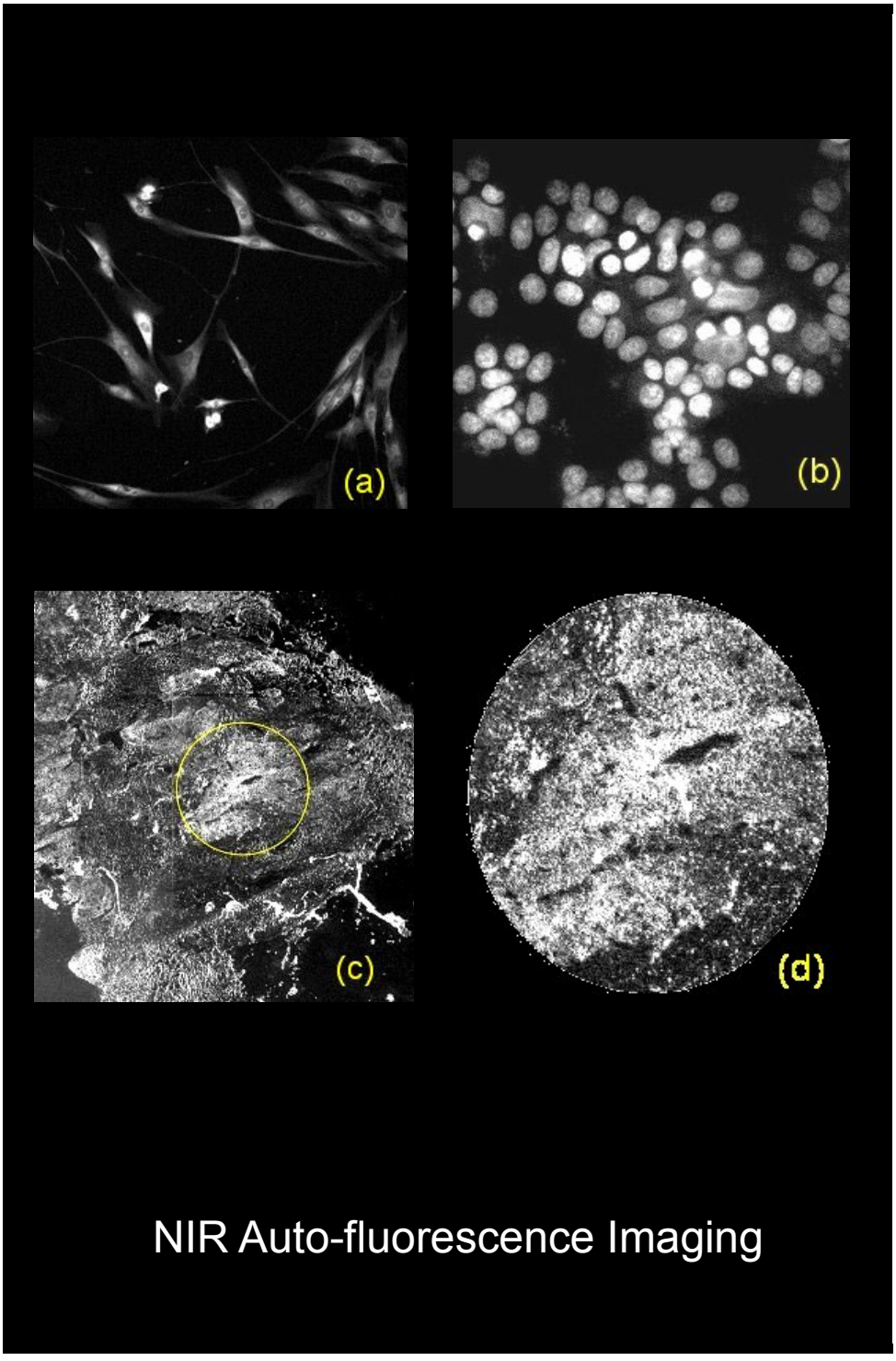
InterACTIONS

CANADIAN MEDICAL PHYSICS NEWSLETTER
Le BULLETIN CANADIEN de PHYSIQUE MÉDICALE



NIR Auto-fluorescence Imaging

COMP OCPM

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

48 (3) juillet/July 2002

About our Cover

Recently, near infrared (NIR) auto-fluorescence has been used to distinguish between normal and cancerous tissue. The cancerous tissue was reported to fluoresce more brightly in the NIR. Confirmation of this result and determining the cause of the difference in fluorescence is part of our present research. Since fresh large tissue samples can be difficult to obtain routinely, the fluorescence from normal and cancerous cells is an important adjunct to our work. With cells, one can also vary the type, life-cycle and other properties, as needed.

Pictures (a) and (b) show NIR auto-fluorescence images of normal skin cells and cancerous breast tissue cells excited by visible light. The normal cells undergoing mitosis have rounded-up their keratin filaments and are extremely bright. Aside from the near absence of extra-nuclear keratin filaments, the proportion of bright cancer cells is larger due to their near continuous state of mitosis.

Picture (c) is an auto-fluorescent image of a ~1 cm^2 thin section of breast tissue with cancerous ductal inclusions. After sectioning, the tissue was fixed with formalin. The sample was excited with 633 nm light from a helium neon laser and the fluorescence was imaged onto a cooled CCD detector after passing through a 700 nm long pass filter. The lighter portions of the image were identified as cancerous by staining an adjacent tissue slice. Picture (d) is a magnified portion of (c) showing clear evidence for cellular level auto-fluorescence.

Images courtesy of R. Girardin and Dr. W.J.Keeler, Department of Physics, Lakehead University and Dr. John Th'ng and Dr. P. McGhee, the Northwestern Ontario Regional Cancer Centre, Thunder Bay, Ontario.

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, article submissions can be made to:

Pat Cadman
Saskatoon Cancer Centre
20 Campus Drive
Saskatoon, Saskatchewan, S7N 4H4
Email: pcadman@scf.sk.ca
Phone: (306) 655-2696
Fax: (306) 655-2701

Members of the Editorial Board include:

Peter Munro:	peter.munro@lrcc.on.ca
Michael Kolios:	mkolios@acs.ryerson.ca
Lara Rodriguez:	lrodrig2@salick.com
Horacio Patricinio	horatio@medphys.mcgill.ca

Please submit stories in Publisher 98, Word 6.0, Word 97, or ASCII text format. Hardcopy submissions will be scanned to generate an electronic document for inclusion in the Newsletter. Images in Tiff format at 300 dpi resolution are preferred.

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Lara Rodriguez
Email: lrodrig2@salick.com
Phone: (212) 367-1793
Fax: (212) 604-6090

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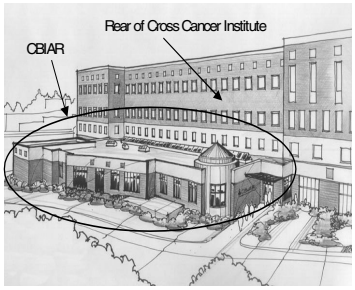
InterACTIONS 48 (3) juillet/July 2002



Inside this issue:

CCPM BOARD

COMP/CCPM Office

Ms. Barb Callaghan
COMP Secretariat
COMP/CCPM Office
PO Box 39059
Edmonton, AB, T5B 4T8
Telephone: (780) 488-4334
Facsimile: (780) 482-4425
compoffice@powersurfr.com

Message from the COMP Chair:

There are many issues remaining to be tackled. The main one is the government recognition of the professional of medical physicists.

Since my last message, the activities of COMP evolved mainly the organization of the upcoming COMP meeting, as well as, some professional issues. The AAPM-COMP meeting will have some interesting Canadian content. Specifically, there will be separate COMP/CCPM Symposia on Canadian Light Source, on Gel Dosimetry and on Image-guided radiation therapy. A list of eminent Canadian or Canadian-based medical physicists will be giving plenary-type sessions on these topics. You are probably all very well aware of the Canadian nite-out on the Sunday, July 14. Sherry Connors is very busy organizing the Canadian social activities at the 2002 Meeting, and Michael Henry is busy with corporate sponsorship activities. I would like to personally acknowledge their hard work in these endeavors. Please take the opportunity to attend these Canadian Activities.

Our COMP speaker for this year's CAP meeting in Quebec City, was Ervin Podgorsak. We thank him for accepting our invitation to represent COMP at the CAP. We are happy to announce that Jack Cunningham was awarded CAP-COMP Peter Kirkby Memorial Medal for Outstanding Service to Canadian Physics. The Peter Kirkby Memorial Medal was introduced in 1996. 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 communication physics to the non-scientific community, or by making physics more attractive as a career. It is awarded biennially, so this is only the third Peter Kirkby Medal to be awarded by the CAP-COMP. We thank Ervin for accepting to give Jack's acceptance presentation at the CAP reception since Jack was unable to attend. We were unable to obtain a CAP speaker at our meeting, but we have filled up the spots, as discussed above, with two experts on the Canadian Light Source, various experts on Gel Dosimetry and three experts on image-guided radiotherapy.

Some interesting discussions between the CAP and the Professional Engineers and Geoscientists of BC (APEG) are being held. My take on the subject after reviewing the most recent communications, is that the discussions are, indeed, progressing in the right direction for physicists and medical physicists in particular. Our Professional Affairs Committee and our Executive Director are keeping a close eye on the situation.

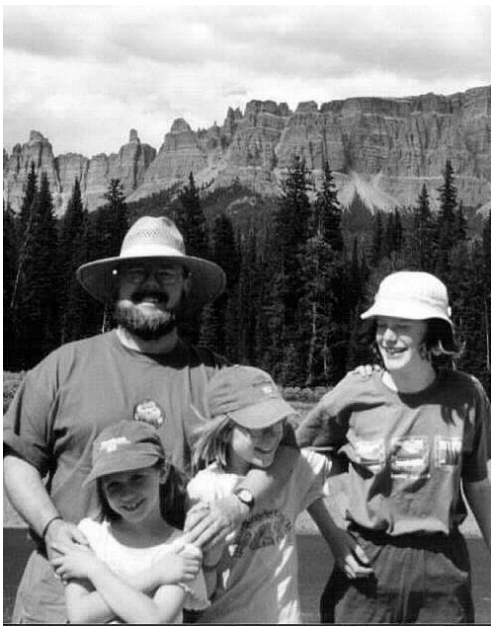
I would like to end my note by thanking the COMP executive for their

services during my term as Chair of COMP. There are many issues remaining to be tackled. The main one is the government recognition of the professional of medical physicist. Michael Henry is organizing a meeting between myself and an Alberta government politician in effort to inform government of the existence and nature of medical physicists and how professional status can be achieved. At the 2002 meeting, I will transfer the COMP chair to Clement Arsenault, and thus wish him the best for the next two years. It is all yours, Clement.

B.G. Fallone, Chair of COMP

Message from the CCPM President:

This is my last President's Message to you. By the time you read this message, you will have had the chance to read some preliminary information for the College's Annual General Meeting and should be nicely aware of the current CCPM concerns: changes of some bylaws; the clarification of standards for membership and fellowship, the proposal to change the format of the membership exam, etc. So, I needn't discuss these here. Rather, I did want to end my tenure as President with some observations from the last three years.



When I took on the presidency, I decided I would try to emphasize my view of the College as the body which through its certification processes and through its support of education and training of highly qualified medical physicists provides the Canadian public assurances of the quality of medical physics professionals working clinically in the country. This had always been the mandate of the College, but I think the 'community' (including medical physicists in and out of the College) had sometimes forgotten this role, and would occasionally interpret the actions of the College more as the actions of a guild or, sadly, even an old boys club. Thus, I (and others) thought it was necessary to strengthen communication with colleagues in the physics community and in other medical professions, and to review our certification processes. I think over the last few years the Board, and others working behind the scenes, have been able to raise the profile of the College and correct some misconceptions of its role. This work continues and I am confident the profile of the College will continue to grow in the future.

Before joining the Board, I had heard frustration with how the College worked: that gaining membership or fellowship was too difficult for *real* clinical physicists, that change was impossible to achieve, that no one listened to feedback from physicists in the ranks. Therefore, I had hoped during my term to strengthen exchange between the Board and the College's general membership, and between the College and medical physicists considering election to the College. I took this task seriously and made a point of encouraging feedback in nearly all my messages. I do apologize if this seemed to be preaching, but I am still convinced that this is an important point for the President to emphasize continuously. In my time on the Board it has been made very clear to me that the Board is always looking at how the College functions and on ways to improve. When we do these reviews we have to look at issues from various points of view: assuring protection of the public through a rigorous certification process, encouraging a growing membership with all medical physicists considering certification valuable, looking at developments in the medical physics community in jurisdictions around us and in the practices of other certifying boards (medical physics and other professional groups), etc. Such broad based review can bring up conflicting viewpoints and so change involves a long process. I have been impressed at how seriously the Board does reflect on the function of the CCPM and I would ask you to be patient with the pace of change (usually slow, but occasionally apparently frantic as we try to move in a particular direction we believe critical). But again, your input into our deliberations is vital! BUT you should use the whole year and not just the annual AGM to make your views clear. Again this year we have had very little feedback on some major issues we are pursuing. I know that in the next two weeks we will have an AGM where many members will want to express their views. Unfortunately, before the meeting we will have received only about 5 submissions commenting on our proposed bylaw and examination processes (unless there is a flurry of e-mails in the next week). I hope that you can understand that this can make it very difficult for the Board to assess the membership's concerns as we move forward.

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Message from the Executive Director of COMP/CCPM

On the national scene, your executive has made a submission to the Romanow Commission on the Future of Health Care in Canada. Please contact our secretariat if you would like a copy of the submission

By the time this reaches your mailbox, we should be enjoying the wonderful city of Montreal and taking in the AAMP/COMP/CCPM meetings.

The Montreal event promises to be packed with information, exchange and fun. We especially look forward to meeting with our colleagues across Canada and North America. The "Canadian Night Out' promises to be its usual entertaining evening!

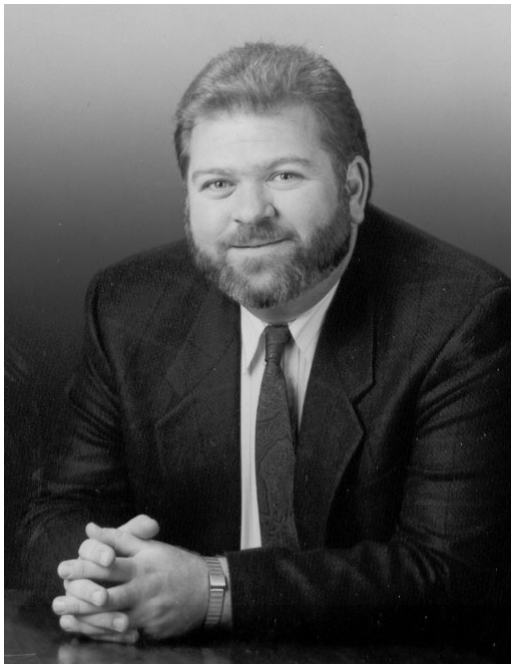
I would like to express thanks to the corporate sponsors of this event. Without their ongoing support, the event would be much more difficult to offer. We will provide a complete listing in the fall Interactions.

On the national scene, your executive has made a submission to the Romanow Commission on the Future of Health Care in Canada. Please contact our secretariat if you would like a copy of the submission.

COMP has arranged a meeting with the new Health Minister, The Hon. Anne McLellan. We expect this meeting to take place in late August. It will be an opportunity for COMP and CCPM to bring focus to the challenges facing medical physics and the need for a long-term approach to research funding and support for educating new medical physicists.

Last issue, I reported on the issue of scope of practice and the relationship with other disciplines and professions, and specifically the activity by the Association of Professional Engineers and Geo-Scientists of British Columbia (APEGBC) in developing a draft revision of the Engineers & Geoscientists Act (British Columbia). As I reported last issue, the draft includes definitions that, in our opinion, could lead to the Act being applied to the work of Medical Physicists. We have contacted APEGBC and registered our objection to the proposed infringement on the scope of practice of medical physics. We have also contacted the B.C. government and registered our opposition. The B.C. government has indicated that it has no plans to introduce a revision of the Act and would not consider a proposal by APEGBC that includes the questionable provision, without adequate consultation with COMP/CCPM.

Michael Kolios has been working with the Communications Committee to re-vamp our website. The website will have a new look and new features for our members. Many thanks to Michael and his committee for the work behind the scenes in updating the website. We will alert the members when the new site is launched. We look forward to the new website later this fall!



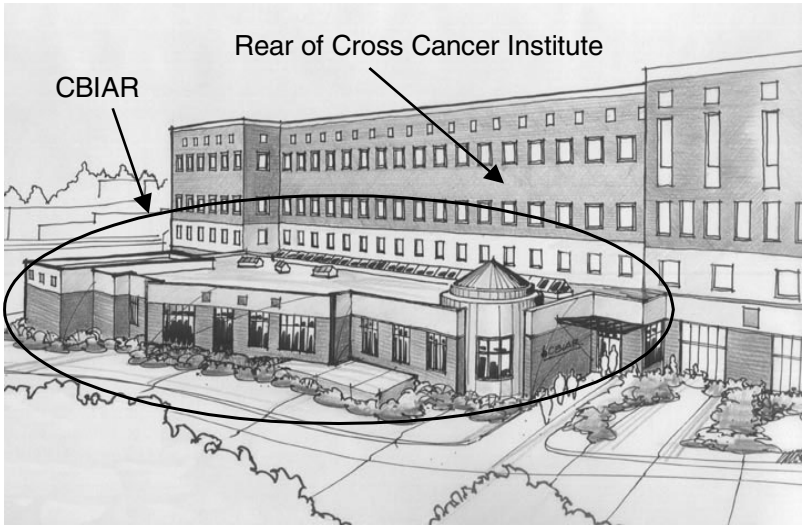
In August you should receive your updated COMP/CCPM directory. We will be giving our corporate members an opportunity to advertise in the directory. When you have contact with our corporate advertisers, please let them know that you appreciate their support of your professional groups.

Michael Henry
Executive Director
COMP/CCPM

Center for Biological Imaging and Adaptive Radiotherapy (CBIAR)

By Gino Fallone
Cross Cancer Institute

A biologically-targeted radiotherapy facility called the Center for Biological Imaging and Adaptive Radiotherapy (CBIAR) has recently been created at the Cross Cancer Institute, Edmonton AB. We, and our research reviewers, believe that such a facility is a first in the world. The Center is essentially divided into two main research areas: *a*) Image-guided adaptive radiotherapy (IGAR), and *b*) PET oncologic imaging with the associated isotope-production facilities. The IGAR activities will also very heavily involve PET oncologic imaging. The Center houses, or will house in the very near future, one of the world's first Helical Tomotherapy system, a whole-body 3 T Magnetic resonance and spectroscopy system, an EBCO isotope-production cyclotron, 2 Philips PETs, a Siemens microPET, a PET-CT, and associated chemistry and medical physics laboratories. The Center was built with infrastructure funding of over thirty-one million dollars from cancer foundations, and from national and provincial research agencies. Table 1 summarizes the sources of infrastructure funding. Figure 1 depicts the CBIAR extension of the Cross Cancer Institute.



IGAR has grown from our belief that, in order to improve cancer patients outcome and quality of life through safer radiation treatments, we require: 1) precise definition of the biological extent of the tumor, 2) precise patient positioning between imaging and treatment, and 3) accurate dose delivery to the tumor avoiding normal tissue toxicities.

Although the tumor mass is visualized on conventional imaging modalities (CT, 1.5 T MR, ultrasound, SPECT), the true biological extent of the neoplasia is not provided. To properly define the biological characteristics of the tumor we require a) improved anatomical imaging to examine finer structures in more detail and detect small abnormalities not possible with conventional imaging, b) metabolic and biochemical information at increased spatial resolution to determine disease state that cannot be represented by anatomical changes alone, c) definition of regions of high-perfusion that are indicative of neovascularization representing the leading edge of tumor growth not seen through conventional imaging, d) improved detection of relaxation properties of abnormalities to identify subtle changes before they are visually apparent, etc. Both PET Imaging and the ultra-high whole-body magnetic resonance system operating at 3 Tesla would provide the information to assess the biological characteristics of tumor.

The PET facility at the Cross Cancer Institute has been designed to fulfill a clinical, in addition to, the research function. The program will be supported by radiochemists providing clinical and research radiopharmaceuticals. This chemistry group will work with the tumor groups and radiobiologists to design innovative probes to look into tumor metabolism. The PET program will interface closely with the Department of Medical Physics for image processing, modeling, and targetry research.

The development of intensity-modulated radiation therapy (IMRT) in recent years has significantly improved the ability to deliver dose to the tumor while still avoiding healthy tissue. In this technique, both the geometric shape and the intensity within the geometric shape is varied. IMRT requires an inverse treatment planning stage[1-3] to design intensity-modulated radiation fields that have been mathematically optimized to satisfy certain user-defined dose-volume- type objectives under some constraints. In April 2000, the Cross Cancer Institute was one of the first, if not the first, Canadian institution to clinically implement IMRT.

An important and novel approach that can deliver highly-conformal IMRT is called helical TomoTherapy (HT), and has been studied by Mackie et al. at the University of Wisconsin in Madison (UW).[4,5] This modality combines IMRT capabilities with megavoltage computed tomography (MVCT) imaging. The instrument consists of a CT-like gantry with a linac of 3.5 MV (imaging) to 5.5 MV (therapy) that rotates around the couch. The couch translates through the gantry opening to create a helical radiation beam with respect to the patient on the couch, in the same way as a conventional helical CT. In addition, instead of using a broad beam, the HT beam is collimated into a fan beam and is temporally modulated with an MLC comprised of 64 interleaved leaves (0.615-0.643 cm wide tungsten) giving a maximum field of 40 cm by 4.5 cm at the isocenter. An important advantage of HT is the presence of the on-board MVCT to obtain tomographic images before, after and perhaps during the delivery of the treatment to verify patient ositioning. On-board MVCT imaging is used to 1) record the subject's anatomical information, 2) detect the radiation that traverses the subject, and 3) modify the radiation fields based on the day-to-day location of the primary tumor and critical tissues. Most importantly, the 3-D distribution of delivered dose to the patient is then accurately calculated using the measured incident

(Continued on page 80)

Table 1: Summary of funding sources for CBIAR

CBIAR Funding $30 M (as of April 2002)

Shared & Common	6.750
• AB Infr.	5.000
• ACF (2001)	0.750
• ACF- Allard Fdn	1.000

PET/Cyclotron	10.246
• CFI	4.569
• ASRA	2.200
• Interest ASRA	0.093
• Private Donor	0.862
• AB Infrastructure	0.990

IGAR	13.804
Tomotherapy	4.924
• CFI	1.508
• ACF-Allard Fdn	0.350
• ACF (March 00)	1.150
• ACF (June 01)	0.314
• ASRA (IIPP)	0.957
• ACB RIP-MedPhys	0.369
• ACB RIP-Clinical	0.126
3T MRI/MRS	8.880
• CFI	3.846
• CFI (operating)	1.154
• ASRA (ISRIP)	3.880

CFI: Canada Foundation for Innovation
ASRA: Alberta Science and Research Authority
ACB: Alberta Cancer Board; RIP: Research Infrastructure Program
ACF: Alberta Cancer Foundation
AB Infr: Alberta Infrastructure

Investigators successful in receiving the peer-reviewed funding:

PET & Cyclotron related:
A. McEwan (PI), B.G. Fallone, A. Belch, S. McQuarrie, J. Mercer, D. Murray, A. Murtha, M. Suresh, L. Wiebe

Helical TomoTherapy related:
B.G. Fallone (PI), C. Field, T. Mackie, A. McEwan, D. Murray, M. Parliament, R. Pearcey, W. Roa, D. Robinson, R. Urtasun

3T MRI/MRS related:
B.G. Fallone (PI), T. Mackie, S. Halls, A. McEwan, D. Murray, M. Parliament, L. Ryner, R. Scrimger, J. Tuszynski, R. Urtasun

CBIAR (Continued from page 79)
radiation (fluence) by the CT detectors and the MV tomographic images obtained in the treatment position.

The Center represents an interesting approach to biologically-targeted radiotherapy, and it is hoped that, with the scientific and clinical personnel at the Cross Cancer Institute and at the University of Alberta, this field of research would significantly enhance clinical outcome with improved quality of life for cancer patients. I would also like to make a personal invitation to Canadian researchers to consider using our facilities for some of their own experiments. Most of the facilities of CBIAR will be operational by the end of 2002. We have a mechanism to allow external scientists access to these facilities, and I would be more than happy to describe the process at your request. Furthermore, tours of the facilities will be organized for the COMP/CCPM meeting in Edmonton, 2003; and again you are all invited to attend.

References:

[1] A Brahme, in *Treatment optimization using physcial and radiobiological objective functions*, edited by A.R. Smith (Springer-Verlag, New York, 1995), pp. 210.

[2] D. H. Hristov and B. G. Fallone, "An active set algorithm for treatment planning optimization", Med Phys **24** (9), 1455-1464 (1997).

[3] D. H. Hristov and B. G. Fallone, "A continuous penalty function method for inverse treatment planning", Med Phys **25** (2), 208-223 (1998).

[4] T. R. Mackie, T. Holmes, S. Swerdloff et al., "Tomotherapy: a new concept for the delivery of dynamic conformal radiotherapy", Med Phys **20** (6), 1709-1719 (1993).

[5] T. R. Mackie, J. Balog, K. Ruchala et al., "Tomotherapy", Semin Radiat Oncol **9** (1), 108-117 (1999).

Mammography Forum in Montreal

The Accreditation Committee on Physics of Mammography has undergone some changes in early 2002. Its members are now:

Ian Cunningham
Cupido Daniels
Alain Gauvin, Chairman
Gordon Mawdsley
Rasika Rajapakshe
Martin Yaffe

Its first undertaking for 2002 will be to hold a mammography forum during the Montreal meeting, at the Delta Centre-Ville, on July 13th from 16h00 to 18h00. The main topics of discussion will be:

1 - Presentation of a plan for writing some terms of reference to govern the activities of the Committee.
2 - Discussion on the process of renewal of physics accreditation.
3 - Talk and discussion on facility accreditation of digital systems in Canada, with an update on technology.
4 - Artefact session. Participants are welcome to contribute by bringing their own films of artefacts.

Accredited physicists, or individuals contemplating accreditation are invited to participate to the forum.

Workshop on the Dose Limits for Pregnant Workers from Exposures to Ionizing Radiation

The Federal Provincial Territorial Radiation Protection Committee (FPTRPC), a committee comprised of the various regulatory bodies from the federal, provincial and territorial levels of government associated with the regulation of ionizing radiation in Canada, is organizing the above mentioned workshop on Monday, October 21st, 2002 to take place in Ottawa.

As you may be aware, there are at least three different federal values for the control of the occupational exposure to pregnant workers. This is further complicated by several additional values in the provincial and territorial jurisdictions. This is an obvious opportunity for potential harmonization of regulatory requirement in Canada. As a possible stakeholder, your input into the harmonization is important.

An objective chairperson qualified in radiation protection, addressing questions and concerns from the presentation will facilitate the workshop. The format will be a presentation focusing on the difficulties and complexities associated with the subject limits followed by the chairperson summarizing the issues and associated questions and breaking the audience into several working groups who will then be asked to further rationalize the problem and consider options to solve the multiplicity of control limits. The working groups will meet separately for discussion and development of options and then present its ideas to the plenary. A short list of options will be developed through facilitation by the chairperson and the short list will then be forwarded to the FPTRPC for final consideration for the way ahead for harmonization.

The results of the workshop and the FPTRPC report on the way ahead for harmonization will be published at the FPTRPC website located at **http://www.hc-sc.gc.ca/ehp/ehd/rpb/fptrpc/index.htm**.

As a potential stakeholder you are invited to participate in this harmonization opportunity. Please indicate your preliminary interest by advising the provincial chair of the FPTRPC at **wtiefenbach@lab.gov.sk.ca**. If you wish to send your response by mail, the return mailing address is Wayne Tiefenbach, Radiation Safety Unit, Department of Labour, 1870 Albert Street, Regina SK S4P 3V7.

Medical Applications of X-rays in Hungary

From the Beginning – Research, Manufacturing, Radiation Protection, Quality Assurance and Testing

By TAMÁS PORUBSZKY
National "Frédéric Joliot-Curie" Research Institute for Radiobiology and Radiohygiene, Division of Occupational Radiohygiene
Budapest, Hungary

Historical milestones of Hungarian radiology

There are many points in the classical period of radiology which, unfortunately, are not known outside Hungary.

Jenõ Klupáthy (1861-1931), professor of physics repeated Röntgen's experiments - based on his preliminary report – at the beginng of January 1896 and gave the first public lecture about X-rays in Hungary on 16th January, a week earlier than Prof. W. C. Röntgen did the same in Würzburg. Prof. *Endre Hõgyes*, MD (1847-1906) in his paper "Skeleton photography through the body according to Röntgen" published in "Medical Weekly" in January 1896 predicted the therapeutic applications of X-rays. There were several X-ray physical laboratories in Hungary in the period 1896-1900. The most outstanding personality of classical period of Hungarian radiology, first professor of the Central X-Ray Institute of Budapest University of Sciences, *Béla Alexander*, MD (1857-1916) created the so-called "plastic" or "relief-type" radiograms using two copies (similar images nowadays are made by digital edge enhancement).

There has been some production of medical X-ray equipment in Hungary continuously since 1918. Today's two most important manufacturers are GE Medical Systems Division (formerly Medicor X-Ray Corporation) and Innomed Medical Corporation.

Radiation protection concerning medical roentgenology has also a very long history in Hungary. Prof. *Nándor Ratkóczy*, MD (1891-1977) in 1923 designed the so-called protective seat, and then in 1929 a protective cabin, the so-called "Ratkóczy-cabin". They were manufactured in Erlangen by Siemens. Medical X-ray protection has been legislated in Hungary since 1942.

Implementing related directives of the European Union in Hungary

Medical devices (93/42/EEC) directive was implemented from April 2000. So certification of conformance of medical devices in Hungary is completely identical with that within the EU. Moreover, from June 2001 the so-called PECA-agreement (Protocol to the Europe Agreement on Comformity Assessment and Acceptance) between Hungary and the EU also came into force. It means that EU and Hungary mutually recognize certifications of each other (not only for medical devices, there are some other fields, too), provided the products are to be considered as of EU or Hungarian origin. Therefore American, Canadian, Japanese and other products and/or manufacturers, even if they legally have got a CE-marking, are tested in Hungary repeatedly and separately further on. The only solution to this controversial situation will be our full membership. At present, there is one "notified body" in Hungary in the field of medical devices which is notified not only by the Hungarian Ministry of Health but also in Brussels by the European Union. This is the "Institute for Medical and Hospital Engineering" in Budapest. This institute has the right of certification of all medical devices according to all applicable Annexes of the directive, except type testing (Annex III) of radiological equipment. Our laboratory has an accreditation. We will have the right to perform such conformance testing as a subcontractor, restricted to devices of diagnostic radiology. (The National Institute for Roentgenology and Radiation Physics is not accredited yet for such testing.)

Directive 96/29/Euratom about radiation protection generally and of the public is implemented from July 2000, merged together with some local conventions. Hungary has 19 counties and the capital Budapest is outside them. Radation health authority is organized as institutes in each county, they are part of the so-called State Public Health and Medical Officer Service (SPHAMOS). From the 20 county (Budapest included) institutes of SPHAMOS there are seven having a radiation health division, so-called decentrums. In every decentrum there are physicians, physicists and public health inspectors. They help also two (or in case of Budapest one) neighbouring counties in their decision making. Of course, any activity with radiation can be made only by the licence of the authority. Its necessary conditions are – among others – the appropriate qualification, recognized radiation protection training and medical fitness of employees, moreover, the existence of radiation protection dosemeter(s), radiation protection service and performing personal dosimetry.

Directive 97/43/Euratom about radiation protection of patients is also implemented, it came into force only some months ago. It requires the quality control and application of medical physicists in radiology. Assessment of patient doses for determining national guidance levels and performing acceptance testing of new radiological equipment are designated to our institute. The status tests will be performed by accredited organizations. (It can be supposed that they will be mostly the same – mainly service firms – who already perform the so-called periodic safety checkings.) Daily (weekly, monthly) QC, i.e. constancy tests are the responsibility of the user.

The implementation of all the three mentioned directives – as normally also of others – was made by ministerial orders.

QC in radiation therapy and nuclear medicine was a daily practice long ago but in diagnostic radiology it has not an extensive past and present in Hungary. In 1986-87 there was an attempt – only in bigger hospitals – to use a so-called QC bag initiated and manufactured by the National Institute for Roentgenology and Radiation Physics. It contained very simple tools based on recommendations of WHO at that time. Because

(Continued on page 83)

X-rays in Hungary (Continued from page 82)

of the lack of the interest this initiative quickly died. Now there are only a few X-ray technicians and engineers in the coutry who perform QC (periodic performance checking). In radiology departments – or even hospitals – having their own quality system, generally just the performance checking lacks from the system. But our intention to join to the EU, the new legislation as well as common sense requires to overtake our lag.

The only field on which there are already definitive results in our country is the assessment of patient doses in diagnostic radiology. The so-called National Patient Dose Assessment Programme is going since 1989 under the management of department leader and deputy institute director *Sándor Pellet*, MD, PhD, and performed mostly by physicist *Ferenc Giczi*, PhD. There are some regional results, moreover, results for the whole country for photofluorographic mass chest screening, computed tomography and mammography. The started next step is lumbar spine radiography as also one of the examinations going with the highest patient doses.

Education, institutions and professional organizations in Hungary (medical radiology, radiation protection, medical physics, medical engineering)

In Hungary there are four medical faculties of universities, in some of the largest cities: Budapest, Debrecen, Szeged and Pécs, and one postgraduate medical faculty, in Budapest – now it is a part of Semmelweis University. The majority of radiographers are educated in secondary school level training colleges although a university college level education has already began.

There is some postgraduate education of hospital engineers and the so-called biomedical engineers but just education of medical physicists is not solved yet. At the universities of sciences (Budapest, Debrecen, Szeged) the educated profession is: "physicist" (MSc level), and then one becomes a "medical physicist" in practice.

About our radiation health authority, the SPHAMOS I have already written. Our institute, the NRIRR is a part of the so-called "József Fodor" National Public Health Centre (NPHC) which is an organization under SPHAMOS.

The National Institute for Roentgenology (Radiology) and Radiation Physics is above all a medical professional institute of the Ministry of Health. It was till 2000 the so-called type testing institute in radiology, too. By implementing the European legislation, however, this function, as well as expertizing of radiological plans and discarding radiological equipment, is stopped. So future of technical-physical activity and staff of this institute is uncertain at present.

Professional organization of radiologists is the "Hungarian Radiological Society". Radiation protection specialists are gathered in the Radiation Protection Section of the "Roland Eötvös Physical Society"; it is a member organization of IRPA. Medical engineering has two organizations in Hungary, one of them is the Medical Engineering Section of the "Scientific Society for Measurement, Automation and Informatics". This section is a member organization of IFMBE. The other organization is the "MEDING" National Medical Engineering Society.

The Hungarian Association of Medical Physicists which is a member organization of IOMP and EFOMP functions as a section of the "Hungarian Biophysical Society" as an umbrella organization. The number of its members is above 50 people. More than 80 % of it are radiation therapy physicists in the 13 radiation therapy centres of the country. Only about 3-5 people are from nuclear medicine, the health authority, firms and the mentioned institutes. Some of these colleagues partly deal also with some diagnostic radiology problems but full-time medical physicist dealing exclusively with diagnostic radiology is only one person at present.

Activities of NRIRR

By the decision of the Hungarian government in 1954, the institute was founded by the Ministry of Health under the name Central Research Institute for Radiobiology in 1957. The first director (1957-1972) was Dr. *Vilmos Várterész*. The basic task of the institute was to study radiation-induced diseases and their healing that could arise in some persons or group of peoples through the peaceful utilization of nuclear energy or its use for military purposes, and through an extensive application of radioactive isotopes.

The name of the institute was changed to "Frédéric Joliot-Curie" Central Reserch Institute for Radiobiology from 1959.

The sphere of tasks of the institute continued to expand, first with the national guidance and implementation of radiohygiene research and practical activities, including occupational and environmental radiohygiene sectors, and later with research and development of radioactive therapeutic preparations. In the interest of performing the newer tasks and clarifying the profile of public health institutes, Department of Radiation Hygiene of the National Institute of Occupational Medicine, the Radiation Physics Department of the National Institute for Roentgenology and Radiation Physics and the Radiation Hygiene Laboratory of the National Institute of Public Health were attached to the institute. The name of the institute from that time is National "Frédéric Joliot-Curie" Research Institute for Radiobiology and Radiohygiene (NRIRR, in Hungarian: OSSKI).

The institute has been the professional health centre of the country for radiation hygiene and radiation protection. Our third director (1974-1997), Prof. Dr. *László B. Sztanyik* reorganized the institute in 1974, establishing three professional departments: the Department of Radiation Biology, the Department of Application of Radiations and Isotopes and the Department of Radiation Hygiene. A fourth unit, the formerly independent Division of Non-Ionizing Radiations now is the part of Radiohygiene Department.

In 1984 the Department of Radiohygiene of the Postgraduate Medical University was established and it functions as the basis of the institute.

Since 1998 the institute forms a part of the so-called "József Fodor" National Public Health Centre. Since then the director of the institute has been Prof. Dr. *György Köteles*.

Reference: Balázs Bugyi: Hungarian medical radiology – past and present. Published by the Medicor Works, Budapest, 1977.

2001 Professional Survey

By Richard Hooper

For the Professional Affairs Committee, COMP/CCPM

The format and data collection procedure for the 2001 COMP Professional Survey was similar to that used for the 2000 survey. Approximately 250 questionnaires were mailed out to all COMP full members currently residing in Canada, and 137 surveys were returned. All survey responses were handled in the strictest confidence so as to ensure the anonymity of respondents. Responses are summarized by geographic area and degree/certification in tables 1 and 2 below. Some surveys were incomplete and could not be used in all or parts of the remaining analysis.

Salaries

A summary of the salary data for Medical Physicists working in Canada is provided in table 3 below. Full statistics are provided for groups with at least 11 respondents. Only average and median results are provided for groups of 5 to 10 respondents. Data for groups of fewer than 5 could jeopardize confidentiality and thus are not listed.

A comparison of average and median salaries for 2000 and 2001 is provided in table 4. Only groups with at least 11 respondents in both years are included in this table. Figure 1 depicts percentile ranges of primary income from 1997 through 2001 for all Medical Physicists working in Canada, and also for subgroups by degree and certification.

Individuals were asked to specify by what percentage their salaries increased or decreased between 2000 and 2001. Of the respondents who had at least three years experience in medical physics, worked as full-time employees, and had not changed jobs in the past two years, 5% reported that their salary decreased, 8% reported that their income did not change, and 87% reported that their income increased. For all these individuals the average increase was 5.5% and the median increase 4.0%. For the 87% who reported an increase in income the average increase was 6.7% and the median increase 5.0%.

The regular hours of work specified in employment contracts for full-time employees was, on average, 37.4 hours per week.

Benefits

The average annual vacation allotment was 22.4 days per year.

Some employers allocate each of their physicists an annual personal travel and/or professional expense allowance, while other employers reimburse these expenses on an ad-hoc basis. Of all the respondents who listed themselves as full-time employees, 62% reported receiving reimbursement of at least $1,000 while 29% either did not answer the question or reported receiving no reimbursement. For those receiving at least $1,000 the average allocation was $4,347 and the median allocation $2,400.

Other benefits data is summarized in table 5.

Additional information regarding salaries or benefits, such as a detailed summary for a particular geographical region, is available upon request provided the data can be reported without jeopardizing confidentiality. Requests for further information or comments regarding the survey should be directed to Richard Hooper (rick.hooper@cancerboard.ab.ca).

REGION	Number of Responses
British Columbia (BC)	15
Alberta (AB)	13
Saskatchewan (SK)	6
Manitoba (MB)	12
Ontario (ON)	59
Quebec (PQ)	21
New Brunswick (NB)	3
Nova Scotia (NS) and Prince Edward Island (PE)	5
Newfoundland (NF)	1
Not Specified	2
Total	137

Table 1: COMP 2000 Professional Survey responses by geographical region.

	Certification				
Degree	None	CCPM(M)	CCPM(F)	Other	Total
Bachelors	3	0	2	0	5
Masters	19	6	13	3	41
Doctorate	34	15	34	7	90
Other	1	0	0	0	1
Total	57	21	49	10	137

Table 2: COMP 2000 Professional Survey responses by degree and certification

2001 Professional Survey cont.

			PRIMARY INCOME							
		Ave Yrs	Average	Percentiles						
	Number	Exper	Income	20th	Median	80th	Income	20th	Median	80th
OVERALL (Canada)	129	12.8	92.3	68.3	92.0	115.0	94.4	69.3	97.0	115.0
PROVINCE										
BC + AB + SK + MB	45	12.4	96.2	78.0	100.0	117.5	97.0	78.0	103.0	117.5
ON	56	14.5	95.9	70.0	100.5	114.3	99.2	74.7	101.5	115.0
QC	20	10.1	73.3	64.0	74.5	81.2	73.8	65.0	74.5	82.5
NB + NS + PE + NF	7	12.2	95.4		92.0		102.0		95.4	
EMPLOYER										
General Hospital	33	12.3	83.1	65.0	79.0	100.0	88.7	65.1	80.0	108.6
Cancer Institute	77	12.6	97.6	78.8	103.0	116.1	98.3	78.8	103.0	116.1
University or Government	18	15.3	86.4	66.4	87.5	118.6	88.4	66.6	87.8	118.6
FUNCTIONS (>= 50%)										
Clinical Service	75	9.8	89.1	65.5	92.0	110.0	89.2	65.9	92.0	110.0
Teaching + R&D	33	13.4	91.0	70.0	90.0	120.2	95.7	72.0	98.0	120.2
Administration	14	27.1	114.6	88.6	119.8	138.2	119.7	89.8	123.8	143.7
SPECIALTIES (>= 50%)										
RT	93	10.9	92.3	67.0	92.0	115.1	93.1	67.0	95.5	115.1
DR + NM + MR	26	15.7	90.3	68.8	91.1	107.4	98.1	71.8	97.5	114.5
RP	6	23.5	89.2		94.8		89.2		94.8	
YEARS EXPERIENCE										
< 5	30	2.2	64.6	52.2	65.5	79.0	65.0	52.2	65.9	79.2
5 - 9.9	25	6.7	87.5	69.0	91.0	102.5	88.0	69.0	92.5	102.5
10 - 14.9	25	11.7	96.8	87.0	100.0	109.5	98.5	90.5	100.0	109.5
15 - 19.9	14	16.7	106.4	84.4	112.5	125.7	106.6	84.4	112.5	125.7
20 - 24.9	14	21.4	109.0	87.9	116.6	126.3	116.4	93.9	116.6	136.8
25+	21	28.3	111.6	99.8	110.0	132.7	116.6	99.8	110.4	144.0
DEGREE/CERTIFICATION										
Bachelors/all	4									
Masters/all	37	12.8	84.2	60.0	80.4	110.5	84.5	60.0	80.4	110.5
Masters/no cert.	18	6.2	66.0	51.6	61.7	79.9	66.3	51.6	61.7	79.9
Masters/CCPM(M)	6	13.6	94.7		98.5		94.7		98.5	
Masters/CCPM(F)	11	20.5	105.7	82.9	111.0	124.8	106.2	82.9	111.0	125.7
Masters/CCPM(M or F)	17	18.1	101.8	80.4	105.0	115.3	102.1	80.4	105.0	115.3
Masters/other cert.	2									
Doctorate/all	87	12.6	97.0	77.0	100.0	118.0	100.0	79.2	100.0	118.0
Doctorate/no cert.	34	8.2	82.3	61.8	82.2	104.2	82.8	61.8	82.2	104.2
Doctorate/CCPM(M)	15	9.2	94.8	82.0	98.0	106.0	98.9	88.4	100.0	109.5
Doctorate/CCPM(F)	32	18.5	113.1	98.0	115.0	128.1	118.4	100.9	115.5	129.7
Doctorate/CCPM(M or F)	47	15.5	107.3	91.0	107.0	120.4	112.2	97.8	110.0	121.4
Doctorate/other cert.	6	14.3	100.6		100.0		102.3		101.5	
DEGREE/YEARS EXPER.										
Masters/< 10	16	3.5	64.2	52.6	61.7	79.0	64.5	52.6	61.7	79.0
Masters/10+	21	19.9	99.4	81.5	105.0	113.6	99.7	81.5	105.0	113.6
Doctorate/< 5	18	1.9	65.2	47.0	68.4	79.3	65.5	47.0	68.4	80.5
Doctorate/5 - 9.9	19	7.1	95.6	86.3	98.0	103.0	96.2	86.3	98.0	103.0
Doctorate/10 - 19.9	27	13.3	104.6	90.9	107.0	118.1	106.3	91.9	107.0	118.2
Doctorate/20+	23	24.7	114.3	98.3	115.1	129.5	122.9	103.3	118.0	151.2

Table 3: Salary data for Medical Physicists working in Canada. Salaries are in thousands of dollars. In order to ensure confidentiality, data are not listed for subgroups of less than 5, and only average and median values are reported for groups of 5 to 10 respondents.

2001 Professional Survey cont.

	PRIMARY INCOME					
	2000		(% of 2000 Income)			
	Average	Median	Average	Median	Average	Median
OVERALL (Canada)	86.0	85.0	92.3	92.0	7.3%	8.2%
PROVINCE						
BC + AB + SK + MB	92.6	95.0	96.2	100.0	3.9%	5.3%
ON	87.6	90.0	95.9	100.5	9.5%	11.7%
QC	69.6	70.0	73.3	74.5	5.3%	6.4%
EMPLOYER						
General Hospital	75.2	75.0	83.1	79.0	10.5%	5.3%
Cancer Institute	92.6	95.0	97.6	103.0	5.4%	8.4%
University or Government	75.8	76.0	86.4	87.5	14.0%	15.1%
FUNCTIONS (>= 50%)						
Clinical Service	82.7	83.0	89.1	92.0	7.7%	10.8%
Teaching + R&D	82.9	77.3	91.0	90.0	9.8%	16.4%
Administration	107.7	113.5	114.6	119.8	6.4%	5.6%
SPECIALTIES (>= 50%)						
RT	87.9	88.3	92.3	92.0	5.0%	4.2%
DR + NM + MR	81.8	79.8	90.3	91.1	10.4%	14.2%
YEARS EXPERIENCE						
< 5	65.7	59.0	64.6	65.5	-1.7%	11.0%
5 - 9.9	79.5	81.0	87.5	91.0	10.1%	12.3%
10 - 14.9	88.0	87.0	96.8	100.0	10.0%	14.9%
15 - 19.9	106.4	109.0	106.4	112.5	0.0%	3.2%
20 - 24.9	98.9	105.1	109.0	116.6	10.2%	10.9%
25+	104.3	104.5	111.6	110.0	7.0%	5.3%
DEGREE/CERTIFICATION						
Masters/all	79.1	75.0	84.2	80.4	6.4%	7.2%
Masters/no cert.	65.7	59.0	66.0	61.7	0.5%	4.6%
Masters/CCPM(M or F)	91.1	85.0	101.8	105.0	11.7%	23.5%
Doctorate/all	90.4	90.5	97.0	100.0	7.3%	10.5%
Doctorate/no cert.	77.7	76.0	82.3	82.2	5.9%	8.2%
Doctorate/CCPM(M or F)	100.9	102.3	107.3	107.0	6.3%	4.6%
DEGREE/YEARS EXPER.						
Masters/< 10	62.8	61.2	64.2	61.7	2.2%	0.8%
Masters/10+	94.7	95.0	99.4	105.0	5.0%	10.5%
Doctorate/< 5	70.2	67.0	65.2	68.4	-7.1%	2.1%
Doctorate/5 - 9.9	86.2	89.8	95.6	98.0	10.9%	9.1%
Doctorate/10 - 19.9	96.4	95.5	104.6	107.0	8.5%	12.0%
Doctorate/20+	108.3	107.0	114.3	115.1	5.5%	7.6%

Table 4: Comparison of average and median values for primary income in 2000 and 2001. Income values are in thousands of dollars, and change in income is specified as percentage of primary income in 2000. Only groups with at least 11 respondents in both years are included in this table.

2001 Professional Survey cont.

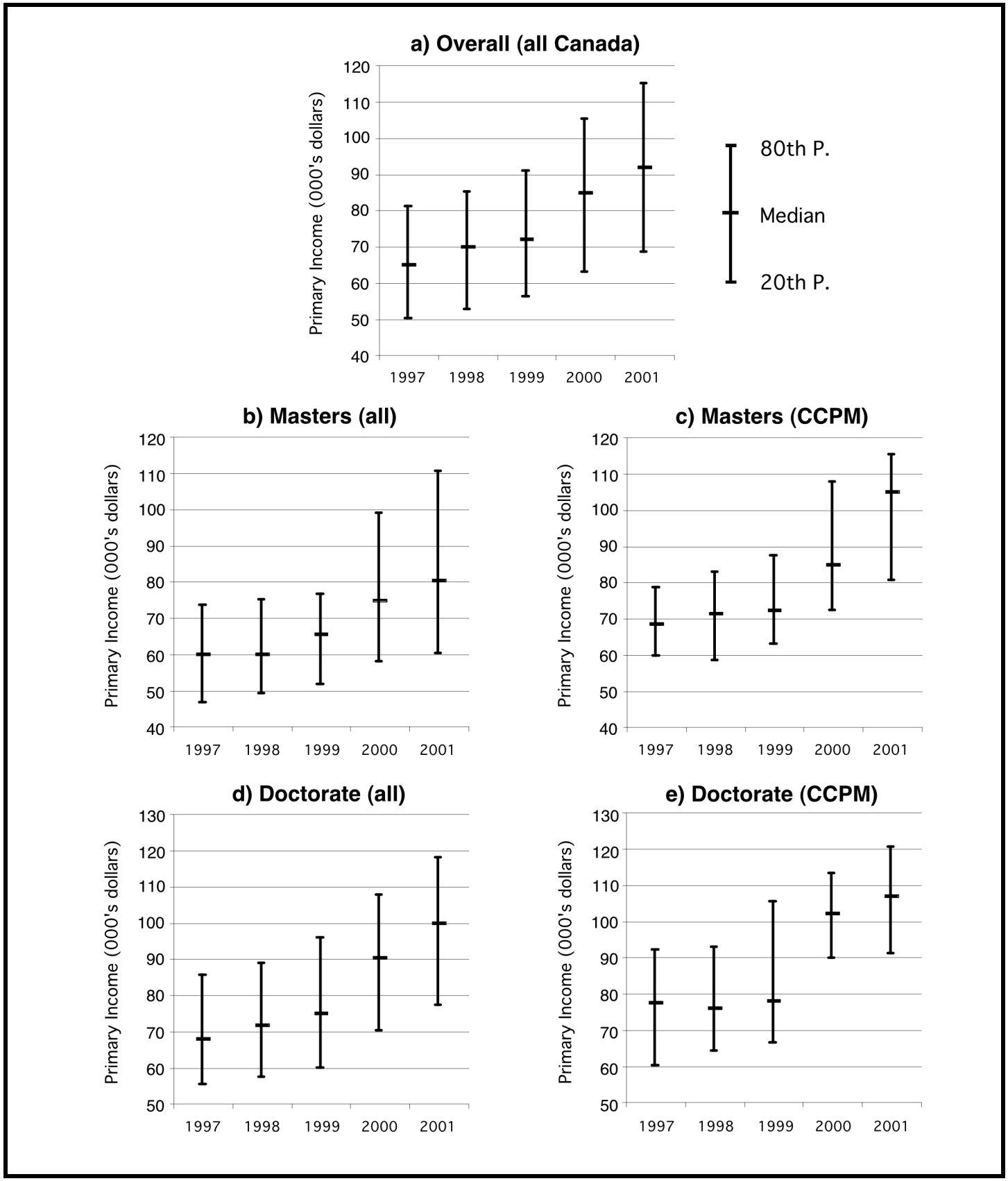


Figure 1: Percentile ranges of primary income from 1997 through 2001 for all Medical Physicists living in Canada, and for subgroups by degree and certification. CCPM designation includes both members and fellows.

2001 Professional Survey cont.

Benefit	Yes (%)	No (%)	Unknown or N/A (%)
Medical coverage	79	10	11
Dental coverage	81	12	7
Term life insurance	70	14	16
Disability insurance	69	14	18
Retirement pension plan (exclusive of CPP or QPP)	86	6	7
Sabbatical leave	20	57	23
Tuition benefits (self)	16	65	19
Tuition benefits (dependent)	6	74	19

Table 5: Percentage of full-time employees who received at least 50% funding from their employer for the listed benefits. Due to roundoff error, totals do not necessarily add up to 100%.

NEW MEMBERS OF THE COMP EXECUTIVE

In the January issue of Interactions a call was published for nominations to two positions on the COMP executive: Chair Elect and Treasurer. This was followed by an email to all COMP members before the April 1 deadline. In response, one nomination was received for each position. In accordance with the motion passed at the Annual General Meeting in Kelowna last year, a mail ballot will not be conducted and the nominees are acclaimed. Brief biosketches provided by them can be found below. On behalf of COMP, I welcome Peter and Horacio to the executive and thank them for taking on these responsibilities.

Mike Patterson
Chair, Nominating Committee

PETER O'BRIEN, CHAIR ELECT (from AGM, 2002)

Peter O'Brien is the Chief Physicist and head of the Department of Medical Physics at the Toronto Sunnybrook Regional Cancer Centre and Assistant Professor in the Department of Radiation Oncology at the University of Toronto. Peter started his career at the Calgary Cancer Centre in 1971 after receiving an MSc from the University of Guelph. Peter has been the chair of the Division of Medical and Biological Physics of the Canadian Association of Physicists (1980) and a member of the board and of the examination panel of the Canadian College of Physicists in Medicine (1984-88). Peter was the chair of the Radiation Therapy Advisory Committee of the Ontario Healing Arts Radiation Protection Commission (1992–1998) and a member of the federal Advisory Committee on Radiological Protection (1999-2001). Since 1998 he has been the chair of the joint CCPM/COMP Radiation Regulations Committee. Peter's current professional interests include development and implementation of technology for precision radiation therapy, organization of medical physics programs and quality assurance standards for radiation therapy. Peter O'Brien lives with his wife Mary in Unionville, Ontario. They have 2 sons and 2 daughters.

HORACIO PATROCINIO, TREASURER (from January 1, 2003)

Horacio Patrocinio received his B.Sc. from Concordia University in 1990 and his M.Sc. in Medical Physics from McGill in 1993. From 1993 to 1997, he has worked as a radiation oncology physicist at the CHUM (Hôtel-Dieu Hospital) in Montreal and has worked at the McGill University Health Centre since then. He has also held teaching appointments with the Université de Montréal and McGill University during that time. Horacio is a member of the CCPM and a diplomate of the ABR. From 1999-2002, he held the position of treasurer of the Association Québequoise des Physiciens Médicaux Cliniques. He is looking forward to putting the knowledge he acquired in that role with the AQPMC and his remedial arithmetic skills to good use in his capacity as treasurer of COMP.

WesCan 2002

By Peter L. McGhee

This year the annual WesCan meeting was hosted by the Northwestern Ontario Regional Cancer Centre in Thunder Bay, Ontario. The meeting was held from March 20 through to March 23 and, as Chair of the Organizing Committee, I am pleased to say that it was well attended. For those who are not familiar with WesCan, this is a relatively informal, low budget conference for Medical Physicists, Dosimetrists, Radiation Therapists, Simulator and Mould Room staff, Electronics Technologists, Machinists, Physics Assistants, Computer Scientists and any and all related support staff and students. Forums where all of these groups can congregate and network are relatively rare. Furthermore, many of these groups are not structured such that they can organize regular meetings on a significant scale so, for such groups, WesCan provides a relatively unique opportunity for participants to meet with peers from elsewhere in the country. These participants were particularly enthusiastic about the meeting. Indeed, the general feedback received indicated that the meeting was a very positive and useful experience. It does make one wonder whether or not eastern Canada would benefit from following the lead of the West with the resurrection of such a forum. Even so, I am sure that no one from WesCan would object to those from the east pencilling this meeting into their calendars.

Figure 1. After an intense morning, recuperation (bread

The first day of the meeting was comprised of presentations from a series of invited speakers. The sessions were opened by the Mayor of Thunder Bay, Ken Boshcoff. The morning then proceeded with the first of the two themes for the day. Because a new Cancer Centre is currently under construction in Thunder Bay, adoption of Facility Design as this first theme seemed most apropos. An overview of the design of the new facility, with particular emphasis on the external beam treatment rooms (or, more rudimentarily, bunkers), was provided by Peter McGhee and John Costa of the Northwestern Ontario Regional Cancer Centre. Don Robinson from the Cross Cancer Institute then provided a timely and informative review of design considerations when developing a room to accommodate IMRT. Particular consideration was given to the different impact on the design resulting from the installation of a tomotherapy versus a conventional treatment unit. Tom Feuerstake from the Princess Margaret Hospital then discussed the impact of the evolution of technology from the perspective of linear accelerator service personnel, including an overview of the current state of affairs and challenges for these essential members of the radiation treatment team. Finally, Ramzi Jammal provided an informative (and occasionally eye-opening) update on the current state of affairs at the Canadian Nuclear Safety Commission. The interest in the activities of the CNSC raised during the session led to an *ad hoc* discussion session being organized for Saturday morning.

The theme for the afternoon of the first day was selected to get the adrenalin pumping: Quality Assurance. To the credit of the series of speakers, this much maligned yet so fundamental aspect of radiation treatment was made both informative and entertaining. Peter O'Brien of the Toronto-Sunnybrook Regional Cancer Centre, who has been championing the cause for establishing national Canadian standards for Quality Assurance, provided an overview of the current state of affairs. A review of RTOG IMRT Protocol, timely for many, was provided by Pat Cadman from the Saskatoon Cancer Centre. Many may recall that Pat recently covered this topic in a previous edition of Interactions (**48**:1, p.25). The quality assurance associated with Record and Verify systems was discussed by Ian Hudson of the Tom Baker Cancer Centre, while Emily Vollans of the Vancouver Cancer Centre provided insights into those processes associated with Stereotactic Techniques. Finally, Jeff Bews from Cancer Care Manitoba gave a run down on brachytherapy that, while informative, was entertaining to an extent most incongruous with the subject matter - an excellent way to end a most productive and enjoyable day.

(Continued on page 93)

Figure 2. Proof of Gino's keynote presentation (or at least that he was definitely somewhere doing something).

The principal activity on the second day was the series of presentations provided by meeting attendees. These proved to be of a high quality and ran the gamut in subject matter. One particular highlight was the presentation by the keynote speaker, Gino Fallone, from the Cross Cancer Institute. Speaking on the topic of *Image-Guided Adaptive Radiotherapy at the Cross Cancer Institute*, Gino described the impressive expansion of facilities and technologies at CCI. Clearly a very ambitious program, it encompasses a broad spectrum of the latest equipment and techniques associated with radiation treatment, holding tremendous promise for advancing the field and developing the more integrated approach that many believe holds the greatest benefit for patients. Also interspersed throughout the day were student presentations. A number of judges, who remained anonymous, graciously volunteered to assess the student's work for the purpose of dispensing awards.

Concurrent to this main session, more than a dozen radiotherapy equipment service personnel from across Canada were gathering in a separate room to discuss the formation of an association to professionally represent and credential them. Their counterparts in the United States are presently organizing, and a working group is being established to determine what the options are in Canada. Tom Feuerstake, who presented the previous day, chaired the sessions. An Interim Committee consisting of Tom Feuerstake (chair), Bruce Gillies (co-chair), Brian Martin (secretary), Stephan Kloster, Claude Deslauriers, John Ukos, Lawrence Degagne (resource) and Robert Knutson (resource) was formed to establish the association, which will be known as the Association of Radiation Therapy Equipment Service Technologists (AREST). Membership will be open to all Canadian radiotherapy equipment service personnel. For more information, contact any one of the individuals on the committee.

A banquet was held that evening, commencing with some opening remarks from Dr. H. S. Dhaliwal, CEO of the NWORCC. During the course of the banquet the spirit of the attendees shone through. In particular, kudos go out to the contingent from Winnipeg. They maximized fiscal responsibility by ensuring that the leftovers were kept to a minimum and epitomized the dedicated nature of those in the field as they undertook to ascertain who, amongst their group, could consume the most prime rib. The unfortunate who succumbed may have inadvertently started a new tradition. True to his word, and in the presence of most of the attendees, this most robust and masculine individual donned swimming attire of the feminine persuasion, climbed the ladder to the top of a multi-story water slide (somewhat to the surprise of the attending lifeguard), and rode the slide down into the pool…and,

Figure 3. An ARESTing group of gentlemen.

(Continued on page 94)

Figure 4. The winners - congratulations to all the students.

no doubt, history.

The student awards were also presented during the banquet. Six students participated and all gave excellent talks so, in the interest of promoting future student participation, all six received an award. First place went to Heather Andres of Cancer Care Manitoba while the runner up was Robert Girardin of Lakehead University.

The third day began with the aforementioned *ad hoc* discussion session with representatives from the CNSC. Chaired by Ramzi Jammal, the session was well attended. Ramzi and his colleagues fielded a variety of questions with regard to new regulations. As one example, particular concern was expressed with regard to the CNSC Licence to Service that must be obtained by June 1, 2002. Those present found the forum to be very useful and informative.

The remainder of the day was filled with tours of the existing NWORCC facility and of the partially completed new facility. At the existing site, Terry Stupar from MDS Nordion, presented on HDR brachytherapy, a topic of particular interest in Thunder Bay because of a recently implemented HDRB program. Happily, no one was lost during the tours and, to the best of my knowledge, no one missed their flights home.

By all accounts, I am pleased to report that the meeting appears to have been a success. Such a result is directly attributable to the efforts of the local organizing committee, the vendors who sponsored the meeting, and the terrific response of those who attended. Of course, our thanks also to all the invited speakers for agreeing to participate and doing such a superb job. Thanks also go out to COMP for facilitating advertising of WesCan on their website. Information about WesCan 2002, as well as copies of most of the presentations and a few pictures, can be found at www.wescan.org. Please take advantage and peruse the site.

Attention now turns to WesCan 2003, which will be the 25th anniversary of the meeting. The torch is being handed off to Boyd McCurdy and Cancer Care Manitoba in Winnipeg. Boyd can be contacted at:

Boyd McCurdy, Ph.D.	phone: (204) 787-1966
Medical Physics Department	pager: (204) 932-8379
CancerCare Manitoba	fax: (204) 775-1684
675 McDermot Avenue	e-mail: boyd.
Winnipeg, MB	mccurdy@cancercare.mb.ca
R3E 0V9	
CANADA	

If you have not been to WesCan, consider going next year. If you have, we hope to see you there! After all, it is in Winnipeg and I understand they have waterslides…

WesCan 2002 Organizing Committee

Peter McGhee (Chair)
Bans Arjune
Peter Dunscombe
Patrick Rapley
Laura Haskell
Michael Tassotto
David Gladun
Michael Del Nin
Frank Bagdon
Alison McMullen

WesCan 2002 Supporting Vendors

Best Medical International
Hilferdine Scientific Inc
IMPAC Medical Systems Inc
MDS Nordion
NOMOS Corporation
Philips Medical Systems
Varian Medical Systems
Siemens Canada Ltd

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(Continued from page 94)

Association of Radiation Therapy Equipment Service Technologists Interim Committee

Tom Feuerstake (PMH): tom.feuerstake@rmp.uhn.on.ca
Bruce Gillies (TSRCC): bruce.gillies@tsrcc.on.ca
Brian Martin (SCC): bmartin@scf.sk.ca
Stephen Kloster (KRCC): stephen.kloster@krcc.on.ca
Claude Deslauriers (NEORCC): cdeslauriers@neorcc.on.ca
John Ukos (HRCC): john.ukos@hrcc.on.ca
Lawrence Degagne (NWORCC): lawrence.degagne@nworcc.on.ca
Robert Knutson (NWORCC): robert.knutson@nworcc.on.ca

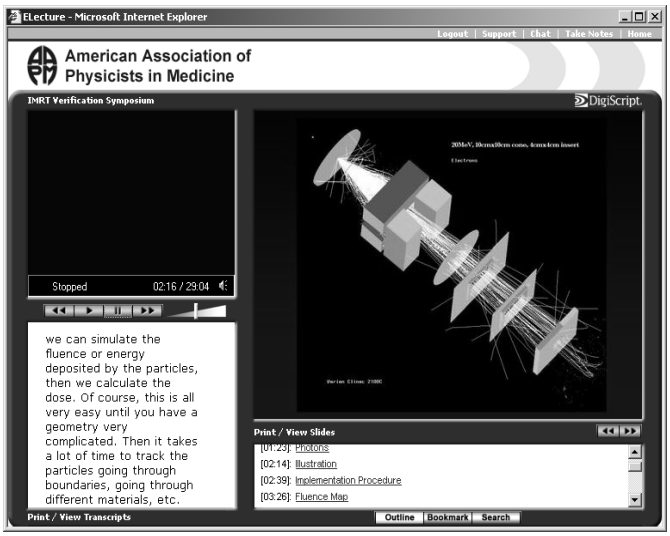
Figure 5. The survivors - the ones who accepted the challenge, survived the meeting, and made it to the climactic tour of the new site.

NetWorthy by Darcy Mason

Learning Resources

The internet is a great tool for disseminating information. Here are a few sites I have come across that could help in continuing education or in learning for newcomers to medical physics. Please send in any sites that you know of for future articles.

AAPM Virtual Library (via www.aapm.org, see below)



I am *really* impressed with the AAPM Virtual Library. This site allows you to view recorded presentations – a video of the speaker in one panel, the slides in another, and even a written transcription of what the speaker is saying. You can jump to different slides by title, and after a brief pause, the video will jump to that portion of the presentation. The screen capture here shows some of this information (although I wasn't able to capture the video of the speaker in the upper left).
If you haven't tried this, I recommend you do, just so you know what is available. Access is free for AAPM members, but a bit confusing. Go to www.aapm.org, and currently there is a blurb about the Virtual library right at the top of the page. Click on the "logging in" link. Log in and, after a pause, you will be brought back to the same page but a "Virtual library" link will be there. Clicking on this sends you to the host site (digiscript.com). Sign up under New User Registration as per the instructions.

Web-rad-train (www.columbia.edu/~ejh1/web-rad-train)

This site is a teaching site for medical radiation topics. The material is prepared by Eric J. Hall, author of *Radiobiology for the Radiologist*. For each topic there are review materials, and quiz sections. The topics include Interactions of Radiation with Matter, DNA damage / Chromosomal Aberrations / Cellular response, Tissue Response, and Factors affecting Radiation Response. Many more topics are promised. Only the first topic is available until you register (free).

Hyperphysics (http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html **)**

This link is not a medical physics link, but a large collection of physics information of all kinds. As the name implies, each topic is hyper-linked to many other related topics. The section on quantum physics includes a summary of Compton scattering, suitable for students new to medical physics. An interesting calculation section under Compton scattering allows you to incoming photon wavelength (or energy) and scatter angle and the web page calculates and displays the energy of the outgoing photon and energy transferred to the electron in various units.

Some other topics of interest to medical physics newcomers I happened to come across at Hyperphysics: ionizing radiation (and explanations of units such as the Roentgen and Gray), half-life, brehmsstrahlung, and a section on Chernobyl.

Darcy Mason
Cancer Centre for the Southern Interior
Kelowna, BC
DMason@bccancer.bc.ca

Letter to the editor:

Re: Proposed CCPM Bylaw Amendments regarding Radiation Safety

I read with interest the proposed changes to the College bylaws (April Interactions, pp. 51-54), and in particular, the proposal that applicants of all subspecialties be assessed for radiation protection competency.

To recap, the proposal states that for the written Membership exam,

> Sections I and II. (2 1/2 hours total) Section I consists of short answer questions (no choice) covering general medical physics and also clinical anatomy and biological science relevant to clinical medical physics practice. Applicants from all sub-specialties write the same exam. Section II of the exam consists of short answer questions (no choice) covering radiation safety in their subspecialty.

and for the oral examination for Fellowship, it is stated that

> Part of the oral exam is devoted to radiation safety and candidates not demonstrating competence in this section will fail the exam.

There are currently four subspecialties in which individuals can be certified: therapy, diagnostic, nuclear medicine, and mri.

From talking to Board members, I understand that the intent of the proposed change is to make it evident that the most appropriate professional to be responsible for radiation safety in a facility like a cancer clinic is a College-certified medical physicist. Fair enough and an authority worth reinforcing. But as drafted above, the radiation safety requirement is not sufficiently clear. Many would interpret the above as that the radiation protection competency assessment is on ionising radiation for therapy, diagnostic, or nuclear, with the details being different for each, and on rf and magnetic fields for mri. A second interpretation, however, was given to me by one of the Board members. This second interpretation is that the radiation protection competency assessment for *all* candidates is for *ionising* radiation. In my view, for mri physicists this would be inappropriate and excessive. For mri physicists the evaluation should not be on the basis of their knowledge of ionising radiation, even as used for imaging, but should be on the hazards of rf radiation, magnetic fields with time-varying gradients, hazards due to metallic implants and to projectiles, etc.

Most or all hospital mri physicists that I know, unless they do have ionising radiation experience, would be happy to leave protection in the x-ray facility etc. to physicists in ionising radiation, whether they be in-house or consultants. Indeed, for all concerned it would probably be best if the realm of Gy, Sv, w_R, w_T, occupancy factors, TVL's, exposure rate constants, CNSC regulations, transport packaging, provincial x-ray regulations, etc. was the responsibility of experts working a significant fraction of their time with ionising radiation.

The proposed Bylaw change should be revised to be clear. Use of the terms “ionising” and “non-ionising” would help. To not do so could leave the requirement open to faulty interpretation. A perceived requirement for ionising radiation safety competency would be a real turn-off to potential College members and fellows from the mri physics community, which is already poorly represented in the College. It's as important to mri patients and to owners or administrators of mri facilities that the physicists working there are certified to be competent as it is important to radiation therapy, nuclear medicine, and x ray patients and facilities.

Paul C. Johns, PhD FCCPM
Carleton University

Letter to the editor:

The attached photo shows a small deciduous tree that has self-seeded right next to a radiation warning sign in a high dose rate exclusion area on the flat, non-landscaped roof directly above the array of accelerators in Hamilton Regional Cancer Centre. This spring, Little_Tree really hit its growth stride. I snapped the photo with my (professional allowance-purchased) digcam and sent it to a few physicist colleagues.

Recognizing my protective feelings for Little_Tree, and that as RSO, I've recently endured CNSC licensing for new facility construction, servicing, nuclear substances, accelerator renewal (and pretty much anything that moves or doesn't), our salty-humoured department head and past-COMP chair, Mike Patterson, offered the following poignant suggestion in the email below:

From: Patterson, Mike
Sent: Thursday, June 06, 2002 10:08 AM
To: Wyman, Doug
Subject: RE: landscaping over bunkers

I think we should develop a proactive strategy for its protection. What about a few rumors (based on a nugget of truth) that the tree itself is radioactive so cannot be cut down unless you have a Radioactive Vegetation Attenuation License from CNSC?

My response: Don't give them any ideas!!

Doug Wyman

I would like to say that it has been a real pleasure to work on the Board and in the medical physics community. There was quite a bit of work and, to be honest, I have often felt that I haven't done enough. However, my interactions with fellow Board members, with the executive of COMP, with members of various committees within the College and shared with COMP, and with many colleagues who helped behind the scenes, have been generally a lot of fun. Although I often complain in these messages that there are not enough people involved in our Canadian medical physics organizations, I must say that many people are working hard for us all and that they show a strong commitment to the medical physics community in this country. I really cannot give these folk enough praise. I will repeat that this type of work is very fulfilling and is a lot of fun. And I really would encourage all of you to get more involved with the organizations, not just because it is important that people get involved for the organizations to continue to function, but also because it is actually a positive step in one's professional development. Get involved, meet the people across the country, see what they do and what they are concerned about, and perhaps have the odd beer with someone you may not have met otherwise. It is worth it!

Finally, I'm not going to thank all the people with whom I've worked. Invariably I would leave out someone important (as I am losing the little memory I once had). I will say that I feel that I've been really blessed in the last few years with a great group of colleagues. This made my job much easier than I had thought. I thank people for their patience, I am somewhat disorganized and I'm always behind, folk have been very forgiving for the most part and I really appreciated that. I also would like to thank my beautiful growing family and my colleagues in Kingston (physicists, physician colleagues and my administration) who have encouraged me in this work. Without all their encouragement it would have been very difficult to take on this work. I look forward to continuing to help the College however I can, and I hope that you will all lend your support to Brenda Clark as she takes on her new role.

Thank you very much. John

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Milpitas CA 95035 USA
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website: www.adaclabs.com

Contact: Ms. Jennifer L. Anderson
mailto:janderson@adaclabs.com

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7643 Fullerton Road
Springfield VA 22153 USA
Phone: (703) 451-2378
Fax: (703) 451-8421
website: www.best-medical.com

Contact: Mr. Krishnan Suthanthiran
mailto:krish@best-medical.com

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2817-B Lebanon Pike
Nashville TN 37214 USA
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Fax: (615) 885-0285
website: www.cnmcco.com

Contact: Mr. Ferd Pusl
mailto:CNMCsales@earthlink.net

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1055 Sarnia Road, Unit B2
London ON N6H 5J9 Canada
Phone: 1-800-473-7710
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Contact: Mr. Steve Gensens
mailto:sgensens@cspmedical.com

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Contact: M. Michel Donaldson
mailto:donaldson.marphil@qc.aibn.com

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Whitby ON L1P 1N8 Canada
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Fax:
website: www.elekta.com

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mailto:jacques.verhees@elekta.com

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website: www.harpellassociates.com

Contact: Mr David Harpell, P.Eng.
mailto:David@harpellassociates.com

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mailto:droberts@swna.org

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website: www.siemens.ca

Contact: Mr. Dean Willems
mailto:dean.willems@siemens.ca

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mailto:edewerd@standardimaging.com

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Contact: Ms. Jan Roth
mailto:JRoth@os.varian.com

MEDICAL PHYSICISTS

The Prince Edward Island Cancer Treatment Centre and its host hospital, the Queen Elizabeth Hospital (QEH), are seeking Medical Physicists to join the organization in support of its expanded Cancer Treatment and Diagnostic Imaging Programs.

The Cancer Centre is currently equipped with a CT-simulator, 3-D treatment planning system, and a cobalt-60 teletherapy machine. Construction has begun to expand the Centre; and a new Varian 21EX linear accelerator with 120 leaf MLC, a-Si portal imaging, and VARiS is scheduled to be installed in November 2002. The Department of Diagnostic Imaging is a fully equipped, modern department with a province-wide Radiology Information System (IDX). A Maritime-wide Picture Archiving and Communication System (AGFA) will be in place within the next year. Expansion of the QEH to add a Siemens 1.5T MRI is occurring concurrently with the Cancer Centre expansion. The addition of both large pieces of equipment will greatly improve the local access to modern diagnostic and radiation therapy facilities.

A qualified medical physicist is required on a permanent basis to join the cancer care group comprised of a medical physicist, a radiation oncologist, radiation therapists, and other professionals. The ideal candidate will also be qualified to provide medical physics support to the MRI; qualifications in general radiography, mammography, nuclear medicine, and regulatory health physics would be additional assets.

Temporary positions for qualified medical physicists are also available to assist in the ongoing clinical radiation therapy program and the commissioning of the linear accelerator during the expansion phase.

The successful candidate must have a masters or doctorate degree in physics (preferably medical physics) and must hold certification or be eligible to attempt certification with the Canadian College of Physicists in Medicine (preferably in radiation oncology or magnetic resonance imaging). The QEH is also interested in hearing from interested candidates qualified in one speciality of medical physics and willing to pursue training in other specialities.

Picturesque Prince Edward Island offers a relaxing, safe community-oriented lifestyle for individuals and families who can appreciate beautiful scenery, wide-open spaces, miles of pristine, uncrowded beaches, and an endless variety of recreational activities (e.g., world-class golf courses, fishing, cross country skiing).

Interested candidates for either the permanent or temporary positions are invited to submit their curriculum vitae by 09 August 2002 to:

Glen Doyle

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PEI Public Service Commission
P.O. Box 2000 Charlottetown, PE
Canada C1A 7N8
Toll Free: 1-877-989-5627
Fax: 902-368-4383
E-mail: grdoyle@gov.pe.ca

CAREER OPPORTUNITY,
MEDICAL PHYSICS
DEPARTMENT

KINGSTON REGIONAL CANCER CENTRE

25 King Street West, Kingston, Ontario, Canada K7L 5P9

MEDICAL PHYSICS RESIDENT

Applications are invited for a medical physics resident position in the Medical Physics Department of the Kingston Regional Cancer Centre (KRCC). The Centre is one of nine regional cancer centres operated by Cancer Care Ontario (CCO) and is located at the Kingston General Hospital, adjacent to Queen's University Campus. Cancer Care Ontario, a provincial agency, is responsible for the development of an integrated cancer control system in Ontario, Canada. The Kingston Regional Cancer Centre sees approximately 3,000 new patients per year. Ambulatory care services are provided at KRCC and at outreach clinics at other hospitals in Southeastern Ontario. KRCC is formally affiliated with Queen's University.

The Radiation Oncology Programme operates one Clinac 600C and two Varian Clinac 2100C/D linacs, an orthovoltage unit, an LDR afterloading unit, and a Theraplan Plus 3D treatment planning system. A new high-energy Varian MLC/EPID equipped 2100EX linac and a Philips CT Simulator will be installed in the clinic in the late fall and early winter of 2002. A T780 cobalt unit is available for a focussed cobalt tomotherapy research program within the department. The resident will join a strong clinical team consisting of five medical physicists, a physics resident, research personnel (graduate students and post docs) and technical support staff. The medical physicists supervise medical physics graduate students in the Department of Physics at Queens University.

The Medical Physics Resident will receive hands-on training over two years covering all aspects of clinical physics related to radiation treatment including radiation dosimetry, treatment planning, brachytherapy, and quality assurance of all radiation therapy equipment. The resident is encouraged to participate in medical physics courses and radiation oncology training and clinical rounds. At the completion of the program the candidate will have the foundation necessary for the CCO Review A clinical certification process. About one fifth of the resident's time will be devoted to research.

Qualifications for the residency position include a graduate degree in Physics or a related field: the preferred entry requirement is a Ph.D. in Physics or a related subject; the minimum entry requirement is a M. Sc. in Medical Physics. Candidates should also have good verbal and written communication skills, basic knowledge in radiation physics, and a strong interest in working in a multidisciplinary medical team.

Applications are invited from all qualified candidates. Priority will be given to Canadian citizens and permanent residents of Canada, in accordance with Canadian Immigration requirements. Please submit curriculum vitae, transcripts of graduate and undergraduate studies (may be unofficial) and the names of two professional referees by **July 31, 2002** to:

L. John Schreiner, Ph.D., FCCPM

Chief, Medical Physics, Kingston Regional Cancer Centre

25 King Street West, Kingston, ON, Canada, K7L 5P9

FAX:(613) 544-9708

E-mail: john.schreiner@krcc.on.ca

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CANADA RESEARCH CHAIR IN MEDICAL PHYSICS

Department of Physics, Carleton University

Applications are invited for a senior position in the field of Medical Physics, with a preference for a radiation therapy physicist. The position is supported by a Tier I award through the Canada Research Chairs (CRC) program. The CRC program was established by the Canadian Government to enable our universities to achieve the highest level of research excellence (see www.chairs.gc.ca).

Carleton offers outstanding opportunities for a research program in radiation therapy. It has strong ties with the Monte Carlo and radiation dosimetry programs at the National Research Council of Canada where a clinical accelerator is being delivered solely for research purposes. There are also strong ties with the Ottawa Cancer Clinic which treats 3000 new patients per year with extensive external beam and brachytherapy programs and which has an active collaboration with the Ottawa Heart Institute's intravascular brachytherapy program. Carleton itself has active research programs in x-ray and MRI imaging and in therapeutic ultrasound.

Carleton has developed one of the strongest graduate programs in Medical Physics in Canada. The program is delivered in partnership with the Ottawa Medical Physics Institute, a dynamic research and education network of medical physicists at several institutions in the national capital region. (see www. physics.carleton.ca/ompi) The successful candidate will take a leadership role in this enviroment, building a thriving research program at Carleton and participating in thegraduate and undergraduate programs of the Department of Physics.

Carleton's location in Canada's capital, Ottawa, offers a very high quality of life, close to nature and many cultural activities.

Candidates must have a strong, sustained record of internationally recognized research including supervision of graduate students and post-doctoral researchers. Appointment will be at the Associate or Full Professor level commensurate with experience. The possibility of an appointment at the Tier II level exists. Candidates should send their curriculum vitae and a statement of research and teaching interests, and should arrange for letters from three referees to be sent to:

Prof. Pat Kalyniak
Chair, Department of Physics
College of Natural Sciences
Carleton University
1125 Colonel By Drive
Ottawa, Canada
K1S 5B6

The deadline for applications is September 15, 2002 however consideration of applications will continue until the position is filled. Carleton University is committed to equality of employment for women, aboriginal peoples, visible minorities, and people with disabilities.

Faculty Position
Department of Physics & Astronomy
Laurentian University

The Department of Physics and Astronomy at Laurentian University invites applications for a three-year term appointment at the Assistant Professor level effective July 1, 2002. Applicants must have a Ph.D. in physics with preference being given to candidates specializing in medical physics who have membership in the Canadian College of Physicists in Medicine, or equivalent. Successful candidates will be expected to teach at the undergraduate and graduate level and to conduct research in a field related to the department's specialties. These include medical or biomedical physics possibly in collaboration with colleagues at the North Eastern Ontario Regional Cancer Centre, neutrino astrophysics and trace radioisotope research at the nearby Sudbury Neutrino Observatory, and condensed matter physics. While it is anticipated that the appointment will be in an area related to medical physics, other qualified physicists are invited to apply, in which case preference will be given to applicants with postdoctoral or equivalent experience. The department has an M.Sc. graduate program in Applied Physics, and a biomedical physics undergraduate program in addition to general and honours physics degree programs. This position requires teaching in English. In accordance with the University's Policy on Bilingualism, Laurentian has a requirement of passive bilingualism (French/English) as a condition of tenure.

Applications will be accepted until the position has been filled. Applicants should send curriculum vitae, and should arrange to have three letters of reference sent to:

Chair of Search Committee
Department of Physics and Astronomy
Laurentian University
Sudbury, Ontario P3E 2C6
Fax: (705) 675-4868
E-mail: physics_chair@laurentian.ca

Laurentian University is committed to equity in employment and encourages applications from all qualified applicants, including women, aboriginal peoples, members of visible minorities and persons with disabilities. In accordance with Canadian Immigration requirements, all qualified candidates are encouraged to apply, however, Canadians and permanent residents will be given priority.

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Medical Imaging Physicist
Full-time
Salary commensurate with academic rank and experience

Competition # 9351 - Diagnostic Services - Nuclear Medicine

The Department of Nuclear Medicine operates across the 3 acute care hospitals of Hamilton Health Sciences. The department has 11 Gamma Cameras, 2 Bone Densitometry scanners, 1 Positron Emission Tomography scanner coupled to a Medical Cyclotron facility. Of the five cameras recently purchased, one is the VG Hawkeye system (one of 4 in Ontario). Research Imaging devices in the Department of Nuclear Medicine include 1 Quantitated Computed Tomography scanner and a small bore, 1 Tesla Magnetic Resonance Imager. Our well equipped facility is fully integrated with a dedicated PACS.

The Medical Imaging Physicist will be responsible for participating in all aspects of the clinical service and academic Nuclear Medicine activities. An emphasis will be placed on image analysis, image processing and image management. The opportunity is available for academic appointment to McMaster Univeristy in the Medical Physics Unit or the Department of Radiology and for colloboration with members of the McMaster Institution of Applied Radiation Sciences.

Qualifications:

1. PhD or equivalent in Medical Physics or a related relevant field
2. Certification or eligibility in the Canadian College of Physicists in Medicine
3. Experience in image processing, computer networks, and software development
4. Demonstrated technical expertise in Medical Physics, specifically Nuclear Medicine
5. Eligible for appointment to McMaster University, if warranted, by participation in education and research programmes
6. Evidence of commitment to continuous education with a research and development career

Please apply with a cover letter and resume quoting competition # 9351 to:

Recruitment, Human Resources
e-mail: recruitment@hhsc.ca
Fax: 905-318-2558
www.hamiltonhealthsciences.ca

Position: Radiation Oncology Medical Physicist

Location: St. Vincents Comprehensive Cancer Center Greenwich Village, New York, NY

Description:

St. Vincents Comprehensive Cancer Center has an outstanding opportunity for a motivated Medical Physicist to join one of the leading community cancer centers in the country. The successful candidate will have 3 or more years of clinical experience, strong communication skills, an MS or PhD, and board certified in Therapeutic Radiological Physics.

The Department of Radiation Oncology is a Varian Learning Center where both U.S. and international visitors routinely visit to learn about some of the latest techniques and practices within our field. These include electronic patient information management, digital imaging, IMRT, Stereotactic Radiosurgery with electronic patient positioning, and Respiratory Gating. The Department has 2 identical Varian 21EX Platinum Accelerators, a GE Nxi/Pro Dual-Slice CT scanner, a VariSource HDR unit, the Varis Patient Management System, CadPlan Helios Treatment Planning for IMRT (Upgrading to Eclipse in Summer 2002), 2 CMS Focus workstations for conventional 3D Treatment Planning, and an active prostate seed implant program. The GE Discovery LS PET/CT scanner will be installed this fall and plans for another identical linear accelerator are underway. The department has been filmless for over 2 years and is preparing to transition to a completely electronic medical record.

The successful applicant will join a growing department of highly skilled professionals including 3 physicists, 1 dosimetrist, and 5 radiation oncologists. Responsibilities of this position include routine calibration and quality assurance of the linear accelerators and treatment planning systems, prostate seed implants, chart checks, involvement in special procedures, commissioning and acceptance testing, and other duties as required.

The Saint Vincents Comprehensive Cancer Center is a proud affiliate of Salick Health Care, Inc.

Please mail, e-mail, or fax your CV to:

Richard Emery, MS, DABR
Chief Physicist
Saint Vincents Comprehensive Cancer Center
325 West 15th St.
New York, NY 10011

Fax: (212) 367-1880
E-mail: remery@salick.com

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