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LE COLLÈGE CANADIEN DES PHYSICIENS EN MÉDECINE

59 (2) April/avril 2013

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InterACTIONS

Volume 59, Number 2 – April/avril 2013

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Winter School Faculty

From left to right: Tom McGowan, Svetlena Taneva-Metzger, Jean-Yves Fiset, Vera Pantelic, Marie-Andree Fortin, Robyn Grant, Stephen Breen, Kerry Bowman

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Message from the COMP President

Let me start this edition of the message from the president by giving my congratulations to Stephen Breen and his team on a wonderful 2013 Winter School program. I was not planning on attending this year (I went to the past two editions). But decided to participate in the Canadian Partnership for Quality Radiotherapy (CPQR) Delphi meeting. The Winter School has managed through the years to change just enough of its content and add some new information delivery format to be appealing even for someone who has participated multiple times before. Not counting that this year, in addition to the audience response system, Twitter was officially one medium by which the participants could send their comments and questions to the Faculty. I have to admit that I made my first ever tweet during the Winter School and I am now officially a follower of the COMP twitter account.

Regarding CPQR, numerous technical documents are now in the various stages of the writing, review or validation process, and a sizable number (7 if I remember correctly) should be available to the community by the end of 2013. Since CPQR obtained a renewal of its funding for the next 5 years, we can expect the effort to be sustained in the longer term. A major thank you to Michelle Nielson and Jean-Pierre Bissonnette for their current role, leading the technical document portion. Many of you probably have heard that AAPM is also considering producing clinical practice documents. An observer from AAPM was at the meeting and confirmed that the goals of the CPQR documents were quite similar to what AAPM had in mind. COMP and AAPM will further explore if collaboration on some specific topics (e.g. Cyberknife, for which access to the equipment could be limited in Canada) could lead to joint documents.

It is important to underline that COMP has been a supporter of CPQR since the beginning, starting in the CAPCA days. As of April 1st 2013, COMP has agreed to provide the financial administration (through AMCES services) of the funds provided by CPAC to CPQR. This will be cost neutral for COMP over the next 5 years.

I am also quite happy to announce that all parties involved in preparing the World Congress to be held in Toronto in 2015 have now agreed to the final contractual details. The 2015 World Congress is organized jointly by COMP and CMBES (the Canadian Medical and Biological Engineering Society) for the International Union for Physical and Engineering Sciences in Medicine (IUPESM). As the name of the latter society indicates, IUPESM represents both IOMP (of which COMP is a founding member) and the International Federation for Medical and Biological Engineering (IMFBE). The lead figures for COMP are David Jaffray (who lead the COMP bid in Beijing), Marco Carlone and Jean-Pierre Bissonnette. This meeting is a great opportunity to provide international visibility to COMP. I wish the 2015 World Congress conference organizing committee all the best in getting things rolling and assure them of our full support moving forward.

The Imaging Task Force (ITF) committee, announced in the previous edition of InterActions, is now fully constituted and operating. The group is working hard on a general position statement related to physicists and medical imaging at large in Canada and a second statement specifically regarding Safety Code 35. I am happy to report that the ITF group has selected Dr. Thorarin Bjarnason as the Chair. Thorarin is a medical physicist and radiation safety and quality lead in the Diagnostic Imaging Services at Interior Health and a clinical lecturer at the University of British Columbia. He has also taken the role of Liaison to the COMP Board.

I mentioned IOMP earlier in this article with regards to the 2015 World Congress. It should be pointed out that IOMP will celebrate its 50th anniversary during the 2013 International Congress of Medical Physics in the UK in September (http://www.icmp2013.org). As part of the celebration, the exceptional contributions of 50 medical physicists worldwide will be highlighted. COMP has submitted the names of its Gold medalists and also of Prof. Harold Johns. The final choice now resides with IOMP. I am convinced that this will not be an easy task. As a founding member, COMP will be represented at this meeting and will deliverer a short address. Futhermore, please note that IOMP is also planning a Medical Physics day on November 7th (http://www.iomp.org/?q=content/international-day-medical-physics), which coincides with the birthdate of Marie Sklodowska-Curie (1867). Mark the date on your calendar. More to come later this year.

Luc Beaulieu

The next major undertaking by the Board is the compliance with the Not-for-profit Act and this should start within the next few weeks in order to be ready by the 2013 annual meeting in September. Our Executive Director Nancy Barrett and her team are preparing various documents for the Board to review and build upon. While we are told that the exercise might not lead to dramatic changes to our bylaws, you can be assured that we will convey to the membership all relevant information on this critical initiative well in advance of the annual meeting.

À la prochaine

Message from the CCPM President

It is a great pleasure to start off this report with a congratulatory note. Renée-Xavière Larouche, our Deputy Chief Examiner, had a baby girl on Feb 14, 2013. Congratulations Renée. Renée will be taking a brief break from her CCPM duties and we hope she will enjoy her time off.

In my last column, I mentioned that the board was proceeding to bring our bylaws into line with the new Canadian Not-For-Profit Corporations Act. It is not the intention of the board to make any substantive changes to how the CCPM operates or is governed, but some changes are mandated by the new act and these must be in place no later than October 17, 2014. This work is underway, and the consultants that we have engaged to help us with this process have produced a draft set of bylaws that the board is reviewing. It is still our hope that we will be able to present the new bylaws to the membership in time for ratification at the next AGM in September.

The CCPM examination process is, of course, at the very core of our business. The board members, and especially the Chief Examiner and Deputy Chief Examiner, are always working hard to ensure that the exams and the examination process are relevant and up to date. Recently, the CCPM Board has enacted some changes to the membership oral exam in order to streamline the process. From now on, under certain circumstances, candidates who fail a section of the oral exam but pass the other two sections convincingly will only be re-examined on the failed section in subsequent attempts. There are some rules for how this change is applied and I invite you to check out the FAQ section of the CCPM website for a complete explanation. The FAQs concerning this new change are also reprinted in this issue of Interactions. These changes will be in place for the 2013 examination year.

The Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM) has undertaken a process ultimately aimed at creating an international agreement on the certification of medical physicists. The first contact with the CCPM on this matter came over two years ago. The discussions that have taken place up to now have been between CCPM board members and other involved parties, primarily COMP and CAMPEP. In the bigger picture, the ACPSEM has also been in contact with ACR, ABR, AAPM, and IPEM (Institute of Physics and Engineering in Medicine, a UK organization). I feel that these discussions have now reached the point where it is time to bring them to the attention of our members.

The ACPSEM has engaged a facilitator to move this initiative along. The stated aims of the ACPSEM in this matter are to work towards establishing formal recognition of ACPSEM certified medical physicists within the USA, UK, and Canada. This would be in the form of some sort of reciprocal arrangement that would allow for medical physicists to travel between the participating countries and practice professionally.

I remember the issue of reciprocity with other organizations being discussed at the very first CCPM board meetings I attended after becoming a member, so there is certainly a long history of similar discussions. At that time, the discussions focused solely on our relationship with American organizations. At present, thanks to the hard work of some former board members, CCPM certification is recognized by the AAPM, by the USNRC, and by a number of states

Matthew G. Schmid

that require licensure of medical physicists. The similarity of our standards for certification to those of the ABR has been instrumental in making this happen. For this reason, we have always taken the standards of other organizations into consideration when making decisions about our own certification process.

As you are all aware, the CCPM will soon have a requirement that candidates applying for membership must have completed a CAMPEP accredited graduate or residency program. The ACPSEM has a similar method of accrediting education programs, and until now, much of the focus of the discussions with ACPSEM has centered on accepting graduation from an ACPSEM program as equivalent to graduation from a CAMPEP accredited program. The ACPSEM has supplied detailed documents comparing the requirements of the two programs, however the board hasn't yet undertaken a formal assessment of the ACPSEM accreditation process. Part of the reason for this is that the ACPSEM is trying to develop some sort of formal agreement

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Executive Director Report April 2013

2013 has been a busy year for COMP so far! We started the year off with a bang with a very successful Winter School in Mont Tremblant. While the theme has remained constant since the Winter School began, each year gets better with the introduction of new speakers, fresh content and expanded delivery mechanisms. One of the leaders in the Canadian medical physics community who attended for the first time this year commented that the Winter School was the *"most important CE activity I have been on in years"*. Congratulations to Stephen Breen and the planning committee on another success and thank you to our sponsors: Varian Medical Systems and the Canadian Nuclear Safety Commission. We will be looking for volunteers to lead this initiative in 2014, so please let us know if you are interested or would like more information.

The new Imaging Taskforce is a key initiative for COMP and the group has not wasted any time since its first meeting in December. Under the leadership of Thor Bjarnason, the taskforce is finalizing a statement on Imaging Physics in Canada for publication on the COMP website and has provided input to the Canadian Association of Radiologists on key position statements they are developing. The Imaging Taskforce provides organizations such as CAR and CAMRT with a much needed resource, and will only serve to increase their awareness of the important role that medical physicists play in the clinical application of medical imaging.

Planning for the joint meeting with the Canadian Association of Radiation Oncologists is progressing well. The 2013 meeting will build on the success of the 2007 joint meeting and the expanded CE offerings introduced at the 2012 meeting in Halifax. We look forward to seeing you in Montreal from September 18 -21st.

In 2013, we are pleased to offer the **"Salsa for Medical Physics Travel Award".** This award is the result of a donation made by medical physicist and COMP member, Mauro Tambasco. Mauro taught salsa lessons while he was at the University of Calgary and each year he donated the proceeds to various organizations. In 2012, he decided to make a $3000 donation to support student travel to science and education events so that six awards of $500 can be made available to our eligible student members. I am quite certain that this is a very unique award and we are grateful to Mauro for his generosity.

In the January issue, I included an article on the new Canada Not-for-Profit Corporations act with which COMP and CCPM must comply by the fall of 2014. I am pleased to report that we are on track with the transition to the new Act and that new draft bylaws for both organizations have been prepared. The bylaws are currently being reviewed and discussed by both Boards so that they can be presented to the membership for review and ratification.

Ms Nancy Barrett

As a founding member of the International Organization of Medical Physicists, COMP is looking forward to contributing to the celebrations that will be taking place in September in Brighton, England. We have nominated nine of our members to be included in a poster exhibit to mark the occasion. Putting the nomination package together was a very humbling exercise for me as I was reminded of the outstanding contribution to science, healthcare and society made by each of our nominees. The IOMP has also designated November 7, 2013 as the International Day of Medical Physics. Please mark your calendars and stay tuned for more details!

As always, please feel free to contact me or Gisele or at any time with your feedback and suggestions.

CNSC Feedback Forum
Training Requirements for the Receipt and Handling of Radioactive Packages

Dave Whitby, Project Officer,
Accelerators and Class II Facilities Division, CNSC

Historically there has been some confusion regarding the training requirements for licensee staff who may be involved in receiving, moving or opening packages containing radioactive material. Typically, the confusion involves identifying which staff must be trained in the Transport of Dangerous Goods (TDG) regulations. This may stem in part from the regulatory overlap between the two different government agencies having jurisdiction over the transport of radioactive materials. These are the Canadian Nuclear Safety Commission (CNSC), and Transport Canada (TC).

This article is intended to clarify regulatory expectations for training related to handling of nuclear substances, in the specific context of a typical radiotherapy treatment centre. This includes Medical Physicists and other staff at hospitals who may be involved with shipping and receiving the ^{192}Ir sources used in High Dose Rate (HDR) brachytherapy remote afterloaders, or sources used for permanent brachytherapy implants, such as ^{125}I or ^{103}Pd.

What Regulations apply to receiving active shipments?

The CNSC's *Packaging and Transport of Nuclear Substances (PTNS) Regulations* specify requirements for all phases of the packaging and transport of radioactive materials in Canada. Section 18(1) requires that every "consignee" of radioactive material implements a radiation protection program. Radiotherapy centres operating under a CNSC licence are required to have a comprehensive radiation protection program in place in order to get a licence. This program must encompass safe handling procedures for all radioactive sources that will be used or stored under the licence.

The *PTNS Regulations* require that shipments of radioactive materials in Canada be properly packaged. They must be transported in a manner that is safe for the public, the handlers and the carriers. Specific requirements for safe transport are stipulated, such as the package type, associated documents, labelling, placards and dose rate limits. These regulations refer directly to Transport Canada's *Transport of Dangerous Goods Act and Regulations* as well as to IAEA Safety Standard *TS-R-1,* which ensures consistency with international standards when shipping between countries.

"Nuclear Substances", as defined by the *Nuclear Safety and Control Act,* are also categorized as a Class 7 Dangerous Good in Part 1 of the *Transport of Dangerous Goods (TDG) Regulations.* Section 6.1 of these regulations require that any person who "handles, offers for transport, or transports" dangerous goods must be adequately trained and hold a TDG training certificate.

Some pertinent definitions:

- *Consignor* is defined in the TDG Regulations as the person named on the Shipping Document (this person is responsible for preparing the consignment for transport as stipulated in IAEA TS-R-1)
- *Consignee* is defined by the PTNS Regulations as the person who receives the consignment or to whom the consignment is intended
- *Consignment* is defined by the IAEA TS-R-1 as any package or load of radioactive material presented for transport
- *Handling* is defined in the TDG Act as loading, unloading, packing or unpacking dangerous goods in a means of containment for the purposes of, in the course of or following transportation and includes storing them in the course of transportation.

Do hospital Shipping/Receiving staff require TDG Training?

Yes. Most large metropolitan hospitals have a dedicated shipping and receiving area. The Shipper/Receiver and their staff may be involved with loading & unloading trucks, consigning outgoing packages for shipment, and dealing with packages of all types, including many different classes of Dangerous Goods.

The CNSC expects all consignees and consignors of Class 7 Dangerous Goods shipments, including Shipper/Receivers, to have TDG training. Preparation of shipping documents or loading/unloading of transport trucks requires TDG training under the TDG regulations. Similarly, upon receipt of a Class 7 package, the Receiver must make a determination if the package is damaged or has been tampered with and must take appropriate action if it has.. Essentially, the person at the hospital or the institution, who receives the package from the consignor on

behalf of their employer, should be appropriately trained. The TDG training for consignees and receivers must include the actions that need to be taken in the event that a package has been damaged.

Are there any additional temporary storage requirements compared with non-radioactive shipments?

Yes. Once the package has been signed as having been received by the Shipper/Receiver, the transfer to the licensee has been completed. The care and control of the package is now the sole responsibility of the licensee and all the appropriate measures to ensure security and the safety of personnel must be taken. These measures will be identified within each licensee's radiation protection program documentation

Upon receipt at a hospital, many shipments will be temporarily held or "staged" in the Shipping area until the package can be delivered to, or picked up by, the end user. This includes packages containing radioactive material. Such packages should normally be staged in a locked enclosure (or equivalent) to prevent unauthorized access. It should also be held in a low occupancy area to keep doses to staff ALARA. Staging the package under the shipper's desk until it gets picked up is NOT acceptable practice.

Does the individual delivering the Package to the end user internally require TDG training?

No. According to the definition in the TDG Regulations, this person is not "handling" the package and therefore is not required to receive TDG training. Remember, the person receiving the package from the consignor would have already determined that the package was intact.

However, the licensed facility must comply with the ALARA principle and ensure the security of the package at all times, including during internal movement. To put it simply, the licensee must take all reasonable precautions to prevent theft or loss of the package and prevent unnecessary radiation exposure of staff and the public. [For more detailed guidance on implementing a program to keep doses ALARA, refer to CNSC document G-129 Keeping Radiation Exposures and Doses As Low As Reasonably Achievable (ALARA).] The staff delivering the package must be trained in the licensee's prescribed ALARA and security procedures. These should include:

- The person delivering the package should use a cart instead of holding the package against their torso.
- The delivery person should avoid using crowded hallways or elevators where people may come in close proximity to the package.
- During delivery, the package must never be left unattended.
- The delivery person should not unnecessarily linger or permit others to linger next to the package.
- The package must be delivered directly to the end user or to a designated locked storage location.

Does the person opening the package require TDG Training?

Yes. Even though the shipment has been completed, the initial opening of the package meets the definition of "handling" and TDG training is therefore required. There are also regulatory obligations for the person opening a package to check for damage and containment as stipulated in section 21 of the PTNS Regulations.

For HDR source changes, a third party servicing engineer may be the person opening the package, at the time of the source change. In such cases, that individual requires TDG training from their own employer. Similarly, anyone directly involved in the packaging and preparation for shipment of the spent HDR source requires TDG training from their employer.

Does the TDG training need to encompass all of the TDG regulations?

No. Employees only require training in the aspects of the regulations that are directly related to their duties. It is the employer's responsibility to determine what constitutes adequate training for their employees. In other words, the training should be commensurate with their duties.

TDG training does not necessarily need to be given by a third party provider. Once the employee is trained, the employer issues the training certificate that lists the aspects of handling the employee was trained on.

Must the certificate of TDG training be readily available?

Yes. Any person who handles the dangerous good must provide their training certificate to an inspector immediately upon request. The required content of the training certificate is stipulated in section 6.3 of the TDG Regulations. Under 6.6 of the TDG Regulations, the employer is required to keep proof of training of staff. Remember that TDG training certificates expire after 36 months and the employer is required to ensure that training certificates for employees are valid.

If you have questions about this article or any previous articles in the CNSC Feedback Forum, please contact Kavita.Murthy@cnsc-ccsn.gc.ca.

CCPM Frequently Asked Questions
Incomplete Oral Exam

Horacio Patrocinio

Medical Physics Unit, Montreal General Hospital, Montreal, QC

Q: What is an "Incomplete Oral Exam" status?

A: A candidate for the membership oral examination who fails a single section of the exam while obtaining a mark of at least 80% in each of the two remaining sections may be attributed the status of "Incomplete Oral Examination". This status is considered a failure, but the candidate will not be examined in all the sub-sections of the oral exam the following year(s), only the failed sub-section.

Q: Why has the CCPM introduced the "Incomplete Oral Exam" status?

A: The CCPM has introduced this additional status to help streamline the examination process and recognize candidates who may present a weakness in a single area, such as clinical knowledge or safety, while having demonstrated sufficient knowledge and competence in other areas.

Q: Under what circumstances would I receive the "Incomplete Oral Exam" status?

A: According to the CCPM bylaws, you have three years following the date of the successful written examination to pass the oral exam. If you fail a single section of the oral exam while passing both others with a mark of least 80% in either the first or second year, you will be granted the "Incomplete Oral Exam" status. As such, you will only be examined on the failed sub-section in the following year(s).

Q: What if I fail to pass the oral exam after having previously received an "Incomplete Oral Exam" status?

A: You have a total of three years to pass the oral exam regardless of the status received ("Fail" or "Incomplete Oral Exam"). If, for example, you receive the "Incomplete Oral Exam" status in the first year you are eligible for the oral exam, you will have two more years where you will only be examined on the failed sub-section. If after three years you have not passed the oral exam, you will have to wait three years before re-applying to the entire CCPM membership examination process (both written and oral).

Q: What happens if I fail a single section of the oral examination in the last year I am eligible for the oral exam?

A: Unfortunately, you will not be eligible for the "Incomplete Oral Exam" status if you fail a single sub-section in the final year you are eligible for the oral exam. Your status will then remain as "Fail" and you will have to wait three years before re-applying to the entire CCPM membership examination process (both written and oral).

Message from the CCPM President

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with CAMPEP. It is their hope that the programs that have been accredited by the ACPSEM won't have to go through the formal CAMPEP accreditation process individually. The board has taken the position that we won't take any further action on this until the situation with CAMPEP becomes more clear. The ACPSEM has invested significant resources in this initiative, and is funding a trip by a panel of international experts to Australia and New Zealand so that they can have a first hand look at the ACPSEM education programs and certification process. Dr. Wayne Beckham, who holds both CCPM and ACPSEM certification and who is also the vice-president of CAMPEP, will be a member of the expert panel. It will be interesting to hear the opinions of the expert panel members and I look forward to seeing their report.

Progress in areas such as this is always slow, but I expect to have more to report on this matter by the time of the next issue of InterActions. Aside from our annual AGM, this column is the board's primary vehicle for communication with the members, so if there are any further developments, you will be able to read about them here. If there is any progress, I expect that there will be a discussion of the ACPSEM proposal at the next AGM in Montreal where everyone will have a chance to have their voice heard. Of course, I am always happy to receive comments about any CCPM business, so please feel free to contact me at any time.

New COMP Members

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

Last Name	First Name	Institute/Employer	Membership Type
Aldosary	Ghada	McGill University	Student
Alexander	Kevin	Cancer Centre of Souteastern Ontario	Student
Boivin	Jonathan	Université Laval	Student
Camborde	Marie-Laure	BC Cancer Agency - Vancouver	Full
Cantin	Audrey	Université Laval	Student
Cappon	Derek	McMaster University	Student
Close	Laura	McMaster University	Student
Conroy	Leigh	University of Calgary	Student
Courtial	Laurie	Université de Monrtéal	Student
Esquinas Fernandez	Pedro Luis	University of British Columbia	Student
Friedland	Lisa	McMaster University	Student
Gholampourkashi	Sara	McGill University	Student
Gräfe	James	Tom Baker Cancer Centre	Full
Hou	Xinchi	University of British Columbia	Student
Kaci	Linada	London Health Sciences Centre	Associate
Kim	Anthony	Odette Cancer Centre	Full
Liang	Yicheng	McMaster University	Student
Ma	Hillgan	University of British Columbia	Student
Marshall	François	Carleton University	Student
McIntosh	Bryan	CancerCare Manitoba	Student
Miksys	Nelson	Carleton University	Student
Mostafaei	Farshad	McMaster University	Student
Mutanga	Theodore	Trillium Health Partners/Credit Valley Hospital	Full
Poirier	Yannick	Tom Baker Cancer Centre	Student
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Uribe	Carlos	University of British Columbia	Student
Vallières	Martin	Université McGill	Student
Viel	Francis	BC Cancer Agency - Vancouver	Student
Yoo	Tae Sun	Odette Cancer Centre	Student
Zlateva	Yana	McGill University	Student

Congratulations to our past student members who are now full members:

Last Name	First Name	Institute/Employer
Alexander	Andrew	The Ottawa Hospital
Ali	Elsayed	The Ottawa Hospital Cancer Centre
Cui	Congwu	Trillium Health Partners/Credit Valley Hospital
Sonier	Marcus	Sunnybrook Health Sciences Centre



Experienced Medical Physicists - Radiation Oncology

Waikato is one of New Zealand's most beautiful regions, with a pleasant temperate climate. It combines the best of city, community and rural life. Waikato District Health Board plans, funds and provides health services across a district of more than 364,000 people. It leads regional cancer, MRI, trauma, emergency care coordination and screening services for the Midland health region with a population of more than 830,000. Waikato Hospital is a modern 600-bed tertiary and teaching hospital in Hamilton city. There are several smaller private and public hospitals in the region, as well as many community and rural based health services.

Waikato Regional Cancer Centre
Job number: 046057

We are seeking experienced, dynamic and innovative Radiation Oncology Medical Physicists to join our team of five physicists and two trainees.

The Waikato Regional Cancer Centre is located in Hamilton, New Zealand and serves a population of 550,000 with a staff of approximately 120. Radiotherapy is delivered by four Varian linear accelerators with Rapid-Arc/OBI capability and a comprehensive HDR brachytherapy programme. We use advanced treatment techniques incorporating IMRT and IGRT and have a strong involvement in clinical trials and research.

Situated in the heart of the North Island, Hamilton enjoys a warm, attractive climate. A population of approximately 120,000 makes it the fourth largest city and it possesses the vibrancy and amenities of a metropolitan area with short commutes, reasonably priced housing and relaxed living. It's central position and proximity to other destinations makes it a great base for exploring the upper and central North Island with numerous opportunities for New Zealand's famous outdoor activities or just exploring and lazing on pristine beaches.

Applicants should possess an MSc in Physics/Medical Physics, ACPSEM Certification (or equivalent) and experience in a wide range of clinical radiation oncology physics, including dosimetry, quality assurance, commissioning and development of equipment and treatment techniques. It would be especially desirable for the candidate to have IMRT, RapidArc, IGRT and HDR experience. Recently qualified candidates are encouraged to apply but for senior posts a minimum of 8 years experience is required.

In return we can offer competitive remuneration, flexible working arrangements and opportunities for leading research and commissioning projects. Personal professional development and training is also available and encouraged, with good access to courses. Assistance with relocation and help with visas and permits for international candidates will also be available.

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http://www.waikatodhb.govt.nz/radiationtherapystaff

For enquiries please contact Mark Holmes at Mark.Holmes@waikatodhb.health.nz

For further information and to apply, please visit our website http://www.waikatodhb.govt.nz/page/pageid/2145876490/Vacancies.

www.waikatodhb.health.nz/jobs

Waikato District Health Board

QATrack+

R. Taylor, C. Angers, D. La Russa, R. Studinski
The Ottawa Hospital Cancer Centre

A Free and Open Source Tool For Radiotherapy Quality Assurance

About

QATrack+ was developed at The Ottawa Hospital Cancer Centre to help manage the growing complexity of radiotherapy QA programs by: providing a consistent interface for entering QC test results, making data review and trending simple, providing a high level overview of QC test status across all treatment and imaging units and collecting all QC data in a single database. QATrack+ is currently being evaluated at a number of other cancer centres across Canada. More discussion is available in our article in the Jan 2013 Issue of COMP Interactions.

Features

- Free & Open Source
- Easy to use web based interface
- Online admin pages for configuring tests, test lists and units
- Multiple test types (Numerical, Boolean, Mult. Choice and Composite/Calculated) with integrated procedures via embedded html
- Data charts and statistical process control charts
- Pages for getting a quick overview of current state of your QC program
- Multiple user groups and permissions
- Deployable on Windows, Linux or Mac

Try It Out Online

A QATrack+ demo is available online.

URL: http://randlet.com/qatrack/

User / Password: demo / demo

Download It

The source code for QATrack+ can be downloaded from our online source code repository.

URL: http://qatrackplus.com

More Information

There are a few channels for getting help and more information about QATrack+:

QATrack+ Wiki: http://goo.gl/rNIcl

Google Groups: http://goo.gl/hFwjv

Email: rataylor@toh.on.ca

QATrack+ at TOHCC

QATrack+ is being used for all Daily QA and the majority of Monthly QA in our clinic. Here are some stats about QATrack+ at TOHCC:

Live In Clinic	10 Sep 2012
Users	120 Therapy/Physics
Units	20 treatment and imaging units over 2 campuses
Daily QA	50 Test Lists Performed on Daily Basis(Therapy)
Monthly QA	200 Test Lists Performed on Monthly Basis (Physics Techs)
Performed to Date	110,000 Tests / 6500 Test Lists Performed
Spreadsheets Replaced	> 100

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Canadian Medical Physics Staffing for Radiation Treatment – an Update

Brenda G. Clark[a] and Jerry J. Battista[b]
[a]Radiation Medicine Program, The Ottawa Hospital Cancer Centre, Ottawa, and
[b]London Regional Cancer Program, London

Introduction: This article provides an update to the article published in the October 2011 edition of InterACTIONS.

Existing Radiotherapy Physics Staffing in Canada

A second survey was sent across Canada in April 2012 with a request for data from a 12 month period, either fiscal or calendar year. The respondents were asked to provide numbers according to the categories listed in Table 1, as well as current staffing and trainee numbers.

Table 1: Categories Considered by the Ontario Algorithm

Clinical Procedures and Services
- All radiation beam/source therapy (external beam therapy and brachytherapy) (cases/yr)
- Complexity bonus increment for inverse IMRT (including tomotherapy), clinical trial protocols, gated beams, 4D plans, multi-modality image fusion (cases/yr)
- External beam special procedure bonus (TBI, SRS, SBRT) (cases/yr)
- Brachytherapy - LDR or HDR (fractions/yr)
- Brachytherapy - interstitial seed implants (cases/yr)

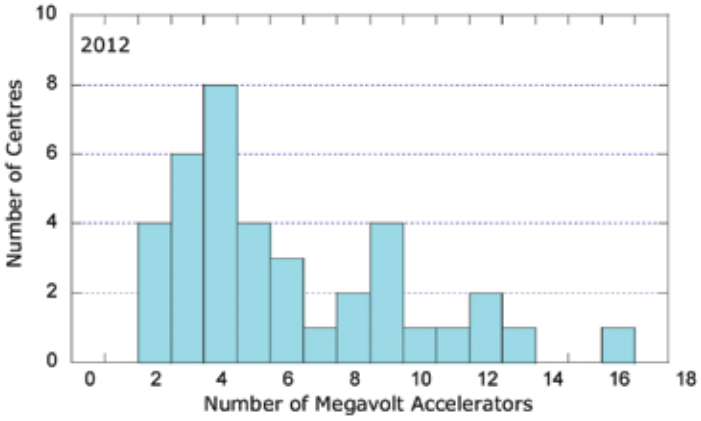
Radiotherapy Equipment Support
- Accelerators (all linacs, including tomotherapy and robotic linacs)
- Major ancillary RT equipment: TPS (1/vendor/10 licenses), HDR, PET-CT, MR-Sim, 4DCTsim,
- Minor ancillary RT equipment: X-ray Sim, CT-Sim, LDR unit, Cobalt unit, Gamma Knife, orthovoltage unit, ultrasound unit, gating/motion monitoring device

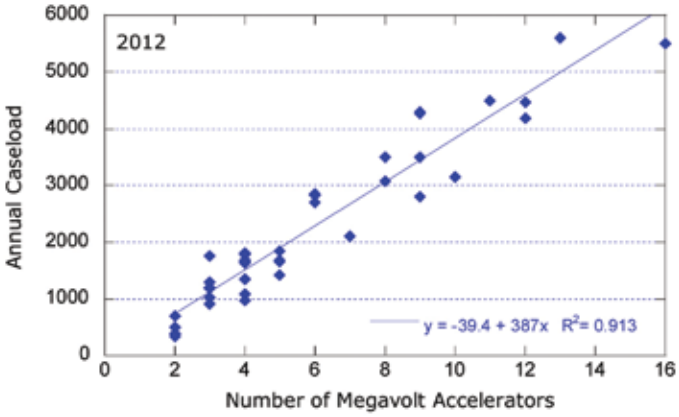
Training and Education of Specialists
- Clinical Physics Residents
- Medical Physics Graduate Students
- Radiation Oncology Residents
- Radiation Therapy Students

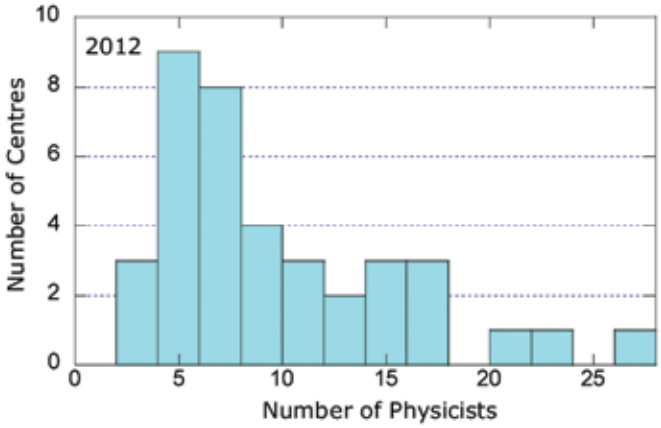
Administration & Other Duties
- Administrative workload per staff category (Human Resources)
- Administration (by Chief, Radiation Safety Officer)
- Clinical development, conference attendance, courses, site visits
- Time away for paid holidays and vacation (FTE per employee)

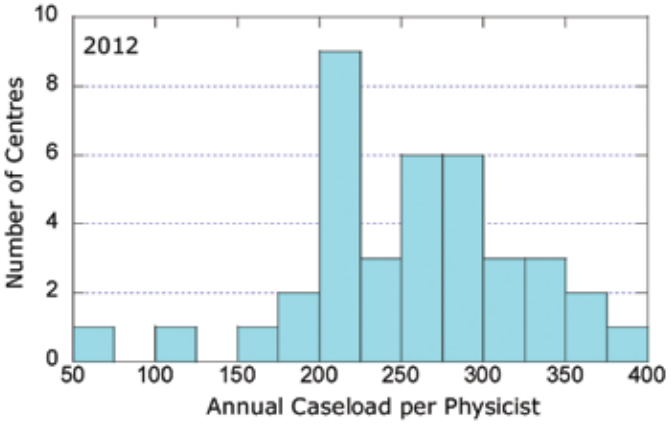
This analysis uses data from 38 centres, 32 responses from this survey and 6 using data from 2010 from centres that did not respond this year. Of the 38 centres, 13 are in Ontario, 8 in Québec, 5 in British Columbia, 3 in Alberta, 2 in Saskatchewan, 2 in New Brunswick, 2 in Nova Scotia, 1 in Manitoba, 1 in Prince Edward Island and 1 in Newfoundland. Four centres are not represented, all in Québec. The data corresponds to 87,168 annual treated cases, 30.3% of which were classified as complex (see Table 1), up from 22.3% in 2010; 3.4% were classified as special procedures, up from 2.9%, and 14.2% were brachytherapy treatments, approximately the same as the 2010 rate of 14.5%. These patients were treated on 227 megavoltage accelerators with support from a total of 350 medical physicists. Many of these physicists participated in supporting the training of a total of 639 "students", listed as 158 medical physics graduate

students, 46 medical physics residents, 134 radiation oncology residents and 215 radiation therapy students. The plots below present a snapshot of the staffing in Canada for 2012 from these 38 centres.

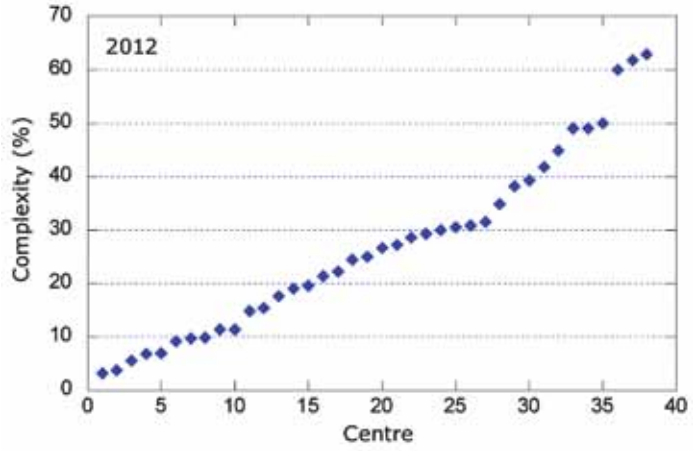


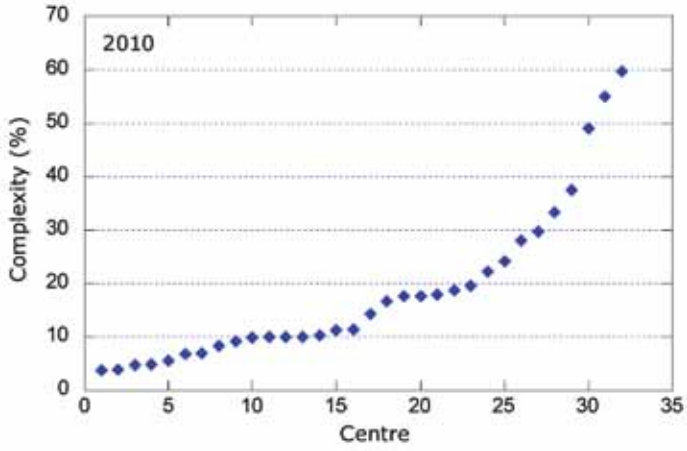




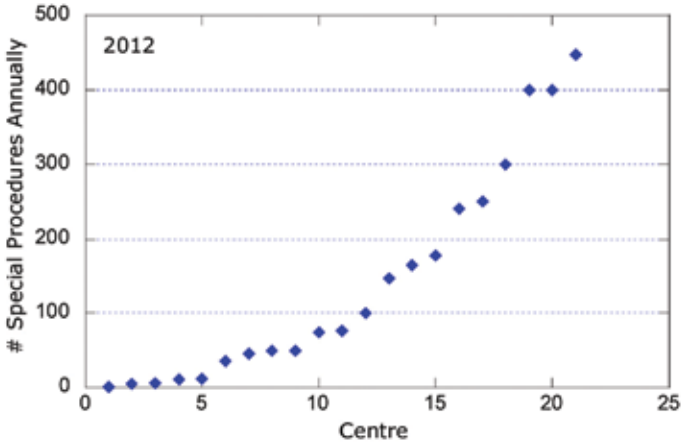


The average annual caseload per physicist in 2012 is 253 (range 60 to 360), down slightly from 260 (range 80 to 386) from 2010. There has been a measurable increase in complexity of cases which loosely translates to increased adoption of IMRT, with a 60% increase in the reported average complexity rate from 18.8% in 2010 to 30.3% in 2012. As in 2010, there are three centres with complexity rates substantially higher than any other centre, two in Québec and one in Ontario.

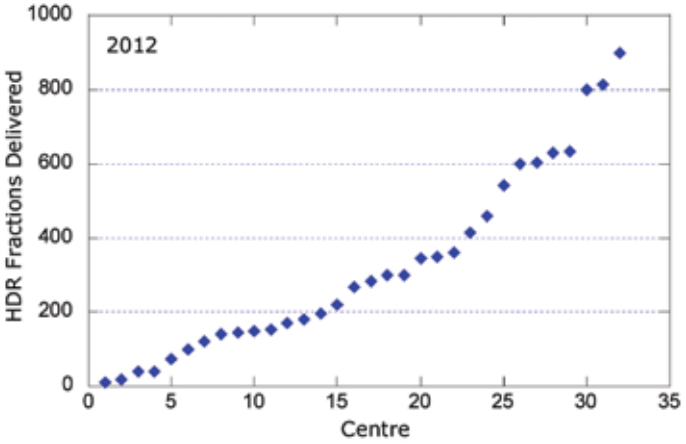


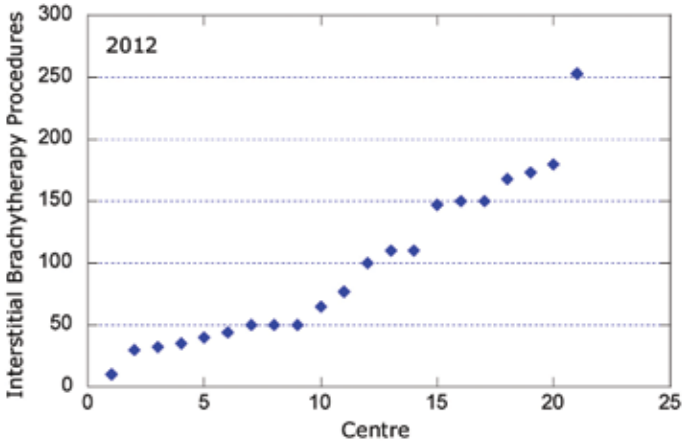


Just over half of the centres (21/38, 55%) carry out special procedures such as TBI or SABR; 5/21 of these centres perform 12 or less of these procedures per year.

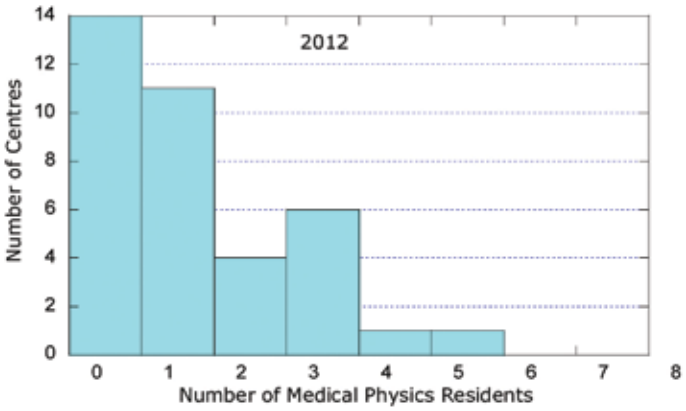


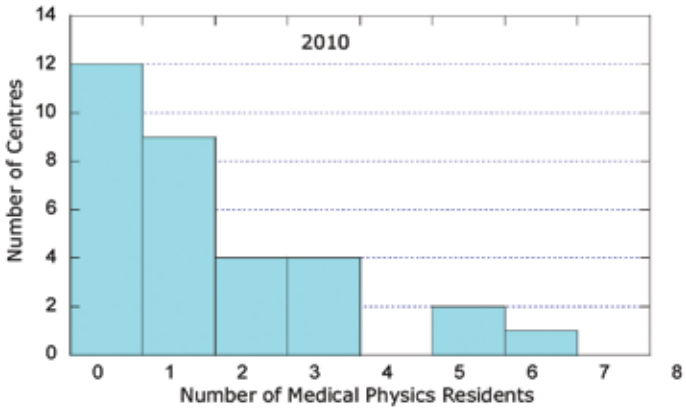
Almost all centres (32/38, 84%) have an HDR brachytherapy program but only 21/38 (55%) perform interstitial seed implants. The 3 centres reporting more than 800 HDR fractions delivered per year are all in Québec and none of them are the centre reporting 250 seed implants.





There has been a slight change in the distribution of medical physics residents compared to 2010, with an increase in the number of centres reporting zero or one residents, fewer centres with 5 or more residents and the University of Toronto integrated program accounting for a total of 11 residents across four centres. Of the 46 residents in 2012, 26 were training in Ontario, 9 in Quebec, 5 in Alberta, 3 in British Columbia, 2 in Manitoba, 1 in Nova Scotia and 32 (70%) are in CAMPEP-accredited programs.





continued on page 58

Canadian Winter School 2013

Andrea McNiven

Radiation Medicine Program,
Princess Margaret Cancer Centre,
Toronto, Ontario

The 4th Canadian Winter School on Quality and Safety was held January 27-31 in Mt Tremblant, Quebec. This meeting, sponsored by the Canadian Organization of Medical Physicists (COMP), focuses on the organizational aspects of quality and safety. This year's meeting (chaired by Dr. Stephen Breen) had approximately 85 attendees from across Canada, representing radiation physics, oncology, therapy, industry and regulatory agencies.

The Winter School promoted the use of "process orientation" and demonstrated how organizational culture is fundamental to achieving quality and safety. The organizers of the meeting designed the program to bring together experts in quality and safety from both within radiation oncology and external perspectives. Human factors engineers, psychologists, computer scientists, lawyers, and bioethicists share the stage with radiation therapists, medical physicists, and radiation oncologists. The inter-disciplinary nature of the meeting, in terms of both faculty and attendees, is one feature that distinguishes this meeting from many others (along with the slope-side ambience and opportunity for some excellent skiing or snow-shoeing).

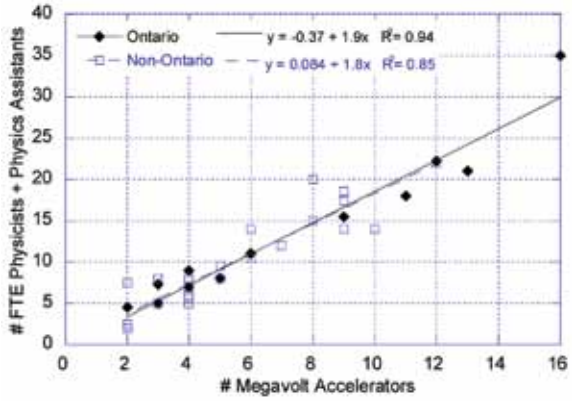
The keynote speaker was Dr. G. Ross Baker, Professor at the Institute of Health Policy, Management & Evaluation of the University of Toronto. In his presentation, *"Why is Reducing Healthcare Error So Hard?"* he spoke about designing processes around clinical microsystems to reduce error and improve quality. Faculty spoke about elements of human and team performance, and how that influences quality and safety; ethical and legal issues relating to quality; designing and monitoring clinical processes; and quality management. The Project Galleries were filled with animated discussions. Presenters led small-group discussions about their efforts towards quality improvement. They presented the tools or processes that they have introduced in their own clinics. We also had the chance to discuss and apply the (potentially new) concepts that we were learning about in small-group discussions about radiation therapy incidents. On the last day of the meeting, a statement from Dr. Jean-Yves Fiset, with respect to companies claiming that they have a "safety culture," resonated with me. In terms of choosing between productivity and safety, he said that companies much choose which one they value the most, and that if you don't say safety, you don't have a safety culture. This is something, I think, that every individual should consider in their own context.

Winter School was once again a great forum for learning about quality and safety, from which attendees could head home with new knowledge, tools and ideas (maybe also some wind-burn for those that took advantage of the skiing!)

Canadian Medical Physics Staffing for Radiation Treatment

continued from page 57

As in 2010, the total number of medical physicists plus physics assistants or technologists correlates well with the number of megavolts accelerators.



Summary

There have been minor changes in the radiation therapy medical physics staffing levels across Canada in 2012 as compared to 2010, including a 2.8% reduction in annual caseload per physicist. A significant increase in complexity of treatments delivered was reported, most likely reflecting increased adoption of IMRT. There are indications that the placement of medical physics residents is being consolidated in CAMPEP-accredited programs, in preparation for the CCPM requirement for clinical certification scheduled for 2016.

Acknowledgement: Thanks to all the individuals who responded to our survey.

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May 2-4, 2013

October 3-5, 2013

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Citation Award 2012

Michael S. Patterson

Juravinski Cancer Centre and McMaster University,
Hamilton, Ontario

Once upon a time I wrote an article for *Interactions* (Vol. 50, pp. 29-32) in which I suggested that the ground rules for the Sylvia Fedoruk Award should be changed. I argued that it is laborious and inevitably subjective to try to identify the "best" paper published in our field each year. Many papers are never even considered because the range of journals in which medical physicists publish is so broad. I proposed a simple, objective solution that would recognize the paper published in a given year that was cited most often over the next ten years. My plea has been to no avail but, nevertheless, I have announced a winner in *Interactions* for nine years. The rules (invented by this author) 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. The winner is determined from data in the Web of Science maintained by the Institute of Scientific Information (ISI) including citations from all databases.

For 2012, we have a photo finish – this paper was cited 192 times from its publication to the end of 2012:

M. Niedre, M. S. Patterson and B. C. Wilson, Direct near-infrared luminescence detection of singlet oxygen generated by photodynamic therapy in cells in vitro and tissues *in vivo,* Photochemistry and Photobiology 75: 382-391 (2002).

Abstract: Singlet oxygen ($^1O_2$) is believed to be the major cytotoxic agent involved in photodynamic therapy (PDT). Measurement of $^1O_2$ near-infrared (NIR) luminescence at 1270 nm in biological environments is confounded by the strongly reduced $^1O_2$ lifetime and probably has never been achieved. We present evidence that this is now possible, using a new NIR-sensitive photomultiplier tube. Time-resolved $^1O_2$ luminescence measurements were made in various solutions of aluminum tetrasulphonated phthalocyanine (AlS_4Pc) and Photofrin. Measurements were also performed on suspensions of leukemia cells incubated with AlS_4Pc, and a true intracellular component of the $^1O_2$ signal was clearly identified. Time-resolved analysis showed a strongly reduced $^1O_2$ lifetime and an increased photosensitizer triplet-state lifetime in the intracellular component. *In vivo* measurements were performed on normal skin and liver of Wistar rats sensitized with 50 mg/kg AlS_4Pc. In each case, a small but statistically significant spectral peak was observed at 1270 nm. The $^1O_2$ lifetime based on photon count rate measurements at 1270 nm was 0.03-0.18 μs, consistent with published upper limits. We believe that these are the first direct observations of PDT-generated intracellular and *in vivo* $^1O_2$). The detector technology provides a new tool for PDT research and possibly clinical use.

In second place (but way ahead in economic impact!) with 191 citations to the end of 2012:

F. S. Foster, M. Y. Zhang, Y. Q. Zhou, G. Liu, J. Mehi, E. Cherin, K. A. Harasiewicz, B. G. Starkoski, L. Zan, D. A. Knapick and S. L. Adamson, A new ultrasound instrument for in vivo microimaging of mice, Ultrasound in Medicine and Biology 28: 1165-1172 (2002).

Abstract: We report here on the design and evaluation of the first high-frequency ultrasound (US) imaging system specifically designed for microimaging of the mouse. High-frequency US or US biomicroscopy (UBM) has the advantage of low cost, rapid imaging speed, portability and high resolution. In combination with the ability to provide functional information on blood flow, UBM provides a powerful method for the investigation of development and disease models. The new UBM imaging system is demonstrated for mouse development from day 5.5 of embryogenesis through to the adult mouse. At a frequency of 40 MHz, the resolution voxel of the new mouse scanner measures 57 μm x 57 μm x 40 μm. Duplex Doppler provides blood velocity sensitivity to the mm per s range, consistent with flow in the microcirculation, and can readily detect blood flow in the embryonic mouse heart, aorta, liver and placenta. Noninvasive UBM assessment of development shows striking similarity to invasive atlases of mouse anatomy. The most detailed noninvasive in vivo images of mouse embryonic development achieved using any imaging method are presented.

For the record, here are the winners from previous years:

Year of publication	Winner	Citations in 10 years	Current total
1994	R. M. Henkelman, G. J. Stanisz, J. K. Kim and M. J. Bronskill, Anisotropy of NMR properties of tissues, Magnetic Resonance in Medicine 32: 592-601.	129	238
1995	D. W. O. Rogers, B. A. Faddegon, G. X. Ding, C.-M. Ma, J. Wei and T. R. Mackie, BEAM: A Monte Carlo code to simulate radiotherapy treatment units, Medical Physics 22: 503-524.	310	768
1996	A. Kienle, L. Lilge, M. S. Patterson, R. Hibst, R. Steiner and B. C. Wilson, Spatially resolved absolute diffuse reflectance measurements for noninvasive determination of the optical scattering and absorption coefficients of biological tissue, Applied Optics 35: 2304-2314.	125	279
1997	J. S. Gati, R. S. Menon, K. Ugurbil and B. K. Rutt, Experimental determination of the BOLD field strength dependence in vessels and tissue, Magnetic Resonance in Medicine 38: 296 – 302.	196	288
1998 (Tie)	J. H. Siewerdsen, L. E. Antonuk, Y. El-Mohri, J. Yorkston, W. Huang and I. A. Cunningham, Signal, noise power spectrum, and detective quantum efficiency of indirect-detection flat-panel imagers for diagnostic radiology, Medical Physics 25: 614 – 628.	121	155
	A. Kienle, M. S. Patterson, N. Dognitz, R. Bays, G. Wagnieres and H. van den Bergh, Noninvasive determination of the optical properties of two-layered turbid media, Applied Optics 37: 779 – 791.	121	167
1999	D. H. Simpson, C. T. Chin and P. N. Burns, Pulse inversion Doppler: a new method for detecting nonlinear echoes from microbubble contrast agents, IEEE Transactions on Ultrasonics Ferroelectrics and Frequency Control 46: 372-382 (1999).	201	279
2000	I. Kawrakow, Accurate condensed history Monte Carlo simulation of electron transport. I. EGSnrc, the new EGS4 version, Medical Physics 27: 485-498.	333	425
2001	J. G. Sled and G. B. Pyke, Quantitative imaging of magnetization transfer exchange and relaxation properties in vivo using MRI, Magnetic Resonance in Medicine 46: 923-931 (2001).	121	135

COMP Salsa for Medical Physics Student Travel Fund

The Canadian Organization of Medical Physicists was the very fortunate beneficiary of a one-time donation from the University of Calgary Salsa Dancing Club. The donation was made specifically to support student travel to the COMP Annual Scientific Meeting. Three $500.00 awards will be granted to M.Sc. students in Medical Physics and three $500.00 awards will be granted to Ph.D. students in Medical Physics. Submission deadline is Friday June 14th, 2013.

Those accessing the fund must meet the following criteria:

1. Recipients must be COMP student members in good standing.

2. The applicants must have submitted an abstract that is accepted for presentation at the Joint CARO/COMP Annual Scientific Meeting.

3. In addition to an accepted abstract, applicants must also submit their CV's for review.

4. International students are eligible as long as no additional support is required to facilitate travel documents.

5. The student's supervisor/department head must provide a letter stating that they do not have funding for the student or have only partial funding for travel to the Joint CARO/COMP ASM.

Please submit applications by Friday June 14th to Gisele Kite at admin@medphys.ca.

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Kanata, ON K2K 2P4
fax: 613.435.7257

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The COMP Science and Education Committee is responsible for presenting nominees for position of Winter School Chair and Course Director, with the objective of ensuring that the organization continues to be governed with excellence and vision.

Chair, Winter School

We are seeking a committed individual to serve as Chair for the Winter School. The Chair's responsibilities include selection of the organizing committee to meet continuing education accreditation needs; holding regular meetings of the organizing committee to address advertising and promotion, venue selection, and recruiting volunteers to assist in daily operations during the Winter School; and overseeing the budget. The Chair reports to the Science and Education committee.

Course Director, Winter School

The Winter School Course Director is responsible for all aspects of the curriculum of the Winter School, including the theme, content and schedule of the continuing education sessions, the selection of faculty and the keynote speaker, continuing education accreditation, and proffered content. The Course Director is a member of the organizing committee.

Interested members can e-mail their intention and any supporting information, such as a résumé, by April 30, 2013, to:

Chair, Science and Education Committee
C/0 COMP Office
PO Box 72024 Kanata North RPO
Kanata, ON K2K 2P4
nancy@medphys.ca
fax: 613.435.7257

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Dates to Remember

InterACTIONS Summer Issue Deadline is June 1, 2013!

Harold Johns Travel Award application deadline April 12, 2013

Call for Nominations: COMP Board Secretary April 30, 2013

Call for Volunteers, 2014 Winter School: Chair and Course Director April 30, 2013

International Conference on the Use of Computers in Radiation Therapy May 6 – May 9, 2013 Melbourne, Australia

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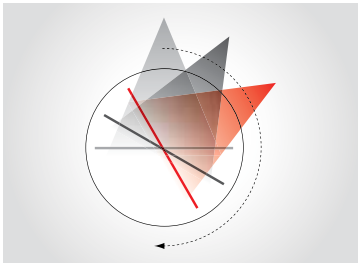

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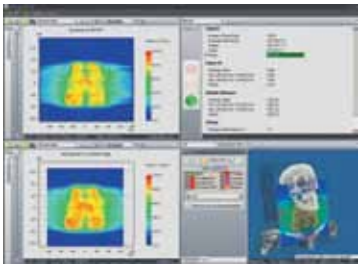

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