McGILL UNIVERSITY

MEDICAL PHYSICS UNIT

Annual Report : January-December 2011

May 2012

Jan Seuntjens, Ph.D., FCCPM, FAAPM, Professor & Director
jseuntjens@medphys.mcgill.ca
Tel: (514) 934-1934 x44124
Fax: (514) 934-8229
Web: http://www.medphys.mcgill.ca

Margery Knewstubb, Administrative Coordinator
mak@medphys.mcgill.ca
Tel: (514) 934-1934 x44158
1. **INTRODUCTION**

The main areas of interest in medical physics at present are: (i) treatment of cancer by ionizing radiation (radiation oncology physics); (ii) diagnostic imaging with x rays, ultrasound and nuclear magnetic resonance (diagnostic radiology physics); (iii) diagnostic imaging with radionuclides (nuclear medicine physics); and (iv) the study of radiation hazards and radiation protection (health physics). In recent years medical physics has grown into a complex multidisciplinary science with involvements and affinities to biomedical engineering, health and life sciences, systems biology and biophysics.

Medical physics is a rapidly expanding profession and job opportunities for graduates of medical physics programs remain excellent locally, nationally and internationally. McGill, as one of 9 universities in Canada and one of 36 universities in North America with accredited graduate programs in medical physics, is playing an important role in academic training of professionals for this important, field involved with diagnosis and treatment of human disease. The training in medical physics at McGill is done under the auspices of the Medical Physics Unit (MPU), an academic unit in the Faculty of Medicine. The MPU graduate programs in medical physics were first accredited in 1993 for a period of 5 years and reaccredited in 1998, in 2003, and 2008 for additional 5-year periods. The current 5-year accreditation term will expire on December 31, 2013. McGill was the third university in North America with such accreditation and between 1993 and 2004 it was the only Canadian university with such an accreditation.

Since 1997 the MPU also provides a residency program in radiation oncology physics. In this program graduates in medical physics receive a structured clinical-professional training in radiation oncology physics. The program received its first accreditation in 2000, and was re-accredited in 2005 and 2010 for additional 5-year period. The current accreditation will expire on December 31, 2015. McGill is one of eight institutions in Canada and one of 53 in North America with this type of accreditation.

The accreditation of graduate and residency programs in medical physics is provided by the *Commission on Accreditation of Medical Physics Educational Programs* (CAMPEP) sponsored by four organizations: the *American Association of Physicists in Medicine* (AAPM); the *American College of Medical Physics* (ACMP); the *American College of Radiology* (ACR); and the *Canadian College of Physicists in Medicine* (CCPM).
2. **FACTS-IN-BRIEF ON THE MEDICAL PHYSICS PROGRAMS AT McGill**

Details regarding the graduate programs and research in medical physics can be found on the Medical Physics Unit website at: [www.medphys.mcgill.ca](http://www.medphys.mcgill.ca).

| Established: | September 1979 by the Faculty of Medicine of McGill University in Montréal |
| Directors: | M. Cohen (September 1979 to August 1991) |
| | E.B. Podgorsak (September 1991 to December 2008) |
| | J. Seuntjens (January 2009 to present) |

**GRADUATE PROGRAMS:**

- **Graduate Program Director (GPD):** Jan Seuntjens, Ph.D., FCCPM, FAAPM
- **Degrees offered:** M.Sc. & Ph.D. in medical physics
- **Accreditation:** CAMPEP* accredited the M.Sc. & Ph.D. programs since 1993
- **Re-accreditation:** CAMPEP* re-accredited both programs (1998, 2003 & 2008) for 5 years
- **M.Sc. degrees conferred to date:** 193
- **Ph.D. degrees conferred to date:** 30
- **Current M.Sc. student enrollment:** 25
- **Current Ph.D. student enrollment:** 10
- **Number of mandatory courses:** 12 (M.Sc), 2 (Ph.D)
- **Number of academic faculty:** 6
- **Number of clinical faculty:** 15
- **Number of affiliated members:** 2

**RESIDENCY PROGRAM IN RADIATION ONCOLOGY PHYSICS:**

- **Residency Program Director (RPD):** William Parker, M.Sc., FCCPM
- **Accreditation:** CAMPEP* accredited the Residency program (2000) for 5 years
- **Re-accreditation:** CAMPEP* re-accredited the program (2005, 2010) for 5 years
- **Number of graduates to date:** 34
- **Current enrollment:** 5
- **Program duration:** 2 years
- **Number of mandatory rotations:** 4
- **Number of mandatory courses:** 4

*CAMPEP*, the Commission on Accreditation of Medical Physics Educational Programs, is sponsored by:

- American Association of Physicists in Medicine (AAPM)
- American College of Medical Physics (ACMP)
- American College of Radiology (ACR)
- Canadian College of Physicists in Medicine (CCPM)
3. **GENERAL OBJECTIVES OF THE MEDICAL PHYSICS UNIT**

1) To promote the field of medical physics through teaching, research and clinical service.

2) To encourage interest, education, training and research in medical physics.

3) To join in one academic unit (Medical Physics Unit) the various members of McGill departments and McGill University Health Centre departments who, through their academic training in physics, engineering or a related science and through work in clinical and academic environments, support the objectives (i) and (ii) above.

4) To offer a graduate program leading toward an M.Sc. degree in medical physics.

5) To offer, in conjunction with McGill’s Physics and Biomedical Engineering departments, a graduate program leading toward a Ph.D. degree in medical physics.

6) To offer a residency program in radiation oncology physics.

7) To maintain CAMPEP accreditation of the M.Sc. and Ph.D. academic programs as well as the residency training program in radiation oncology physics.

8) To offer support to other institutions wishing to provide a residency program in radiation oncology physics through affiliation with the CAMPEP-accredited McGill program.

9) To encourage, promote and excel in research in the application of physics in diagnosis and treatment of human disease.

10) To promote McGill as an important institution in the international medical physics community through excellence in teaching of, and research in, medical physics.

11) To promote national and international medical physics organizations through active participation of the Medical Physics Unit and its members in these organizations.

12) To encourage links and collaboration between medical physicists, clinicians and basic scientists with the goal of developing and improving methods for diagnosis and treatment of human disease.

13) To provide medical physics consultation services to McGill institutions, national and international organizations and the general public, as required.

14) To initiate a structured student recruitment program at the Ph.D. level and to provide a stimulating research environment to these candidates.

15) To work with clinicians and basic scientists in the development of a strategic research program in radiation oncology.
4. **MEETING THE OBJECTIVES OF THE MPU FOR THE PAST ACADEMIC EVALUATION PERIOD**

The MPU is in relatively good shape: its teaching programs in medical physics on the M.Sc., Ph.D. and residency levels are accredited and respected around the world; the number of students is high; and the staff are very active on the local, national, and international level.

However, one of the issues faced over the past few years has been the severe loss in terms of key academic faculty of the unit. To maintain the teaching program the MPU had to heavily rely on clinical faculty thereby creating even more severe budgetary problems. Despite these issues the MPU has been able to sustain and maintain its student enrolment and research programs: the student body in the last 30 years has more than quadrupled (from around 8 to 40 students per year to date), while the faculty complement has halved (from typically 4 core faculty to 2). However, the maintenance of vigorous research programs associated to tenure track academic medical physicists will become essential for the MPU to maintain its longstanding CAMPEP accreditation.

The employment situation of M.Sc. medical physicists has become somewhat more restricted in the face of the 2014/2016 ABR/CCPM deadline. By this time every clinical medical physicist wishing to sit for the certification exams of the ABR or CCPM must come from a CAMPEP accredited residency program. Despite the increase in CAMPEP-accredited residency programs, access to these programs is severely restricted for M.Sc. graduates, since they compete often with Ph.D. candidates applying to the same positions. The recruitment philosophy of the M.Sc. program, hence, is tending towards recruitment for candidates who are more likely interested in the Ph.D. program. In the past year the recruitment cohort of M.Sc. candidates consists of 60-70 candidates, out of which around 10-15 were shortlisted. A subset of these were interviewed, and another subset having outstanding GPA were made offers using the GPS financial packages. The incoming cohort for September 2012, will consist of 9 students with GPA typically above 3.7.

5. **OBJECTIVES OF THE MPU FOR THE 2011-2012 ACADEMIC YEAR**

Despite the modest but appreciated support increases to the MPU budget the situation in terms of academic support is very fragile. The MPU has been able to survive over the last year with just two academic faculty in radiation oncology physics (instead of four) but this is at the expense of more involvement of clinical faculty, a solution which is acceptable *ad hoc* but does not improve or even maintain the same quality and depth as needed for an internationally recognized program.

The goals for the upcoming academic year are revolving around preparations for the 2013 re-accreditation exercise of the teaching program as well as the need to further develop the Unit’s research capacity and support structure:

1) To continue rebuilding the academic program staffing after recent departure or retirement of key-faculty.

2) To continue graduate program curriculum revisions commensurate recent developments in Medical Physics and its interaction with associated sciences.
3) To further improve the MPU’s operating budget to cover adequately the teaching responsibilities of non-McGill clinical physics staff (rate at McGill is $1500 per credit).

4) To continue attempts to secure teaching assistantships to MPU graduate students for support of clinical faculty course teaching.

5) To continue attempts to secure funds to equip two important laboratory courses (“Lab in Radiation Oncology Physics” and “Lab in Diagnostic Radiology Physics”).

6) To maintain productivity with regard to standard academic indicators (number of publications, presentations, graduating students, etc.).

6. HIGHLIGHTS OF THE 2011 CALENDAR YEAR


2) **El Naqa, Issam**: MUHC award, 2011.


5) **Pike, G. Bruce**: James McGill Professor, McGill University, 2007-2013.

6) **Pike G. Bruce**: Killam Professor, Montreal Neurological Institute, 2003-present.

7) **Soisson, Emilie**: CCPM Harold E. Johns Travel Award, attended PSI Proton Winter School, Bad Zürich, Switzerland, 2011.

8) **Seuntjens, Jan**: Herbert S Lang Award in Oncology and Surgery, McGill University Health Centre (2010-present)

9) **Seuntjens, Jan**: Organizer and host of the 4th International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy (June 8-10, 2011).

10) **Seuntjens, Jan**: Chair of Report Committee, “Prescribing, Recording, and Reporting of Stereotactic Treatments with Small Photon Beams”, International Commission of Radiation Measurements and Units (ICRU), 2009-present.

7. THE 2011 CALENDAR YEAR

7.A. Introduction

The 2010-2011 & 2011-2012 academic years were a difficult year as there were only two radiation oncology physics academic staff and a large student contingent. This has put additional pressure on clinical staff of the MUHC and on the operating budget of the MPU.

In September 2010, the MPU attracted 14 new students to its first-year class (6 from Quebec, 3 from another province, 3 from the US, and 2 originating from abroad), bringing the total registration of graduate students (M.Sc. and Ph.D.) to 27 students on September 01, 2010. Thirteen of the 14 first-year M.Sc. students successfully completed
their didactic medical physics courses during the Fall and Winter terms of 2010-2011 and one student withdrew from the program due to unsatisfactory academic performance. All Fall 2010 first-year students are well into their M.Sc. thesis research, 7 at the Montreal General Hospital in radiation oncology physics, 2 at the Montreal Neurological Institute in imaging physics, 2 at the SMBD-Jewish General Hospital in radiation oncology physics, and 2 at the Hôpital Maisonneuve-Rosemont in radiation oncology physics.

In September 2011, the MPU attracted 11 new students to its first-year class (5 from Quebec, 4 from another province, 1 from the US, and 1 originating from abroad), bringing the total registration of graduate students (M.Sc. and Ph.D.) to 34 students on September 01, 2011. Eight of the 11 first-year students successfully completed their Fall & Winter 2011-2012 coursework and two students have course requirements to complete. One student withdrew from the program due to a change in choice of field of study. All Fall 2011 first-year students have selected a thesis research supervisor and are beginning their projects in Summer 2012, 3 at the Montreal General Hospital, 4 at the SMBD-Jewish General Hospital, 1 at the Montreal Neurological Institute, and 1 at the Hôpital Maisonneuve-Rosemont.

7.B. Medical Physics Bursaries

Recognizing the shortage of medical physicists in North America in general and in Quebec in particular, the Quebec government started a medical physics bursary program in 1999. One bursary at $17,000 per year for a total of 2 years was allocated to McGill for support of a medical physics graduate student beginning medical physics studies in each of the 2010-2011 and 2011-2012 academic years.

In each of the years 2010 and 2011, one M.Sc. student was recommended for the 2-year bursary at $17,000 per year by the MPU and their application was approved by the Quebec Ministry of Health. As the recipient has to commit to be employed in Quebec the bursary provides not only support to the student but also an important flow of graduates beneficial to Quebec. The bursary program is expected to continue for the next year but it is expected that within the next few years the program will shift towards support for residency trainees, rather than graduate training, to offset the bottleneck that now exists for access of M.Sc. graduates into clinical medical physics jobs. The bursary system (graduate or residency) will not only help Quebec hospitals find suitable candidates for their medical physics openings in the near future but will also help the MPU in playing an even more important role in training of medical physicists for Quebec institutions.

7.C. Staff of the Medical Physics Unit................................................................. (Appendix I)

The staff of the MPU consists of 23 staff members (21 internal, 2 affiliated) and a full-time Administrative Coordinator (Margery Knewstubb). The MPU Administrative Coordinator holds the only permanent staff position in the MPU, and organizes the day-to-day activities of the MPU, deals with graduate students on a daily basis, corresponds with potential applicants to the medical physics program, and records minutes of MPU staff meetings.

The MPU is run by a Director who is appointed by the Dean of Medicine. Since 1991 the directorship of the MPU is a part-time position, and until January 2009 the position was filled by the director of the Medical Physics Department of the McGill University Health Centre. Since January 2009, the two positions are filled by different individuals. Two
committees help with the running of the MPU: the graduate committee and the seminar committee.

The Graduate Committee (Dr. J. Seuntjens, chairman; M. Knewstubb; Dr. G.B. Pike; Dr. E.B. Podgorsak; Dr. I El Naqa) evaluates applications to the academic programs, decides on the number of candidates to be accepted for a particular academic year, and recommends the most suitable candidates for admission. During the 2010-2011 and the 2011-2012 academic years, 60 and 56 complete applications were received by the MPU, respectively, and the graduate committee recommended to McGill 26 and 24 candidates for admission into the 2010-2011 and 2011-2012 academic cohorts, respectively. For more information, please see Section 8.C.

The Seminar Committee (current chairman: Dr. H Patrocinio, local arrangements MUHC: Dr. A. Sarfehnia; JGH: Dr. S. Devic) organizes the medical physics seminar series, a bi-monthly collection of seminars given by MPU staff, outside visitors or graduate students to staff and students of the MPU. The medical physics seminars organized during the Winter semester 2011 and the Fall & Winter semesters of the 2011-2012 academic year are listed in Appendix XVI.

All academic members of the MPU, except for the two affiliated members, hold primary appointments in other major departments either of the McGill’s Faculty of Medicine. For more information see Appendix I.

The two affiliated members work outside McGill; Dr. R. Richardson at the Atomic Energy of Canada in Chalk River, Ontario and Dr. W. Wierzbicki at the Maisonneuve-Rosemont Hospital in Montreal. Both have special links with the MPU, Dr. Richardson as an academically inclined health physicist and Dr. Wierzbicki as a lecturer and thesis supervisor.

During 2011, Dr. Podgorsak, Emeritus Professor, continued to participate in teaching the course MDPH 601 (Radiation Physics) and MDPH 602 (Applied Dosimetry).

Appendix I provides a list of the MPU staff, their academic rank, divisional affiliation (clinical or imaging) and source of salary support (University, hospital or affiliated institution). Also given in Appendix I is a complete list of the staff of the Medical Physics Department of the MUHC.

The main responsibilities of clinical physicists are related to clinical aspects of radiation therapy; however, the clinical physicists get involved with teaching of didactic medical physics courses and laboratories, as well as with co-supervision of M.Sc. graduate students. The engineers are involved with teaching of medical electronics (Léger).

7.D. Graduates of the MPU Graduate Programs .....................(Appendices II & III)

From January to December 2011, 7 M.Sc. degrees in medical physics were granted through the MPU (Appendix II). Four of the M.Sc. graduating students are continuing with Ph.D. studies in medical physics, the other three are participating in the Residency Training Program in Radiation Oncology Physics with the McGill University Health Centre, either at the Montreal General Hospital or at the SMBD-Jewish General Hospital. Two M.Sc. degrees in medical physics are anticipated in the Spring 2012 graduation cohort.
During Fall 2011, one student (A. Alexander) completed Ph.D. thesis requirements in medical physics through the Department of Physics - the student successfully passed his Ph.D. oral defense exam in January 2012 and simultaneously obtained his Ph.D. medical physics degree. A. Alexander took up a clinical residency position at the Ottawa Hospital Regional Cancer Centre.

The current overall number of McGill graduates in medical physics stands at 193 M.Sc. degrees and 30 Ph.D. degrees. Considering that the Canadian Organization of Medical Physics (COMP) counts a total of some 400 active members, it is obvious that McGill's MPU continues to play an important role in the training of medical physicists in Canada. It is interesting to note that over 50% of medical physicists practicing in Quebec received their degrees from McGill’s MPU. A listing of the McGill M.Sc. and Ph.D. graduates in medical physics to date and their current employment are given here:

http://www.medphys.mcgill.ca/alumni/mscgrad.html

http://www.medphys.mcgill.ca/alumni/phdgrad.html

A statistical summary providing the demographic data for all M.Sc. and Ph.D. graduates to date is shown in Appendix III.

7.E. Graduates of the Residency Training Program .........................(Appendix IV)

During the 2011 year, 2 residents completed the two-year Residency Training Program in Radiation Oncology Physics (E. Poon & J. Thébaut). An additional resident (A. Sarfehnia) completed his two-year program in January 2012. Since the Residency Training Program in Radiation Oncology Physics was first accredited, between 1999-2010, 20 residents have completed all requirements of the Training Program - an additional 14 residents completed their training in the non-CAMPEP accredited program between 1980-1998, bringing the total number of McGill University Residency graduates to 34. A listing of the graduates and various relevant data are provided in Appendix IV.

8. PLANNING & PERFORMANCE

8.A. Undergraduate Student Teaching

Not relevant to the MPU.

8.B. Teaching.................................................................(Appendices V & VI)

The teaching distribution during the 2011 calendar year is shown in the list of instructors for didactic courses in Appendix V. During the 2011 calendar year, all 12 mandatory graduate courses underwent evaluations by students. The results were circulated to staff, are filed in the MPU office, and their summaries without instructor identification are enclosed as Appendix VI.

A total of 14 individual instructors were evaluated and also 2 courses, having several instructors each, were evaluated based on the course itself as opposed to an individual
instructor. On a scale of 1 (bad) to 5 (excellent) and averaged over all registered students, the evaluations for the Winter 2011 semester ranged from 3.29 to 4.58 and for the Fall 2011 semester they ranged from 4.20 to 4.67. The number of instructors for the two semesters adds up to 14 due to the fact a few instructors were teaching in both semesters and thus obtained more than one evaluation.

A conclusion can be made that the MPU students are reasonably satisfied with the quality of education they receive, but that they also send a message to certain instructors that improvements in their teaching methods and attitudes could be made. Considering that of the 14 individual instructors, who taught didactic or laboratory courses during the 2011 calendar year, 10 come from the ranks of clinical physicists who essentially volunteer their time and efforts to the academic activities of the MPU, the teaching evaluations attest to an excellent collaboration between the academic and clinical physicists of the MPU as well as to considerable commitment from the clinical staff to offer good quality teaching.

8.C. Student Retention ......................................................... (Appendices VII to IX)

On December 31, 2011 the MPU had 33 full time students (male : female ratio is 23 : 10) at various levels of their graduate studies (25 M.Sc. and 8 Ph.D.). The students who began their first year of M.Sc. medical physics studies are listed in Appendix VII. Students who continued with their second year thesis research project are listed in Appendix VIII - the 2 students who finished their third year of M.Sc. studies and completed their thesis work in Fall 2011 are also listed in Appendix VIII.

The nine students at various stages of their Ph.D. thesis work are listed in Appendix IX. Most have already passed the preliminary examination at the Physics department of McGill.

The summary of student statistics for the end of the 2010-2011 academic year is as follows:

- Total registration on June 01, 2011 22
- Completed first year course requirements 13
- Total M.Sc. graduates in 2011 calendar year 7
- Total Ph.D. graduates in 2011 (oral defense: January 2012) 1

The summary of student statistics for the start of the 2011-2012 academic year is as follows:

- Complete applications to the M.Sc. program 56
- Accepted to the M.Sc. program 24
- Registered in the M.Sc. program (Fall 2011) 11
- Total registration (M.Sc. & Ph.D., on September 01, 2011) 34

For the current 2011-2012 academic year the MPU office received 56 completed applications to the M.Sc. program in medical physics. Of the 56 potential students, 24 were accepted for admission, 2 declined the admission offer, and 13 registered in first year didactic studies in September 2011.
The calendar year 2011 in relation to teaching, research, and service was a normal year for the MPU, with all performance indicators fairly stable in comparison to previous academic years. As demonstrated by the lists of publications (x37, Appendix X), published abstracts (x62, Appendix XI), invited presentations (x24, Appendix XII), and presentations at national and international conferences (x24, Appendix XIII), all for calendar year 2011, the MPU staff are productive, representing with distinction McGill's involvement in medical physics research.

Academic productivity of MPU staff from 1996 to December 31, 2011 can be found at the following URLs:


The listing of research and teaching grants held by the MPU staff (Appendix XIV) also attests to the respectable professional standing of the MPU staff members. It should be noted that the grants are generally attained under the auspices of the grantee's primary department. Current research interests of the 23 MPU academic staff members are shown in Appendix XV.

Two meetings of the MPU academic staff were held during the 2011 calendar year:

- on January 19, 2011: completion of the first and start of the second semester of the 2010-2011 academic year;
- on June 01, 2011: completion of the second semester and start of M.Sc. thesis research work of the 2010-2011 academic year.

The purpose of the staff meetings is to discuss the issues affecting the MPU in general and the performance of graduate students in particular. Minutes of each staff meeting are taken by the graduate coordinator and distributed to staff and the Dean of Medicine as soon as possible following each meeting. The minutes of all staff meetings are filed in the MPU office and available for inspection upon request.

During the Winter semester of the 2010-2011 academic year and the Fall semester of the 2011-2012 academic year, the MPU organized regular medical physics seminars given by staff, graduating students or visiting scientists. The frequency of the seminars averaged two per month in the Fall semester and one per week in the Winter semester (location: Osler Amphitheatre at the Montreal General Hospital; time: Friday noon). The presentations are video linked to the JGH to allow MPU members there to attend without significantly disturbing their clinical activities. The attendance of seminars is mandatory for graduate students and is verified through a sign-in sheet. A seminar committee
chairled by Mr. H. Patrocinio organizes the seminars and a listing of the MPU medical physics seminars during the 2011 calendar year is given in Appendix XVI.

All McGill graduate students in medical physics are required to attend weekly formal research presentation meetings (Fridays at 9:15 a.m.). The presentations are given either by staff or students. At least once every three months each student presents his or her research work and results, and thus gains practical experience on organizing and giving scientific presentations. The speaker of a given seminar is introduced by the presenter of the previous seminar. Student attendance is compulsory and verified through a sign-up sheet. The senior Ph.D. student, who also serves as a student representative, organizes the weekly research seminars and organizes the sign-up sheet.

All graduate students attend the weekly informal research meetings (Thursday 11:30 am) where students discuss daily problems and solutions in their research projects preceded by a review of journal papers. Discussions are performed in subgroups where students working on related subjects discuss. There are currently four subgroups of 3 to 5 students: (1) beam modeling and modulated electron therapy; (2) dosimetry and clinical; (3) imaging and (4) radiobiology. In each group students are responsible to invite attendance of MPU staff suitable for their projects. Each fourth meeting is a group meeting of the entire group, with compulsory attendance of all students.

The weekly clinical physics meetings of the MUHC Medical Physics Department are open to graduate students and some with particular interests in radiation oncology attend them regularly. Students are also encouraged to attend the weekly seminars organized by the Radiation Oncology Department.

Students are encouraged to submit their work for presentation at national and international scientific meetings, either as regular presentations or as presentations during young investigator symposia. During the past 11 years, MPU students received 6 awards in the J.R. Cameron AAPM young investigator symposia, 4 awards in the J.R. Cunningham COMP/CCPM young investigator symposia, and 1 award in the young investigator symposium of the ICCR.

8.F. Committees and Boards ...........................................(Appendices XVII and XVIII)

As shown in Appendices XVII and XVIII, the MPU staff members are active on committees and boards within and outside of McGill. M.D.C. Evans serves as the Chairman of the Radiation Safety Committee for the MUHC.

Currently, the MPU members serve on Boards of Directors of the two Canadian medical physics organizations: the Canadian College of Physicists in Medicine (CCPM) and the Canadian Organization of Medical Physicists (COMP).

MPU staff members currently also serve on Boards of American Medical Physics organizations: the Commission on Accreditation of Medical Physics Education Programs (CAMPEP); the American Association of Physicists in Medicine (AAPM); and the AAPM Summer School.

Of the 23 MPU academic members, 4 are certified as Members of the CCPM and 8 are certified as Fellows of the CCPM. One of the Fellows of the CCPM (Seuntjens) is also a Fellow of the AAPM. Two of the Fellows of the CCPM (Patrocinio, Podgorsk) and
three of the Members of the CCPM (Gauvin, Ruo, Soisson) are certified by the American Board of Radiology (ABR), one also by the American Board of Medical Physics (ABMP) (Gauvin). MPU members are also active on AAPM, International Atomic Energy Agency (IAEA), and International Commission of Radiation Measurements and Units (ICRU) Task groups, Work Groups, committees and subcommittees. For a full list, see Appendices XVII and XVIII.

9. **EVALUATION OF PERFORMANCE**

As evident from the Highlights above and the Appendices to this report, the MPU staff and students have during the past academic year continued to bring some prestige to the University. They also fulfilled the basic objectives of the MPU. The MPU is known worldwide for its high quality teaching programs, and its M.Sc. and Ph.D. graduates generally do not have difficulties in finding suitable jobs upon graduation.

As shown in Appendices II through IV, graduates of McGill medical physics programs and the residency program are distributed in institutions throughout Quebec, Canada, North America and around the World; quite a number of them in leadership positions. This attests to high standards of the McGill programs, helps with the retention of the CAMPEP accreditation, and attracts high quality graduate students into the programs.

One may state that 2011 was relatively stable for the MPU in relation to teaching, research, and service, with all performance indicators similar to those of previous academic years, providing the M.Sc. and Ph.D. students in Medical Physics with the academic standards they expected from McGill.

10. **MAJOR STAFF ISSUES AFFECTING FUTURE ACCREDITATION OF MPU PROGRAMS**

Major problems with regard to tenure track academic staff reduction have a deleterious effect on the MPU’s performance and retention of staff. As is apparent from this report, in recent years, at any given year, the total number of graduate students (M.Sc., Ph.D., clinical residency) in the McGill Medical Physics Program ranges anywhere between 30 and 35 students. This excludes the students that are performing short (3-6 month) Medical Physics internships or projects in undergraduate programs or international students or fellows. McGill Medical Physics when measured on number of students, is one of the largest Medical Physics schools and the second largest radiation oncology medical physics school in North America and this attests to great success and perseverance and important role of the clinical faculty in the Unit.

In sharp contrast with this, the number of academic faculty committed by the University to the Medical Physics Unit through the department of Oncology used to be traditionally at 4 full-time university faculty in radiation oncology physics but has dwindled to two due to a recent departure and retirement. Dr. F. Verhaegen left the MPU in September 2009 and maintains the status of Adjunct Professor in the Department of Oncology and associate member status in the Dept. of Physics. Dr. Ervin Podgorsak retired as of June 2010. We were fortunate to attract Dr. El Naqa from Washington University (St. Louis) who started his activities at the MPU in June 2010 thereby bringing the MPU faculty count in radiation therapy to two. The Faculty of Medicine has unfortunately effectively
prevented the MPU from recruiting additional faculty despite our student numbers and despite great interest from very promising newly upcoming and competitive international faculty to come to McGill. In spite of this unsustainable situation, the M.Sc. and Ph.D. programs have continued thanks to an increased role of MUHC and JGH–based clinical faculty in the academic programs. Whereas the professional nature of part of the Medical physics profession requires the role of clinic-based teaching, a too large component of that also inevitably leads to a slow decline in the rigorous academic and research components of the programs. Academic faculty with vigorous research programs, are essential to keep the teaching programs to a standard required for McGill programs to maintain its CAMPEP accreditation. A potential for loss of CAMPEP accreditation of the Medical Physics programs is entirely preventable by the restoration of the two lost academic faculty positions in the Unit. Appendix XIX presents a recent report to the Dean of Medicine with regards to the student/faculty ratio.
APPENDICES

I. List of MPU faculty members; List of MUHC Medical Physics staff .................. 14
II. M.Sc. degrees in medical physics during 2011 ............................................. 17
III. Basic demographic data for M.Sc. and Ph.D. graduates ............................... 18
IV. List of Residency graduates 1999-2011 ..................................................... 21
V. Course instructors: Winter 2011 & Fall 2011 ........................................... 23
VI. Course evaluations: Winter 2011 & Fall 2011 ........................................ 24
VII. Students beginning first year of M.Sc. studies in Fall 2011 ......................... 26
VIII. Students continuing in second year of M.Sc. studies in Fall 2011 ............ 27
IX. Students currently working on Ph.D. projects in medical physics ............... 29
X. Publications by MPU staff during the 2011 calendar year ........................... 30
XI. Published abstracts by MPU staff during the 2011 calendar year ................ 33
XII. Invited presentations by MPU staff during the 2011 calendar year ............ 37
XIII. Conference presentations by MPU staff during the 2011 calendar year ....... 39
XIV. Research grants by MPU staff: January to December 2011 ....................... 41
XV. Current research interests of MPU staff .................................................. 46
XVI. Medical physics seminars: January to December 2011 ............................ 48
XVII. Committee & board membership by MPU staff: 2011 (within McGill) ...... 49
XVIII. Committee & board membership by MPU staff: 2011 (outside McGill) ... 52
XIX. Report to the Dean, Faculty of Medicine, McGill University:
"History of Educational Effort" .................................................................... 55
# Appendix I.

**LIST OF FACULTY MEMBERS**

*McGill University: Medical Physics Unit*

<table>
<thead>
<tr>
<th>FACULTY MEMBER</th>
<th>DIVISION</th>
<th>SALARY SUPPORT</th>
</tr>
</thead>
</table>
| 1 JAN P. F. SEUNTJENS, Ph.D., FAAPM, FCCPM  
  *Professor & Director, Medical Physics Unit* | Clinical | U |
| 2 FRANÇOIS DEBLOIS, Ph.D., FCCPM  
  *Assistant Professor, Department of Oncology* | Clinical | HP |
| 3 SLOBODAN DEVIC, Ph.D., FCCPM  
  *Assistant Professor, Department of Oncology* | Clinical | HP |
| 4 ISSAM EL NAQA, Ph.D.  
  *Associate Professor, Department of Oncology* | Clinical | U |
| 5 MICHAEL D. C. EVANS, M.Sc., FCCPM  
  *Assistant Professor, Department of Oncology* | Clinical | HP |
| 6 ALAIN GAUVIN, M.Sc., MCCPM, DABMP, DABR  
  *Lecturer* | Imaging | HP |
| 7 GYORGY HEGYI, Ph.D.  
  *Lecturer* | Imaging | HP |
| 8 CHRISTIAN JANICKI, Ph.D.  
  *Lecturer* | Clinical | HP |
| 9 JOHN KILDEA, Ph.D., MCCPM  
  *Lecturer* | Clinical | HP |
| 10 PIERRE LÉGER, B. Eng.  
  *Chief Electronic Engineer, MUHC* | Clinical | HE |
| 11 SHIRLEY M. LEHNERT, Ph.D.  
  *Professor, Department of Oncology* | Clinical | U |
| 12 WILLIAM A. PARKER, M.Sc., FCCPM  
  *Assistant Professor, Department of Oncology;  
  Chief, Department of Medical Physics /  
  Director, Residency Training Program, MUHC* | Clinical | HP |
| 13 HORACIO J. PATROCINIO, M.Sc., FCCPM, DABR  
  *Assistant Professor, Department of Oncology* | Clinical | HP |
### MPU Faculty members (continued)

<table>
<thead>
<tr>
<th>FACULTY MEMBER</th>
<th>DIVISION</th>
<th>SALARY SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 <strong>G. BRUCE PIKE</strong>, Ph.D.</td>
<td>Imaging</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><em>Professor, Department of Neurology &amp; Neurosurgery</em></td>
<td></td>
</tr>
<tr>
<td>15 <strong>ERVIN B. PODGORSAK</strong>, Ph.D., FCCPM, DABMP, FACMP, FAAPM</td>
<td>Clinical</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><em>Emeritus Professor</em></td>
<td></td>
</tr>
<tr>
<td>16 <strong>ANDREW READER</strong>, Ph.D.</td>
<td>Imaging</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><em>Associate Professor, Brain Imaging Centre</em></td>
<td></td>
</tr>
<tr>
<td>17 <strong>RICHARD B. RICHARDSON</strong>, Ph.D.</td>
<td>Clinical</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td><em>Research Scientist, Internal Dosimetry Service</em></td>
<td></td>
</tr>
<tr>
<td>18 <strong>RUSSELL RUO</strong>, M.Sc., FCCPM, DABR</td>
<td>Clinical</td>
<td>HP</td>
</tr>
<tr>
<td></td>
<td><em>Lecturer</em></td>
<td></td>
</tr>
<tr>
<td>19 <strong>EMILIE SOISSON</strong>, Ph.D., MCCPM, DABR, CMD</td>
<td>Clinical</td>
<td>HP</td>
</tr>
<tr>
<td></td>
<td><em>Assistant Professor, Department of Oncology</em></td>
<td></td>
</tr>
<tr>
<td>20 <strong>GABRIELA STROIAN</strong>, Ph.D.</td>
<td>Clinical</td>
<td>HP</td>
</tr>
<tr>
<td></td>
<td><em>Assistant Professor, Department of Oncology</em></td>
<td></td>
</tr>
<tr>
<td>21 <strong>ALASDAIR SYME</strong>, Ph.D.</td>
<td>Clinical</td>
<td>HP</td>
</tr>
<tr>
<td></td>
<td><em>Assistant Professor, Department of Oncology</em></td>
<td></td>
</tr>
<tr>
<td>22 <strong>NADA TOMIC</strong>, M.Sc., MCCPM</td>
<td>Clinical</td>
<td>HP</td>
</tr>
<tr>
<td></td>
<td><em>Lecturer, Medical Physics Unit</em></td>
<td></td>
</tr>
<tr>
<td>23 <strong>WIESLAW WIERZBICKI</strong>, Ph.D., FCCPM</td>
<td>Clinical</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td><em>Chief Physicist, Department of Radiation Oncology, Hôpital Maisonneuve-Rosemont Lecturer, Medical Physics Unit</em></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>A</th>
<th>Affiliated member</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE</td>
<td>Hospital engineering position</td>
<td>(1)</td>
</tr>
<tr>
<td>HP</td>
<td>Hospital clinical physics position</td>
<td>(14)</td>
</tr>
<tr>
<td>U</td>
<td>McGill University academic position</td>
<td>(6)</td>
</tr>
</tbody>
</table>

---

23
## LIST OF STAFF MEMBERS

### McGill University Health Centre: Department of Medical Physics

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief, Medical Physics Department, MUHC</td>
<td>William Parker</td>
<td>MS, FCCPM (Lecturer)</td>
</tr>
<tr>
<td>Director, Medical Physics Unit, McGill University</td>
<td>Jan Seuntjens</td>
<td>PhD, FCCPM, DABMP, FAAPM (Professor)</td>
</tr>
<tr>
<td>Administrative officer/Research Coordinator</td>
<td>Tatjana Nisic</td>
<td>MA</td>
</tr>
<tr>
<td>Administrative Coordinator</td>
<td>Margery Knewstubb</td>
<td></td>
</tr>
<tr>
<td>Medical Physic平ists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephen Davis</td>
<td>PhD</td>
<td></td>
</tr>
<tr>
<td>Michael Evans</td>
<td>MSc, FCCPM, Rad.Safety Officer, Class II, MUHC</td>
<td></td>
</tr>
<tr>
<td>Gyorgy Hegyi</td>
<td>PhD</td>
<td></td>
</tr>
<tr>
<td>Maritza Hobson</td>
<td>PhD, MCCPM, DABR</td>
<td></td>
</tr>
<tr>
<td>John Kildea</td>
<td>PhD, MCCPM</td>
<td></td>
</tr>
<tr>
<td>Thalat Monajemi</td>
<td>PhD, MCCPM</td>
<td></td>
</tr>
<tr>
<td>Horacio Patrocinio</td>
<td>MSc, FCCPM, DABR (Lecturer)</td>
<td></td>
</tr>
<tr>
<td>Emily Poon</td>
<td>PhD, MCCPM</td>
<td></td>
</tr>
<tr>
<td>Marija Popovic</td>
<td>PhD, FCCPM</td>
<td></td>
</tr>
<tr>
<td>Russell Ruo</td>
<td>MSc, FCCPM</td>
<td></td>
</tr>
<tr>
<td>Arman Sarfehnia</td>
<td>PhD, MCCPM</td>
<td></td>
</tr>
<tr>
<td>Monica Serban</td>
<td>MSc, MCCPM</td>
<td></td>
</tr>
<tr>
<td>Emilie Soisson</td>
<td>PhD, CMD, MCCPM, DABR</td>
<td></td>
</tr>
<tr>
<td>El-Naqa Issam</td>
<td>PhD (Associate Professor)</td>
<td></td>
</tr>
<tr>
<td>Ervin B. Podgorsak</td>
<td>PhD, FCCPM, DABMP, FAAPM</td>
<td></td>
</tr>
<tr>
<td>(Professor Emeritus)</td>
<td>FACMP</td>
<td></td>
</tr>
<tr>
<td>Dosimetrists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irene Marie Bélanger</td>
<td>RTT</td>
<td></td>
</tr>
<tr>
<td>Line Comeau</td>
<td>RTT, CMD</td>
<td></td>
</tr>
<tr>
<td>Lioudmila Dychkant</td>
<td>RTT</td>
<td></td>
</tr>
<tr>
<td>Chris Kaufmann</td>
<td>RTT, CMD – Chief Dosimetrist</td>
<td></td>
</tr>
<tr>
<td>Francesco Paolino</td>
<td>RTT, BS</td>
<td></td>
</tr>
<tr>
<td>Maria Papageorgiou</td>
<td>RTT</td>
<td></td>
</tr>
<tr>
<td>Dinesh Parmar</td>
<td>RTT</td>
<td></td>
</tr>
<tr>
<td>Cenzetta Procaccini</td>
<td>RTT</td>
<td></td>
</tr>
<tr>
<td>Chief electronic engineer</td>
<td>Pierre Léger, BEng, Chief Engineer</td>
<td></td>
</tr>
<tr>
<td>Electronic technicians</td>
<td>Bhavan Siva, BEng</td>
<td></td>
</tr>
<tr>
<td>Joe Larkin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information systems technician</td>
<td>Suzana Darvasi, BSc</td>
<td></td>
</tr>
<tr>
<td>Machine shop technician</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>Gregory Twork, MSc</td>
<td></td>
</tr>
<tr>
<td>Research Assistant</td>
<td>Norma Ybarra, PhD</td>
<td></td>
</tr>
</tbody>
</table>
**APPENDIX II.**

**M.Sc. DEGREES IN MEDICAL PHYSICS : January-December 2011**

1. **ALONSO ORTIZ, Eva (G.B. Pike)**  
   *The effect of caffeine on the whole brain oxygen extraction fraction (OEF)*  
   Currently: Ph.D. student, Biomedical Engineering, McGill University, Montreal, Québec

2. **CARLINI, Lina (J. Nadeau)**  
   *Quantum dots as photosynthesizers for photodynamic therapy*  
   Currently: Ph.D. student, Biophysics, École Polytechnique Fédérale de Lausanne, Switzerland

3. **MITROU, Ellis (F. DeBlois)**  
   *Monte Carlo based electron treatment planning and cutout output factor calculations*  
   Currently: Resident, Radiation Oncology Physics, SMBD-Jewish General Hospital, Montreal, Québec

4. **MORCOS, Marc (F. DeBlois)**  
   *Applications of deformable image registration: Automatic segmentation and deformable dose accumulation*  
   Currently: Resident, Radiation Oncology Physics, SMBD-Jewish General Hospital, Montreal, Québec

5. **PAPACONSTADPOULOS, Pavlos (J. Seuntjens)**  
   *Modulated electron radiation therapy: an investigation on fast beam models and radiation-tolerant solutions for automated motion control of a few leaf electron collimator*  
   Currently: Ph.D. student, Medical Physics Unit, McGill University, Montreal, Québec

6. **SHIN, Naomi (Parker)**  
   *Modeling secondary cancer risk following paediatric radiotherapy: A comparison of intensity modulated proton therapy and photon therapy*  
   Currently: Resident, Radiation Oncology Physics, McGill University Health Centre, Montreal, Québec

7. **TWORK, Gregory (H.J. Patrocinio)**  
   *Validation of the spatial accuracy of the ExacTrac® Adaptive Gating System*  
   Currently: Resident, Radiation Oncology Physics, McGill University Health Centre, Montreal, Québec
APPENDIX III.

BASIC DEMOGRAPHIC DATA

for the 193 M.Sc. and 30 Ph.D. GRADUATES

of the MEDICAL PHYSICS PROGRAMS

at McGill UNIVERSITY
# M.Sc. GRADUATES IN MEDICAL PHYSICS: 193

## 1980 - October 2011

**MEDICAL PHYSICS UNIT: McGill University**

<table>
<thead>
<tr>
<th>Total number of M.Sc. graduates in medical physics:</th>
<th>193</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Graduates’ origin:</th>
<th>Quebec</th>
<th>64/193</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>another Canadian province</td>
<td>58/193</td>
</tr>
<tr>
<td></td>
<td>USA</td>
<td>11/193</td>
</tr>
<tr>
<td></td>
<td>another country</td>
<td>60/193</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working in medical physics:</th>
<th>165/193</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Quebec</td>
<td>68/165</td>
</tr>
<tr>
<td>in another Canadian province</td>
<td>44/165</td>
</tr>
<tr>
<td>in the USA</td>
<td>37/165</td>
</tr>
<tr>
<td>in another country</td>
<td>16/165</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Currently Ph.D. student:</th>
<th>18/193</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Origin of M.Sc. graduates currently working in Quebec:</th>
<th>68/193</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec</td>
<td>35/68</td>
</tr>
<tr>
<td>another Canadian province</td>
<td>11/68</td>
</tr>
<tr>
<td>USA</td>
<td>2/68</td>
</tr>
<tr>
<td>another country</td>
<td>20/68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M.Sc. graduates of Quebec origin:</th>
<th>64/193</th>
</tr>
</thead>
<tbody>
<tr>
<td>working in medical physics</td>
<td>57/64</td>
</tr>
<tr>
<td>in Quebec</td>
<td>35/64</td>
</tr>
<tr>
<td>in another Canadian province</td>
<td>7/64</td>
</tr>
<tr>
<td>in the USA</td>
<td>11/64</td>
</tr>
<tr>
<td>in another country</td>
<td>2/64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Currently Ph.D. student:</th>
<th>2/64</th>
</tr>
</thead>
</table>
## Ph.D. GRADUATES IN MEDICAL PHYSICS : 30

### 1983 - February 2012

*MEDICAL PHYSICS UNIT : McGill University*

<table>
<thead>
<tr>
<th>Total number of Ph.D. graduates in medical physics:</th>
<th>30</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Graduates’ origin:</th>
<th>9/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec</td>
<td></td>
</tr>
<tr>
<td>another Canadian province</td>
<td>12/30</td>
</tr>
<tr>
<td>USA</td>
<td>0/30</td>
</tr>
<tr>
<td>another country</td>
<td>9/30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working in medical physics:</th>
<th>29/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Quebec</td>
<td>10/29</td>
</tr>
<tr>
<td>in another Canadian province</td>
<td>8/29</td>
</tr>
<tr>
<td>in the USA</td>
<td>9/29</td>
</tr>
<tr>
<td>in another country</td>
<td>2/29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Origin of Ph.D. graduates currently working in Quebec:</th>
<th>10/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec</td>
<td>5/10</td>
</tr>
<tr>
<td>another Canadian province</td>
<td>2/10</td>
</tr>
<tr>
<td>USA</td>
<td>0/10</td>
</tr>
<tr>
<td>another country</td>
<td>3/10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ph.D. graduates of Quebec origin:</th>
<th>9/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>working in medical physics</td>
<td>9/30</td>
</tr>
<tr>
<td>in Quebec</td>
<td>5/9</td>
</tr>
<tr>
<td>in another Canadian province</td>
<td>1/9</td>
</tr>
<tr>
<td>in the USA</td>
<td>3/9</td>
</tr>
<tr>
<td>in another country</td>
<td>0/9</td>
</tr>
</tbody>
</table>
# Graduates of the Accredited Two-year Residency Training Program

in Radiation Oncology Physics at McGill

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Date of grad</th>
<th>Background at entry</th>
<th>Current position</th>
<th>Current address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Belal Moftah, Ph.D.</td>
<td>Dec '99</td>
<td>Ph.D. (high energy physics) U. British Columbia</td>
<td>Chief physicist</td>
<td>Dept of Biomedical Physics, King Faisal Specialist Hospital &amp; Research Centre, Jeddah, Saudi Arabia</td>
</tr>
<tr>
<td>2</td>
<td>Lara Dyke, Ph.D.</td>
<td>May '00</td>
<td>M.Sc. (medical physics) U. Alberta</td>
<td>Clinical medical physicist</td>
<td>Varian Medical Systems, Miami, Florida, USA</td>
</tr>
<tr>
<td>3</td>
<td>Tony Falco, Ph.D.</td>
<td>Dec '00</td>
<td>Ph.D. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Resonant Medical, Incorporated Montreal, Quebec</td>
</tr>
<tr>
<td>4</td>
<td>Slobodan Devic, Ph.D.</td>
<td>Mar '02</td>
<td>Post-graduate training Washington U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>6</td>
<td>Jennifer Barker, M.Sc.</td>
<td>Dec '02</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>7</td>
<td>François DeBlois, Ph.D.</td>
<td>Jul '03</td>
<td>Ph.D. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>8</td>
<td>Siobhan Ozard, Ph.D.</td>
<td>Nov '03</td>
<td>Ph.D. (medical physics) U. British Columbia</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, Windsor Regional Cancer Centre Windsor, Ontario</td>
</tr>
<tr>
<td>9</td>
<td>Wamied Abdel-Rahman, Ph.D.</td>
<td>Dec '05</td>
<td>Ph.D. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, King Faisal Specialist Hospital, Damman, Saudi Arabia</td>
</tr>
<tr>
<td>10</td>
<td>Yiizhen Wang, M.Sc.</td>
<td>May '06</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Credit Valley Hospital, Mississauga, Ontario</td>
</tr>
<tr>
<td>11</td>
<td>Li Heng Liang, M.Sc.</td>
<td>Aug '06</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>12</td>
<td>Nada Tomic, M.Sc.</td>
<td>Aug '06</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>13</td>
<td>Gabriela Stroian, Ph.D.</td>
<td>Aug '07</td>
<td>Ph.D. (theoretical physics) U Paul Sabatier, France</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>14</td>
<td>Eric Reynard, M.Sc.</td>
<td>Mar '09</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>PEI Cancer Treatment Centre, Queen Elizabeth Hospital, Charlottetown, Prince Edward Island</td>
</tr>
<tr>
<td>15</td>
<td>Kristin Marchant, Ph.D.</td>
<td>Mar '09</td>
<td>Ph.D. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Allan Blair Cancer Centre, Regina, Saskatchewan</td>
</tr>
<tr>
<td>16</td>
<td>Krum Asiev, M.Sc.</td>
<td>Jun '09</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>17</td>
<td>Ismail Aldahlawi, M.Sc.</td>
<td>Jun '10</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, King Faisal Specialist Hospital, Damman, Saudi Arabia</td>
</tr>
<tr>
<td>18</td>
<td>Emily Poon, Ph.D.</td>
<td>May '11</td>
<td>Ph.D. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, McGill University Health Centre Montreal, Quebec</td>
</tr>
<tr>
<td>19</td>
<td>Jonathan Thébaut, M.Sc.</td>
<td>May '11</td>
<td>M.Sc. (medical physics) McGill U</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>20</td>
<td>Arman Sarfehnia, Ph.D.</td>
<td>Feb '12</td>
<td>Ph.D. (medical physics) U Western Ontario</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, McGill University Health Centre Montreal, Quebec</td>
</tr>
</tbody>
</table>
Currently registered residents:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Degree Completion</th>
<th>Degree Type</th>
<th>Position</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>John Kildea, M.Sc.</td>
<td>Jun '12</td>
<td>Postdoc (astrophysics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, McGill University Health Centre Montreal, Quebec</td>
</tr>
<tr>
<td>22</td>
<td>Stephen Davis, Ph.D.</td>
<td>Aug '12</td>
<td>Ph.D. (medical physics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, McGill University Health Centre Montreal, Quebec</td>
</tr>
<tr>
<td>23</td>
<td>Joseph Holmes, M.Sc.</td>
<td>Aug '12</td>
<td>M.Sc. (medical physics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>24</td>
<td>Ellis Mitrou, M.Sc.</td>
<td>Aug '13</td>
<td>M.Sc. (medical physics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>25</td>
<td>Marc Morcos, M.Sc.</td>
<td>Aug '13</td>
<td>M.Sc. (medical physics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Radiation Oncology, Jewish General Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>26</td>
<td>Greg Twork, M.Sc.</td>
<td>Aug '13</td>
<td>M.Sc. (medical physics)</td>
<td>Clinical medical physicist</td>
<td>Dept of Medical Physics, McGill University Health Centre Montreal, Quebec</td>
</tr>
</tbody>
</table>
## COURSE INSTRUCTORS: CALENDAR YEAR 2011

**MEDICAL PHYSICS UNIT: McGill University**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Winter semester 2011</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDPH 602</td>
<td><em>Applied Dosimetry</em></td>
<td>E.B. Podgorsak</td>
</tr>
<tr>
<td>MDPH 603</td>
<td><em>Laboratory in Radiation Physics</em></td>
<td>W. Parker, J. Seuntjens, M.D.C. Evans</td>
</tr>
<tr>
<td>MDPH 607</td>
<td><em>Physics of Medical Imaging</em></td>
<td>A. Reader, G.B. Pike</td>
</tr>
<tr>
<td>MDPH 609</td>
<td>Radiation Biology</td>
<td>S. Lehnert</td>
</tr>
<tr>
<td>MDPH 612</td>
<td>Computers in Medical Imaging</td>
<td>H.J. Patrocinio, F. DeBlois</td>
</tr>
<tr>
<td>MDPH 616D (Part II)</td>
<td><em>Selected Topics in Medical Physics</em></td>
<td>E. Soisson, W. Parker</td>
</tr>
<tr>
<td>563-625 D</td>
<td><em>Thesis Research</em></td>
<td><em>(individual supervisors)</em></td>
</tr>
<tr>
<td><strong>Fall semester 2011</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDPH 601</td>
<td><em>Radiation Physics</em></td>
<td>E.B. Podgorsak, J. Seuntjens</td>
</tr>
<tr>
<td>MDPH 611</td>
<td>Medical Electronics</td>
<td>P. Léger</td>
</tr>
<tr>
<td>MDPH 613</td>
<td><em>Health Physics</em></td>
<td>J. Kildea, M.D.C. Evans</td>
</tr>
<tr>
<td>MDPH 614</td>
<td><em>Physics of Diagnostic Radiology</em></td>
<td>I. El Naqa</td>
</tr>
<tr>
<td>MDPH 615</td>
<td><em>Physics of Nuclear Medicine</em></td>
<td>S. Devic</td>
</tr>
<tr>
<td>MDPH 616D (Part I)</td>
<td><em>Selected Topics in Medical Physics</em></td>
<td>E. Soisson, W. Parker</td>
</tr>
</tbody>
</table>

* designates core courses
### Teaching Evaluation Summary – Winter 2011

#### INSTRUCTOR

<table>
<thead>
<tr>
<th>Number of respondents per instructor</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>#6</th>
<th>#7</th>
<th>#8</th>
<th>#9</th>
<th>TOT</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**A. Course material and presentation**

1. Individual classes are well organized.
   
   - 3.2 4.2 4.3 4.6 4.8 4.0 4.1 4.7 3.6 37.34 4.1

2. Instructor develops matter in a logical manner.
   
   - 3.7 3.6 4.3 4.5 4.4 3.9 4.1 4.8 3.8 37.09 4.1

3. Instructor makes material clear and interesting.
   
   - 3.8 2.4 4.3 4.2 4.5 3.9 4.1 4.7 3.5 35.27 3.9

4. Instructor incorporates up-to-date information in course.
   
   - 4.3 2.8 4.5 4.1 4.6 4.3 4.0 4.8 4.4 37.84 4.2

5. Instructor makes good use of the blackboard or audiovisual aids.
   
   - 4.1 4.5 4.3 4.3 4.3 4.1 4.4 4.3 38.09 4.2

B. Interaction with instructor

9. The instructor welcomes questions in class.
   
   - 4.2 2.9 5.0 4.8 4.9 4.9 4.5 5.0 4.6 40.81 4.5

10. The instructor is available for consultation outside classes.
    
    - 4.0 3.8 4.8 4.5 3.5 4.6 4.0 3.8 4.1 37.07 4.1

11. Consultation with the instructor is helpful.
    
    - 4.0 3.5 4.8 4.3 4.2 4.3 4.9 4.3 38.40 4.3

C. Assignments and examinations

12. The mid-term exam questions are fair.
    
    - 4.0 4.5 4.3 4.5 4.0 4.5 4.3 4.5 17.33 4.3

13. The mid-term exam marking and grading are fair.
    
    - 4.0 4.7 4.3 4.4 4.0 4.7 4.3 4.4 17.42 4.4

14. Assignments contribute substantially to students' understanding of course material.
    
    - 3.6 4.0 4.3 4.0 3.9 3.9 4.4 4.2 3.9 36.12 4.0

15. Assignments are returned sufficiently promptly for the student to benefit from corrections.
    
    - 2.7 4.0 4.0 4.2 2.6 4.4 4.2 1.5 27.43 3.4

D. Overall assessment

16. Would like to take another course from the same instructor.
    
    - 3.6 2.3 4.3 3.9 4.6 3.9 4.3 4.8 3.6 35.30 3.9

17. The instructor's overall teaching ability is excellent.
    
    - 3.6 2.4 4.5 4.2 4.6 4.2 4.3 4.9 3.8 36.49 4.1

**Overall average course rating for instructor.**

- 3.84 3.29 4.39 4.26 4.44 4.12 4.25 4.58 3.78

**Overall Average / 5** 4.14
# McGill University - Medical Physics Unit
## Teaching Evaluation Summary – Fall 2011

<table>
<thead>
<tr>
<th>INSTRUCTOR</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>#6</th>
<th>TOT.</th>
<th>AVG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents per instructor</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A. Course material and presentation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Individual classes are well organized.</td>
<td>4.6</td>
<td>4.1</td>
<td>4.3</td>
<td>4.6</td>
<td>4.3</td>
<td>4.3</td>
<td>26.34</td>
<td>4.4</td>
</tr>
<tr>
<td>2. The instructor develops subject matter in a logical manner.</td>
<td>4.8</td>
<td>4.2</td>
<td>4.0</td>
<td>4.4</td>
<td>4.6</td>
<td>3.3</td>
<td>25.33</td>
<td>4.2</td>
</tr>
<tr>
<td>3. The instructor makes the material clear and interesting.</td>
<td>4.7</td>
<td>3.6</td>
<td>4.3</td>
<td>3.9</td>
<td>4.5</td>
<td>3.3</td>
<td>24.48</td>
<td>4.1</td>
</tr>
<tr>
<td>4. The instructor encourages and stimulates student thinking.</td>
<td>4.5</td>
<td>4.4</td>
<td>4.3</td>
<td>4.5</td>
<td>4.6</td>
<td>4.3</td>
<td>26.65</td>
<td>4.4</td>
</tr>
<tr>
<td>5. The instructor incorporates up-to-date information in the course.</td>
<td>4.5</td>
<td>4.6</td>
<td>4.7</td>
<td>4.7</td>
<td>4.8</td>
<td>4.7</td>
<td>27.87</td>
<td>4.6</td>
</tr>
<tr>
<td>6. The pace of the course is satisfactory.</td>
<td>4.8</td>
<td>4.2</td>
<td>4.3</td>
<td>4.3</td>
<td>4.2</td>
<td>4.3</td>
<td>26.17</td>
<td>4.4</td>
</tr>
<tr>
<td>7. The instructor speaks clearly.</td>
<td>4.5</td>
<td>3.6</td>
<td>4.7</td>
<td>3.9</td>
<td>4.7</td>
<td>4.3</td>
<td>25.78</td>
<td>4.3</td>
</tr>
<tr>
<td>8. The instructor makes good use of the blackboard or audiovisual aids.</td>
<td>4.7</td>
<td>4.5</td>
<td>4.7</td>
<td>4.5</td>
<td>4.5</td>
<td>4.3</td>
<td>27.27</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>B. Interaction with instructor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. The instructor welcomes questions in class.</td>
<td>4.8</td>
<td>4.8</td>
<td>4.7</td>
<td>4.5</td>
<td>4.9</td>
<td>4.3</td>
<td>28.01</td>
<td>4.7</td>
</tr>
<tr>
<td>10. The instructor is available for consultation outside classes.</td>
<td>4.8</td>
<td>4.9</td>
<td>4.7</td>
<td>4.5</td>
<td>3.7</td>
<td>4.3</td>
<td>26.92</td>
<td>4.5</td>
</tr>
<tr>
<td>11. Consultation with the instructor is helpful.</td>
<td>4.8</td>
<td>4.8</td>
<td>4.5</td>
<td>4.7</td>
<td>4.2</td>
<td>4.3</td>
<td>27.34</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>C. Assignments and examinations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. The mid-term exam questions are fair.</td>
<td>4.5</td>
<td>3.6</td>
<td>3.3</td>
<td>4.4</td>
<td>4.5</td>
<td>4.5</td>
<td>24.79</td>
<td>4.1</td>
</tr>
<tr>
<td>13. The mid-term exam marking and grading are fair.</td>
<td>4.5</td>
<td>4.5</td>
<td>3.7</td>
<td>4.4</td>
<td>4.2</td>
<td>4.5</td>
<td>25.68</td>
<td>4.3</td>
</tr>
<tr>
<td>14. Assignments contribute substantially to students' understanding of course material.</td>
<td>4.3</td>
<td>4.2</td>
<td>5.0</td>
<td>4.0</td>
<td>4.2</td>
<td>4.3</td>
<td>25.94</td>
<td>4.3</td>
</tr>
<tr>
<td>15. Assignments returned sufficiently promptly for students to benefit from corrections.</td>
<td>4.8</td>
<td>4.4</td>
<td>5.0</td>
<td>3.8</td>
<td>4.4</td>
<td>4.3</td>
<td>26.70</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>D. Overall assessment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. You would like to take another course from the same instructor.</td>
<td>4.7</td>
<td>3.6</td>
<td>3.3</td>
<td>3.6</td>
<td>4.1</td>
<td>3.7</td>
<td>23.08</td>
<td>3.8</td>
</tr>
<tr>
<td>17. The instructor's overall teaching ability is excellent.</td>
<td>4.8</td>
<td>3.5</td>
<td>4.3</td>
<td>4.1</td>
<td>4.6</td>
<td>4.0</td>
<td>25.40</td>
<td>4.2</td>
</tr>
<tr>
<td>Overall average course rating for instructor.</td>
<td>4.67</td>
<td>4.21</td>
<td>4.34</td>
<td>4.28</td>
<td>4.41</td>
<td>4.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overall Average / 5** | 4.35
APPENDIX VII.

STUDENTS BEGINNING THEIR FIRST YEAR OF
M.Sc. STUDIES IN MEDICAL PHYSICS IN SEPTEMBER 2011

(major department and supervisor are indicated in parentheses; number following the major department indicates year of M.Sc. study in Fall 2010)

1. ALDOSARY, Ghada (MPU-1, “TBA”)
   (title of thesis not yet available)
2. ASGHARIZADEH, Saeid (MPU-1, “TBA”)
   (title of thesis not yet available)
3. BOURQUE, Alexandra (MPU-1, Pike)
   (title of thesis not yet available)
4. BURTON, Christiane (MPU-1, “TBA”)
   (title of thesis not yet available)
5. FAN, Michael (MPU-1, “TBA”)
   (title of thesis not yet available)
6. GERARD, Ian (MPU-1, “TBA”)
   (title of thesis not yet available)
7. GHOLAMPOURKASHI, Sara (MPU-1, “TBA”)
   (title of thesis not yet available)
8. MULLINS, Joel (MPU-1, “TBA”)
   (title of thesis not yet available)
9. RENAUD, Marc-André (MPU-1, “TBA”)
   (title of thesis not yet available)
10. ZLATEVA, Yana (MPU-1, “TBA”)
    (title of thesis not yet available)

These students started their studies in September 2010, thus will only select their supervisor(s) and start their M.Sc. thesis research work in May 2012.
APPENDIX VIII.

STUDENTS CONTINUING THEIR SECOND YEAR OF M.Sc. STUDIES IN MEDICAL PHYSICS IN SEPTEMBER 2011

(major departments and supervisors are indicated in parentheses; number following the major department indicates year of M.Sc. study in Fall 2011)

1. ARCHAMBAULT, Laurie (MPU-2, Wierzbicki)
   Validation of XiO's electron Monte Carlo module in heterogeneous phantoms

2. BEKERAT, Hamed (MPU-2, Devic, Sarfehnia)
   (title of thesis not yet available)

3. BERMAN, Avery (MPU-2, Pike)
   Simulation of functional MRI signals in the brain microvasculature

4. CARRIER-VALLIÈRES, Martin (MPU-2, El Naqa)
   Outcome prediction of sarcoma tumors using PET/MR imaging

5. DYESS, Amanda (MPU-2, Parker)
   (title of thesis not yet available)

6. KHATCHADOURIAN, Rafael (MPU-2, Kildea, Evans)
   Monte Carlo simulations and physical measurements of neutron equivalent dose in the maze area of linac bunkers

7. LEDUC, Vincent (MPU-2, Wierzbicki)
   Beam data acquisition with the IC Profiler: A feasibility study

8. LETOURNEAU, Étienne (MPU-2, Reader)
   Impact of algorithm, iterations, post-smoothing, count-level and tracer distribution on single-frame PET quantification

9. MILROY, Desmond (MPU-2, Patrocinio, Seuntjens)
   (title of thesis not yet available)

10. NASONKIN, Sergey (MPU-2, Syme)
    (title of thesis not yet available)

11. RENAUD, James (MPU-2, Sarfehnia)
    Developing a graphite probe calorimeter for accurate clinical dosimetry

12. TOLTZ, Allison (MPU-2, Parker, Seuntjens)
    Risks of radiation-induced cardiotoxicity and secondary cancers in Hodgkin’s lymphoma patients

13. WATSON, Peter (MPU-2, Seuntjens)
    Fast Monte Carlo scatter correction in cone-beam computed tomography

These students began their M.Sc. studies in September 2010, completed the Fall and Winter didactic semesters of the 2010-2011 academic year, and are currently completing their M.Sc. thesis research. All are expected to submit their theses by June 2012.
STUDENTS FINISHING THEIR THIRD YEAR OF
M.Sc. STUDIES IN MEDICAL PHYSICS IN SEPTEMBER 2011

(major departments and supervisors are indicated in parentheses; number following the major department indicates year of M.Sc. study in Fall 2011)

1. SINGH, Khushdeep (MPU-3, Devic, Sarfiah)
   Investigating the energy response of EBT-2 GafChromic film model

2. THAKUR, Varun (MPU-3, Parker)
   Planning and delivery comparison of five Linac-based stereotactic radiosurgery techniques
Appendix IX.

Students currently working on Ph.D. projects in medical physics

(major department and supervisors are indicated in parentheses)

1. Chung, Eunah (Physics – J. Seuntjens)
   Dosimetry and non-compliant beams
   Expected to submit thesis: date not yet available (began Ph.D. studies in January 2009)

2. Connell, Tanner (Physics – J. Seuntjens)
   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2009)

   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2010)

   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2011)

5. Oweida, Aynam (Experimental Medicine – S. Lehnert)
   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2010)

6. Papakonstandopoulos, Pavlos (Physics – J. Seuntjens)
   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2011)

   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2011)

8. Perez, Jessica (Biomedical Engineering – I. El Naqa)
   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in January 2012)

   (title not yet available)
   Expected to submit thesis: date not yet available (began Ph.D. studies in September 2011)
APPENDIX X.

PUBLICATIONS

by members of the Medical Physics Unit: 2011 calendar year (x 37)
(names of MPU staff members are underlined, students are indicated by †)


CONSORTIUM PUBLICATIONS

by members of the Medical Physics Unit : 2011 calendar year (x 4)
(names of MPU staff members are underlined, students are indicated by †)
41. G.B. Pike, Brain Development Cooperative Group, Total and regional brain volumes in a population-based normative sample from 4 to 18 Years: The NIH MRI study of normal brain development, Cereb. Cortex, Epub May 25, 2011.
APPENDIX XI.

PUBLISHED ABSTRACTS

by members of the Medical Physics Unit : 2011 calendar year (x 62)
(names of MPU staff members are underlined, students are indicated by †)

2. A. Alexander†, M. Renaud†, J. Seuntjens, All-inclusive DOSXYZnrc source for Monte Carlo QA of external beam radiotherapy, Med. Phys. 38 (6), 3382 (2011); SU-D-BRB-03 - Short oral presentation/ abs doi:10.1118/1.3611521.


24. V. Thakur†, R. Ruo, R. Doucet, E.T. Soisson, J. Seuntjens, W. Parker, A planning comparison of Dynamic Conformal Arc (DCA), static Non-Coplanar Intensity Modulated Radiotherapy (NCP-IMRT), volumetric modulated arc therapy (RapidArc), robotic radiosurgery (Cyberknife), and Helical Thromotherapy (HI-ART Tomotherapy) for SRS, Med. Phys. 38 (6), 3695 (2011); SU-E-T-885.


45. S. Davis, J.D. Moga, T.L. Pike, L.A. DeWerd, Monte Carlo calculations and measurements of emitted photon spectra from a miniature x-ray source, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

46. A. Alexander†, E.T. Soisson, T. Hijaíl. A. Sarfehnia†, J. Seuntjens, Plan comparison of modulated electron radiotherapy to conventional electron boost irradiation and volumetric modulated photon arc therapy for treatment of tumour bed boost in breast cancer, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

47. P. Papaconstadopoulos†, A. Alexander†, T. Connell†, J. Seuntjens, Analytical scatter source model for modulated electron irradiation therapy, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

48. T. Connell†, A. Alexander†, J. Seuntjens, Challenges in modeling a scattering-foil free electron beams for use in modulated electron radiotherapy, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.


50. A. Alexander†, E.T. Soisson, L. Comeau, J. Seuntjens, Patient comparison between the analytic anisotropic algorithm and Monte Carlo dose calculation for head and neck patients treated with simultaneous integrated boost intensity-modulated radiation therapy, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

51. E.T. Soisson, A. Alexander†, J. Seuntjens, Verification of lung plans used for stereotactic body radiosurgery using a Monte Carlo based treatment planning system, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

52. I. El Naqa, Monte Carlo role in radiobiological modeling, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.

53. S. Lee†, G. Stroian, J. Seuntjens, I. El Naqa, Application of Monte-Carlo dose calculation and systematic computed tomography image analysis to analytical modeling of time-dependent radiation-induced lung disease, International Workshop on Recent Advances in Monte Carlo Techniques in Radiation Therapy, Montreal, Québec, June 08-10, 2011.


57. M.M. Shiell, F. Champoux, G.B. Pike, R.J. Zatorre, Differences in white-matter organization after early auditory deprivation revealed by magnetization transfer imaging, 17th Annual Meeting of the Organization
for Human Brain Mapping, Quebec City, Québec, June 26-30-2011.


**APPENDIX XII.**

**INVITED PRESENTATIONS**

by members of the Medical Physics Unit : 2011 calendar year (x 24)

(in multiple author entries, the author who presented the paper is shown with an asterisk)

6. J. Seuntjens, *Small field dosimetry for IMRT and radiosurgery*, Invited teaching lecture, Annual Meeting - South East Chapter of the American Association of Physicists in Medicine, Myrtle Beach, South Carolina, April 07, 2011.
21. G.B. Pike, *Recent advances in quantitative magnetic resonance neuroimaging research*, Montreal...
Neurological Institute, Montreal, Québec, September 15, 2011.


**APPENDIX XIII.**

**CONFERENCE & SEMINAR PRESENTATIONS**

by members of the Medical Physics Unit : 2011 calendar year (x 24)

(presenter is indicated by an asterisk *)

(the names of staff members of the MPU are underlined, students are indicated by †)

---


APPENDIX XIV.

NEW & ONGOING GRANTS

held by MPU FACULTY MEMBERS in 2011

Grants are generally attained under the auspices of the grantee's primary department, i.e., either through McGill University (Oncology or Neurology & Neurosurgery) or the McGill University Health Center (Medical Physics).

DEBLOIS, F.

L. Beaulieu (PI), F. DeBlois, et al.
Advanced model-based dose calculations for brachytherapy clinical applications
Canadian Cancer Society Research Institute (CCSRI), innovation grant (student support)
(2011-2012) ........................................................................................................................................ $17,000

DEVIC, S.

S. Devic
Radiochromic film dosimetry
Natural Sciences & Engineering Research Council (NSERC), operating grant (total award: $135,000)
(2010-2015) ........................................................................................................................................ $27,000

EL NAQA, I.

I. El Naqa
Start-up grant
Fast Foundation, lab start-up grant (new Faculty)
(2010-2013) ........................................................................................................................................ $150,000

I. El Naqa (PI)
A real-time framework for image-guided adaptive radiotherapy
Natural Sciences & Engineering Research Council (NSERC), discovery grant (total award: $285,000)
(2011-2016) ........................................................................................................................................ $57,000

I. El Naqa (PI)
Modeling of radiotherapy induced damage in locally advanced lung cancer by a novel system radiobiology approach
Canadian Institutes of Health Research (CIHR) (total award: $678,950)
(2011-2016) ........................................................................................................................................ $135,790
EVANS, M.

J. Seuntjens, M. Evans, J. Kildea
Research collaboration
Canadian Nuclear Safety Commission (CNSC)
(2011) ............................................................................................................. $15,000

LEHNERT, S.M.

Modeling of radiotherapy induced damage in locally advanced lung cancer by a novel system radiobiology approach
Canadian Institutes of Health Research (CIHR)
(total award: $678,950)
(2011-2016) .................................................................................................. $135,790

PIKE, G.B.

G.B. Pike, D. Arnold
Functional magnetic resonance imaging of brain physiology
Canadian Institutes of Health Research (CIHR), operating grant
(2007-2012) ..................................................................................................... $606,615

G.B. Pike
Quantitative MRI
James McGill Award
(2007-2013) .................................................................................................. $105,000

G.B. Pike
Diffusion imaging of white matter fibre tracts
Natural Sciences and Engineering Research Council (NSERC), discovery grant
(incl. Discovery Acceleratory Supplement of $120,000)
(2007-2012) .................................................................................................. $330,000

D. Gaudet, T. Paus, G.B. Pike et al
Long-term consequences of prenatal exposure to maternal cigarette smoking on brain structure, function and mental health in adolescence: Role of genes and environment in brain development
Canadian Institutes of Health Research (CIHR), operating grant
(2008-2013) .................................................................................................. $1,360,475

J. Gotman, G.B. Pike, F. Dubeau
Electrical, metabolic and structural analysis of human epileptogenic lesions
Canadian Institutes of Health Research (CIHR), operating grant
(2008-2013) .................................................................................................. $761,750

D. Arnold, G.B. Pike, S. Narayanan
Imaging demyelination and remyelination in NS
MSSC, operating grant
(2008-2011) .................................................................................................. $264,350

G.B. Pike et al.
Imaging innovation and translation
CECR Centre of Excellence Commercialization and Research Grant
(2008-2012) .................................................................................................. $1,500,000
B. Bedell, A. Evans, G.B. Pike, P. Rosa-Neto, D. Stanimirovic  
*Multi-parametric imaging studies of novel therapeutic agents in rodent models of glioma*  
Canadian Institutes of Health Research (CIHR), operating grant  
(2008-2012) ................................................................................................................................. $632,896

B. Bedell, A. Evans, E. Hamel, G.B. Pike  
*Integrated in vivo and ex vivo characterization of cerebrovascular dysfunction and its consequences in transgenic models of Alzheimer’s disease*  
Canadian Institutes of Health Research (CIHR), operating grant  
(2009-2012) ................................................................................................................................. $507,978

D. Arnold, G.B. Pike, S. Narayanan  
*Imaging inflammation in MS*  
MSSS, research grant  
(2009-2011) ................................................................................................................................. $240,000

N. Bernasconi, G.B. Pike  
*High field imaging of focal epilepsy*  
Canadian Institutes of Health Research (CIHR), operating grant  
(2009-2013) ................................................................................................................................. $393,809

G.B. Pike, L. Collins, A. Olivier  
*MR venography for image guided neurosurgery*  
Centre of Excellence in Commercialization & Research, commercialization & research grant  
(2010-2012) ................................................................................................................................. $57,500

G.B. Pike et al.  
*Quantitative magnetic resonance imaging of multiple sclerosis*  
Canadian Institutes of Health Research (CIHR), operating grant  
(2010-2015) ................................................................................................................................. $805,242

R. Zatorre, V. Penhume (PIs), A. Evans, K. Hyde, G.B. Pike  
Canadian Institutes of Health Research (CIHR), operating grant  
(2010-2015) ................................................................................................................................. $609,163

T. Paus, G.B. Pike, D. Gaudet  
*Programming brains across generations: How early environment and genes shape the risk of addiction*  
Canadian Institutes of Health Research (CIHR), team grant (Canada-Finland)  
(2011-2014) ................................................................................................................................. $1,000,000

D.L. Arnold, S. Narayanan, G.B. Pike  
*Imaging inflammation in MS*  
MSSS, operating grant  
(2011-2013) ................................................................................................................................. $238,564

D.L. Arnold, G.B. Pike, S. Narayanan  
*MTR assessment of remyelinating therapies*  
MSSS, operating grant  
(2011-2013) ................................................................................................................................. $183,194

V. Gracco, G.B. Pike et al.  
*Regroupement pour la recherche sur le cerveau, le langage et la musique*  
FQRNT and FQRSC  
(2011-2017) ................................................................................................................................. $2,250,000
K. Siddiqi, D.L. Collins, G.B. Pike  
*Reconstruction angulaire et radiale dans l’IRM de diffusion*  
(Radian and angular reconstruction in diffusion MRI)  
FQRNT, team grant  
(2011-2014) .................................................................................................................. $126,000

K. Hyde, G.B. Pike, E. Fombonne  
*Auditory processing in typical development and in autism spectrum disorder: Insight from the brain and behavior*  
Canadian Institutes of Health Research (CIHR), operating grant  
(2011-2016) .................................................................................................................. $570,545

G.B. Pike (McGill) (PI), J. Near (Oxford)  
*Undersampled two-dimensional magnetic resonance spectroscopy for accurate quantification of tissue metabolites in-vivo*  
Oxford-McGill Neuroscience Collaboration Funding (OMNC)  
(2011-2012) .................................................................................................................. $10,800

G.B. Pike  
*Montreal consortium for brain imaging research - II (MCBIR II)*  
Montreal Consortium for Brain Imaging Research  
(2011-2012) .................................................................................................................. $10,000

M. Beauregard, A Brunet, G.B Pike  
*Self-regulation of ventromedial prefrontal activity in post-traumatic stress disorder: A real-time fMRI neurofeedback study*  
Quebec Bio-Imaging Network, Strategic Initiative Program  
(2011-2013) .................................................................................................................. $99,850

**READER, A.**

A.J. Reader  
*Scanner-adaptive image reconstruction platform for accelerated technology transfer in Positron Emission Tomography*  
Centre of Excellence in Commercialization & Research  
(2010-2011) .................................................................................................................. $100,000

A.J. Reader  
*Task-oriented optimization of high-performance positron emission tomography*  
Natural Sciences & Engineering Research Council (NSERC)  
(2010-2015) .................................................................................................................. $135,000

A.J. Reader  
*Canada Research Chair in Positron Emission Tomography*  
Canada Research Chairs Program  
(2008-2013) .................................................................................................................. $500,000

A.J. Reader  
*Advanced PET image reconstruction, modelling and analysis in neuroscience*  
Montreal Neurological Institute  
(2008-2011) .................................................................................................................. $300,000
A.J. Reader

*Advanced reconstruction algorithms for PET imaging in oncology and neuroscience*

EPSRC
(2008-2012)........................................................................................................... £417,991 GBP

**SEUNTJENS, J.**

**J. Seuntjens**

*“Bourse” for students in medical physics*

Ministère de la santé et des services sociaux du Québec
(2009-2011)........................................................................................................... $34,000

**J. Seuntjens**

*“Bourse” for students in medical physics*

Ministère de la santé et des services sociaux du Québec
(2010-2012)........................................................................................................... $34,000

**J. Seuntjens**

*“Bourse” for students in medical physics*

Ministère de la santé et des services sociaux du Québec
(2011-2013)........................................................................................................... $34,000

**J. Seuntjens et al.**

*Accurate reference dosimetry of non-standard beams using water calorimetry, ionization chambers and Monte Carlo dose calculations*

Natural Sciences & Engineering Research Council (NSERC), discovery grant
(2009-2013)........................................................................................................... $267,000

**D. Roberge (PI), J. Seuntjens, et al.**

*Évaluation de l’impact potentiel d’un centre Québécois de protonthérapie chez les jeunes survivants de cancer*

Fonds de la recherche en santé de Québec (FRSQ), research grants
(2010-2013)........................................................................................................... $285,955

**J. Seuntjens et al.**

*Monte Carlo-based mixed electron/photon beam inverse treatment planning, delivery and verification*

Canadian Institutes for Health Research (CIHR), operating grant
(2010-2015)........................................................................................................... $300,000

**SOISSON, E.T.**

**D. Rogerge (PI), E.T. Soisson et al.**

*Évaluation de l’impact potentiel d’un centre Québécois de protonthérapie chez les jeunes survivants de cancer*

Fonds de la recherche en santé de Québec (FRSQ), research grants
(2010-2013)........................................................................................................... $285,955
APPENDIX XV.

RESEARCH INTERESTS OF THE ACADEMIC MEMBERS OF THE MPU

DEBLOIS, François  
Photon and electron beam dosimetry, stereotactic radiosurgery, Monte Carlo treatment planning and medical physics software.

DEVIC, Slobodan  
Radiochromic film dosimetry, GI brachytherapy, imaging modalities for radiotherapy treatment planning and verification, PET/CT.

EL NAQA, Issam  
Oncology informatics; Image-guided and adaptive radiotherapy; Data analysis of different anatomical and functional imaging modalities; Pattern recognition and data mining in biomedical applications…

EVANS, Michael D.C.  
Clinical aspects of radiotherapy, including low and high dose rate brachytherapy, dynamic external beam radiotherapy, linear accelerator calibration and quality assurance, computerized treatment planning, radiation safety.

GAUVIN, Alain  
Wide area medical imaging distribution deals with standard based methods for delivering medical imaging results over multi-provider environments. Methods for addressing different challenges of such networks were presented, and are currently being implemented.

HEGYI, Gyorgy  
Image analysis and manipulation, patient radiation dose determination in radiology with special dosimetry techniques, health physics. Different diagnostic imaging procedures can result in significant radiation dose to the patient. The radiation dose to pediatric patients during CT procedures is of special concern. Special dosimetry tools are required for routine CT dose measurements like radiochromic films, MOSFETs others.

JANICKI, Christian  
Intravascular brachytherapy, internal dosimetry (nuclear medicine), x-ray dosimetry, physics of consciousness.

KILDEA, John  

LEGÉR, Pierre  
Distance and position sensing, dose detection, dose delivery, x-ray control, general application of electronic to geophysics and radiotherapy.

LEHNERT, Shirley M.  
Characterization of the radioresistant phenotype; cross resistance between radiation and chemotherapeutic drugs; radiation-induced genes; delivery systems for radiosensitizing drugs.

PARKER, William  
IMRT quality assurance, tomotherapy clinical applications, pediatric radiotherapy, image guided radiation therapy, stereotactic body radiotherapy, risk management and management in Radiation Oncology.
PATROCINIO, Horacio J.  
Stereotactic radiosurgery, intensity modulated and image-guided radiation therapy.

PIKE, G. Bruce  
Magnetic resonance (MR) imaging: MRI acquisition physics, magnetization transfer theory and applications, functional MR brain imaging, cerebral blood flow imaging, neuronal activation physiology, and diffusion tensor imaging.

PODGORSK, Ervin B.  
Photon and electron beam dosimetry, stereotactic radiosurgery, general applications of physics to radiotherapy.

READER, Andrew  
Image reconstruction, kinetic parameter estimation & system modeling for high resolution 4D Positron Emission Tomography (PET).

RICHARDSON, Richard B.  

RUO, Russell  
Intensity modulated radiotherapy (IMRT), image guided radiotherapy (IMGT), stereotactic radiosurgery (SRS).

SEUNTJENS, Jan P.  
Clinical reference dosimetry for standard and non-equilibrium radiation fields, studying correlations between dosimetric errors and outcome for lung cancer patients, development and clinical implementation of energy modulated electron radiation therapy.

SOISSON, Emilie  
Tomotherapy based stereotactic radiosurgery Proton therapy Clinical implementation of Monte Carlo based treatment planning and Small field dosimetry.

STROIAN, Gabriela  
Lung cancer radiotherapy, respiratory motion, 4D radiotherapy, deformable registration, treatment planning, heterogeneity corrections, Monte Carlo dose calculation, functional imaging, radiobiological modeling.

SYME, Alasdair  
Dosimetry using optical fibres, MR imaging in radiotherapy.

TOMIC, Nada  
CBCT in image guided radiation therapy; PET in radiation therapy; Radiographic film dosimetry.

WIERZBICKI, Wieslaw  
External beam radiotherapy with photons and electrons, mathematical modeling in radiation oncology and physics.
APPENDIX XVIII.

MPU SEMINAR SERIES: 2011 CALENDAR YEAR

Winter 2011

January 14: Louis Archambault (CHUL, Laval, QC)
Toward a 3D monitoring of intensity modulated proton therapy

January 28: Gabriel Sawakuchi (Radiotherapy Physics Lab, Carleton University, Ottawa, ON)
Challenges in proton therapy dosimetry

February 11: Gyorgy Hegyi (Medical Physics, MUHC, QC)
CT dose management

March 04: Various staff (McGill U / MUHC / JGH / MNI, Montreal, QC)
Project presentations to MSc students

March 11: Jermaine Cuyler (Accuray) & Sonja Dietrich (Stanford University, Stanford, CA)
CyberKnife radiotherapy

March 25: L. John Schreiner (Cancer Care of Southeastern Ontario, Kingston, ON)
Image guided adaptive radiation therapy validation with three-dimensional gel dosimetry

March 28: Stefan Both (University of Pennsylvania, Philadelphia, PA)
Clinical implementation of proton radiotherapy at University of Pennsylvania

April 01: Monica Serban (Hôpital Maisonneuve-Rosemont, Montreal, QC)
Development of a patient-specific Co-60 total body irradiation technique

Fall 2011

September 2: Gustavo Kertzscher (Ottawa General Hospital, Ottawa, ON)
Identifying afterloader brachytherapy errors using real-time fiber-coupled luminescence dosimetry: A phantom study

September 16: Ali Sedeghi-Naini (University of Western Ontario, London, ON)
Modelling lung tissue motions and deformations for more accurate tumor ablative procedures

September 30: Emily Heath (Ryerson University, Toronto, ON)
Quantifying and compensating for uncertainties in 4D radiotherapy of lung cancer

October 21: Luis Souhami (Radiation Oncology, McGill U, Montreal, QC)
History of radiosurgery in Canada

October 28: Pier-Yves Trépanier (Université de Montréal, Montreal, QC)
Predicting the location of GBM recurrence after radiotherapy using patient-specific DTI and numerical modelling

November 18: Ernesto Mainegra-Hing (National Research Council of Canada, Ottawa, ON)
Monte Carlo based CBCT scatter corrections
APPENDIX XVII.

COMMITTEE INVOLVEMENT of MPU FACULTY MEMBERS within McGill from January-December 2011

DEBLOIS, F.: Member, Medical Physics Residency Committee (2008-present)
McGill University
Member, Radiation Oncology Radiation Safety Committee (2008-present)
Member, Radiation Oncology Quality Assurance Committee (2008-present)
SMBD Jewish General Hospital

EL NAQA, I.: Member, Medical Physics Radiation Safety Committee (2010-present)
Member, Radiation Oncology / Medical Physics Research Committee
McGill University Health Centre (MUHC)
Member, Graduate Program Committee; Curriculum Review Committee (2010-present)
Medical Physics Unit, McGill University

EVANS, M.D.C.: Member, Residency Training Committee (1999-present)
Member, Radiation Safety Committee
Medical Physics Unit, McGill University
Member, Radiation Safety Committee (2003-present)
Member, Medical Physics Radiation Safety Committee (2006-present)
Member, Radiation Oncology QA Committee (2002-present)
Member, Medical Physics QA Committee (2006-present)
McGill University Health Centre

HEGYI, G.: Member, Radiation Safety Committee
McGill University Health Centre (MUHC)

JANICKI, C.: Member, Radiation Safety Committee
Member, Research Centre Health & Safety Committee
Member, Unité conjointe d’évaluation des technologies de la santé / Joint Technology Assessment Unit (TAU)
McGill University Health Centre

KILDEA, J.: Member, Medical Physics QA Committee
Member, Medical Physics Radiation Safety Committee
Member, Radiation Oncology Electronic Chart Committee
Member, Radiation Oncology LEAN Healthcare Committee
McGill University Health Centre

LEHNERT, S.M.: Member, Radiation Safety Committee
Member, Radiation Oncology Residents Training Committee
McGill University Health Centre
PARKER, W.A.:

Director, Residency Training Committee  
(Radiation Oncology Physics)  
Member, Quality Assurance Committee  
Member, Radiation Safety Committee  
Medical Physics, McGill University Health Centre  
Member, Event Reporting Committee  
Member, Pre-treatment Image Verification Committee  
Member, Review of Patient Waiting Times - Quality Assurance Committee  
(Radiation Oncology)  
McGill University Health Centre

PATROCINIO, H.J.:

Member, Seminar Committee  
Member, Residency Training Committee (Radiation Oncology Physics)  
Member, Medical Physics Quality Assurance Committee  
Member, Radiation Safety Committee  
Medical Physics, McGill University  
Member, Radiation Oncology Brachytherapy Committee  
Member, Radiation Oncology ARIA Implementation Committee  
McGill University Health Centre

PIKE, G.B.:

Co-Chair, Ad-hoc Committee: Coordination of BME Activities at McGill (2009-present)  
Member, Departmental Tenure Committee (2005-present)  
Member, Departmental Advisory Committee (2010-present)  
Member, Ad-hoc Advisory Committee for Merit Exercises (2011-present)  
Biomedical Engineering Department, McGill University  
Member, Admissions Committee (2008-present)  
Member, Search Committee – Academic Positions (2009-present)  
Medical Physics Unit, McGill University  
Senate representative, University Tenure Committee (May 2009-April 2011)  
Faculty of Education, McGill University  
Member, Recruitment Committee  
School of Communication Sciences & Disorders, Faculty of Medicine, McGill University  
Chair, Magnetic Resonance Research Committee (1997-present)  
Member, PET Working Committee (1999-present)  
Chair, BIC Business Committee (1999-present)  
Member, McBIR Faculty Search Committee (2002-present)  
Member, Small Animal MRI Committee (2007-present)  
Member, Centres of Excellence for Commercialization & Research Committee (CECR) (2007-present)  
Member, MNI Strategic Committee (2009-present)  
Member, CECR Advisory Committee (2010-present)  
Member, Search Committee for the Director/MNI and Associate Director General/MNH (2011-present)  
Montreal Neurological Institute

READER, A.:

Member, PET Working Committee (2008-present)  
Montreal Neurological Institute (MNI)
SEUNTJENS, J.: Founding Member, (2009-present)
Society of Directors of Academic Medical Physics Programs (SDAMPP)
Member, Recruitment Committee (2009-2011)
(Director, Radiation Oncology)
Member, Oncology Management Committee (2009-present)
Member, Admissions Committee, Medical Physics Unit (2004-present)
McGill University
Member, Steering Committee (Department of Medical Physics) 2004-present
McGill University Health Centre


**APPENDIX XVIII.**

COMMITTEE INVOLVEMENT of MPU STAFF MEMBERS

OUTSIDE McGILL from January-December 2011

DEBLOIS, F.:
- President, (2011-present)
- Member, Science & Education Committee; Professional Affairs Committee; Quality Assurance & Radiation Safety Committee (2010-present)
- Association Québécoise des Physicien(ne)s Médicaux Cliniques (AQPMC)

DEVIC, S.:
- Member, Board of Editors
  - Journal of Medical Physics

EL NAQA, I.:
- Member, AAPM Task Group No. 211 – Classification, Advantages & Limitations of the Autosegmentation Approaches for PET (2011-present)
- Member, Working Group on Biological Effects of Hypofractionated Radiotherapy/SBRT (2011)
- Member, Editorial Board
  - Journal Radiation Oncology Informatics (2009-present)
- Member, Editorial Board
  - American Journal of Science & Engineering (2011-present)
- Organizing Chair, Special Session on Data Mining Methods for Modeling Treatment Outcomes in Cancer
  - ICMLA, Honolulu, Hawaiii, (2011)
- Member, Organizing Committee
  - International Workshop on Recent Advances in Monte Carlo Techniques for Radiation Therapy (RAMCTRT), June 08-10, 2011, Montreal, Québec

EVANS, M.D.C.:
- Member, Membership Oral Exam Committee
- Representative, International Conjoint Committee on Accreditation:
  - Site visit CAN-Qatar (Doha, Qatar, March 2011)
  - Canadian Medical Association (CMA)
- Member, TG113 Clinical Trials Working Group
  - American Association of Physicists in Medicine (AAPM)
- Member, Quality Assurance & Radioprotection Committee
  - Association Québécoise des Physicien(ne)s Médicaux Cliniques (AQPMC)

LEHNERT, S.M.:
- Member, Scientific Advisory Committee (2001-present)
- Biological Research Facility, AECL Laboratories, Chalk River
- Member, Scientific Advisory Board (2005-present)
  - Resonant Medical Systems, Montreal, Quebec
- Member, Editorial Advisory Board
  - Open Nuclear Medicine Journal
- Member, Editorial Board
  - International Journal of Cancer Research & Remedies
PARKER, W.A.: Chairman, *Sub-Committee – AAPM Summer School*
Member, *Continuing Professional Development Committee*
Chairman, *RSNA Education Coordination Sub-Committee*
    American Association of Physicists in Medicine (AAPM) Annual Meeting
Oral Examiner, *Membership Exam*
    Canadian College of Physicists in Medicine (CCPM)
Member, *Comité de devis techniques en radiothérapie*
    Association Québécoise des Physiciens Médicaux Cliniques (AQPMC)

PATROCINIO, H.J.: President,
    Association Québécoise des Physiciens Médicaux Cliniques (AQPMC)
Oral examiner, *Membership and fellowship exams*
Member, *Comité d’Équité Salariale*
    Programme Général Parapublic du Secteur Santé et Services Sociaux, Québec
Exam item writer, *Radiological Physics*
    American Board of Radiology (ABR)

    Yale University
Member, *Scientific Advisory Committee* (2006-present)
    Quebec Bio-Imaging Network (QBIN)
Member, *Local Organizing Committee – 17th International Conference on Organization of Human Brain Mapping, June 26-20, 2011, Québec City*
Member, *NIMH Advisory Panel* (2008-present)
    Centre for Neuroimaging Sciences, Institute of Psychiatry, KCL, London, UK
Member, *External Advisory Committee* (2009-present)
    NIH Major Instrumentation Research Grant, Yale University
Elected Member, *White Matter Study Group* (2009-2012)
    ISMRM
Member, *Steering Committee* (2009-present)
    Douglas Institute Brain Imaging Centre
    Quebec Bio-imaging Network (QBIN), Montreal Neurological Institute
Member, *Governing Board* (2010-present)
    Canada Magnetoencephalography Consortium
Member, *Advisory Board* (2010-present)
    National Research Council (NRC), Institute for Biodiagnostics

READER, Andrew: Reviewer, *Grant applications*
    Research Grants Council, Hong Kong
    Wellcome Trust, England
Associate Editor,
    *International Journal of Tomography & Statistics*
Member, *IEEE Nuclear & Medical Imaging Sciences Council* (2011-present)
Member, *Scientific Committee*, Fully 3D Reconstruction Meeting (2011)
SEUNTJENS, J.:  
Key Mentor (national), *Excellence in Radiation Research in the 21st Century Training Program* (EIRR21)  
Canadian Institutes for Health Research (2006-present)  
Chair, *Committee on Small-field Photon Dosimetry & Applications in Radiotherapy* (2010-present)  
International Commission on Radiation Units & Measurements (ICRU)  
Member, *Medical Physics & Imaging grant panel* (2009-present)  
Canadian Institutes for Health Research (CIHR)  
American Association of Physicists in Medicine (AAPM)  
Member, *International Advisory Committee on Small-field Dosimetry*  
International Atomic Energy Agency (IAEA) (2007-present)  
Member, *Workgroup on Update of TG-51 (WGTG51)* (2006-present)  
American Association of Physicists in Medicine (AAPM)  
Member, *International Advisory Committee on IAEA Phase Space*  
International Atomic Energy Agency (IAEA) (2006-present)

SOISSON, E.:  
Member, *Imaging for Treatment Verification Work Group*  
Member, *Training & Practice of Medical Dosimetry Sub-Committee*  
American Association of Physicists in Medicine

WIERZBICKI, W.:  
Member, *Provincial Government Radiation Oncology Committee*  
Member, *Committée pour achats regroupés des accélérateurs*  
Quebec City, Quebec
APPENDIX XIX.

REPORT TO THE DEAN, FACULTY OF MEDICINE:
HISTORY OF EDUCATION EFFORT

Introduction

This document presents the history of educational effort and staffing of Medical Physics Unit at McGill University for the last 32 years. The MPU was established on June 1, 1979 with Dr. Montague Cohen as first Director. In 1991, Dr. Ervin Podgorsak became the Director of the Unit. In 2009, Dr. Seuntjens took over directorship.

University based Faculty in the MPU are typically from four different departments: (1) Radiation Oncology and later Oncology; (2) Biomedical Engineering; (3) Neurology and Neurosurgery; (4) Diagnostic Radiology. Core MPU faculty are part of the Department of Oncology. The purpose of this document is to provide historical information on the number of students and number of McGill MPU core faculty and demonstrate that the MPU, despite increased educational and research effort, has faced unacceptable decline in core support. In an appeal letter, we laid out several possible avenues to rectify this situation.

Number of students between 1980 and 2012

Figure 1 shows the number of graduate students at all levels in the unit since inception of the Unit. These numbers include only McGill University registered students and not other trainees, such as, clinical medical physics residents and occasional visiting students hosted by the MPU.

The general trend over the last 30 years is an increase in number of students from between 5 and 10 students in a typical year in the eighties to between 35 and 40 students in a typical year presently which roughly represents a quadrupling of student numbers between eighties and present.

The M.Sc. program is part of the Faculty of Medicine. The typical current class size of the M.Sc. program is 10-12 per year for M.Sc. Y1 and M.Sc. Y2. A typical recruitment exercise consists of selecting 15 high-quality M.Sc. students out of a competition of 65 applicants. The Ph.D. program has students registered mainly in the Department of Physics and exceptionally in the Departments of Biomedical Engineering and Electrical Engineering. The current typical Ph.D. student number amounts to 10 students and is increasing. The reason for this increase is the increased requirements for access to clinical medical physics residency programs and the fact that industry or academia typically needs people with Ph.D. degrees. The need for further training in the form of a clinical residency program has been mandated as a result of certification requirements of medical physics professionals. We must thus expect that the MPU Ph.D. program is bound to grow and the M.Sc. program will increasingly form a recruitment mechanism to excellent candidates for the Ph.D. program. The periodicity in the data for Ph.D. candidates is strongly correlated to the number of core faculty in the unit. With each departure or imminent departure of a faculty member, the number of grad students at the Ph.D. level declines, to pick up again as a new successful faculty comes in. The total number of M.Sc. graduates amounts to just over 200 whereas the Ph.D. program graduated 30 students so far.
Figure 1. Number of MPU M.Sc. students (purple) and MPU Ph.D. students (red) in each year.

Number of MPU core faculty between 1980 and 2012

Figure 2 shows the total number of graduate students in the program (left vertical axis) along with the number of MPU core faculty as a function of time since 1980 (right vertical axis).

At the inception of the Unit the number of core MPU positions was established to be four and this was achieved for most of the initial 15 years of existence of the unit. Between 1996 and 2008, however, the number of faculty members dwindled to three while the student body kept on increasing. As a result of the review of the MPU and the Biomedical Engineering, the Associate Dean of Faculty Affairs (2007) agreed to re-establish the number of positions to four but this was never enacted. On the contrary, upon the recent departure of Dr. Verhaegen (2008) and the retirement of Dr. Podgorsak (2010), the number of core faculty in the Unit has been reduced to two while the student numbers have remained strong mainly due to (1) successful grant support of the two remaining core faculty members, (2) the CAMPEP accreditation of the Unit, (3) contributions from clinical medical physicists with appointments in hospital departments (MGH, JGH), (4) contributions from members of Biomedical Engineering (Pike) and Neurology and Neurosurgery (Reader) departments.
Conclusions

From the data shown here, we can conclude that:

1. The number of graduate students has been increasing from around 5-10 in each year in the early years of the Unit to 30 – 40 in each year currently. This represents a **quadrupling in student body**. There is every indication that these numbers will at least hold and likely further increase in the future because of the demand for higher trained (Ph.D.) medical physicists. These increases in student numbers are only partially visible in the Faculty of Medicine since most of the Ph.D. students come through the Department of Physics.

2. The number of faculty upon unit inception was established to be **four**. The current number of core faculty is **two**. An increasing number of clinical medical physicists are involved in teaching tasks. As these professionals do this as a secondary responsibility this trend represents a dangerous path to erosion of quality of training and research ultimately culminating in a potential loss of CAMPEP program accreditation.