APPENDIX 1

UNIVERSITY OF TORONTO
Proposal for a
Graduate Program

Master of Health Science (M.H.Sc.)
in
Medical Radiation Sciences

in
the Institute of Medical Science

September 2007

43045

TABLE OF CONTENTS

1 Executive Summary

The proposal for a **Master of Health Science (MHSc) in Medical Radiation Sciences** program in the Institute of Medical Science (IMS) is vital to harnessing and contributing to the evolution of practice of the radiation therapy profession in Toronto, across the nation, and indeed around the world. The past decade has seen an impressive shift in the academic contributions of radiation therapy clinicians to the radiation medicine enterprise, and to further facilitate this group's potential, graduate level education is needed. This program will enable these clinical leaders to further develop their analytical, critical, scholarly, professional, and knowledge translation skills to promote continuous improvement in the delivery of radiation treatments and in the care of their patients. As a unique program in a jurisdiction of high demand and virtually no competition, we expect to attract interest from across the country and perhaps beyond.

This is an 8.0 FCE; 2-year program designed for expert radiation therapy clinicians who want to expand their academic competence and contribution. They must be licensed, experienced practitioners who have demonstrated leadership and excellence in their current practice. The program will be composed of course work (required and elective), clinical practica and a major research project designed to provide foundational radiation medicine content, expand clinical skills and reasoning, and further develop the skills of enquiry, innovation, knowledge translation and evidence-based practice. There is no thesis requirement.

This program speaks to one of the major objectives of the Faculty of Medicine's Academic Plan 2004 – 2010 which articulates the need to "Advance our scientific and professional training platform for the 21st century". It also responds to the strategic educational direction of the University of Toronto Department of Radiation Oncology (UTDRO) as articulated in the 2001 Strategic Plan to "develop graduate research and professional training in medical radiation sciences with the aim of developing academic leadership". At this time, the program will offer only one stream of specialization – Radiation Therapy – but over time additional streams in the Medical Radiation Sciences domain will be considered.

2 Academic

2.1 Description and rationale for the proposal

2.1.1 Description of proposed program

The proposed **Master of Health Science (MHSc) in Medical Radiation Science** is a professional master's program that is an 8 FCE, 6-session (2 year) program. Entrance requirements will include:

1. Current licensure (or eligibility for license) from the College of Medical Radiation Technologists of Ontario, **AND**
2. The completion of a 4-year undergraduate degree in Radiation Therapy or equivalent from a recognized institution.

2.1.2 Rationale for proposal

Within the last decade, in response to a variety of pressures and drivers, it has become evident that the role of the radiation therapist is changing, evolving and growing within the radiation medicine enterprise. In order to maximize the potential of this movement, it is imperative that the University of Toronto act to implement a program designed specifically to develop the kind of advanced academic clinician needed in

the cancer care sector. Recognition of the potential impact of further developing this cohort of professionals has been voiced by the organizations that employ them, by the professional bodies that guide and regulate them, and at the governmental level. It has been documented provincially, nationally and, in fact, globally, that promoting advancing practice of the radiation therapy community is resulting in net benefit to the system by decreasing wait times, increasing access and potentially improving the overall health of the community being served.[1]

Radiation therapy is a proven, effective and important tool for treating cancer, and is used for both curative and palliative purposes. Radiation Therapists are the most numerous health care professional in the radiation medicine sector. Together with radiation oncologists and clinical physicists, they make up the triad of professionals who plan and deliver quality radiation therapy to patients with cancer. Radiation Medicine, by its nature, is a truly interdisciplinary practice with professional groups responsible for specific activities along the patient care pathway. Radiation therapists possess a unique combination of knowledge and skills focused on the in depth theory of radiation physics and radiation biology as well as clinical skills focused on patient care and clinical oncology. Also, with the change in academic preparation for entry to practice to a 4-year degree program, offered in partnership by University of Toronto, the Department of Radiation Oncology (UTDRO) and The Michener Institute, the focus of education shifted from vocationally focused skills acquisition to academically rigorous professional preparation for practice in a complex, technically rich, health care environment. This has led to the creation of a new breed of radiation therapist, one that continues to challenge the boundaries of practice and is taking professional and academic involvement to new levels.

The Ministry of Health and Long Term Care (MOHLTC) has been interested in the potential for an advanced practice radiation therapist and is working with relevant stakeholders to investigate its possible benefit in the cancer care system. They have funded several successful pilot and demonstration projects to date and announced, in May 2006, the creation of a new role - the Clinical Specialist Radiation Therapist.[2] This is the designation that they have given to Advanced Practice Radiation Therapists practicing in Ontario. The work is ongoing with interim reports showing significant promise. Part of this work has resulted in a recommendation to the MOHLTC that they consider master's level education as the accepted norm for the preparation of this new cadre of professional.

Much has been written on educational preparation of advanced practitioners in a variety of health disciplines, particularly nursing, physical and occupational therapy. Graduates of such programs are "expected to acquire and apply advanced analytical and interpretative skills"[3] in order to contribute to their disciplines, to educate and transmit knowledge within their domains, to systematically investigate timely questions and produce new knowledge or ways of thinking about their profession, to translate new knowledge to their everyday practice and ultimately extend the services they provide within their discipline and perhaps beyond.[4] It is the enquiry, transformation and innovation in practice that differentiates the graduate prepared radiation therapist from those practitioners who practice within the existing scope of practice. It is our vision that graduates of this program will harness this new understanding and approach to radiation therapy to elevate practice and contribute to the science of radiation medicine overall. They will be considered thought leaders and work within the interdisciplinary culture to evolve the delivery of cancer care.

---

1 See, for example, Bolderston A, Harnett N et al. "A departmental model for the development of academic radiotherapy practice: The Princess Margaret Hospital Experience." (accepted for publication, *Journal of Radiotherapy in Practice*, Elsevier)

2 Ministry of Health and Long-Term Care. (May 3, 2006). *HealthForceOntario Strategy*. News Release.

3 Canadian Association of Graduate Studies, "Your Future: A guide for potential graduate students," from www.cags.ca, p. 3

4 Brigham Young University Office of Graduate Studies, "Principles and Characteristics of Graduate Education," from www.buy/edu/gradstudies, p. 1

Currently, there are no graduate level educational opportunities for radiation therapists in this country. Several research-based master's degrees are available abroad (the United Kingdom and Australia) yet none of these are a practice-based professional program that will be required for the adequate preparation of this innovative and advanced clinician. The development of this Ontario-based program will ensure that standards are met and will help maintain consistency of preparation. This program aims to become the gold standard for the preparation of advanced Radiation Therapists nationally and perhaps internationally.

The Institute of Medical Science (IMS) is the ideal graduate unit for this proposed professional program. The IMS is the primary graduate unit for clinical departments in the Faculty of Medicine, including Radiation Oncology. The IMS currently houses a Radiation Oncology field in their existing MSc and PhD programs. Several radiation oncology, radiation physics and radiation therapy students have either completed or are currently enrolled in this existing MSc/PhD program; all providing positive feedback on the relationship that exists. The IMS also has experience with two other professional master's degree programs (Master of Health Science in Bioethics, and Master of Science in Biomedical Communications). The MHSc students in the proposed MHSc program will be able to integrate with this diverse student population and benefit from the many activities already in place at IMS – e.g. the IMS Scientific Day held annually.

Students will be able to take advantage of the rich educational culture of the UTDRO, which offers a number of education programs. Professional education programs are currently offered in all three of the core radiation disciplines: a post-graduate (post MD) specialty and fellowship program for radiation oncologists, a radiation physics residency program, and an undergraduate BSc/Diploma in Medical Radiation Sciences. Since the UTDRO faculty hold graduate appointments in the Institute for Medical Science (IMS), and other graduate departments in the Faculty of Medicine (i.e. Health Policy Management and Evaluation and Medical Biophysics) they also have experience participating in thesis-based graduate training.

UTDRO includes over 100 interdisciplinary faculty in radiation oncology, radiation therapy and clinical physics who role model inter-professional academic practice in the two fully affiliated teaching hospitals of the University of Toronto: the Princess Margaret Hospital (PMH) and the Sunnybrook Health Science Centre (SHSC). These two hospitals boast the largest radiation cancer facilities in North America, both centrally located with over 15,000 new cancer patients seen and treated with radiation therapy each year. Both the PMH and the SHSC have pioneered the use of academic professional teams in decision making for teaching, research, and clinical care. The UTDRO supports a wide range of basic, translational, clinical and education research at these two campuses, accruing more than $30M in grant support in the last 5 years. Graduate students will be able to take advantage of a phenomenal wealth of clinical and research learning opportunities under the mentorship of world leaders.

2.2 Pedagogical and other academic issues, including expected benefits of the proposed program

Through the strong clinical leadership and mentorship of experienced UTDRO clinical faculty, the radiation therapy profession will establish a strong and significant cadre of academic clinicians that will partner in the continuous evolution of radiation medicine practice. The UTDRO currently offers a number of education programs, both health professional and thesis-based. The UTDRO faculty participate in a thesis-based graduate stream under the auspices of the IMS, and other graduate departments in the Faculty of Medicine i.e. HPME and Medical Biophysics (MBP). It is expected the students in the MHSc program will integrate with those of other radiation medicine professional education programs through interdisciplinary sessions and projects. They will benefit from the natural

interdisciplinary nature of radiation oncology, utilize the experienced teaching staff, the established formats for teaching and evaluation, mentorship, career counseling and other student support services as well as share a common administrative infrastructure.

UTDRO is considered a global leader in radiation medicine research and clinical expertise. Their innovative approach to the academic development of the radiation therapy profession is trend setting and recognized internationally. Through this initiative, they will continue to contribute to the positive movement of radiation medicine and its continued evolution in the treatment of cancer.

2.3 Projected student demand

Currently, there are no graduate level educational opportunities for radiation therapists in this country. Several research-based master's degrees are available abroad (the United Kingdom and Australia)[5] yet none of these are a practice-based professional program that will be required for the adequate preparation of this innovative and advanced clinician. The development of this Ontario-based program will ensure that standards are met and will help maintain consistency of preparation. This program stands to become the gold standard for the preparation of advanced Radiation Therapists nationally and perhaps internationally.

2.4 Impact on the Department's and Division's program of study, including impact on other divisions

This program fits in naturally with the Institute of Medical Science in that the IMS is the umbrella graduate unit for clinical departments at the University of Toronto and plays a strong role in graduate training of health professionals, and promotion of interdisciplinary research at the University of Toronto.

The proposed program exemplifies a major objective of the Faculty of Medicine's Academic Plan 2004 – 2010 which articulates the need to "Advance our scientific and professional training platform for the 21st century". The program is novel and groundbreaking in the radiation therapy community and could become the gold standard for the preparation of a new breed of expert academic practitioner.

UTDRO clearly articulated its desire to develop graduate opportunities through collaborations across the Faculty. In its 2001 Strategic Plan, among its several key priorities was to "develop graduate research and professional training in medical radiation sciences with the aim of developing academic leadership". This program is the result of several years of work towards realizing that important goal. With the implementation of the research-based MSc within IMS that accepts baccalaureate prepared radiation therapists into its program, this course-based professional master's program is the perfect partner for providing tangible advancement opportunities for radiation therapists and will add to the UTDRO's current presence as a world leader in the science of radiation medicine.

2.5 Evidence of consultation with other affected divisions

The interest in, and therefore the study of, advancing academic practice and educational requirements for Radiation Therapy has been underway formally and simultaneously in three distinct, yet complementary jurisdictions in Ontario. As a key partner in the MOHLTC activities, and as part of regular preparation activities for the development of this proposed program, consultation with the following stakeholder

5 See, for example, Sheffield Hallam University (http://www.shu.ac.uk); University of Sydney (http://www.usyd.edu.au); Anglia Ruskin University (http://www.anglia.ac.uk/ruskin/en)

groups has taken place:

- The Radiation Therapy professional community including the Ontario Association of Medical Radiation Technologists, the College of Medical Radiation Technologists of Ontario and the Canadian Association of Medical Radiation Technologists;
- Leaders in advanced radiotherapy practice and education from the UK, Australia and the US;
- Cancer Care Ontario executive;
- Radiation Therapy Managers at all 11 regional cancer centers;
- Affiliated Radiation Medicine professional groups including Radiation Oncologists, Clinical Physicists, Nurses and Advanced Practice Nurses;
- Faculty from the undergraduate Medical Radiation Sciences Program
- Research leaders for Advanced Practice Nursing in Ontario;
- Patients receiving radiation therapy and associated care in Ontario;
- MOHLTC representatives in the Health Human Resource Planning Branch;
- UTDRO clinical faculty at large;
- Dean and Associate Dean of Graduate and Interfaculty Affairs, Faculty of Medicine;
- Dean, Vice-Dean and Associate Dean of Graduate Studies;
- Administration within the School of Graduate Studies;
- Cognate Chair of Medical Imaging
- Associate Dean, Academic Programs, Faculty of Nursing
- Representatives from the Department of Public Health Sciences
- Representatives from the Department of Health Policy, Management and Evaluation Master of Health Science in Health Administration

In order to further support program development, a Program Development Committee has been established with membership designed to ensure a wide range of perspectives including:

- Three core radiation medicine disciplines, including future faculty
- Oncology Nursing
- Radiation Therapy licensure/certification boards
- IMS administration
- UTDRO administration
- Health professional educators

2.6 Appropriateness of the name and designation of the new program

This MHSc program is exclusively for the preparation of advanced academic clinicians who wish to continue to develop their clinical practice in tandem with a scholarly stream to their work. The use of this degree name, MHSc, signifies the course-based, non-thesis program with the clinical focus of a professional master's and clearly distinguishes it from the existing research-based MSc available to Radiation Therapists in the IMS field of Radiation Oncology.

2.7 Program description and requirements, course titles/numbers, and faculty members

2.7.1 Program description and requirements

Admission requirements

The general regulations of the School of Graduate Studies will govern the admissions process for the MHSc Medical Radiation Sciences outlined below under "Academic Eligibility".

Applicants to this program must:

- Either hold relevant certification in Radiation Therapy or provide evidence of eligibility for such **AND**
- Have completed a recognized 4-year bachelor's degree in Medical Radiation Sciences or its equivalent
- Have obtained a GPA of B+ (77 – 79%) over final 2 years of (fulltime) undergraduate studies
- Have performed a minimum of 3 years (5000 hours) of professional practice within 5 years of application
- Arrange for a letter of support from employer and from one other professional referee
- Provide a letter of intent

Program requirements

Degree requirements

The **Master of Health Science in Medical Radiation Sciences** is an 8 FCE program composed of 7.0 FCE of required courses including 1.5 FCE of applied radiation medicine science courses, 2.5 FCE of field specific courses, 2.0 FCE of practica, and 1.0 FCE for the completion of a major research project. Students will take 1.0 FCE of elective courses in a field related course as approved by the Program Director. There is no thesis requirement. The program will require 2 years on a full time basis, or a maximum of 5 years on a part-time basis. Foundational courses in topics specific to Radiation Medicine are combined with courses relevant to the complexities of caring for patients with cancer. The second year consists mainly of preparations for the development and implementation of an original major research project and clinically based internships in the specialty of choice for the application of knowledge to the clinical environment and the development of the skills and judgment necessary to work as an advanced academic clinician in radiation therapy within the interdisciplinary team in that program.

Required Courses (7.0 FCE)

MSC 1500H	Advanced Radiotherapy and Medical Physics
MSC 1501H	Frontiers of Radiation Medicine Research
MSC1502Y	Translational Radiobiology applied to Radiation Science
MSC1503H	Clinical Reasoning and Decision Making in Radiotherapy - Part 1*
MSC1504H	Clinical Reasoning and Decision Making in Radiotherapy - Part 2*
MSC1505H	Clinical Reasoning and Decision Making in Radiotherapy - Part 3*
MSC1506H	Professional and Clinical Leadership*
MSC1507H	Clinical Competence Evaluation*
MSC1508H	Major Research Project – Part 1*
MSC1509Y	Major Research Project - Part 2*
MSC1510H	Clinical Practicum 1* (first clinical practicum)
MSC1511H	Clinical Practicum 2* (second clinical practicum)

Electives (1.0 FCE)

2.7.2 Course titles/numbers

COURSE NAME	COURSE NUMBER
Advanced Radiotherapy and Medical Physics	MSC 1500H
Translational Radiobiology applied to Radiation Science	MSC1502Y
Frontiers of Radiation Medicine Research	MSC 1501H
Clinical Reasoning and Decision Making in Radiotherapy - Part 1*	MSC1503H

Clinical Reasoning and Decision Making in Radiotherapy - Part 2*	MSC1504H
Clinical Reasoning and Decision Making in Radiotherapy - Part 3*	MSC1505H
Professional and Clinical Leadership*	MSC1506H
Clinical Competence Evaluation*	MSC1507H
Major Research Project – Part 1*	MSC1508H
Major Research Project - Part 2*	MSC1509Y
Clinical Practicum 1*	MSC1510H
Clinical Practicum 2*	MSC1511H

* New courses under development – course outlines will be presented for approval in Fall 2007.

2.7.3 Faculty members

Twenty-seven individuals listed in Table 1 have been selected as faculty for this program (3 + 8 pending approval x Category 2, 16 x Category 4) based on their stated interest, the strength of their research and depth of their clinical and teaching/supervision experience. Many of the faculty members have extensive experience in graduate mentoring through existing IMS MSc/PhD programs, as demonstrated in Tables 2.3 and 2.4. Most of the faculty members are known nationally and internationally for their areas of research strength and clinical expertise, as evidenced by indicators of success (below).

With their graduate appointments in IMS, the faculty for this MHSc program holds their clinical appointments in the Department of Radiation Oncology (UTDRO). This strong, interdisciplinary department, composed of radiation medicine professionals from the 3 primary professional groups (Radiation Oncology, Medical Physics and Radiation Therapy) is highly regarded for its progressive approach to science and inter-professional practice and its faculty's global contribution to the specialty of radiation medicine.

There are 125 faculty members with a primary appointment in the clinical Department of Radiation Oncology. Thirty are currently cross-appointed to IMS and hold SGS graduate appointments. There are several new appointments pending (see below). In addition, 6 faculty are cross-appointed from other university departments including Medical Biophysics (MBP). All faculty appointments have associated expectations related to teaching, mentoring and supervision. Assignments are negotiated and agreed to each year as part of the overall department planning.

Overall, the high qualifications and wide range of knowledge and expertise of the faculty, combined with strong clinical affiliations, ensure an intellectually challenging learning environment.

Category 2 – 3 Faculty (8 pending) – non-tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review				
GILLIES, Carol[1]	F	N/A	IMS	Master's
HOLDEN, Lori[1]	F	N/A	IMS	Master's
ROSEWALL, Tara[1]	F	N/A	IMS	Master's
Category 3– Not applicable - tenured or tenure-track **core** faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review				
Category 4 – 16 Faculty - non-tenured or tenure-track **core** faculty members involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review				
BEZJAK Andrea[1]	F	N/A	IMS	Master's

BRISTOW Robert[1]	M	N/A	IMS	Full
CATTON Charles[1]	M	N/A	IMS	Master's
CATTON Pamela[1]	F	N/A	IMS	Full
DAWSON Laura [1]	F	N/A	IMS	Master's
FYLES Anthony [1]	M	N/A	IMS	Full
JAFFRAY David[1]	M	N/A	IMS	Full
MILOSEVIC Michael[1]	M	N/A	IMS	Master's
NYHOF-YOUNG Joyce[1]	F	N/A	IMS	Master's
PIGNOL Jean-Philippe[1]	M	N/A	IMS	Full
RINGASH Jolie[1]	F	N/A	HPME	Master's
WARDE, Padraig[1]	M	N/A	IMS	Full
WONG C. Shun[1]	M	N/A	IMS	Full
WONG, Rebecca[1]	F	N/A	IMS	Master's
SIEWARDSON Jeff	M	N/A	MBP	Full
VITKIN Alex	M	N/A	MBP	Full
Category 5 – Not applicable - other core and non-core faculty – Emeritus Faculty past retirement age but still functioning in professional master's program				
Category 6 - Not Applicable - Non-core faculty who participate in the teaching of graduate courses				

* Note: There are no retirements expected in this group within the next 7 years.
[1] Clinical home is Department of Radiation Oncology

There are an additional 7 Radiation Therapist and 1 PhD educator UTDRO faculty members who have applied for School of Graduate Studies appointments as Associate Members as status only faculty (Category 2) within the Institute of Medical Science.

3 Students

3.1 Student affairs and services

All of the usual facilities and services provided to master's students in IMS will be available to students in this program.

3.2 Student conduct and discipline

Standard university guidelines and policies for student conduct will govern in the MHSc program. In addition, all UT policies and procedures governing health professional students will be followed.

3.4 Student registration and information systems

All standard SGS registration and enrolment procedures will apply to students in this program.

REPORT ON LIBRARY RESOURCES FOR THE PROPOSED MASTER IN HEALTH SCIENCE, MEDICAL RADIATION SCIENCES

BACKGROUND

The University of Toronto libraries provide a rich resource for the support of graduate study in the field of medical radiation sciences. While there is a specific literature that focuses on medical radiation sciences which we collect extensively, the research collection in this area is enhanced by its location in a university library system which through its collections and acquisitions policy supports research and teaching in all areas of the biological, health, physical, social and behavioural sciences and the humanities. The increasingly cross-disciplinary nature of much of the research in the health sciences means that it is extremely difficult to draw firm boundaries around an area or speciality.

DESCRIPTION OF THE COLLECTION

Monographs

The Library's holdings related to medical radiation sciences specifically, and the health sciences more generally, have been built up in a systematic way since 1966 when Dealer Selection Orders were established and librarians employed to monitor the plans and to actively and systematically select research materials that fall outside the plans.

Research material supporting the medical radiation sciences program comes from a wide range of subject areas across the health sciences.

In the health sciences, as in other areas of the collection, it is the policy of the Library to acquire a single copy of all books published in English that are considered to be of research value. This includes the proceedings of conferences and symposia, technical handbooks and reference tools in addition to research monographs. The cross-disciplinary nature of research in medical radiation sciences makes a simple evaluation of the Library's holdings difficult. However, the 2001 edition of the North American Title Count 1 can be useful in comparing the University of Toronto's holdings with that of other similar institutions. books relating to medical physics, medical radiology and nuclear medicine are classed by the Library of Congress (LC) at the call number *R 859* and are reported in the title count within the range *R 690-920.* In this range, the University of Toronto Library, with 6,810 books, ranks second behind the Library of Congress among libraries in the survey using the LC classification system. Among academic libraries using the LC classification system, the University of Toronto Library would rank first.

Books relating to all aspects of oncology, including radiation oncology, are classed by the Library of Congress in the classification range *RC 271* and reported in the survey within the call number range *RC 254 – RC 298*. In this range the University of Toronto Library, with 4,970 titles ranked third among libraries in the survey using the Library of Congress classification system. Since the Library of Congress itself ranked first, when compared only to other academic libraries, the University of Toronto Library took the second position.

Books discussing radiotherapy in a more general sense are classed by the Library of Congress at *RM 844*. In a count of all the titles held in the *RM* range, the University of Toronto Library, with 6,698 titles

6 *North American Title Count, 2001*. Chicago: American Library Association.

ranked third of libraries in the survey using the Library of Congress classification system. Among academic libraries in the survey, the University of Toronto Library ranked second.

The currency of the collection is also important. There have been ongoing improvements in the library's ability to get English language materials to the shelves quickly, and at present there is not a backlog for books in the health sciences.

Journals

The journal holdings of the University of Toronto Library are substantial. However, like all North American libraries we are experiencing great difficulty in keeping up with the rising cost of serial subscriptions. From 1986 until the past few years we were able to buy few new titles. During the 1990's the Library, in consultation with faculty, actually cancelled subscriptions equal in cost to approximately 10% of the total serials budget. However the situation has improved significantly during the past several years due to the Library's holdings of electronic journals. At the present time over 33,000 such journals are available to students and staff at the university. Many of these are new to the Library's holdings.

The most recent statistics compiled by the Library show the total number of journal subscriptions currently held in the life and health sciences is 3,140; in the Humanities and Social Sciences 13,181.7 A check of the ISI journal citation reports (2005) 3 (JCR) can often provide some insight into the Library's holdings in particular disciplines. In the subject category "Oncology," the University of Toronto Library holds twenty-four of the top twenty-five journals as ranked by Impact Factor. Of these twenty-four journals, twenty-three are held electronically and can be accessed by all staff and students at the University.

In the JCR subject category "Radiology, Nuclear Medicine and Medical Imaging," the University of Toronto Library holds all of the top twenty-five journals ranked by Impact Factor. Of these twenty-five journals, twenty-four are available electronically.

In the JCR subject category "Biophysics," the University of Toronto Library holds all of the top twenty-five journals, all of which are available online for staff and students at the University.

Electronic Resources

The electronic information services at the University of Toronto Library have been evolving since 1987, when the first online catalogue was mounted.4 Within a year the online catalogue was available in all the campus libraries, and dial-in access was introduced with a small number of lines. Abstracts and indexes had been computerised since the early 1970's and up until the 1980's were searched by trained intermediaries. Beginning in the late 1980's CD-ROM's and networked databases widened the access of electronic databases to the end-user to perform his or her own searches. In 1991 the Library added seven H.W. Wilson periodical index databases to its electronic network. Today the Library offers over 350 periodical index databases through a variety of information systems to all members of the University of Toronto community. Some of these indexes allow users to search and retrieve citations to journal articles and then to display the full text of that article electronically. Specialists in medical radiation sciences will find the following databases of interest: MEDLINE; EMBASE; SCIENCE CITATION INDEX; SCOPUS; BIOSIS PREVIEWS; COCHRANE LIBRARY; AIDS AND CANCER RESEARCH; ISI CONFERENCE PROCEEDINGS; and PROQUEST DIGITAL DISSERTATIONS.

7 University of Toronto Library. Annual statistics, May1, 2004 – April 30, 2005. Toronto: The Library, 2005
3 *Science Citation Index Journal Citation Reports, 2004.* Philadelphia: Institute for Scientific Information, 2005.
4 Clinton, Peter. From Felix to the digital library and beyond. UTLibrary news, winter 1997/98, p. 2-3.

As mentioned earlier the Library also offers links to 15,000 electronic journals to the University of Toronto community via the Library's web pages. Some 60% of these journals have the full text of their articles available for viewing, printing, and in some cases emailing, by University of Toronto staff and students.

The Library is also committed to building a collection of electronic books in appropriate subject areas and recently purchased a package of 207 online medical textbooks published by the Lippincott Williams, and Wilkins Company. These books are available online to all staff and students at the University.

SUPPORTING COLLECTIONS

Although the main health sciences collection is housed in the Gerstein Science Information Centre, graduate students in medical radiation sciences can also make use of health related materials in the libraries of the Health Science Information Consortium of Toronto. Comprising over 30 teaching and community hospitals and health institutions, the Consortium members cooperate to share resources and so expand the base of research support for their parent institutions.

REFERENCE SERVICES

Given the cross-disciplinary nature of much of the research in the health sciences, and the increasing importance of electronic resources, including the World Wide Web, it is important to recognise that the reference and instructional services offered by the Library play a key role both in making our own collections accessible and in facilitating access to the national and international information networks. The Library is increasingly playing an important role in the linking of teaching and research in the university.

Reference services offered at the Gerstein Science Information Centre include help in searching the collection, the verification of citations, training in the use of databases and electronic journals, the searching of online and print union list files to locate materials not available on campus, and the handling of interlibrary loans. For some locations, e.g. CISTI, it is now possible to process transactions electronically thereby decreasing the time required to fill requests.

Prepared by:

Dan D'Agostino
Life and Health Sciences Book Selector

Submitted by: Carole Moore
Chief Librarian