Department of Medical Imaging
Annual Report 2000-2001

CHAIR’S REPORT .................................................................................................................................................. 3
DEPARTMENT OF MEDICAL IMAGING - UNIVERSITY OF TORONTO ................................................................. 5
Radiologists-in-Chief ........................................................................................................................................ 5
Program Directors ........................................................................................................................................ 5
Division Heads ................................................................................................................................................ 5
Department Administrative Staff ....................................................................................................................... 5
COMMITTEES ....................................................................................................................................................... 6
Executive Committee ....................................................................................................................................... 6
Promotions Committee .................................................................................................................................... 6
Undergraduate Teaching Committee ............................................................................................................ 6
Specialty Training Committee ............................................................................................................................. 6
UNIVERSITY OF TORONTO FULLY AFFILIATED HOSPITALS AND INSTITUTES ............................................. 7
DEPARTMENT OF MEDICAL IMAGING FACULTY ............................................................................................... 8
THE DEPARTMENT OF MEDICAL IMAGING & THE UNIVERSITY OF TORONTO TEACHING HOSPITALS .......................................................................................................................... 11
RESEARCH GRANTS .......................................................................................................................................... 13
PUBLICATIONS: PEER-REVIEWED PAPERS AND ABSTRACTS ........................................................................... 17
PUBLICATIONS: NON-PEER-REVIEWED, BOOKS, CHAPTERS ........................................................................... 27
INVITED PRESENTATIONS AND VISITING PROFESSORSHIPS ......................................................................... 28
SCIENTIFIC PRESENTATIONS: PEER-REVIEWED PAPERS, POSTERS AND EXHIBITS ........................................... 39
AWARDS AND SPECIAL RECOGNITION ........................................................................................................... 50
RESEARCH PROGRAM ....................................................................................................................................... 51
Protected Research Time ................................................................................................................................... 51
Faculty Research Award .................................................................................................................................... 52
RSNA Resident/Fellow Research Award ................................................................................................................ 52
Research Day .................................................................................................................................................... 52
Positron Emission Tomography Centre, Centre for Addiction and Mental Health ................................................ 52
Imaging/Bioengineering Research, SWCHSC ....................................................................................................... 52
Faculty List ..................................................................................................................................................... 52
Grants ............................................................................................................................................................... 53
Publications ....................................................................................................................................................... 56
Original Scientific Presentations .......................................................................................................................... 58
Invited Papers and Professorships ..................................................................................................................... 61
Teaching -- Hours of Lectures .............................................................................................................................. 62
Department of Medical Imaging Annual Research Day 2001 ........................................................................... 63
RESIDENT TRAINING PROGRAM ...................................................................................................................... 66
General description .......................................................................................................................................... 66
PGY1 ............................................................................................................................................................... 66
PGY2 ............................................................................................................................................................... 66
PGY3 ............................................................................................................................................................... 67
PGY 4 ............................................................................................................................................................. 67
PGY5 ............................................................................................................................................................... 67
Armed Forces Institute of Pathology .................................................................................................................. 67
Physics Instruction ........................................................................................................................................... 67
Conferences .................................................................................................................................................... 68
Seminars and Half-Day Program ......................................................................................................................... 68
Research ......................................................................................................................................................... 68
Rounds ............................................................................................................................................................ 68
View Box Teaching ........................................................................................................................................ 69
Journal Club .................................................................................................................................................... 69
Visiting Professor Program ................................................................................................................................. 69
Organ Imaging Review Course ............................................................................................................................ 69
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Evaluations</td>
<td>70</td>
</tr>
<tr>
<td>Resident Awards</td>
<td>70</td>
</tr>
<tr>
<td>Summary</td>
<td>71</td>
</tr>
<tr>
<td>RESIDENTS</td>
<td>72</td>
</tr>
<tr>
<td>PGY1 Level</td>
<td>72</td>
</tr>
<tr>
<td>PGY2 (R1) Level</td>
<td>72</td>
</tr>
<tr>
<td>PGY3 (R2) Level</td>
<td>73</td>
</tr>
<tr>
<td>PGY4 (R3) Level</td>
<td>73</td>
</tr>
<tr>
<td>PGY5 (R4) Level</td>
<td>73</td>
</tr>
<tr>
<td>NUCLEAR MEDICINE TRAINING PROGRAM</td>
<td>75</td>
</tr>
<tr>
<td>General Description</td>
<td>75</td>
</tr>
<tr>
<td>General Objectives</td>
<td>75</td>
</tr>
<tr>
<td>Dual Radiology and Nuclear Medicine Residency</td>
<td>75</td>
</tr>
<tr>
<td>RADIOLOGY SCIENTIST TRAINING PROGRAM</td>
<td>76</td>
</tr>
<tr>
<td>Objectives</td>
<td>76</td>
</tr>
<tr>
<td>Organization</td>
<td>76</td>
</tr>
<tr>
<td>Eligibility and Application Procedure</td>
<td>76</td>
</tr>
<tr>
<td>Remuneration</td>
<td>76</td>
</tr>
<tr>
<td>Selection of Research Project and Supervisor</td>
<td>76</td>
</tr>
<tr>
<td>Graduate Degrees</td>
<td>77</td>
</tr>
<tr>
<td>Clinical Responsibilities</td>
<td>77</td>
</tr>
<tr>
<td>OBJECTIVES OF TRAINING &amp; SPECIALTY TRAINING REQUIREMENTS IN DIAGNOSTIC</td>
<td>78</td>
</tr>
<tr>
<td>RADIOLOGY</td>
<td>78</td>
</tr>
<tr>
<td>Definition</td>
<td>78</td>
</tr>
<tr>
<td>General Objectives</td>
<td>78</td>
</tr>
<tr>
<td>Specific Objectives</td>
<td>78</td>
</tr>
<tr>
<td>Training in Canada</td>
<td>81</td>
</tr>
<tr>
<td>SPECIALTY TRAINING REQUIREMENTS IN DIAGNOSTIC RADIOLOGY</td>
<td>82</td>
</tr>
<tr>
<td>RESIDENT RESEARCH PROGRAM</td>
<td>84</td>
</tr>
<tr>
<td>Seminar Series</td>
<td>84</td>
</tr>
<tr>
<td>Support</td>
<td>84</td>
</tr>
<tr>
<td>Presentation Day</td>
<td>85</td>
</tr>
<tr>
<td>Resident Research Awards</td>
<td>85</td>
</tr>
<tr>
<td>FELLOWSHIP PROGRAM</td>
<td>86</td>
</tr>
<tr>
<td>UNDERGRADUATE PROGRAM</td>
<td>88</td>
</tr>
<tr>
<td>Year 1</td>
<td>88</td>
</tr>
<tr>
<td>Year 2</td>
<td>88</td>
</tr>
<tr>
<td>Year 3</td>
<td>89</td>
</tr>
<tr>
<td>Year 4</td>
<td>90</td>
</tr>
<tr>
<td>Other Teaching Activities and Involvement</td>
<td>91</td>
</tr>
<tr>
<td>CONTINUING EDUCATION PROGRAM</td>
<td>93</td>
</tr>
<tr>
<td>Organ Imaging Review</td>
<td>93</td>
</tr>
<tr>
<td>7th Annual Interventional/Vascular Radiology Course</td>
<td>95</td>
</tr>
<tr>
<td>INVITED LECTURERS, VISITING PROFESSORS AND CITY-WIDE ROUNDS</td>
<td>97</td>
</tr>
<tr>
<td>JOURNAL CLUB</td>
<td>99</td>
</tr>
</tbody>
</table>
CHAIR’S REPORT

Medical imaging is a very technology-dependant specialty. This year, I am particularly pleased with the physical developments in our department, especially in terms of its major technological advances. There have been major improvements in imaging equipment and space at all our teaching hospitals. These improvements in turn will allow our faculty to better fulfill their academic mandates. Our faculty will be able to better teach the latest and most modern techniques, and the availability of the best and most modern and innovative equipment will facilitate our research endeavors, while helping us attract new academically oriented faculty.

Even though physical resources are extremely important to our specialty, it is our people that continue to be its most important asset. Accordingly, as in previous years, I would like to highlight some of our faculty members, especially those that have distinguished themselves in teaching and research.

Our departmental teaching awards this year were: Dr. Matthew Lax was presented with the Edward L. Lansdown Award for Outstanding Teaching in the Residency Training Program. Dr. Mostafa Atri, Dr. Paul Babyn, Dr. Edna Becker, Dr. Dae-Gyun Chung, Dr. Lisa Ehrlich, Dr. Nimu Ganguli, Dr. Paul Hamilton, Dr. Kevin Ibach, Dr. Nasir Jaffer, Dr. Anne Keller, Dr. Matthew Lax, Dr. Andrew Lata, Dr. Walter Montanera, Dr. Derek Muradali, Dr. Martin O’Malley, Dr. Joel Rubenstein, Dr. Martin Yaffe and Dr. Leon Zelovitzky were recognized for outstanding teaching in the residency program; Dr. Derek Armstrong, Dr. Edna Becker, Dr. Susan Blaser, Dr. Alan Daneman, Dr. Anthony Hanbidge, Dr. C.S. Ho, Dr. John Kachura, Dr. Matthew Lax, Dr. Martin O’Malley, Dr. Daniel Rappaport, Dr. David Salonen, Dr. Kenneth Sniderman, Dr. Karel TerBrugge, Dr. Lawrence White, Dr. Robert Willinsky and Dr. Stephanie Wilson were recognized for outstanding teaching in the fellowship program; and Dr. Edna Becker, Dr. Matthew Lax and Dr. Martin O’Malley achieved distinction for outstanding teaching in both the residency and fellowship programs.

Our department increased the level of support of its faculty for protected research time. This bore fruit with a larger number of research awards, including major awards from the Canada Foundation for Innovation (CFI) and the Ontario Research and Development Challenge Fund (ORDCF). This year, the faculty members with departmentally sponsored research time were: Dr. Richard Farb (High Resolution Contrast Enhanced MR Angiography for the Evaluation of GDC Treated Cerebral Aneurysms), Dr. Masoom Haider (MRI Oxymetry and Dynamic Enhancement in Carcinoma of the Uterine Cervix: Correlation with Direct Interstitial Fluid Pressure Measurement and Tumor Oxygen Levels), Dr. Korosh Khalili (Preoperative Staging of Cholangiocarcinoma: A Prospective Comparative Study of Sonography, CT, and MRI), Dr. Derek Muradali (Contrast Enhanced Sonography of the Breast: Can Vascular Morphology Predict Malignancy?), Dr. Martin O’Malley (Evaluation of cystic pancreatic tumors with MRI including T1-weighted values), Dr. Rene Shumak (Usefulness of Magnetic Resonance Imaging in the Surveillance of Women at High Risk for Hereditary Breast Cancer), Dr. Lawrence White (Optimized Fast Spin-Echo Imaging of Meniscal Tears).

The academic promotions this year were (effective July 1, 2001): to Full Professor - Dr. Robert Willinsky, to Associate Professor – Dr. Susan Blaser, Dr. Peter Chait, Dr. David Mikulis, and
Dr. Daniel Rappaport and to Assistant Professor - Dr. Suzanne Laughlin and Dr. Martin O’Malley.

We welcomed several new faculty to our department: Dr. Douglas Cheyne – Hospital for Sick Children, Dr. Allan Fox – Sunnybrook and Women’s College Health Sciences Centre, Dr. George Tomlinson - University of Toronto Office and Dr. Jeffrey Traubici – Hospital for Sick Children.

I have spent part of the last few months starting the strategic planning exercise for 2001 and beyond and I have concluded that the coming five years will present us with tremendous academic opportunities. Our specialty is dynamic and expanding, and funding opportunities have not been better in the last twenty years. Our infrastructure has never been better. Our current faculty continue to develop new talents, and new faculty have joined us with enthusiasm and great new ideas. I am looking forward to exciting and fulfilling times!

Walter Kucharczyk, M.D., F.R.C.P. (C)
Professor and Chair
Chair .......................................................................................................................... Kucharczyk, W.
Associate Chair ............................................................................................................ Shulman, H.

Radiologists-in-Chief

Hospital for Sick Children ..................................................................................................... Babyn, P.
Mount Sinai Hospital-University Health Network (Princess Margaret Hospital/
Toronto General Hospital/Toronto Western Hospital) ......................................................... Bret, P.
St. Michael's Hospital ......................................................................................................... Common, A.
Sunnybrook & Women's College Health Sciences Centre ......................................................... Shulman, H.S.

Program Directors

Continuing Education ........................................................................................................... Hamilton, P.
Fellowship ..................................................................................................................... Pugash, R.
Neuroradiology ................................................................................................................. Willinsky, R.
Nuclear Medicine ............................................................................................................... Hendler, A.
PGY1 ................................................................................................................................... Clark, J.
Radiology Residency .......................................................................................................... Becker, E.
Research ........................................................................................................................... Wood, M.L.
Undergraduate ................................................................................................................... Dowdell, T.
Undergraduate (Co-Director) ............................................................................................... Jaffer, N.

Division Heads

Abdominal Imaging ............................................................................................................ Hanbidge, A.
Breast Imaging .................................................................................................................. Muradali, D.
Musculoskeletal Imaging ..................................................................................................... White, L.
Cardiothoracic Imaging ...................................................................................................... Merchant, N. & Shulman, H.S.
Neuroradiology ................................................................................................................. TerBrugge, K.G.
Nuclear Medicine ............................................................................................................... Hendler, A.
Pediatric Imaging ................................................................................................................ Manson, D.
Vascular and Interventional Radiology ................................................................................. Asch, M.

Department Administrative Staff

Business Officer ................................................................................................................ Sciortino, G.
Secretary .......................................................................................................................... Shea, A.
Research Assistant .......................................................................................................... Weir, S.
COMMITTEES

Executive Committee
Kucharczyk, W.  (Committee Chair)
Babyn, P.
Becker, E.
Bret, P.
Clark, J.
Common, A.
McGregor, C.  (Chief Resident – July 1, 2000)
Dowdell, T.
Fong, K.
Hamilton, P.
Hendler, A.
Jaffer, N.
Pugash, R.
Salem, S.
Shulman, H.
Wood, M.

Promotions Committee
Bret, P.
Shulman, H.  (Committee Chair)
TerBrugge, K.
Wilson, S.
Yaffe, M.

Undergraduate Teaching Committee
Dowdell, T. (Committee Chair)
Chan, R.
Jaffer, N.
Kachura, J.
Lax, M.
Montanera, W.
Paul, N.
Pearce, D.
Weiser, W.

Specialty Training Committee
Becker, E. (Committee Chair)
Clark, J.
Hendler, A.
Laughlin, S.
MacDonald, C.
Mikulis, D.
Muradali, D.
Noël de Tilly, L.
Shumak, R.
David, E.
Layton, Z.
Luong, A.
McGregor, C. (Chief Resident)
Ossip, M.
Waddock, S.
UNIVERSITY OF TORONTO FULLY AFFILIATED HOSPITALS AND INSTITUTES

Hospital for Sick Children ........................................... 555 University Avenue
Toronto, Ontario
M5G 1X8

Mount Sinai Hospital ........................................... 600 University Avenue
Toronto, Ontario
M5G 1X5

St. Michael's Hospital

Bond site ........................................... 30 Bond Street
Toronto, Ontario
M5B 1W8

Sunnybrook & Women’s College Health Sciences Centre

Sunnybrook Campus ........................................... 2075 Bayview Avenue
Toronto, Ontario
M4N 3M5

Women’s College Campus .................................... 76 Grenville Street
Toronto, Ontario
M5S 1B2

University Health Network

Princess Margaret Hospital ................................... 610 University Avenue
Toronto, Ontario
M5G 2M9

Toronto General Hospital .................................... 200 Elizabeth Street
Toronto, Ontario
M5G 2C4

Toronto Western Hospital .................................... 399 Bathurst Street
Toronto, Ontario
M5T 2S8

Clarke Institute of Psychiatry ................................ 250 College Street
Toronto, Ontario
M5T 1B8

Positron Emission Tomography Centre ................................ 250 College Street
Toronto, Ontario
M5T 1B8
## DEPARTMENT OF MEDICAL IMAGING FACULTY

**Academic Rank as of July 1, 2001**

<table>
<thead>
<tr>
<th>NAME</th>
<th>RANK</th>
<th>DIVISION</th>
<th>HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alton, D.J.</td>
<td>Assistant Professor</td>
<td>Pediatric Imaging</td>
<td>Hospital for Sick Children</td>
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<td>Asch, M.R.</td>
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</tr>
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</tr>
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<td>University Health Network</td>
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Holmes, R.B.                    Professor Emeritus        Nuclear Medicine       Clarke Institute of Psychiatry
Houle, S.                        Associate Professor       Vascular Imaging       Mount Sinai Hospital
Jaffer, N.M.                      Associate Professor       Breast Imaging        Mount Sinai Hospital
Jong, R.A.                       Assistant Professor        Vascular Imaging       University Health Network
Kachura, J.                      Assistant Professor        Vascular Imaging       Mount Sinai Hospital
Kassel, E.E.                     Associate Professor        Neuroradiology        University Health Network
Keller, M.A.                     Assistant Professor        Neuroradiology        University Health Network
Khallili, K.                     Lecturer                   Abdominal Imaging      University Health Network
Khan, A.                         Lecturer                   Pediatric Imaging      Hospital for Sick Children
Kucharczyk, W.                   Professor                   Neuroradiology        University Health Network
Lansdown, E.L.                   Professor Emeritus         Cardiothoracic Imaging   St. Michael’s Hospital
Lata, A.C.                      Assistant Professor        Neuroradiology        University Health Network
Laughlin, S.                     Assistant Professor        Musculoskeletal        University Health Network
Lax, M.                          Lecturer                   St. Joseph’s Health Centre
Leekam, R.N.                     Assistant Professor        Pediatric Imaging      Hospital for Sick Children
MacDonald, C.E.                  Assistant Professor        Pediatric Imaging      Hospital for Sick Children
Manson, D.E.                     Assistant Professor        Vascular Imaging       St. Michael’s Hospital
Margolis, M.                     Assistant Professor        Abdominal Imaging      Mount Sinai Hospital
McCallum, R.W.                   Professor Emeritus         Cardiothoracic Imaging   St. Michael’s Hospital
Meema, H.E.                      Professor Emeritus         St. Joseph’s Health Centre
Merchant, N.                     Assistant Professor        Cardiothoracic Imaging   University Health Network
Mikulis, D.                      Associate Professor        Neuroradiology        University Health Network
Moes, C.A.F.                    Professor Emeritus         University Health Network
Montanera, W.                   Associate Professor        Neuroradiology        University Health Network
Muradali, D.                    Assistant Professor        Breast Imaging        University Health Network
Murphy, J.                       Assistant Professor        Abdominal Imaging      Sunnybrook & Women’s College Health Sciences Centre
Murray, S.Y.                     Assistant Professor        Nuclear Medicine       Sunnybrook & Women’s College Health Sciences Centre
Noël de Tilly, L.                Assistant Professor        Neuroradiology        St. Michael’s Hospital
Nugent, P.                      Lecturer                   Abdominal Imaging      Sunnybrook & Women’s College Health Sciences Centre
Olscamp, G.C.                   Associate Professor        Abdominal Imaging      University Health Network
O’Malley, M.                   Assistant Professor        Abdominal Imaging      University Health Network
Pearce, D.                       Lecturer                   Abdominal Imaging      St. Michael’s Hospital
Peto, R.                         Lecturer                   Cardiothoracic Imaging   University Health Network
Potts, D.G.                     Professor Emeritus         St. Michael’s Hospital
Pugash, R.A.                   Assistant Professor        Vascular Imaging       University Health Network
Rajani, D.                       Lecturer                   Breast Imaging        University Health Network
Ranson, M.                       Assistant professor         Pediatric Imaging      Mount Sinai Hospital
Rappaport, M.                   Associate Professor        Cardiothoracic Imaging   University Health Network
Reilly, B.J.                     Professor Emeritus         Sunnybrook & Women’s College Health Sciences Centre
Reilly, R.M.                    Associate Professor        Nuclear Medicine       Sunnybrook & Women’s College Health Sciences Centre
Rosen, I.E.                     Assistant Professor        Abdominal Imaging      Sunnybrook & Women’s College Health Sciences Centre
Rowlands, J.A.                   Professor                   Research/Medical Biophysics  Sunnybrook & Women’s College Health Sciences Centre
Rubenstein, J.D.               Associate Professor        Musculoskeletal Imaging     Sunnybrook & Women’s College Health Sciences Centre
Saibil, E.A.                    Assistant Professor        Vascular Imaging       Sunnybrook & Women’s College Health Sciences Centre
Salem, S.                       Associate Professor        Abdominal Imaging      Mount Sinai Hospital
Salonen, D.C.                  Assistant Professor        Musculoskeletal Imaging     University Health Network
Salsberg, B.B.                 Lecturer                   St. Joseph’s Health Centre
Samuels, T.H.                   Assistant Professor        Breast Imaging        Sunnybrook & Women’s College Health Sciences Centre
Sanders, D.E.                   Professor Emeritus         Sunnybrook & Women’s College Health Sciences Centre
Sarrazin, J.                    Assistant Professor        Cardiothoracic Imaging   Sunnybrook & Women’s College Health Sciences Centre
Shankar, L.                     Assistant Professor        St. Joseph’s Health Centre
Shorter, A.M.                   Lecturer                   Sunnybrook & Women’s College Health Sciences Centre
Shuckett, B.                     Assistant Professor        Pediatric Imaging      Hospital for Sick Children
Shulman, H.S.                   Professor                   Cardiothoracic Imaging   Sunnybrook & Women’s College Health Sciences Centre
Shumak, R.                       Assistant Professor        Breast Imaging        Sunnybrook & Women’s College Health Sciences Centre
Simons, M.                       Assistant Professor        Vascular Imaging       University Health Network
Sniderman, K.W.               Associate Professor        Vascular Imaging       University Health Network
Stewart, L.                     Assistant Professor        Abdominal Imaging      Mount Sinai Hospital
Temple, M.                       Lecturer                   Pediatric Imaging      Hospital for Sick Children
TerBrugge, K.G.                Professor                   Nuclear Medicine       University Health Network
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thurston, W.</td>
<td>Assistant Professor</td>
<td>St. Joseph’s Health Centre</td>
</tr>
<tr>
<td>Ting, G.</td>
<td>Lecturer</td>
<td>Abdominal Imaging</td>
</tr>
<tr>
<td>Toi, A.</td>
<td>Associate Professor</td>
<td>University Health Network</td>
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<tr>
<td>Tomashpolskaya, J.</td>
<td>Lecturer</td>
<td>Abdominal Imaging</td>
</tr>
<tr>
<td>Tomlinson, G.</td>
<td>Assistant Professor</td>
<td>Sunnybrook &amp; Women’s College Health Sciences Centre</td>
</tr>
<tr>
<td>Traubici, J.</td>
<td>Lecturer</td>
<td>Research/Biostatistics</td>
</tr>
<tr>
<td>Turchin, R.</td>
<td>Lecturer</td>
<td>Pediatric Imaging</td>
</tr>
<tr>
<td>Wall, J.</td>
<td>Lecturer</td>
<td>St. Joseph’s Health Centre</td>
</tr>
<tr>
<td>Weisbrod, G.L.</td>
<td>Professor</td>
<td>Abdominal Imaging</td>
</tr>
<tr>
<td>Weiser, W.J.</td>
<td>Professor</td>
<td>Cardiac Imaging</td>
</tr>
<tr>
<td>White, L.</td>
<td>Assistant Professor</td>
<td>Musculoskeletal Imaging</td>
</tr>
<tr>
<td>Willinsky, R.A.</td>
<td>Professor</td>
<td>Neuroradiology</td>
</tr>
<tr>
<td>Wilson, C.</td>
<td>Assistant Professor</td>
<td>Breast Imaging</td>
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<td>Wilson, S.R.</td>
<td>Professor</td>
<td>Abdominal Imaging</td>
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<tr>
<td>Wood, M.L.</td>
<td>Professor</td>
<td>Research/Medical Biophysics</td>
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<tr>
<td>Wortzman, G.</td>
<td>Professor Emeritus</td>
<td>Neuroradiology</td>
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<td>Wright, B.E.</td>
<td>Assistant Professor</td>
<td>Breast Imaging</td>
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<td>Yaffe, M.J.</td>
<td>Professor</td>
<td>Research/Medical Biophysics</td>
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<td>Yoo, S.J.</td>
<td>Professor</td>
<td>Pediatric Imaging</td>
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<tr>
<td>Zalev, A.H.</td>
<td>Assistant Professor</td>
<td>Abdominal Imaging</td>
</tr>
<tr>
<td>Zelovitzky, J.L.</td>
<td>Assistant Professor</td>
<td>Cardiothoracic Imaging</td>
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</table>

**Cross Appointments**

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronskill, M.J.</td>
<td>Medical Biophysics</td>
</tr>
<tr>
<td>Foster, S.</td>
<td>Medical Biophysics</td>
</tr>
<tr>
<td>Freedom R.</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>Henkelman, R.M.</td>
<td>Medical Biophysics</td>
</tr>
<tr>
<td>McLaughlin, P.R.</td>
<td>Medicine</td>
</tr>
<tr>
<td>Noyek, A.M.</td>
<td>Otolaryngology</td>
</tr>
<tr>
<td>Pharaoah, M.J.</td>
<td>Dentistry</td>
</tr>
<tr>
<td>Plewes, D.B.</td>
<td>Medical Biophysics</td>
</tr>
<tr>
<td>Trachtenberg, J</td>
<td>Surgery</td>
</tr>
</tbody>
</table>
The academic programs in the Department of Medical Imaging are integrated with its five major teaching hospitals: the University Health Network (UHN), Mount Sinai Hospital (MSH), St. Michael’s Hospital, Sunnybrook & Women’s College Health Sciences Centre, and the Hospital for Sick Children. The medical imaging departments at UHN and MSH were consolidated into a single operational unit under the leadership of Dr. Patrice Bret in 1997. The other hospitals’ medical imaging departments are led by Dr. Harry Shulman, Dr. Andrew Common, and Dr. Paul Babyn. Short descriptions of each hospital department are presented below.

**University Health Network/Mount Sinai Hospital - Department of Medical Imaging**

The academic year 2000-2001 was a very active one in all aspects. The competition for manpower became more acute and we faced several tight situations that had some impact on both the academic program and the delivery of clinical services. Although our Department has been successful in recruiting nine radiologists during the course of the academic year, we continued to experience a shortage in the Divisions of Breast and Abdominal Imaging. Our Department continued to invest in the digitization of all modalities and computer applications related to image management. At the same time, the effort undertaken during the previous years to update obsolete equipment continued. Among the more visible projects completed in that domain: two new MRI systems at MSH; the redesign of Interventional Imaging at the TGH that will allow us to centralize biopsy, venous line placement and interventional procedures in a new redesigned space; the rollout of computed radiography (CR) technology throughout all 4 sites; the redeployment of Obstetrical and Gynecology Ultrasound at the point of care in the Hydro building immediately next to the Gynecology-obstetrical clinics. In May, the Academic Program was reviewed by the Royal College. The team of reviewers recognized both the outstanding performance of the Program Director, Dr. Edna Becker, who is a Staff Radiologist at UHN/MSH, and the many strengths that our Department brings to the Academic Program. Additional information can be found at [http://www.uhn.on.ca](http://www.uhn.on.ca)

**Sunnybrook and Women’s College Health Sciences Centre (SWCHSC)** is a 1200 bed hospital currently operating on three campuses – Sunnybrook, Women’s College and Orthopedic and Arthritic. There are 23 full-time faculty radiologists. SWCHSC has two clinical MR systems, two research MR systems and three CT scanners. All of the modalities on the Sunnybrook and Women’s campus are integrated with PACS and a RIS. The department performs 260,000 exams annually in support of the Hospital’s five major programs; Oncology, Trauma, Heart and Circulation, Perinatal & Gynecology and Musculoskeletal. Construction is scheduled to begin this year that will eventually result in all inpatient beds relocating to the Sunnybrook campus with the Women’s College site becoming an Ambulatory Care Centre. Additional information about the Hospital can be found at [http://www.swchsc.on.ca](http://www.swchsc.on.ca)
St. Michael’s Hospital’s Department of Medical Imaging has undergone considerable expansion and remodelling in the past few years, concomitant with the integration of programs and services from the Wellesley Central site. The annual tally of imaging examinations is over 240,000, excluding a very busy cardiac catheterization service which does over 4000 examinations per year. Virtually all of the imaging equipment has been replaced in the past few years, with two new helical CT scanners, two new MRI units, and three anio suites including a bi-plane neuro interventional facility. The general radiographic equipment has also been upgraded to PACS readiness, and PACS is budgeted for in the Hospital’s Strategic Information Plan for the years 2002/2003. An aggressive recruiting campaign of subspecialist radiologists has brought staffing levels to 20 which will allow the department to better meet the needs of the University Residency and Fellowship Programs. St. Michael’s is proud of its commitment to teaching and clinical excellence, with a lesser emphasis historically on research. The hospital has recently appointed a renowned critical care researcher as VP of Research, and there is renewed commitment to increasing the research profile of the hospital and of the imaging department in particular. Other unique programs which are reflected in the Medical Imaging Department at St. Michael’s are the Inner City Health focus, the world-renowned Minimal Access Therapeutics Program, and the HHT Program.

The Hospital for Sick Children’s Department of Diagnostic Imaging provides full imaging services for all children up to the age of 18 years. We currently perform approximately 130,000 examinations per year. The department has 17 full-time staff currently with pediatric subspecialists in neuroradiology, intervention, cardiology, and body-cross sectional imaging. The department has recently undergone a significant upgrade of almost all imaging equipment with two state of the art MR scanners, two CT scanners (including one multi-slice CT) along with a newly opened Image Guided Therapy suite. This suite is designed to allow both interventional radiology and minimally invasive surgical procedures to be combined, and consists of four rooms containing integrated CT fluoroscopy, a biplane unit, and two single plane fluoroscopic units with ultrasound. In addition the department has an active sonography service with eleven ultrasound units. There is an integrated PACS and RIS system providing image and report distribution throughout the department and the hospital. Research and training are active interests of the department with three imaging scientists and eleven fellows in subspecialty training from across the world.
Members of the Department of Medical Imaging were investigators on the following grants, identified by the principal investigator, other investigators, project title, sponsor, total amount of grant, and start and end dates of the funding period.


Caldwell CB, Mah K, Ung, YC, Ehrlich LE. Evaluation of fusion of nuclear medicine images with computed tomography images to enhance management of oncology patients. Industry Grant from Marconi Medical Systems, Inc. $60,000. 1999-2000.


Houle S, Vaccarino F. Depth-Encoded Advanced Research Tomograph, Canada Foundation for Innovation (CFI) $1,450,000 and Ontario Innovation Trust (OIT) $1,450,000. [PET component of a larger grant entitled “University of Toronto Functional Imaging Network (FIRN)”, Stuss D (PI) totalling $10,700,000 from each of CFI and OIT].


Lilge LD (Principal Investigator), Jong RA (Co-Investigator). Optical transillumination spectroscopy of breast tissue to determine cancer risk in pre- and post-menopausal women. United States Army Medical Research and Materiel Command. $200,000.00. 2000-2002.


Narod S (Principal Investigator), Nam R, Trachtenberg J, Jewett M, Flesher N, Pollak M, Toi A, Brunet J-S (Co-investigators). The role of serum IGF-1 levels and androgen receptor genotype in prostate cancer diagnosis. NCIC. $140,000.00 per annum. 1999-2002.


Saint-Cyr J (Principal Investigator), Mikulis DJ (Co-Investigator). Radiological and clinical evaluation of sub-thalamic nucleus deep brain stimulation. The Parkinson Foundation of Canada. $28,500.00 (2001), $28,500.00 (2002).

Tumer TO (Principal Investigator), Jong RA (Consultant). Improved x-ray image detector systems for digital mammography. US Army Grant $US 15,000.00/year for 1997-2000.


Wilson S (Principal Investigator), Burns PN (Co-Investigator). An open label, nonrandomized, phase II trial to assess lesion characterization of liver pathology with DMP 115. Dupont. Value $100,000.00 USD. July 1999-2001.


Asch M. Arm ports abandoned: lack of local nursing expertise. CARJ October 2000;51(5):308-309. (Letter to the Editor)


Asch MR. Venous access: options, approaches and issues. CARJ June 2001;52(3):153-164.


Fisher, D.M Cheung, G Pirouzmand, P. Cooper, P. Antonyshyn, O. Fialkov, J. Forrest, C.R. The Posterior Ledge in the Management of Orbital Floor Fractures. Hospital for Sick Children Centre for Craniofacial Care and Research, and Sunnybrook Health Science Centre, University of Toronto, Canada.


Ortega D, Wilson SR (Joint Author), Hope Simpson D, Burns PN. Tissue harmonic imaging of the biliary ducts. AJR March 2001;176:653-659.


Starok, MS, Rubenstein JD. Normal anatomy of the foot and ankle. Practical MRI of the Foot and Ankle. CRC Press LLC. 2000.


PUBLICATIONS: NON-PEER-REVIEWED, BOOKS, CHAPTERS


INVITED PRESENTATIONS AND VISITING PROFESSORSHIPS


Blaser S. Labyrinthine dysplasias. Westmead New Childrens Hospital, Sydney, Australia, September 2000.

Blaser S. Labyrinthine dysplasias. Brisbane Childrens Hospital, Brisbane, Australia, September 2000.


Blaser S. Pediatric neuroimaging. 32nd International Diagnostic Course in Davos; Davos, Switzerland, March 25-31, 2000.


Chait P. XXIX Brazilian Congress of Radiology. Salvador, Bahia. November 2000


Dowdell TR. General radiology imaging seminars. 2 - 2 hour sessions. Vos Andes Hospital, Quito Ecuador, May 3-4, 2001.


Ho CS. Radiofrequency ablation of hepatomas. Hong Kong Sanatorium and Hospital CME Seminar. Hong Kong. February 2001.

Huyer D, Mian M. Armstrong D "Is there a correlation between retinal findings and intracranial findings in SBS". The Israel Ophthalmological Society meeting on Pediatric Ophthalmology and Strabismus, November 1, 2000.


Pugash RA. Venous access. Invited talk at meeting of Toronto IV Therapy Nurses, April 11, 2001.


Temple M. Biopsy in the pediatric patient. Interventional Ultrasound Course, Michener Institute, Toronto, Ontario, November 2000.


Deitel W. Chronic pancreatitis mimicking pancreatic head carcinoma: are there suggestive clinical or imaging features? 63rd Annual Meeting of the Canadian Association of Radiologists. Toronto June 12, 2000.


Fox, AJ. Post-Graduate Course, NYU “MRI: Clinical State of the Art”, 2000
a)Hyperacute Stroke: Radiologists' Rapid Response to New Treatments: Immediate D Diagnostic Studies and the Role of Intra-arterial Thrombolysis

a)The Vulnerable Carotid Plaque: Uses and Limitations of X-ray Angiography


Greyson ND. Uniqueness and cost effectiveness of nuclear medicine. 63rd Annual Meeting of the Canadian Association of Radiologists, Toronto June 12, 2000.


Toi A. At what gestational age can the normal corpus callosum be seen? ISUOG. Zagreb, Croatia. October 4-7, 2000.


AWARDS AND SPECIAL RECOGNITION


RESEARCH PROGRAM

Many of the faculty, residents, and fellows in the Department of Medical Imaging devote considerable effort to research. Clearly, research is an important mission of the Department of Medical Imaging. The nature of this research depends primarily on the interest and expertise of individuals and on resources at particular hospitals. In addition, the department promotes certain research topics, including the development and evaluation of imaging methods, such as magnetic resonance (MR) imaging, percutaneous and transvascular treatment methods, use of contrast agents, and most recently, minimally-invasive diagnosis and therapy.

Approximately eight years ago, an aggressive program to enhance research within the Department was initiated. The Research Program was created in 1992 with two main objectives:

- to encourage more faculty to participate in research related to radiological observations and procedures;
- to allow at least a few of the faculty to perform intensive medical-imaging research

The two objectives are being pursued through several initiatives, involving contributions to the salary of a small number of faculty, shared access to certain resources, and an annual forum for highlighting research accomplishments. A synopsis of the key initiatives is presented below. Also included below are the research grants and publications of the faculty who are not listed with one of the affiliated hospitals.

Protected Research Time

Protected Research Time, our most successful initiative, allows a select group of radiologists to devote at least one day each week to a particular research project. The radiologists listed in the table below were awarded Protected Research Time in 2000-2001.

<table>
<thead>
<tr>
<th>Award Holder</th>
<th>Hospital</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard Farb</td>
<td>TWH</td>
<td>High Resolution Contrast Enhanced MR Angiography for the Evaluation of GDC Treated Cerebral Aneurysms</td>
</tr>
<tr>
<td>Masoom Haider</td>
<td>PMH</td>
<td>MRI Oxymetry and Dynamic Enhancement in Carcinoma of the Uterine Cervix: Correlation with Direct Interstitial Fluid Pressure Measurement and Tumor Oxygen Levels</td>
</tr>
<tr>
<td>Korosh Khalili</td>
<td>TGH</td>
<td>Preoperative Staging of Cholangiocarcinoma: A Prospective Comparative Study of Sonography, CT, and MRI</td>
</tr>
<tr>
<td>Derek Muradali</td>
<td>TGH</td>
<td>Contrast Enhanced Sonography of The Breast: Can Vascular Morphology Predict Malignancy?</td>
</tr>
<tr>
<td>Martin O’Malley</td>
<td>TGH</td>
<td>Evaluation of Cystic Pancreatic Tumors with MRI Including T1-Weighted Values.</td>
</tr>
<tr>
<td>Rene Shumak</td>
<td>SWCHSC</td>
<td>Usefulness Of Magnetic Resonance Imaging In The Surveillance Of Women At High Risk For Hereditary Breast Cancer</td>
</tr>
<tr>
<td>Lawrence White</td>
<td>MSH</td>
<td>Optimized Fast Spin-Echo Imaging of Meniscal Tears</td>
</tr>
</tbody>
</table>
Faculty Research Award

In addition to the Protected Research Time initiative, the department provided support to allow Dr. David Mikulis, Dr. Shi-Joon Yoo, and Dr. Stephanie Wilson to devote 50% of their time to research.

RSNA Resident/Fellow Research Award

The RSNA Research and Education Fund offers an award annually to recognize and encourage outstanding residents and fellows in radiology research. The award is for one resident or fellow in each training program in North America who is deemed to have participated meaningfully in research during the previous year. Dr. Jae Kim was selected for this Award in 2000-2001.

Research Day

Our Annual Research Day, which was held on April 19, 2001, consisted of a record number of presentations from senior residents, the faculty who received Protected Research Time, and many other members of the department. The presentations are listed by title at the end of this section.

Positron Emission Tomography Centre, Centre for Addiction and Mental Health

The University of Toronto Positron Emission Tomography (PET) Centre is under the direction of Dr. Sylvain Houle. Investigations concentrate on schizophrenia, mood and anxiety disorders, cognitive neuroscience, aging and dementia, movement disorders, and PET methodology.

Imaging/Bioengineering Research, SWCHSC

Much of the department's research occurs under the auspices of Imaging/Bioengineering Research at Sunnybrook and Women's College Health Sciences Centre. Several faculty in the department make use of exceptional resources in conducting research involving X-ray, nuclear medicine, magnetic resonance, and ultrasound technology. The success of this research effort is demonstrated by the grants and publications listed below.

Faculty List

(Academic Rank as of July 1, 2000)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Affiliation</th>
</tr>
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<tbody>
<tr>
<td>John A. Rowlands</td>
<td>Professor</td>
<td>Senior Scientist, SWCHSC</td>
</tr>
<tr>
<td>Michael L. Wood</td>
<td>Professor</td>
<td>Director, Research Program</td>
</tr>
<tr>
<td>Martin J. Yaffe</td>
<td>Professor</td>
<td>Senior Scientist, SWCHSC</td>
</tr>
<tr>
<td>Sylvain Houle</td>
<td>Associate Professor</td>
<td>Director, PET Centre</td>
</tr>
</tbody>
</table>
Grants

Members of the Department of Medical Imaging (underlined) were investigators on the following grants, identified by the principal investigator, other investigators, project title, sponsor, total amount of grant, and start and end dates of the funding period.


Boyd NF, Yaffe MJ. Mammographic densities and risk of breast cancer, National Institutes of Health / National Cancer Institute, $336,022 USD, 1999-2002.


Houle S. Depth-encoded advanced research tomograph, Canada Foundation for Innovation (CFI), $1,450,000 and Ontario Innovation Trust (OIT) $1,450,000. [This is the PET component of a larger grant entitled, "University of Toronto Functional Imaging Network"].


Publications

(a) Peer-Reviewed:


(b) Books or Book Chapters


Original Scientific Presentations

(a) Peer-Reviewed


Cunningham CH, Wright GA, Wood ML. Shortening multiband RF pulse duration for reduced motion sensitivity. ISMRM Ninth Scientific Meeting and Exhibition, Glasgow, Scotland, April 2001.


(b) Non-Reviewed


Invited Papers and Professorships


Caldwell CB. PET for radiation therapy treatment planning. 31st Annual Spring Meeting of the Mid-eastern Chapter, Society of Nuclear Medicine, Rockville, MD, 21 April 2001.


## Teaching -- Hours of Lectures

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Students</th>
<th>Residents, Fellows, Faculty</th>
<th>Technologists</th>
</tr>
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<tbody>
<tr>
<td>C.B. Caldwell</td>
<td>10</td>
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<td>2</td>
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<tr>
<td>S. Houle</td>
<td>10</td>
<td>20</td>
<td>10</td>
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<tr>
<td>J.A. Rowlands</td>
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<tr>
<td>M.L. Wood</td>
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<td>4</td>
<td></td>
</tr>
<tr>
<td>M.J. Yaffe</td>
<td>10</td>
<td>38</td>
<td>3</td>
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</table>
Department of Medical Imaging Annual Research Day 2001

Date: Thursday, April 19, 2001
Location: Sadowski Auditorium, 18th floor of the Mount Sinai Hospital
Starting Time: 12:30 pm with welcome from Dr. Walter Kucharczyk

Session I: Neuroimaging and Pediatric Imaging
Moderator: Karel terBrugge

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:35</td>
<td>Cheemun Lum</td>
<td>Investigating Agenesis of the Corpus Callosum Using Functional MRI</td>
</tr>
<tr>
<td>12:45</td>
<td>Richard Farb</td>
<td>Spinal Dural Arteriovenous Fistula Localization using a Technique of Real-Time Auto-Triggered Elliptical Centric Ordered 3D Gd-MRA: An Initial Assessment</td>
</tr>
<tr>
<td>12:55</td>
<td>David Mikulis</td>
<td>MRI of Cerebro-Vascular Reactivity: Efficacy in a Patient with Moya-Moya Disease</td>
</tr>
<tr>
<td>1:05</td>
<td>Allan Fox</td>
<td>Development of 3-D Computed Rotational Angiography (CRA)</td>
</tr>
<tr>
<td>1:15</td>
<td>James Haroun</td>
<td>The Role of Routine MRI of the Brain in Evaluating the Safety of Carotid Artery Stenting</td>
</tr>
<tr>
<td>1:25</td>
<td>Jae Kim</td>
<td>Cardiac-Gated High Spatial Resolution 3D Gd-MRA Technique for the Carotid Arteries</td>
</tr>
<tr>
<td>1:35</td>
<td>Nir Stanietzky</td>
<td>Imaging of Maxillofacial Fractures by Helical CT</td>
</tr>
<tr>
<td>1:45</td>
<td>Manu Shroff</td>
<td>Pituitary Duplication: MR Findings in Four New Cases and a New Associated Finding of Basilar Artery Duplication</td>
</tr>
<tr>
<td>1:55</td>
<td>Shi-Joon Yoo</td>
<td>MR Evaluation of the Pulmonary Veins in Children: Value of Contrast-Enhanced Angiography</td>
</tr>
</tbody>
</table>
### Session II: Breast Imaging and Nuclear Medicine
Moderator: David Mikulis

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:25</td>
<td>Petrina Causer</td>
<td>Nodular Ductal Carcinoma In Situ: Can it be Differentiated from Invasive Ductal Carcinoma on Sonography?</td>
</tr>
<tr>
<td>2:35</td>
<td>Derek Muradali</td>
<td>Optison Enhanced Sonography of the Breast: Can Vascular Morphology Differentiate Benign from Malignant Breast Nodules?</td>
</tr>
<tr>
<td>2:45</td>
<td>Supriya Kulkarni</td>
<td>SonoCT Compound Imaging: Improved Margin Resolution And Perilesional Tissue Visualization Of Solid Breast Nodules</td>
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<td>2:55</td>
<td>Rene Shumak</td>
<td>Pilot Study of the Use of MRI in Addition to Conventional Surveillance for Women at High Risk for Hereditary Breast Cancer</td>
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<td>3:05</td>
<td>Raymond Reilly</td>
<td>Targeted Auger Electron Radiotherapy of Breast Cancer</td>
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<td>3:15</td>
<td>Nimu Ganguli</td>
<td>The Utility of CT Image Co-Registration in the Interpretation of FDG PET Images with an Integrated Triple Head Coincidence Camera</td>
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### Session III: Vascular and Interventional Radiology
Moderator: Andrew Common

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>3:25</td>
<td>Murray Asch</td>
<td>Recovery Filter: Initial Human Experience</td>
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<tr>
<td>3:35</td>
<td>Raymond Chan</td>
<td>Radiofrequency Ablation of Malignant Hepatic Neoplasms</td>
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<td>3:45</td>
<td>John Kachura</td>
<td>Radiofrequency Ablation of Renal Cell Carcinoma</td>
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<td>3:55</td>
<td>Hilarie Broom</td>
<td>Reuse of Transjugular Liver Biopsy Instruments: Does Sterilization Eliminate the Hepatitis Virus?</td>
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<td>4:15</td>
<td>Soe Lwin Kyone</td>
<td>Relationship of an Angiographically Based Vascular Index to Uterine Fibroid Size and Response to Uterine Arterial Embolization</td>
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### Session IV: Abdominal Imaging and Musculoskeletal Imaging
Moderator: Anthony Hanbidge

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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<tbody>
<tr>
<td>4:35</td>
<td>Martin O’Malley</td>
<td>Primary Cystic Pancreatic Tumors: Radiologic-Pathologic Correlation</td>
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<tr>
<td>4:45</td>
<td>Korosh Khalili</td>
<td>Work in Progress: Hilar and Hepatic Biliary Obstruction: Contrast Enhanced Ultrasound vs. MR Imaging</td>
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<td>4:55</td>
<td>Stephanie Wilson</td>
<td>Hemangiomas: A Challenge for Microbubble Contrast Agents</td>
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<tr>
<td>5:05</td>
<td>Tanya Chawla</td>
<td>Pancreatic Transplant: Is Sonography an Optimal Modality for Assessing Complications?</td>
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<td>5:15</td>
<td>Max Ryan</td>
<td>Dropped Gallstones Following Laparoscopic Cholecystectomy Mimicking Peritoneal Seeding: Computed Tomography and Ultrasound Features</td>
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<td>5:25</td>
<td>Elizabeth David</td>
<td>Level of Training and its Impact on Resident Interpretation of On Call Abdominal Trauma CT's: A Quality Assurance Study – Preliminary Results from S&amp;WHSC</td>
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<td>5:35</td>
<td>Anoosh Sharif</td>
<td>The Friday Syndrome: Fact or Fiction?</td>
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<td>5:45</td>
<td>Gilbert Chow</td>
<td>Ultrasonographic Evaluation of Fetal Anatomy: Is There a Difference Between 16, 18, and 20 weeks?</td>
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<td>5:55</td>
<td>David Jacobs</td>
<td>Predicting the Response of Liver Metastases to Chemotherapy using MRI Perfusion</td>
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<td>6:05</td>
<td>Lawrence White</td>
<td>Digital Versus Analog Templating of Images Preceding Primary Hip Arthroplasty</td>
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<tr>
<td>6:15</td>
<td>Teresa Loucks</td>
<td>Radiographic Progression following Bulk Osteochondral Allograft to the Knee: Normal Incorporation and Evidence of Complications</td>
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RESIDENT TRAINING PROGRAM

General Description

There were 48 residents in our program in the 2000-2001 year. The five-year program consists of one year of preliminary clinical training (PGY1), followed by four years of training in medical imaging.

The university-wide integration and rotational system ensures that each resident will have access to all the strengths of our large and expert faculty and the huge volume of clinical pathology. Residents have the opportunity to train at several large modern hospitals, doing so in groups of 5 – 10 trainees of all levels, thus maintaining a close working environment with peers and faculty. All hospitals are equipped with state-of-the-art equipment. Residents work daily with the best of general radiographic, ultrasound, CT and MRI technology. Several hospitals have digital image archiving and communication systems.

PGY1

PGY1 Clinical training is divided into two blocks, one eight-nine month block at core teaching hospitals and a two-three month block at a community hospital. During 2000 - 2001, the core teaching hospitals have been the Mount Sinai Hospital and the St. Michael’s Hospital. Community training is principally done at the North York General Hospital. The content of the PGY1 program included Medicine (General Medicine and Respiratory); Surgery (General Surgery, Orthopaedics, Urology, Neurosurgery, Obstetrics and Gynaecology); one month of Paediatrics; one month of Anatomy at the U of T Anatomy Department; and two months of elective choices. In the final month of PGY1, all residents come together for a Radiology Orientation Program, which introduces the trainees to physics, imaging equipment, clinical lectures, program issues and the core hospitals. The PGY1 rotation opportunities are reviewed annually, attempting to make the best of training choices in the clinical services.

PGY2

This is the first year of training in medical imaging. During 2000 - 2001, a PGY2 trainee spent the entire year at one or two of the three core teaching Departments (Mount Sinai – University Health Network, Sunnybrook and Women’s College Health Sciences Centre and St. Michael’s Hospital). There is a graduated increase in responsibility over the course of the year. In order to prepare residents to take night call (which starts in September), the year begins with a 10 week introductory program covering thoracic, GI, GU, CNS, MSK, CT and nuclear imaging. The remainder of the year consists of one or two month rotations in each of the above organ systems, as well as a one-month rotation in ultrasound.
PGY3

In 2000 - 2001, residents in this training year divided their rotations into three to six month blocks at hospitals different from that of their PGY2 training year. This allows the trainee an opportunity to see a different spectrum of pathology and to work with a different group of faculty. Rotations during the PGY3 year have included Breast Imaging, Neuroradiology, Ultrasound, Vascular-Interventional, and Nuclear Medicine as well as additional training in CT, MSK, GI and Chest. MRI training is included within all organ system rotations and is a strong component of all core hospitals.

PGY 4

During this year, each resident spent a four-month block in Paediatric Radiology at the world famous Hospital for Sick Children. The other eight months is at one or two of the core hospitals. This year includes a two-month block of dedicated Angio-Interventional training. The resident also has four to six months of General Radiology rotations. The Armed Forces Institute of Pathology (AFIP) six-week rotation for Radiology-Pathology is scheduled during the General radiology time.

PGY5

The resident is usually allowed to use this year for electives, but this is conditional upon the resident having achieved an acceptable standard of competence in medical imaging. It may be spent concentrating on areas of relative weakness, or on subspecialty areas. Most residents include electives in obstetric ultrasound, cardiac imaging and Body MRI in this final year.

Armed Forces Institute of Pathology

All residents are encouraged to attend the Armed Forces Institute of Pathology in Washington, D.C., where they receive a six-week, intensive, didactic course in pathology correlated to imaging. This generally occurs during the PGY4 year. Some financial support is available. To date, we have been successful in reserving a sufficient number of positions at AFIP to permit all of our residents to attend at some point in their training.

Physics Instruction

All residents must be knowledgeable about the physics of medical imaging. To that end, intensive physics instruction is provided. One week courses are provided for the PGY1 and PGY3 years and there is also a five-day review course in the PGY3 or PGY4 year of training. These courses are organized by Martin Yaffe, Ph.D. (Department of Medical Imaging) and taught by the faculty of our department, the faculty of the Department of Medical Biophysics, and guest speakers.
Conferences

Residents are encouraged to attend imaging conferences, both to be involved in presenting papers or posters and also for the benefit of knowledge and interaction with the imaging community at large. During the PGY3 year, each resident is given the opportunity to attend a major imaging conference with the provision of financial support. The resident is not required to present at the conference to receive this support but does prepare a report following the meeting to highlight what they gained in their attendance. In addition, residents presenting papers or posters at recognized meetings generally receive financial support through affiliations with hospital imaging departments.

Seminars and Half-Day Program

Wednesday afternoons from September to June have been the focus for the academic program. There is a formal two to three hour weekly clinical seminar for PGY1, PGY2 and PGY3 residents. Most seminars are organized around organ systems and imaging modalities. As well, there are special sessions for all resident years on non-clinical topics such as ethical and legal issues, practice management and career planning. Speakers from outside the Department add interest to the content of these featured sessions. A 10 hour review series is provided for PGY5 residents each spring in preparation for the ABR and Royal College examinations.

Research

Residents in Medical Imaging are required to have a good foundation of research methodology and critical appraisal in order to either critically evaluate scientific medical literature or pursue independent research activities. Principles and issues of health technology assessment, quality improvement and clinical audits are also core components of the clinical research curriculum. Dr. George Tomlinson, statistician, has recently joined the Department, and with the resident Research Committee under Dr. David Mikulis, is responsible for the design and delivery of the course curriculum, workshops, tutorials and lectures on these topics. Instruction in this curriculum is given throughout the Residency Program. In total, residents in Medical Imaging receive over 30 hours of course instruction.

Each resident is required to become involved in a research project beginning no later than the PGY3 year. All residents receive protected time to work on their project. The research is conducted in conjunction with one or more staff persons with a view to presenting the project during the PGY4 or PGY5 years at our Annual Research Day. The residents are encouraged to publish their results and to present them at national or international meetings.

Rounds

Teaching rounds, or small group conferences, are held at each of the core hospitals once or twice a day. University Division rounds are held for the entire department six to eight times annually at a central location.
**View Box Teaching**

Every resident in the PGY2 through to the PGY5 years receives daily teaching from faculty at the view box and in the procedure rooms. Teaching is based on the day’s cases, but may be supplemented with related cases from faculty teaching files. The amount of teaching varies from rotation to rotation but on average there are one to two hours of this type of one-to-one teaching daily. This program is widely recognized for the quality of teaching provided to residents. In addition, residents learn to teach others and are expected to teach students and observers in the Department.

**Journal Club**

This is organized by the residents and is held approximately five times annually.

**Visiting Professor Program**

This program of six lectures between October and April is organized by the CME Director of our department and is provided for all imaging specialists including community radiologists. Residents attend the lecture and reception. Visiting Professors from outside Toronto usually present resident teaching sessions at two or three of the teaching hospitals during their visits to Toronto.

**Organ Imaging Review Course**

This is a week-long, internationally recognized review course. It is given in September or October of each year. It is primarily intended as a CME course for practicing radiologists but also contains a wealth of valuable teaching material for residents. All residents are given some time off clinical services to attend, and can do so at no cost.

**Program Evaluation**

In addition to that carried out by the Radiologists-in-Chief and the teaching co-ordinators at each hospital, the residents complete an assessment of each rotation, and an annual assessment of the faculty’s teaching.

**Program Supervision**

This is the direct responsibility of the Program Director who is, in turn, responsible to the Departmental Chair and the Departmental Executive Committee. The Program Director is assisted by the Resident Training Committee, which is composed of a representative from each of the teaching hospitals, a PGY1 coordinator responsible for all PGY1 issues, as well as from Nuclear Medicine and the Research Committee. In addition, the University of Toronto Chief Resident in Medical Imaging and a resident representative from each year of training are full members of the committee.

There are Division Heads appointed for Cardiothoracic, Musculoskeletal, Abdominal, Pediatric, Vascular-Interventional, Breast Imaging and Neuroradiology. These Division Heads and the
Program Director for Nuclear Medicine are responsible for rotation goals and objectives, suggested reading lists and recommendations regarding the resident lectures and seminars. Division Heads advise the Program Director and Resident Training Committee.

Resident Evaluations

Evaluation consists of the following:

- An in-training evaluation completed following each rotation.
- A summary in-training evaluation at the end of each year of training.
- Results of the American College of Radiology multiple choice in-training examination, taken in the spring of each year.
- Results of a yearly oral examination based on the Royal College format (PGY2-5).
- Results of a written examination in physics following the PGY1 course.
- A practice OSCE examination in the spring of each year (PGY3-5).

Resident Awards

Outstanding residents are recognized by awards for clinical excellence, teaching and research.

1) Gordon Potts Award

This award of a commemorative plaque is made to the outstanding final-year resident, based on a combination of the following academic and personal strengths: Interpersonal skills, willingness to explore new methods and ideas, dedication to patient service and academic activities, intellectual capacity and publications in residency.
2000 – 2001 winner: Dr. Caitlin McGregor, PGY5

2) Resident Teacher-Mentor Award

This award will be made to a final year graduating resident, based on a combination of the following strengths and contributions: dedication to teaching, resident advocate and mentor, contribution to Resident Program and commitment to personal continuing educational growth.
2000 - 2001 winner: Dr. Mark Fruitman, PGY5

3) Research Awards

Each year a second-year resident is nominated to attend the RSNA/AUR/ARRS program entitled ‘Introduction to Research’. 2000 – 2001 winner: Dr. Tareng Sheth, PGY3
Each year residents as well as fellows are nominated to receive the RSNA Research Award for Research excellence within the University of Toronto Department of Medical Imaging.
2000 – 2001 winner: Dr. Jae Kim, PGY4
Summary

The University of Toronto training program in Medical Imaging is designed to provide the best possible training in all aspects of imaging. The program is an intensive one, with considerable emphasis on teaching, in addition to exposure to a huge volume of clinical pathology. The university-wide integration and rotational system ensures that each resident will have access to all of the strengths of our departments.
RESIDENTS

PGY1 Level

Susan Armstrong, MD
   University of Toronto, 2000
Debra Chang, MD
   University of Toronto, 2000
Marc Freeman, MD
   University of Toronto, 2000
Aaron Glickman, MD
   University of Western Ontario, 2000
Anish Kirpalani, MD
   McMaster University, 2000
Sarah Koles, MD
   University of Calgary, 2000
Vikash Prasad, MD
   Dalhousie University, 2000
Michael Stefanos, MD
   University of Toronto, 2000

PGY2 (R1) Level

Peter Ballyk, MD
   University of Toronto, 1999
Carrie Betel, MD
   University of Toronto, 1999
Anita Chae, MD
   University of Western Ontario, 1999
Zdenko Filakovic, MD
   Ontario International Medical Program, 1999
Angela Ho, MD
   University of Toronto, 1999
Zeinab Layton, MD
   University of Western Ontario, 1999
Selina Lem, MD
   Queen’s University, 1999
Bonnie O’Hayon, MD
   University of Toronto, 1999
Markian Shulakewych, MD
   University of Manitoba, 1994
Steven Singer, MD
   University of Ottawa, 1998
Sameh Tadros, MB, BCh
   Ontario International Medical Program, 1999
Lana Wilkinson, MD
   McMaster University, 1999
PGY3 (R2) Level

Frederick Lan, MD
    University of Toronto, 1998
Erika Mann, MD
    Queen’s University, 1998
Marc Ossip, MD
    University of Toronto, 1998
Jillian Pugh, MD
    Dalhousie University, 1998
Tarang Sheth, MD
    University of Toronto, 1998
Vincent Shin, MD
    University of Ottawa, 1998
Robert Yu, MD
    University of Toronto, 1998

PGY4 (R3) Level

Hilarie Broom, MD
    University of Ottawa, 1997
Elizabeth David, MD
    University of Toronto, 1997
David Jacobs, MD
    Queen’s University, 1996
Jae Koul Kim, MD
    University of Toronto, 1997
Teresa Loucks, MD
    University of Ottawa, 1997
Nikunj Patel, MD
    Queen’s University, 1997
Anoosh Sharif, MD
    University of Western Ontario, 1997
Nir Stanietzky, MD
    University of Ottawa, 1997

PGY5 (R4) Level

Gilbert Chow, MD
    Queen’s University, 1996
Mark Fruitman, MD
    University of Western Ontario, 1996
Christopher Guest, MD
    University of Toronto, 1996
James Haroun, MD
George Washington University, 1996
Soe Lwin Kyone, MD
   University of Toronto, 1996
Angela Luong, MD
   University of Toronto, 1996
Caitlin McGregor, MD
   University of Toronto, 1996
James Meindok, MD
   University of Toronto, 1996
Andrea Miller, MD
   McMaster University, 1996
Angeline Young, MD
   Dalhousie University, 1996
Eugene Yu, MD
   University of Toronto, 1996
NUCLEAR MEDICINE TRAINING PROGRAM

General Description

Nuclear medicine is a branch of medical practice primarily concerned with the use of unsealed radioactive sources in the study, diagnosis, and treatment of disease. Our program currently provides dual-certification in radiology and nuclear medicine. This is a six year (including PGY1) program with two years of subspecialty training in nuclear medicine (provided that the subspecialty training is taken following the completion of at least 18 months in Diagnostic Radiology, effective June 1, 1998).

The Nuclear Medicine Program provides formal instruction and training for both radiology and nuclear medicine residents. Formal lectures cover various aspects of nuclear medicine including cardiac and oncologic nuclear medicine, functional neuroimaging, radiopharmacy, nuclear physics, and general nuclear medicine. Residents have specific goals, objectives and reading lists during their rotation at one of the teaching hospitals. There are weekly or biweekly teaching rounds for both radiology and nuclear medicine residents at these hospitals. Also, there are city-wide nuclear medicine rounds held every Friday morning at the Hospital for Sick Children. The residents acquire skills by participating in daily clinical work. Didactic instruction is supplemented by teaching files at each hospital. In addition, there are monthly teaching rounds during the academic year at Mount Sinai Hospital. These rounds are given by internationally renowned guest speakers, who also present evening lectures on current topics in nuclear medicine at the Toronto Nuclear Medicine Society Meeting.

The Nuclear Medicine Program is actively involved in clinical and basic science research including functional neuroimaging with SPECT and PET, cardiac, oncologic, and pediatric nuclear medicine, and radiochemistry. Residents are encouraged to participate in these research activities.

General Objectives

The goal of the nuclear medicine resident is to be able to function independently as a medical specialist with the ability to advise on, supervise, perform, and interpret all diagnostic procedures, and to achieve a level of competence in the performance of radiotherapy with unsealed radioactive sources so as to act as a consultant to referring physicians. The resident must acquire excellent communication and technical skills, and the knowledge and professionalism appropriate to a lifetime career in nuclear medicine.

Dual Radiology and Nuclear Medicine Residency

Applicants will be considered from candidates who are already in the Diagnostic Radiology Training Program at the University of Toronto, usually, one slot per year is reserved for the dual certification program.
RADIOLOGY SCIENTIST TRAINING PROGRAM

Objectives

The purpose of the Radiological Scientist Training Program (RSTP) is to provide a small group of radiology residents with the opportunity to develop skills important to the pursuit of independent research. These skills encompass research methodology, publications, grant writing, and presentations. The research training is intended to complement the excellent clinical training for which the Department of Medical Imaging is already recognized.

Organization

The RSTP is a six-year program with two years of research and four years of clinical training. The Royal College of Physicians and Surgeons of Canada will accept one year of research towards fulfilling the requirements of the five year program in diagnostic radiology. The RSTP is able to accommodate as many as two residents per year. The first two years of the RSTP are identical to the regular radiology training program. The difference is in the PGY3 and PGY4 years which, in the RSTP, are entirely devoted to research. Research opportunities are available in many departments relevant to radiology. Under certain circumstances, residents in the RSTP may pursue a M.Sc. or Ph.D. degree. The final two years, PGY5 and PGY6, are designated for clinical training to fulfill the requirements of the Royal College of Physicians and Surgeons of Canada.

Eligibility and Application Procedure

Applications will be considered from candidates already accepted into the regular radiology training program and will occur during the PGY2 training year. A maximum of two places per year will be reserved for residents in the RSTP. Applicants need not have prior experience in research or a special background, but are expected to be self-motivated.

Remuneration

Residents in the RSTP will be remunerated commensurate with residents in the regular radiology training program, up to a maximum of the PGY5 level.

Selection of Research Project and Supervisor

Residents in the RSTP should select a project and a supervisor as soon as possible, and before the PGY3 year. The Director of Research and the Chair of the department can offer assistance with this selection. A supervisor may be selected from various University of Toronto departments, including Medical Imaging, Medical Biophysics, Anatomy, Physiology, Biochemistry, Computer Science, Clinical Epidemiology, or Electrical Engineering, specifically the Institute of Biomedical Engineering. The supervisor must have operating funds to support the research, but is not expected to provide remuneration for the resident. Candidates will be strongly encouraged also to apply for a fellowship from an agency such as the Medical Research Council or similar.
Council, but acceptance into the RSTP will not be conditional upon success in obtaining such a fellowship.

**Graduate Degrees**

Residents in the RSTP are encouraged to pursue a graduate degree. The procedure depends somewhat on the department in which the research is to be conducted, but requires a separate application to that department and the School of Graduate Studies or Institute of Medical Sciences. Residents are responsible for fulfilling all requirements of the department in which they are registered as graduate students.

**Clinical Responsibilities**

During the two years of research training, residents in the RSTP will have minimal clinical responsibilities, probably limited to one on-call evening/night per week. In addition, residents in the RSTP are encouraged to maintain contact with clinical activities through attendance at select departmental rounds and teaching sessions. Such attendance will not be compulsory for RSTP residents in the two research years, as it is for residents in the regular training program.
OBJECTIVES OF TRAINING & SPECIALTY TRAINING
REQUIREMENTS IN DIAGNOSTIC RADIOLOGY

Definition

Diagnostic Radiology is a branch of medical practice concerned with the use of imaging techniques in the study, diagnosis and treatment of disease.

General Objectives

On completion of the educational program, the graduate physician will be competent to function as a consultant in Diagnostic Radiology. This requires the physician to have the ability to supervise, advise on and perform imaging procedures to such a level of competence, and across a broad range of medical practice, as to function as a consultant to referring family physicians and specialists.

Communication skills, knowledge, and technical skills are the three pillars on which a radiological career is built, and all are dependent on the acquisition of an attitude to the practice of medicine which recognizes both the need to establish a habit of continuous learning and a recognition of the importance of promoting a team approach to the provision of imaging services.

Residents must demonstrate the knowledge, skills and attitudes relating to gender, culture and ethnicity pertinent to Diagnostic Radiology. In addition, all residents must demonstrate an ability to incorporate gender, cultural and ethnic perspectives in research methodology, data presentation and analysis.

Specific Objectives

At the completion of training, residents will have achieved the following competencies so as to function effectively as:

i) Medical Expert/Clinical Decision-Maker

General Requirements

- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- Access and apply relevant information to clinical practice so as to have competence in clinical radiological skills.
- Demonstrate effective consultation services with respect to patient care, education and legal options.

Specific Requirements

- Understand the nature of formation of all types of radiological images, including physical and technical aspects, patient positioning, contrast media.
- Knowledge of the theoretical, practical and legal aspects of radiation protection, including other imaging techniques and their possible harmful effects.
• Knowledge of human anatomy at all ages, both conventional and multi-planar, with emphasis on radiological applications.
• Knowledge of all aspects of clinical radiology, including understanding of disease, appropriate application of imaging to patients, importance of informed consent, complications such as contrast media reactions, and factors affecting interpretation and differential diagnosis.
• Understand the fundamentals of quality assurance in radiology.
• Understand the fundamentals of epidemiology, biostatistics and decision analysis.
• Show competence in manual and procedural skills and in diagnostic and interpretive skills.
• Demonstrate the ability to manage the patient independently during a procedure, in close association with a specialist or other physician who has referred the patient. The radiologist should know when the patient’s best interests are served by discontinuing a procedure, or referring the patient to another physician.
• Understand the acceptable and expected results of investigations and or interventional therapy as well as unacceptable and unexpected results. This must include knowledge of and ability to manage radiological complications effectively.
• Understand the appropriate follow-up care of patients who have received investigations and/or interventional therapy.
• Show understanding of a sound and systematic style of reporting.
• Competence in effective consultation, conduct of clinico-radiological conferences, and the ability to present scholarly material and lead case discussions.

ii) Communicator

• Establish appropriate therapeutic relationships with patients/families.
• Listen effectively.
• Obtain the appropriate information during consultation with referring physicians in order to be able to make recommendations regarding the most appropriate testing and/or management of patients.
• Discuss appropriate information with patients/families and the health care team, and be able to obtain informed consent for tests and procedures when this is needed.

Specific Requirements

• Have the ability to produce a radiological report which will describe the imaging findings, most likely differential diagnosis, and when indicated, recommend further testing and/or management.
• Understand the importance of communication with referring physicians, including an understanding of when the results of an investigation or procedure should be urgently communicated.
• Communicate effectively with patients and their families and have a compassionate interest in them.
Recognize the physical and psychological needs of the patient and their families undergoing radiological investigations and/or treatment, including the needs of culture, race and gender.

iii) Collaborator

General Requirements
- Consult effectively with other physicians and health care professionals.
- Contribute effectively to other interdisciplinary team activities.

Specific Requirements
- Have the ability to function as a member of a multi-disciplinary health care team in the optimal practice of radiology.

iv) Manager

- Utilize resources effectively to balance patient care, learning needs, and other activities.
- Allocate finite health care resources wisely.
- Work effectively and efficiently in a health care organization.
- Utilize information technology to optimize patient care, life-long learning and other activities.

Specific Requirements
- Be competent in conducting or supervising quality assurance including an understanding of safety issues and economic considerations.
- Be competent in computer science as it pertains to the practice of radiology.

v) Health Advocate

General Requirements
- Identify the important determinants of health affecting patients.
- Contribute effectively to improve the health of patients and communities.
- Recognize and respond to those issues where advocacy is appropriate.

Specific Requirements
- Understand and communicate the benefits and risks of radiological investigation and treatment including population screening.
- Recognize when radiological investigation or treatment would be detrimental to the health of a patient.
- Educate and advise on the use and misuse of radiological imaging.

vi) Scholar

General Requirements
- Develop, implement and monitor a personal continuing education strategy.
- Critically appraise sources of medical information.
- Facilitate learning of patients, house staff/students and other health professionals.
- Contribute to development of new knowledge.
Specific Requirements

- Competence in evaluation of the medical literature.
- The ability to be an effective teacher of radiology to medical students, residents, technologists and clinical colleagues.
- The ability to conduct a radiology research project, which may include quality assurance.
- Appreciation of the important role that basic and clinical research plays in the critical analysis of current scientific developments related to radiology.

vii) Professional

General Requirements

- Deliver highest quality care with integrity, honesty and compassion.
- Exhibit appropriate personal and interpersonal professional behaviours.
- Practice medicine ethically consistent with the obligations of a physician respecting the needs of culture, race and gender.

Specific Requirements

- Be able to accurately assess one’s own performance, strengths and weaknesses.
- Understand the ethical and medical-legal requirements of radiologists.

Training in Canada

The foregoing represents the general and specific objectives that all candidates for the Royal College examinations in Diagnostic Radiology are expected to meet. For those training in Canadian programs, these objectives will be accomplished in a staged manner. Residents in Canadian programs may obtain the document describing this approach from their program directors.
SPECIALTY TRAINING REQUIREMENTS IN DIAGNOSTIC RADIOLOGY

These specialty training requirements apply to those who began training on or after 1 June 1997.

The five years of approved training require, at first, a closely supervised practice, with the opportunity for increasing responsibility in the final years, so that the resident near the end of training can function as a general radiology consultant, requesting help from staff radiologists when necessary. The residency may be followed by one or more years of fellowship training in a subspecialty discipline, as the residence training is not intended to provide a subspecialty level of expertise.

This period must include:

1) one year of basic clinical training.
The purpose of this year is to give the resident a degree of independent responsibility for clinical decisions; an opportunity for further development of the skills required in making effective relationships with patients; the consolidation of competence in primary clinical and technical skills across a broad range of medical practice; and an understanding of the nature of the relationship between a referring physician and a clinical radiological consultant.

2a) three years of approved resident training in “general diagnostic imaging”, this must include:
Respiratory, cardiovascular, gastro-intestinal and biliary, genitourinary, musculoskeletal, mammography, neurological and pediatric radiology, as well as the following modalities: fluoroscopy, ultrasound, CT and MR imaging.
Because of the varying training programs in the recognized university training centres, these 36 months may be allocated as block periods of at least three months or their equivalents.

2b) one year of approved residency that may consist of one to twelve month periods in any of the following, as long as these are appropriately integrated by the Residency Training Committee.

- further training in diagnostic radiology
- diagnostic ultrasound
- CT
- MR
- nuclear medicine
- cardiac and/or vascular radiology
- interventional radiology
- neuroradiology
- pediatric radiology
- pathology or other clinical specialty relevant to the practice of radiology (for up to three months)
• a full-time research project, relevant to diagnostic imaging, and acceptable to the program director and the Credentials Committee.

**NOTE:** In view of the amount and variety of radiology to be covered and the skills required at the time of the final examination, it will seldom be appropriate to spend the entire 12 months of the fifth year in any one of these areas.
RESIDENT RESEARCH PROGRAM

While training in clinical radiology remains the main focus of the residency, research is considered to be of paramount importance as well. It is essential that residents gain experience in as many aspects of research as possible, including searching the literature, data analysis and manuscript preparation. A resident cannot know if he/she would enjoy an academic career without firsthand experience. The feeling of satisfaction that accompanies completion of a project, and contribution of information to the medical/scientific literature, can only be appreciated if personally experienced.

The Research Program consists of three aspects; a seminar series, resident support, and a formal presentation day.

Seminar Series

Residents in Medical Imaging are required to have a good foundation of research methodology and critical appraisal in order to either critically evaluate scientific medical literature or pursue independent research activities. Principles and issues of health technology assessment, quality improvement and clinical audits are also core components of the clinical research curriculum. Workshops, tutorials, and lectures on these topics are organized by the department’s epidemiologist who is responsible for the design and delivery of the course curriculum. Attendance at these sessions is compulsory and instruction of this curriculum is given throughout the Residency Program.

Support

Department faculty are asked to submit research topics from which residents may choose a project, which he or she finds interesting. The residents are given the opportunity to create their own topic or to choose one from this faculty-generated list. Residents are freed from clinical responsibilities for their work. Each resident presents a short, informal outline of the intended project to the Resident Research Committee in November of their PGY3 year so that project feasibility can be assessed before too much time has been devoted to it. Helpful suggestions are offered by Committee Members. Data collection for the project begins in January of the PGY3 year and extends to December of the same year. During June, the residents present an interim report, again informal, to the Committee, to confirm that data collection has begun and is progressing satisfactorily. In November/December the residents present a third informal discussion for assessment of project status and to determine if an abstract can be generated for submission to a national/international meeting. It is at this time that the Committee determines if the project is satisfactory. Incomplete studies may be considered satisfactory depending on the circumstances described by the resident. Finally, the study is presented formally in the following Spring at the Annual Research Day.
Presentation Day

Our 13th annual Department of Medical Imaging Research Day held at the Sadowski Auditorium, 18th Floor of the Mount Sinai Hospital on April 19, 2001 was the venue for excellent resident research presentations. Support for the event was provided by Nycomed Amersham (Canada) Inc. The presentations included:

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>James Haroun (resident)</td>
<td>The Role of Routine MRI of the Brain in Evaluating the Safety of Carotid Artery Stenting</td>
</tr>
<tr>
<td>2</td>
<td>Jae Kim (resident)</td>
<td>Cardiac-Gated High Spatial Resolution 3D Gd-MRA Technique for the Carotid Arteries</td>
</tr>
<tr>
<td>3</td>
<td>Nir Stanetzky (resident)</td>
<td>Imaging of Maxillofacial Fractures by Helical CT</td>
</tr>
<tr>
<td>4</td>
<td>Hilarie Broom (resident)</td>
<td>Reuse of Transjugular Liver Biopsy Instruments: Does Sterilization Eliminate the Hepatitis Virus?</td>
</tr>
<tr>
<td>5</td>
<td>Soe Lwin Kyone (resident)</td>
<td>Relationship of an Angiographically Based Vascular Index to Uterine Fibroid Size and Response to Uterine Arterial Embolization</td>
</tr>
<tr>
<td>6</td>
<td>Elizabeth David (resident)</td>
<td>Level of Training and its Impact on Resident Interpretation of On Call Abdominal Trauma CTs: A Quality Assurance Study – Preliminary Results from S &amp; WCHSC</td>
</tr>
<tr>
<td>7</td>
<td>Anoosh Sharif (resident)</td>
<td>The Friday Syndrome: Fact or Fiction?</td>
</tr>
<tr>
<td>8</td>
<td>Gilbert Chow (resident)</td>
<td>Ultrasonographic Evaluation of Fetal Anatomy: Is There a Difference Between 16, 18, and 20 Weeks?</td>
</tr>
<tr>
<td>9</td>
<td>David Jacobs (resident)</td>
<td>Predicting the Response of Liver Metastases to Chemotherapy using MRI Perfusion</td>
</tr>
<tr>
<td>10</td>
<td>Teresa Loucks (resident)</td>
<td>Radiographic Progression following Bulk Osteochondral Allograft to the Knee: Normal Incorporation and Evidence of Complications</td>
</tr>
</tbody>
</table>

While presentation at this meeting is an end unto itself, many of the projects have since been presented at national and international meetings and have been published in peer-reviewed journals. Since the research program was instituted, 56 of the resident’s projects have appeared in peer-reviewed journals. Of those not published, many have been presented either orally or as a poster at national/international meetings.

Resident Research Awards

The faculty have observed that the research performed and presented by the residents was of high quality. Some of the residents have received awards recognizing outstanding research, therefore independently confirming the faculty’s impressions. The following is a list of such rewards obtained by the residents in the 2000-2001 academic year:

Jae Kim
RSNA Resident/Fellow Research Award June 2001.
FELLOWSHIP PROGRAM

With access to several thousand inpatient beds, the affiliated hospitals of the University of Toronto form one of the largest teaching facilities in the world, thereby serving as an ideal setting for advanced subspecialty training in Medical Imaging. The program has national and international stature both clinically and in research, and attracts fellows from around the world.

In 2000-2001 the seven divisions of the University of Toronto Department of Medical Imaging offered a comprehensive array of fellowships:

- Abdominal Imaging
- Cross-sectional Imaging
- Breast Imaging
- Women's Imaging
- Magnetic Resonance Imaging
- Musculoskeletal Imaging
- Neuroradiology
- Pediatric Imaging
- Thoracic Imaging
- Vascular/Interventional Radiology
- Research

The flexibility of the program permits tailoring of the fellowship experience to accommodate most needs. Research is encouraged as an integral component of the fellowship program and to this end protected research time is available to all Medical Imaging fellows.

2000–2001 Department of Medical Imaging Fellows

Abdominal Imaging Fellows

- Giovanni Artho
- Marianne Amitai
- Ofer Benjaminov
- Petrina Causer
- Tanya Chawla
- Vicky Goh
- Elaine O’Riordan
- Max Ryan
- Ben Taylor

Cross-sectional Imaging Fellows

- Peter Law
- Weldon Liu
- Susan Ward

Breast Imaging Fellow

- Viviane Massad
Women's Imaging Fellows
  . Supriya Kulkarni
  . Miriam Sklair-Levy
  . Eulla Tu

Musculoskeletal Imaging Fellows
  . David Elias
  . Kathrin Hammer
  . David Simpson

Vascular/Interventional Radiology Fellows
  . Raymond Chan
  . Paul Hagen
  . Robert Lim
  . Maurice Voss

Thoracic Imaging Fellow
  . TaeBong Chung

Neuroradiology (diagnostic) Fellows
  . Justin Cross
  . Chee-Yan Hiew
  . Cheemun Lum
  . Manu Shroff

Neuroradiology (interventional) Fellow
  . Seon-Kyu Lee

Magnetic Resonance Imaging Fellow
  . Andreas von Ritschl

Pediatric Imaging Fellows
  . Walid Abou Reslan
  . Pedro Albuquerque
  . Andrea Doria
  . Ricardo Faingold
  . David Koff
  . Lisa Raviv-Zilka
  . Ricardo Restrepo
  . Bradley Wood
  . Jeffrey Traubici
  . Conor Murray
  . Leslie MacPherson
UNDERGRADUATE PROGRAM

Year I

Anatomy – Radiology Seminars

A large number of staff from all the teaching hospitals delivered a total of 72 hours of seminars again this year. Anatomy-radiology seminar sessions included: the thorax, abdomen, lumbar spine, pelvis and urinary tract, leg, arm and head and neck. The seminars are conducted in the Medical Sciences Building, Department of Anatomy.

Imaging Exhibit

A multi-panel multi-imaging exhibit concentrating on chest and cardiac imaging was set up and displayed to the first year students during the initial six weeks of their anatomy course. This display is stationed in the Anatomy museum at the Medical Science Building, and emphasizes multidisciplinary imaging, the algorithmic approach to imaging, as well as the economic aspects of modern imaging. Modern modalities such as CT, MRI and nuclear medical studies are included.

PBL Tutor: Foundations of Medical Practice Course

Drs. Jane Wall, Wayne Deitel and Danny Marcuzzi provided 102 hours of teaching time as tutors, plus an additional 55 hours of preparation for this course.

Year II

Teaching

Year II teaching generally centers around the two main programs in the Year II curriculum: The Pathobiology of Disease (the first half of the year), and The Foundations of Medical Practice (the second half of the year).

The Pathobiology of Disease Course

The aim of our department is to develop the material and teaching methods that would be appropriate for delivery for this PBL oriented curriculum.

Pathobiology-Imaging Viewer

A series of images with annotations is exhibited on a viewer opposite the main lecture theatre at the Medical Science Building. The content of this series roughly parallels and/or emphasizes the imaging aspects of the material given in the Pathobiology of Disease course.
Full Class Lectures: Chest Imaging

A full class lecture is given by Dr. S. Herman at the beginning of the Pathobiology of Disease Course. It includes anatomy, physiology, pathophysiology of the lungs and of lung disease, along with numerous imaging examples of common lung diseases.

Foundation of Medical Practice Course

This course has major radiologic input. At least seven Medical Imaging Packages have been assembled by various radiologists for use in the Foundations course. These packages serve to instruct both the PBL tutors and their students, and serve as the basis for small group discussions which are centered at each of the Academy radiology departments.

Year II Seminars:

Chest Seminars

A number of Chest seminars, generated as part of the Year II Foundations course “Respiratory Week” were given at the various teaching hospitals. Up to 10 radiologists served as seminar leaders, with a total teaching time of about 20 hours.

Pathology Imaging Exhibits

This series of exhibits demonstrates common radiologic pathology, and serves to emphasize and give examples of the kinds of diseases and processes discussed during the Year II of the new curriculum. Initially designed for the old curriculum, this material compliments the Year II students’ learning experience, and has proved very useful to Year I as well as Years III and IV medical students.

Radiology Case of the Week

Unknown cases are periodically put up on a viewer in the medical student lounge adjacent to the main lecture theatre. These cases parallel areas of pathology and organ system teaching that is currently being presented to the students. These cases offer the student the opportunity to correlate their knowledge of anatomy, physiology and pathology with diagnostic imaging.

Year III

Elective Students

A significant number of third year medical students at the University of Toronto took electives in radiology at the various teaching hospitals during the 2000-2001 Academic year.
**Hospital Based Seminars**

As part of the new curriculum, various Year III seminars have been held in the teaching hospitals as part of their Medicine - Surgery block rotation. These include a series of chest seminars, as well as neuroradiology seminars.

**Year IV**

**University of Toronto Electives**

Sixty eight University of Toronto students took an elective in their clerkship year in radiology at the various teaching hospitals during the 2000-2001 academic year.

**Visiting Elective Students**

Forty non-University of Toronto students, many of these overseas foreign students in their senior undergraduate year, took part in visiting electives during the 2000–2001 academic year.

**Total Undergraduate Elective Students**

More than one hundred and ten elective students were taught by the Department of Medical Imaging in this academic year.

**Hospital Seminars**

Although somewhat informal, and arranged on a teaching hospital rather than on a university level, a number of senior student seminars are given at the various teaching hospitals. These generally are based on organ system coverage of disease, or coverage of the imaging aspects of cardinal signs and symptoms.

An example of such programs are ones given at St. Michael’s hospital to the clinical clerks on the Principles of Chest Radiology. This consists of a series of six one-and one-half hour sessions given by Dr. W.J. Weiser and Dr. A. Zalev. Similar series of Chest Seminars are given to the residents and elective students on the Respirology service and the Anaesthesiology service during the academic year.

**The Bruce Tovee LMCC Review Lectures**

The Undergraduate Committee in radiology has been involved in this review course for some years now. Three hours of radiology review lectures are given to final year medical students. The majority of these are University of Toronto students. However, the review course has been very well received and final year students from McMaster and other local medical schools routinely attend. The program is carried out in the evening at the main lecture theatre of the University. The radiologic content includes:
i) Musculoskeletal radiology  
ii) Chest radiology  
iii) Gastrointestinal radiology  

This program was organized by Dr. David Salonen, with Dr. Greg Olscamp, Dr. Daniel Rappaport, and Dr. David Salonen delivering these lectures.

The final year students have had access to a series of notes, the MCCQE Study Guide. This lecture series and syllabus are updated and revised annually under the direction of Dr. David Salonen.

Other Teaching Activities and Involvement

Physiotherapy Student Seminars

A series of seminars is given to the physical therapy students at the University of Toronto. Dr. William J. Weiser gives a series on Chest Radiology at the Fitzgerald Academy. At the Wightman Academy, Dr. David Salonen gives a series on Musculoskeletal Imaging and Dr. Walter Montanera a series on Imaging of the Spine.

Career Sampling Electives in Radiology

On a somewhat informal basis, undergraduate students, many in Year I, have spent various periods of time, from several days to weeks, in all of the teaching hospital radiology departments as part of a career sampling experience.

Undergraduate Teaching Computer File for Radiology

A comprehensive interactive computerized teaching program, called Radiofile has been developed by the Department of Medical Imaging. This program allows undergraduate students to have a uniform exposure to core medical imaging teaching material. The students can access this program either in the various radiology departments, or in the Academy computer laboratories. The program is available centrally, in the computer laboratory in the Medical Sciences Building.

Other Undergraduate Computer Learning Projects

Many computerized learning projects are underway in the Department of Medical Imaging.

An authoring module had been developed, which allows the easy and rapid preparation of computer based teaching programs for use by our students for self directed learning.

Collaboration is underway in the preparation of a central teaching case registry. This database will be developed and made available via networking and telecommunication to all the Academy
radiology departments. Such a core radiology database will further ensure the uniform exposure of core teaching material to our students.

**The Internet and Undergraduate Education in Radiology**

The Department of Medical Imaging has a web site on the internet, and various program descriptions are posted there. Considerable interest has been expressed to demonstrate some of the Department of Medical Imaging teaching programs on the internet and to promote the Department of Medical Imaging and computer assisted learning at the University of Toronto.

This Radiology Teaching site has several cases at present demonstrating basic medical imaging and interesting case material. It is primarily aimed at radiology residents and senior medical students. It will be developed on a continuing basis.

**The Future Direction of the Medical Imaging Undergraduate Teaching Program**

Efforts are currently under way to standardize the major components of the undergraduate medical imaging teaching program through the development and implementation of standardized curriculum and electronic teaching tools. This approach will be ongoing and promises to further optimize the efficiency, scope and value of the undergraduate teaching program in Medical Imaging.
CONTINUING EDUCATION PROGRAM

Organ Imaging Review
September 10–14, 2000

Course Description

This four day course focuses on aspects of primary interest to both radiologists and radiologists-in-training. The course content includes general concepts of diagnostic imaging with emphasis on recent advances. The participant learns new ideas and has the opportunity to enhance their knowledge in selected common clinical situations. The participant is also able to participate in problem-solving with daily case reviews in each of the organ systems.

Course Chairman: Walter Kucharczyk, M.D.
Course Director: Daniel Rappaport, M.D.

University of Toronto Faculty

Armstrong, Derek, M.B., B.S. Assistant Professor
Asch, Murray, M.D., Assistant Professor
Atri, Mostafa, M.D. Associate Professor
Becker, Edna J., M.D., Associate Professor
Bukhanov, Karina, M.D., Assistant Professor
Christakis, Monique, M.D., Assistant Professor
Clark, John, M.D., Assistant Professor
Common, Andrew, M.D., Assistant Professor
Crossin, Jane, M.B., BCh, Clinical Fellow
Daneman, Alan, M.B., BCh., Professor
Farb, Richard, M.D., Assistant Professor
Ginzburg, Brian, M.B., BCh., Assistant Professor
Glanc, Phyllis, M.D., Assistant Professor
Herman, Stephen J., M.D., Associate Professor
Jong, Roberta, M.D., Assistant Professor
Kachura, John, M.D., Assistant Professor
Kucharczyk, Walter, M.D., Professor and Chairman
Manson, David, M.D., Assistant Professor
Merchant, Naeem, M.D., Assistant Professor
Mikulis, David, M.D., Associate Professor
Moore, Lori, M.D., Lecturer
Muradali, Derek, M.D., Assistant Professor
Murphy, John, M.D., Assistant Professor
Noël de Tilly, Lyne, M.D., Assistant Professor
Pearce, Dawn, M.D., Lecturer
Pugash, Robyn, M.D., Assistant Professor
Ranson, Marilyn, M.D., Assistant Professor
Rappaport, Daniel, M.D., Associate Professor
Rubenstein, Joel, M.D., Associate Professor
Saibil, Eric, M.D., Assistant Professor
Salem, Shia, M.D., Associate Professor
Salonen, David, M.D., Assistant Professor
Samuels, Taube, M.D., Assistant Professor
Shumak, Rene, M.D., Assistant Professor
Simons, Martin, M.D., Assistant Professor
TerBrugge, Karel, M.D., Professor
Toi, Ants, M.D., Associate Professor
Weiser, William, M.D., Professor
White, Lawrence, M.D., Assistant Professor
Willinsky, Robert, M.D., Professor
Wilson, Christine, M.D., Assistant Professor
Wilson, Stephanie R., M.D., Professor
Wright, Barbara, M.D., Assistant Professor
Yoo, Shi-Joon, M.D., Ph.D., Professor

Invited Clinical Speakers

Burns, Peter, PhD
Professor
Department of Medical Biophysics

Geerts, William H., M.D.
Associate Professor
Division of Respiratory Diseases
Department of Medicine

Wright, Graham, PhD.
Associate Professor
Department of Medical Biophysics

Guest Faculty

McAdams, H. Page, M.D.
Associate Professor
Department of Diagnostic Radiology
Duke University Medical Center
Durham, North Carolina
7th Annual Interventional/Vascular Radiology Course
October 26-28, 2000

Course Description

This live video course is designed for practicing interventionalists, as well as for residents and fellows pursuing a career in angiography and interventional radiology. The emphasis is on learning by observing live cases and through informal discussion, with limited formal didactic material. Technologists and nurses working in intervention will also benefit from the excellent audiovisual presentation and the informal nature of the discussion.

Course Director: Andrew Common, M.D.
Co-Director: Robyn Pugash, M.D.

Faculty

Asch, Murray, M.D., Assistant Professor
Bell, Stuart, M.D., Assistant Professor
Benko, Andrew, M.D., Assistant Professor
Chisolm, Robert, M.D., Associate Professor
Clark, John, M.D., Assistant Professor
Gray, Bruce, M.D., Assistant Professor
Ho, C.S., M.D., Professor
Jaffer, Nasir, M.D., Associate Professor
Kachura, John, M.D., Assistant Professor
Lossing, Alan, M.D., Associate Professor
Marcuzzi, Danny, M.D., Assistant Professor
Montanera, Walter, M.D., Associate Professor
Noël de Tilly, Lyne, M.D., Assistant Professor
Saibil, Eric, M.D., Assistant Professor
Simons, Martin, M.D., Assistant Professor
Sniderman, Kenneth, M.D., Associate Professor
Strauss, Bradley, M.D., Associate Professor
Stroz, Peter, M.D., Lecturer

Guest Speakers

David W. Hunter, M.D.
Director of Cardiovascular & Interventional Radiology
Fairview University Medical Center
Minneapolis, Minnesota
Mahmood K. Razavi, M.D.
Director of Fellowship Program
Cardiovascular & Interventional Radiology
Stanford University Medical Center
Stanford, California

Lawrence A. Stein, M.D.
Division Head of Vascular &
Interventional Radiology
McGill University Health Centres
Montreal, Quebec
October 16-18, 2000  
Dr. David A. Lynch  
Department of Radiology  
University of Colorado Health Sciences Center  

“Idiopathic Interstitial Pneumonias: Classification and CT Features”  
“High Resolution CT of Diffuse Lung Disease: Value and Limitations”  
“Lung Disease Associated with Collagen Vascular Disease”  

November 6, 2000  
Dr. Lynne S. Steinbach  
Department of Radiology  
University of California at San Francisco  

“MRI of the Knee Excluding Menisci”  
“MRI of the Shoulder: Instability and SLAP Lesions”  
“MRI of the Ankle: Tendons and Ligaments”  

January 8-9, 2001  
Dr. Peter F. Hahn  
Department of Radiology  
Massachusetts General Hospital  

“Imaging of Abdominal Infection”  
“Upper Abdominal MRI: Looking Beyond the Liver”  
“MR and CT of Colorectal Carcinoma”
February 5-6, 2001  
Dr. James Barkovich  
Chief of Pediatric Neuroradiology  
University of California at San Francisco  

“Imaging of Hypoxic and Ischemic Injuries in Neonates and Children”

“Imaging of Pediatric Epilepsy”  
Derek Harwood-Nash Annual Lecture in Neuroradiology

“Neuroimaging of the Phakomatoses”

March 5-6, 2001  
Dr. A. Thomas Stavros  
Department of Radiology  
University of Colorado School of Medicine

“The Fundamentals of Breast Ultrasound”

“Sonographic Characterization of Solid Breast Nodules”

“Sonographic Evaluation of Complex Breast Cysts”

April 30-May 1, 2001  
Dr. Murray Dalinka  
Department of Radiology  
University of Pennsylvania School of Medicine

“MR of the Ankle”

“MR of the Hips”

“MR of the Lumbar Spine”
JOURNAL CLUB

October, 2000

MRI of the breast

December, 2000

Aortic stent grafts

February, 2001

Screening for HCC, US, CT MRI