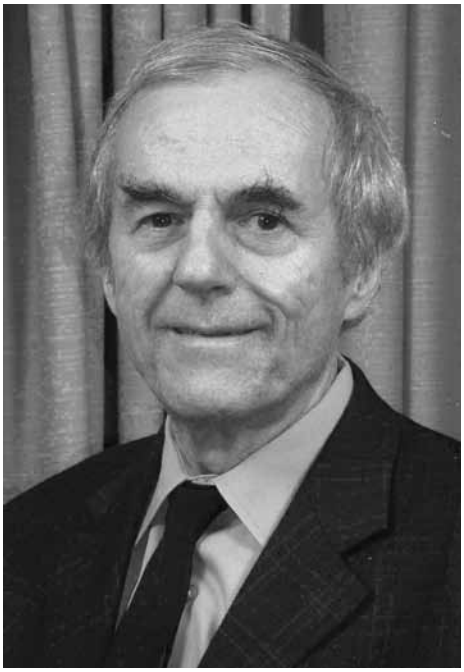
Dr. Podgorsak was born in Vienna, and grew up in Ljubljana, Slovenia, where he earned his Dipl. Ing. He pursued graduate work in medical physics at the University of Wisconsin, receiving his Ph.D. in 1973. He followed this by post-doctoral studies and clinical training in Toronto. In 1975 Dr. Podgorsak joined McGill University's medical physics unit and remained there until his retirement in 2009.

He has stated that one of the highlights of his career was to host the international medical physics meeting of AAPM and COMP held in Montréal in 2002.

Ervin Podgorsak and his wife Mariana have two sons, Matthew and Gregor.

The following is a summary of Dr. Podgorsak's contributions.

1. Director of the McGill University Medical Physics Unit, 1991-2008



and Chief of the MUHC hospital Department of Medical Physics. This entailed combined leadership of both a clinical service and an academic program. Under his directorship, the academic program expanded dramatically. The program had been founded in 1979 and by 1991 had graduated 38 MSc students. During Dr. Podgorsak's 17 years at the helm the program grew substantially and a total of 130 students graduated from McGill University with an M.Sc. degree in medical physics, and 20 with a Ph.D. degree in medical physics. Dr. Podgosak personally mentored many of the students. Many of them have had an academic training component in their own careers so that Ervin Podgorsak is established as the head of a long "family tree" of medical physicists.

2. Dr. Podgorsak has been a strong leader and champion of professionalism for clinical medical physicists. The CCPM was established in 1979 to recognize proven competence in physics as applied to medicine. Candidates with suitable educational background and experience become members of the College by passing written examinations. CCPM certification is becoming widely accepted in Canada and other countries and is often required at senior levels in medical physics. The mission of the CCPM is to serve the public by identifying through certification individuals who have acquired, demonstrated, and maintained a requisite standard of knowledge, skill and understanding essential to the clinical practice of medical physics. Dr. Podgorsak chaired the CCPM Membership and Fellowship Examination Committee 1983-1987, when the College was very young and was in the delicate position of seeking medical physicists already established in their careers to submit to the very rigorous certification examination process. He served as President 1987-1989. He has also served as a member of the examination board of the American Board of Medical Physics (ABMP) and most recently has been on the board of directors of CAMPEP (Commission on Accreditation of Medical Physics Educational Programs), which reviews and accredits MSc, PhD, and residency programs in medical physics.

3. Dr. Podgorsak led his academic program to be the first in Canada to be internationally accredited. In 1993 the McGill program was accredited by CAMPEP, an accrediting body sponsored by US and Canadian medical physics professional societies. McGill's graduate program was the first program in Canada to be accredited, and only the fourth in North America; today there are 30 accredited programs including 8 in Canada. In the year 2000, Dr. Podgorsak led his clinical residency program to another milestone, as the first Canadian residency program to obtain CAMPEP accreditation. At that time there were only four accredited residency programs in all of North America. Today there are over 40.

4. Outspoken voice for the funding of health care in the Province of Québec and in Canada. As the physics leader of one of the larger radiation oncology treatment services in Québec, Dr. Podgorsak had expressed his opinions to senior hospital administrators and to the public media about the poor state of affairs of the health care system, waiting times, and the purchase of critical medical equipment. His initiatives triggered significant changes to improve these operations.

5. Prominent international role in medical physics, as evidenced by committee work for AAPM, ACMP, International Stereotactic Radiosurgery Society, the IAEA, and many others. He has stated that one of the highlights of his career was to host the international medical physics meeting of AAPM and COMP held in Montreal in 2002.

6. Although research is not a criterion for the Kirkby Medal, we would be remiss not to include that Dr. Podgorsak is an accomplished researcher with an extensive list of publications. He has authored or co-authored 155 peer-reviewed publications, 87 book chapters or conference proceedings, 4 monographs, and 3 textbooks. He also gave 145 invited presentations on various aspects of medical physics research and teaching.

About the CAP-COMP Peter Kirkby Memorial Medal for Outstanding Service to Canadian Physics

The COMP-CAP Peter Kirkby Memorial Medal recognizes outstanding service to Canadian physics. The medal is intended to recognize service to the physics community by strengthening the Canadian physics community, by enhancing the profession of physical scientists, by effectively communicating physics to the non-scientific community, or by making physics more attractive as a career. It is intended to provide a lasting memorial to Peter Kirkby and to recognize in others the qualities for which he is remembered best: a vision of a strong Canadian physics community, dedicated efforts to support that vision and, in all things, fairness, and honesty.

The Peter Kirkby Memorial Medal was introduced in 1996 and is awarded biennially. The next award will be in 2013. The list of medallists to date is:

2011 - Dr. Ervin Podgorsak, McGill University Health Centre

2010 - not awarded

2008 - Peter Calamai, The Toronto Star

2006 - Michael Steinitz, St. Francis Xavier University

2004 - Robert Barber, University of Manitoba

2002 - John R. (Jack) Cunningham, Camrose, Alberta

2000 - Paul S. Vincett, FairCopy Services Inc.

1998 - J.S.C. (Jasper) McKee, University of Manitoba

1996 - Donald D. Betts, Dalhousie University (Inaugural Winner)

Participation in the CNSC Public Hearing on the Application from AECL to Renew its Nuclear Research and Test Establishment Operating Licence for the Chalk River Laboratories

L. John Schreiner, PhD., FCCPM
Chief of Medical Physics

Cancer Center of South Eastern Ontario
Kingston, ON

Richard Wassenaar, Ph.D., MCCPM

Radiation Safety Office and Project Coordinator
Best Theratronics
Ottawa ON

On October 4, 2011 the Canadian Nuclear Safety Commission held a second day of public hearings on the renewal of the operating license for the Atomic Energy of Canada Limited (AECL) Chalk River Laboratories, including the National Research Universal (NRU) nuclear reactor. The hearings in Chalk River involved representatives from various organizations, industry, local municipalities, workers groups, aboriginal groups, and concerned citizens, along with individuals who were raising issues they wished the Commission to consider in their review of the AECL's application to renew the licence.

The Chalk River hearings may have generated a bit more public interest than usual because of the recent history of the NRU, when the conditions at the reactor garnered considerable media interest and resulted in some political and operational fallout. Considerable discussion and analysis in the media and in other forums concerned the unavailability of medical isotopes, which was usually limited to discussions regarding Molybdenum-99 for nuclear medicine imaging.

In order to broaden the discussions at the hearings to other relevant medical isotopes, we made a joint Best Theratronics and Cancer Centre of Southeastern Ontario submission to the CNSC asking to be able to present on the importance of the NRU in the production of Cobalt 60. Our submission was accepted and we were invited to participate in the public hearing on October 4.

Our submission to the CNSC, and the full transcripts of the October hearings are available on the CNSC website (at: http://www.nuclearsafety.gc.ca/eng/commission/hearings/documents_browse/date.cfm?dt=4-Oct-2011).

In this article we present a slightly edited version of John's main presentation to the commission (with some minor corrections and clarifications).

11-H7.7 185 Oral presentation by Best Theratronics and the Cancer Centre of Southeastern Ontario (CCSEO) Medical Physics Department:

"Thank you, Mr. President, thank you, Members of the Commission for giving us the opportunity to come and talk to you today. As noted, I am the Chief Medical Physicist at the Cancer Centre of Southeastern Ontario at the Kingston General Hospital. I am also the Radiation Safety Officer for the hospital and for the CCSEO, and I am an Adjunct Full Professor in the Departments of Oncology and Physics at Queen's University. Richard Wassenaar is the Radiation Safety Officer at Best Theratronics and an Adjunct Professor in the Department of Physics at Carleton.

Having read some of the submissions from the community, I would like to start by personally thanking the CNSC for working with us, as the Canadian regulator, in the hospital and clinic to ensure that in Kingston we provide a safe radiation environment for patients and staff. I particularly want to thank colleagues from your Class 2 and your Nuclear Substance and Radiation Devices Divisions who help us ensure

that we maintain a safe environment. Through your licensing activities, the CNSC has held us to high standards and worked with us to establish a very safe and appropriate use of radiation in patient care at the Kingston General Hospital. And I think without the CNSC to hold us to those high standards, and to hold us to our licence, it would be more difficult to do so. So I thank you.

The objectives of this submission are to remind and inform the community of the role of the Chalk River Labs and the NRU in the supply of medical isotopes. I will not repeat the discussions we have heard from two of the previous intervenors today, who spoke mainly about nuclear medicine isotopes. I want to focus primarily on the radioactive isotope, Cobalt-60, which is often left out in the discussions of what is happening with the NRU.

I will not reproduce here our written submission. As you stated, it is availablefor everyone to read. Today, I will try to provide some additional background material. …

Why is it that Cobalt-60 has not been as apparent in many past discussions? When the NRU went through its shutdown, there was considerable media attention and reaction in the community, specifically regarding Molybdenum-99. There was little said about Cobalt 60, and I suspect that that was because, with the half-life of Cobalt-60 being 5.3 years, the effects of the shutdown were not as noticeable on the supply. (Although it is my understanding that as they are now harvesting Cobalt-60 from the reactor after the shutdowns, a lower specific activity has been observed because of the shutdown.)

We believe that Cobalt-60 is still of importance today and that it must be recognized in the further discussions of the activities of the NRU.

Cobalt-60 was a Canadian invention. It was one of the first radioisotopes that was produced and sold by the old NRX in 1949. In 1951, nearly 60 years to this day, the first radiation patient was treated with Cobalt 60 treatment at the London Regional Cancer Centre, and soon afterwards there were treatments of cancer patients also in Saskatoon, Saskatchewan.

Cobalt-60 inaugurated the modern era of radiation therapy and helped establish high-energy radiation therapy as an important modality in the care of patients. Cobalt-60 units were the workhorse in much of the world through the early 70s. They are still the main treatment unit through middle- and low-income countries, and over 2,000 units are presently operating throughout the world. And there is resurgence in Cobalt interest; I will tell a little bit more about that later.

Just to remind you of the importance of radiation treatment: approximately 45 percent of men and women in Canada will personally encounter cancer in their lifetime. Half of these people, from current health services research, will benefit from radiation treatment at some point during their care, either for potential cure or to increase quality of life.

Worldwide, the need for stable radiation delivery is perhaps even more critical. The International Atomic Energy Agency and the World Health Organization have predicted that by 2015 to 2020 -- there are different predictions -- an estimated 5 to 10 million people in middle- and low-income countries will not have access to the radiation treatment from which they could benefit. A low estimate of about 3,000 additional treatment units required by the year 2015 has been projected to deal with this worldwide need.

In our work at the Cancer Centre, we have been investigating whether Cobalt-60 has a role in developed countries and we have been evaluating if modern radiation approaches that we've learned in the clinic in the last 20 years would be feasible with Cobalt-60 radiation therapy. I am very happy to report that we have shown one can do as sophisticated a dose delivery with a Cobalt-60 device as we could do with a linear accelerator, the standard in many clinics in the developed world.

So we believe that past experience in the world, and the results of research by our group in Kingston and by a number of other groups worldwide, are indicating that Cobalt-60 units are still an important part for radiation care.

Together with Best Theratronics, we have been able to advocate for the development of improved devices by the vendors, and we're very excited by joint projects we have with Best to improve the current state of Cobalt therapy.

So Cobalt-60 is a valuable medical radioisotope whose supply must be maintained.

Currently, the NRU here in Chalk River is the only reactor in Canada producing medical-grade Cobalt 60 at the high specific activity required for use in treatment units. Alternate sources for industrial Cobalt 60 are available, but they are not suitable to produce

the high-specific activities required in medical use.

The Cobalt 60 production facility at Chalk River is a source of the majority of the medical Cobalt 60 used worldwide. We heard today that there are plans and developments in alternate approaches to making other medical isotopes. These accelerator-based approaches are not applicable to Cobalt 60, and the use of alternate reactors are not feasible at this time.

We believe that the importance of Cobalt 60 radiation treatment throughout the world makes the maintenance of a secure Canadian source of Cobalt 60 extremely important. Given the unique place of the Chalk River labs and the NRU and the production of Cobalt 60, we ask that the CNSC consider this an important component of their risk/benefit analysis as they review the Chalk River Laboratories licence application and generate an appropriate licence for continued activities of the NRU."

This report has limited itself to John's main presentation to the Commission. Following the presentation there were about 5 minutes of questions to clarify the role of Cobalt-60 in the clinic (one commissioner asked if the gammaknife used Cobalt) and on the Cobalt production capabilities at the AECL. These were answered by Richard, AECL staff and John.

One of the more interesting aspects preparing for the hearing was spending a day or two before the trip reading submissions from the attending groups. Some of these documents were extremely well written (John would encourage you to read the two thoughtful submissions from the Métis Nation of Ontario). Some submissions seemed based on a critical perception that the CNSC did not regulate but rather let the nuclear industry run rampant. It was interesting to observe the spectrum of opinion that the CNSC has to be sensitive to in their deliberations.

There were to our eyes a couple of hundred people in the audience at various times during the hearings making their presentations and or running the meetings and recording the events. The presentations were quite formal, some people reading directly from their statements and some of speaking more off-the-cuff (hence some of the editing for this article). For the most part the presentations were well done (we were impressed with both mayors from the local communities who gave clear and cogent presentations).

We thought that our statements were well received and raised interest for the Commission members on issues they had not previously considered. As an added benefit, our presentation brought the importance of Cobalt 60 production back into the spotlight within AECL itself. The presentation has proven beneficial as Best Theratronics continues to work with AECL in ensuring a stable supply of Cobalt 60 is available. Overall, it was an interesting day spent in Chalk River after a very enjoyable drive on a sunny day from Ottawa.

On October 27, 2011 the CNSC announced its decision to renew the Atomic Energy of Canada Limited (AECL) Chalk River Laboratories Operating Licence for a period of five years. The licence will be valid from November 1, 2011 until October 31, 2016.

CNSC Feedback Forum

continued from page 9

l'équipement réglementé de catégorie II, les accélérateurs de particules qui sont désignés comme équipement réglementé de catégorie II doivent être homologués par la CCSN. Afin de faciliter l'application de cette nouvelle politique, la CCSN utilisera une énergie limite de faisceau de 1 MeV plutôt que 1,5 MeV.

La CCSN autorise et inspecte déjà les accélérateurs de particules capables de produire 10 MeV ou plus. La décision d'inclure maintenant les accélérateurs de particules de faible énergie (c.à-d. ceux qui produisent 1 MeV ou plus) assurera une surveillance réglementaire adéquate, uniforme et cohérente de tous les accélérateurs de catégorie II.

Dans le but d'assurer la sécurité du public et des travailleurs, le personnel de la CCSN pourrait prendre des mesures réglementaires, s'il y a lieu, pour aborder des préoccupations de sûreté immédiates aux installations ayant des accélérateurs produisant 1 MeV ou plus.

La CCSN publiera des documents supplémentaires contenant des renseignements détaillés d'ici avril 2012 pour expliquer les changements apportés à la surveillance réglementaire des accélérateurs de faible énergie et pour fournir plus d'information sur le plan de mise en œuvre de ces changements. Les documents offriront de l'information sur les exigences réglementaires concernant cet équipement et seront accompagnés de documents d'orientation qui expliqueront comment se conformer à ces exigences.

Vous pouvez envoyer vos questions ou préoccupations à ce sujet à l'adresse électronique suivante : Electronaccelerator-Accélérateurdélectron@cnsc-ccsn.gc.ca.

New COMP Members

Please welcome the following new members who have joined COMP since our last issue:

Last Name	First Name	Institute	Member Type
Chng	Nick	BC Cancer Agency – Vancouver	Full
Cropp	Robert	Vancouver Coastal Health	Full
Moran	Gerald	Lawson Health Research Institute	Full
Toltz	Allison	McGill University	Student

Point/Counterpoint

continued from page 33

medical physics organizations have attempted to achieve licensure in the past but their efforts have been thwarted likely due to the small number of members. The problem of numbers would easily be mitigated by partnering with other scientific organizations that have members whose professions impact the public welfare (in the form of a Professional Scientists Act). Even if such an act never comes to fruition, there is no doubt that COMP should be at the table representing its membership in any of the relevant discussions.

Rebuttal Against the Proposition: Marco Carlone, PhD, MCCPM

Dr. Hayward's argument is largely centered on the fear that the lack of a definition for "engineering principles" will allow PEO to impose itself as a regulator of Medical Physics on Ontario. Furthermore, he extends this fear by implying that medical physicists who work in the health domain are at risk of being accused of practicing engineering without a license since the definition of engineering includes the safeguarding of "life, health, property, etc."

My initial arguments addressed this. I believe this fear to have no basis in fact, given that PEO has strong requirements for competency of practice. Further, Dr. Hayward's arguments do not lend themselves to a strategy that COMP can use to define medical physics as a profession in a legal context. As I argued in my opening statement, health professionals are distinct from engineering professionals. The safeguarding of life and health for an engineer means ensuring that his or her designs lead to safe products for the public to use, e.g., bridges that do not fall down. Medical Physicists, as health professional who deal with patients, also have a responsibility to act with competence in the work we do so that our patients are given the best possible health care. The two ideas do not overlap nor are they in competition.

Dr. Hayward also suggests that COMP has a responsibility to the natural sciences community to assume a role in these discussions with engineers. In my view, COMP has a responsibility first to its member's, and second to society as a whole since COMP members provide services that are used by the public. COMP has little responsibility to other natural science societies, and quite contrarily, if association with another community could lead to a misrepresentation of our best interests, then it is COMP's responsibility to not associate with these societies. As I argued in my opening statement, identifying COMP as a society of natural scientists in the eyes of Ontario's Attorney General may not be in COMP's strategic interest.

I do agree with Dr. Hayward in his position that COMP has a responsibility to look strategically to the future. As he correctly points out, technology evolves rapidly and unpredictably, and obscure areas of science today may be very important in the health care setting tomorrow. To ensure that Medical Physicists are always responsible for defining what constitutes Medical Physics, it is neither practical nor strategic to participate in a process that takes on issues as they come up. Like other health professions, advocating for licensure is our best path forward. Licensure, however, will not be easy to achieve given the numbers of medical physicists in Canada. Policies that are built on the public good, that have clear definitions of what COMP members do, and that generate hope and enthusiasm have better chances of succeeding than ones that are based on fear and territory protection. COMP should not make the mistake of engaging in an activity that could confuse one of our most important strategic decisions for many years to come.

Letter to the Editor

As a result of feedback on our article in the last edition of this newsletter, I have agreed to repeat the **staffing survey** early next year. If your centre was not included last time, please send me your contact details before the end of January to make sure you are included. (Email: brclark@toh.on.ca).

Sincerely
Brenda G Clark, PhD, FCCPM, FAAPM
Chief, Medical Physics, The Ottawa Hospital Cancer Centre
Associate Professor, Radiology, University of Ottawa
Adjunct Research Professor, Physics, Carleton University
501 Smyth Road, Box #927 Ottawa, ON K1H 8L6

Message from the COMP President

continued from page 5

licensure, which is clearly a much more substantial challenge. With regard to the article itself, and given that this is our first run at this, your feedback and comments not only on the content but also on the format would be much appreciated. And, contrary to stereotypical perception that Canadians are too polite to be disagreeable, we are looking forward to identifying a few more contentious issues so, by all means, if you have a suggestion let us know.

A particular highlight of recent COMP activity is the efforts being undertaken to develop a new three-year strategic plan. An invited focus group met for a day and a half immediately prior to the Board meetings. The group was selected to maximize the spectrum of representation, even to the extent of including a potential member (i.e., non-member), and the timing was intended to best leverage the investment already being made to support the semi-annual meetings, although this meant that many Board members were constantly sitting in sessions for a solid two and half days. (As far as I know most, if not all, survived…at least physically.) The effort, however, I believe will prove to be well worth it. The focus group was the culmination of consultation efforts performed to solicit input into the new strategy. While a formal plan is now in preparation, the preliminary results promise a clear direction for COMP in the coming years that will build upon the accomplishments arising from the previous strategic plan, notably the first to be undertaken by COMP. Part of the process included a review of the successes and (dare I say it) failures arising from the implementation of the original plan. On the whole, the first plan was deemed to have had a very positive impact on COMP and there was consensus that it had definitely been an overall success (a good thing, given that we were in the midst of repeating the exercise). Lessons learnt as well as new ideas are being incorporated into the new plan, which will go as far as establishing new Vision and Mission statements for COMP. The entire process has been undertaken to best align COMP with the needs and interests of all members. More information will be forthcoming over the coming months as the plan is formalized and we look forward to your feedback as it is rolled out.

Finally, I would like welcome two new members to the Board. Craig Beckett, who hails from the Allan Blair Cancer Center in Regina, has assumed the mantle of Councillor for Professional Affairs and Crystal Angers, who works out of the The Ottawa Hospital Cancer Centre, is transitioning into her role as Treasurer. It will require a short time for their contact information to make its way through all the COMP documentation but, in the meantime, if you wish to get in touch with either they can both be readily found in the Directory. I am very much looking forward to their contributions to the team.

Message from the Editor

Idris Elbakri, PhD, MCCPM
CancerCare Manitoba

This is one of the more interesting issues of InterACTIONS that I have had the privilege of editing. In addition to the regular reports by COMP and CCPM officers, we have a couple of articles that are the realization of ideas we have been working on for some time.

The communications committee has been working on establishing the presence of COMP on Facebook and twitter for some time. The article on this topic by Dr. Parminder Basran is very informative and sets the stage for a discussion in our community about the use of social media for the advancement of our profession in Canada. I wonder, as social media and electronic communications and interactions proliferate our lives, how much longer will we publish a print newsletter? I personally like paper. I think it has a special feel, but can see how future generations may think otherwise.

This issue includes the inaugural article of a new feature in InterACTIONS, namely the "point/counter point" article or debate. This is something we have been working on for some time. It took us longer than we expected to bring this to life because we wanted to offer our readership a relevant and informative piece that speaks to our challenges and concerns as Canadian medical physicists. Thanks to COMP president, Dr. Peter McGhee, for taking one more COMP related task and moderating the first point/counter point article.

I am at about the 50% mark of my term as editor. I have enjoyed my InterACTIONS with the authors and the readers. I appreciate every bit of feedback I have received and hope that I continue to meet your expectations.

Dates to Remember

COMP 2012 Winter School
January 29 - February 2, 2012
Whistler BC

2012 COMP/CCPM Annual Scientific Meeting
July 11-14th, 2012
Halifax, NS

AAPM Summer School
June 24-29, 2012
UC San Diego

AAPM Annual Meeting
July 29 - August 2, 2012
Charlotte, NC

MP3 Water Phantoms
Music to your ears

MP3-T TomoTherapy®

MP3 Large Field Dosimetry

MP3-M Standard LINACS

MP3-XS Stereotaxy / IORT

MP3-P Particle Therapy

One of many reasons why PTW MP3 water phantom systems may also strike a chord with you:

„We have used the PTW water phantom and MEPHYSTO software regularly for the past 8 years. The system is easy to set up, easy to use and is mechanically constant. Over these years, the mechanical reproducibility has been superb. You can be confident that the last scan after 3-4 days of scanning is as accurately positioned as the first scan and that the data collected from the last scan is as accurate as that from the first scan."

David Judd, Ph.D.; NW Medical Physics Center, Selah, WA, USA

PTW Water Phantoms
More than 80 years experience.
More than several thousand installations worldwide.

Distributed in Canada by

HARPELL ASSOCIATES

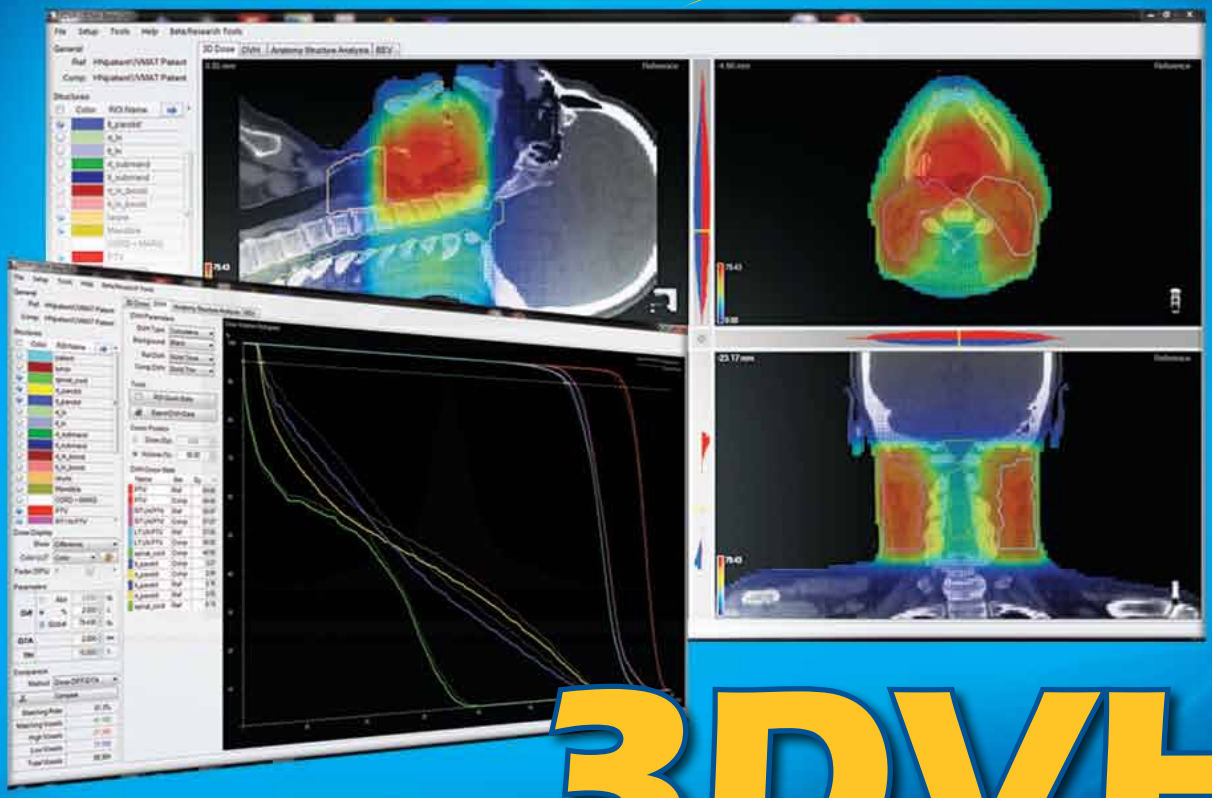
For more information, call us at (1) 516-827-3181 or visit www.ptwny.com/mp3.

PTW

Knowing what responsibility means

WWW.PTWNY.COM USA | LATIN AMERICA | CHINA | ASIA PACIFIC | UK | FRANCE | GERMANY

MapCHECK just got Better



3DVH

If you treat with IMRT or VMAT/Arc therapy, an important new QA option is available that allows you to perform patient dose QA that is clinically relevant, enabling superior confidence in your analysis and decision-making with maximum efficiency.

Sun Nuclear's 3DVH is a 3D dose and DVH QA system for quick and precise QA of delivered dose to patient anatomy. The 3DVH process is efficient, taking only 1-2 minutes. The result is true 3D QA with DVH comparisons, powerful navigation, efficient analysis tools, and flexible criteria.

3DVH uses the patent pending PDP™ algorithm to take absolute dose phantom measurements from MapCHECK, ArcCHECK*, or EPIDose and generate accurate measurement simulation of 3D dose to patient anatomy. 3DVH is fully DICOM compatible, and with 3DVH there is no secondary planning system dose algorithm, no labor intensive commissioning or modeling, and no new sources of error and uncertainty.

Independently verified and documented by multiple institutions, users agree that 3DVH is proving itself as the next generation of plan QA offering accuracy and efficiency that does not sacrifice quality for speed.

Pa PATIENT

Please visit www.sunnuclear.com/3DVH to learn more.

*ArcCHECK support for 3DVH is planned for early 2011

Official Distributor

CSP MEDICAL
www.cspmedical.com

SUN NUCLEAR corporation