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CHAIR’S REPORT

This past year witnessed several positive developments, most notably in the continued success of our departmental faculty in major research awards competitions, and in large scale medical imaging infrastructure expansion at all of our teaching hospitals. These positive developments were tempered by the problem of continuing faculty manpower shortages. While manpower poses significant problems for us, we may count ourselves lucky in view of the dire shortages facing our colleagues elsewhere in Canada and the United States. There is no immediate solution in sight, but I can foresee an expansion in the number of our training positions, and new federal and provincial policies that will facilitate the recruitment of qualified faculty from outside our borders.

Our departmental teaching awards this year were: Dr. Nasir Jaffer was presented with the Edward L. Lansdown Award for Outstanding Teaching in the Residency Program. Dr. Edna Becker, Dr. Dae-Gyun Chung, Dr. Perry Cooper, Dr. Lisa Ehrlich, Dr. Nasir Jaffer, Dr. Walter Montanera, Dr. Derek Muradali, Dr. Taube Samuels, Dr. William Weiser, and Dr. Tara Williams were recognized for outstanding teaching in the residency program; Dr. Mostafa Atri, Dr. Paul Babyn, Dr. Masoom Haider, Dr. Paul Hamilton, Dr. C.S. Ho, Dr. Andrew Lata, Dr. Martin O’Malley, Dr. Kenneth Sniderman, Dr. Gordon Weisbrod, Dr. Lawrence White, and Dr. Stephanie Wilson were recognized for outstanding teaching in the fellowship program; and Dr. Alan Daneman, Dr. Anthony Hanbidge, Dr. Suzanne Laughlin, Dr. Lyne Noël de Tilly, and Dr. Daniel Rappaport achieved distinction for outstanding teaching in both the residency and fellowship programs.

Again this year, many of our faculty devoted substantial portions of their professional time to major research endeavours. These were: Dr. Andrew Common (Uterine Artery Embolization for Symptomatic Fibroids: Initial Results of a Multicentre Trial), Dr. Richard Farb (Evaluation of Intracerebral Arterial Venous Malformations Using a First Pass Gadodiomide Enhanced MR Angiographic Technique), Dr. Masanori Ichise (SPECT/PET Imaging of Dopamine Transporters In Healthy Humans and Patients with Parkinson’s Disease), Dr. Naeem Merchant (MRA of peripheral vascular disease), Dr. Derek Muradali (Echogenic Ovarian Foci, Phase II: Physical Basis in Normal Ovaries, Clinical Significance in Ovarian Masses), Dr. Marilyn Ranson (Detection of Steroid Induced Changes in Bone Marrow Fat Content and Perfusion Using MRI), Dr. Lawrence White (MR Imaging in the Evaluation of the Post Operative Meniscus), Dr. Tara Williams (Comparison of Total Body Echo-Planar Imaging vs. Conventional Methods in the Staging of Neoplasms Especially Neuroblastoma).

The academic promotions this year were Dr. William Weiser and Dr. Michael Wood to Full Professor effective July 1, 2000, and Dr. Timothy Dowdell and Dr. Marilyn Ranson to Assistant Professor effective December 1, 1999.

We welcomed several new faculty to our department: Dr. Nimu Ganguli (Sunnybrook & Women’s College Health Sciences Centre), Dr. Kevin Ibach (University Health Network-Mount Sinai Hospital), Dr. Korosh Khalili (University Health Network-Mount Sinai Hospital), Dr. Matthew Lax (University Health Network-Mount Sinai Hospital), Dr. Dawn Pearce (University Health Network-Mount Sinai Hospital), Dr. Dheeraj Rajan (University Health Network-Mount Sinai Hospital), and Dr. Michael Temple (Hospital for Sick Children).
The reader may notice that the format of this year’s report has been changed. No longer are there separate listings of the faculty and their scholarly accomplishments subdivided by affiliated hospital; the faculty are simply listed alphabetically. This year we will upload our entire report to our Web Page at www.utoronto.ca/imaging/ and provide links to each of the affiliated hospitals. This will provide current and readily accessible information about our entire department for anyone with Web access, and provide the Radiologists-in-Chief at each institution with a mechanism for highlighting their departments. These links may be found at www.utoronto.ca/imaging/hospital.htm.

Once again, I am very grateful for the wonderful help of the FitzGerald building office staff. My thanks to Gina Sciortino, administrative officer, and Amy Shea, administrative assistant and departmental secretary.

Walter Kucharczyk
Professor and Chair

December 14, 2000
DEPARTMENT OF MEDICAL IMAGING - UNIVERSITY OF TORONTO

Chair ......................................................................................................................... Kucharczyk, W.
Associate Chair ........................................................................................................ Daneman, A.

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 ............................................................................................... Rappaport D.C.
Fellowship ................................................................................................................ Pugash, R.
Neuroradiology ......................................................................................................... TerBrugge, K.
Nuclear Medicine ...................................................................................................... Hendler A.
PGY1 ......................................................................................................................... Asch, M.R.
Radiology Residency ................................................................................................ Becker, E.
Research ..................................................................................................................... Wood, M.L.
Undergraduate ......................................................................................................... Weiser, W.J.
Undergraduate (Co-Director) ................................................................................... Olscamp, G.C.

Division Heads
Abdominal Imaging ................................................................................................. Hanbidge, A.
Breast Imaging ........................................................................................................... Samuels, T.
Cardiothoracic Imaging ............................................................................................ Herman, S.J.
Musculoskeletal Imaging .......................................................................................... White, L.
Neuroradiology ........................................................................................................ TerBrugge, K.G.
Pediatric Imaging ..................................................................................................... Manson, D.
Vascular Imaging ....................................................................................................... Common, A.

Department Administrative Staff
Business Officer ....................................................................................................... Sciortino, G.
Secretary .................................................................................................................. Shea, A.
COMMITTEES

Executive Committee
Kucharczyk, W. (Committee Chair)
Asch, M.
Babyn, P.
Becker E.
Bret, P.
Common, A.
Daneman, A.
Fong, K.
Hendler, A.
A. Kumar (Chief Resident - July 1, 1999)
Olscamp, G.
Pugash, R.
Rappaport, D.
Shulman, H.
Weiser, W.
Wood, M.
Zalev, A.

Promotions Committee
Daneman, A. (Committee Chair)
Bret, P.
Shulman, H.
TerBrugge, K.
Wilson, S.

Undergraduate Teaching Committee
Weiser, W. (Committee Chair)
Armstrong, D.
Hamilton, P.
Jaffer, N.
Kachura, J.
Nugent, P.
Olscamp, G.
Salonen, D.

Specialty Training Committee
Becker, E. (Committee Chair)
Clark, J.
Glanc, P.
Hendler, A.
Laughlin, S.
Muradali, D.
Noël de Tilly, L.
Pron, G.
Shumak, R.
Kumar, A. (Chief Resident)
Wu, L. (R4 representative)
Fruitman, M. (R3 representative)
Loucks, T. (R2 representative)
Pugh, J. (R1 representative)
Singer, S. (PGY1 representative)
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

Wellesley Central site .................................................. 160 Wellesley Street East
Toronto, Ontario
M4Y 1J3

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, 2000**

<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>
</tr>
<tr>
<td>Arenson, A.M.</td>
<td>Assistant Professor</td>
<td>Abdominal Imaging</td>
<td>Sunnybrook &amp; Women's College HSC</td>
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<tr>
<td>Armstrong, D.</td>
<td>Assistant Professor</td>
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<td>Asch, M.R.</td>
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<td>Mount Sinai Hospital</td>
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<td>Atri, M.</td>
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<td>Babyn, P.S.</td>
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<td>Becker, E.J.</td>
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<td>Vascular Imaging</td>
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<tr>
<td>Bird, B.L.</td>
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<td>Blaser, S.</td>
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<td>Neuroradiology</td>
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<td>Blend, R.</td>
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<td>Bobechko, P.E.</td>
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<td>Bret, P.</td>
<td>Professor</td>
<td>Abdominal Imaging</td>
<td>Mount Sinai Hospital</td>
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<td>Bukhanov, K.</td>
<td>Assistant Professor</td>
<td>Breast Imaging</td>
<td>Mount Sinai Hospital</td>
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<td>Caldwell, C.B.</td>
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<td>Chung, D.G.</td>
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<td>Clark, J.A.</td>
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<td>Connolly, B.</td>
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<td>Gray, B.</td>
<td>Assistant Professor</td>
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<td>St. Michael's Hospital</td>
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<td>Greyson, N.D.</td>
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<td>Haider, M.</td>
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<td>Hamilton, P.A.</td>
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<td>Hanbidge, A.</td>
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<td>Nuclear Medicine</td>
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<td>Hender, A.L.</td>
<td>Assistant Professor</td>
<td>Cardiothoracic Imaging</td>
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<td>Nuclear Medicine</td>
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<td>Hershkop, M.</td>
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<td>Vascular Imaging</td>
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<td>Ho, C.S.</td>
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<tr>
<td>Holmes, R.B.</td>
<td>Professor Emeritus</td>
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<td>Clarke Institute of Psychiatry</td>
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<tr>
<td>Houle, S.</td>
<td>Associate Professor</td>
<td>Nuclear Medicine</td>
<td>Clarke Institute of Psychiatry</td>
</tr>
</tbody>
</table>
Ichise, M. Associate Professor Nuclear Medicine Mount Sinai Hospital
Jaffer, N.M. Associate Professor Vascular Imaging Mount Sinai Hospital
Jong, R.A. Assistant Professor Breast Imaging Mount Sinai Hospital
Kachura, J. Assistant Professor Vascular Imaging University Health Network
Kassel, E.E. Associate Professor Neuroradiology Mount Sinai Hospital
Keller, M.A. Assistant Professor Neuroradiology University Health Network
Khan, A. Lecturer Pediatric Imaging Hospital for Sick Children
Kucharczyk, W. Professor Breast Imaging Mount Sinai Hospital
Lansdown, E.L. Professor Emeritus Breast Imaging Mount Sinai Hospital
Lata, A.C. Assistant Professor Cardiothoracic Imaging St. Michael’s Hospital
Laughlin, S. Lecturer Pediatric Imaging Hospital for Sick Children
Leekam, R.N. Assistant Professor St. Joseph’s Health Centre
MacDonald C.E. Assistant Professor Pediatric Imaging Mount Sinai Hospital
Manson, D.E. Assistant Professor Pediatric Imaging Hospital for Sick Children
Marcuzzi, D.W. Assistant Professor Vascular Imaging St. Michael’s Hospital
Margolis, M. Assistant Professor Abdominal Imaging Mount Sinai Hospital
McCallum, R.W. Professor Emeritus Cardiothoracic Imaging University Health Network
Meema, H.E. Professor Emeritus Abdominal Imaging University Health Network
Mehta, M.H. Assistant Professor Cardiothoracic Imaging St. Michael’s Hospital
Merchant, N. Assistant Professor Cardiothoracic Imaging University Health Network
Mikulis, D. Assistant Professor Neuroradiology University Health Network
Minuk, C.F. Lecturer Abdominal Imaging University Health Network
Moes, C.A.F. Professor Emeritus Neuroradiology University Health Network
Montanara, W. Associate Professor Breast Imaging University Health Network
Muradali, D. Assistant Professor Abdominal Imaging Sunnybrook & Women’s College HSC
Murphy, J. Assistant Professor Nuclear Medicine Sunnybrook & Women’s College HSC
Murray, S.Y. Assistant Professor Neuroradiology St. Michael’s Hospital
Noël de Tilly, L. Assistant Professor Abdominal Imaging Sunnybrook & Women’s College HSC
Nugent, P Lecturer Abdominal Imaging University Health Network
Olscamp, G.C. Associate Professor Abdominal Imaging University Health Network
O’Malley, M. Lecturer Cardiothoracic Imaging University Health Network
Peto, R. Lecturer Research St. Michael’s Hospital
Potts, D.G. Professor Emeritus Vascular Imaging Mount Sinai Hospital
Prong, G. Assistant Professor Cardiothoracic Imaging Mount Sinai Hospital
Pugash, R.A. Assistant Professor Cardiothoracic Imaging University Health Network
Ranson, M. Assistant professor Breast Imaging Hospital for Sick Children
Rappaport, D. Assistant Professor Cardiothoracic Imaging Mount Sinai Hospital
Reilly, B.J. Professor Emeritus Nuclear Medicine University Health Network
Reilly, R.M. Associate Professor Abdominal Imaging Sunnybrook & Women’s College HSC
Rosen, I.E. Assistant Professor Research Sunnybrook & Women’s College HSC
Rowlands, J.A. Professor Musculoskeletal Imaging Sunnybrook & Women’s College HSC
Rubenstein, J.D. Associate Professor Vascular Imaging Sunnybrook & Women’s College HSC
Saibil, E.A. Assistant Professor Abdominal Imaging Mount Sinai Hospital
Salem, S. Assistant Professor Musculoskeletal Imaging University Health Network
Salonen, D.C. Assistant Professor Breast Imaging St. Joseph’s Health Centre
Salsberg, B.B. Lecturer Cardiothoracic Imaging Sunnybrook & Women’s College HSC
Samuels, T.H. Assistant Professor Cardiothoracic Imaging University Health Network
Sanders, D.E. Professor Emeritus Sunnybrook & Women’s College HSC
Sarrazin, J. Assistant Professor Cardiothoracic Imaging St. Joseph’s Health Centre
Shankar, L. Assistant Professor Sunnybrook & Women’s College HSC
Shorter, A.M. Lecturer Pediatric Imaging Sunnybrook & Women’s College HSC
Shuckett, B. Assistant Professor Pediatric Imaging Sunnybrook & Women’s College HSC
Shulman, H.S. Professor Breast Imaging Sunnybrook & Women’s College HSC
Shumak, R. Assistant Professor Vascular Imaging University Health Network
Simons, M. Assistant Professor Vascular Imaging University Health Network
Sniderman, K.W. Associate Professor Abdominal Imaging Mount Sinai Hospital
Stewart, L. Lecturer Abdominal Imaging University Health Network
TerBrugge, K.G. Professor Abdominal Imaging St. Joseph’s Health Centre
Thurston, W. Assistant Professor Abdominal Imaging Sunnybrook & Women’s College HSC
Ting, G. Lecturer Abdominal Imaging University Health Network
Toi, A. Associate Professor Abdominal Imaging Sunnybrook & Women’s College HSC
Tomashpolskaya, J. Lecturer Abdominal Imaging Sunnybrook & Women’s College HSC
Turchin, R. Lecturer St. Joseph’s Health Centre
Vaughan-Neil, E. Lecturer Nuclear Medicine Mount Sinai Hospital
Wall, J. Lecturer Cardiothoracic Imaging St. Michael’s Hospital
Weisbrod, G.L. Professor Abdominal Imaging University Health Network
Weiser, W.J. Professor Cardiothoracic Imaging St. Michael’s Hospital
White, L. Assistant Professor Musculoskeletal Imaging Mount Sinai Hospital
Williams, T. Lecturer Pediatric Imaging Hospital for Sick Children
Willinsky, R.A. Associate Professor Neuroradiology University Health Network
Wilson, C. Assistant Professor Breast Imaging University Health Network
Wilson, S.R. Professor Abdominal Imaging University Health Network
Wood, M.L. Associate Professor Research Sunnybrook & Women’s College HSC
Wortzman, G. Professor Emeritus Neuroradiology Mount Sinai Hospital
Wright, B.E. Assistant Professor Breast Imaging Sunnybrook & Women’s College HSC
Yaffe, M.J. Professor Research Sunnybrook & Women’s College HSC
Yoo, S-J. Professor Pediatric Imaging Sunnybrook & Women’s College HSC
Zalev, A.H. Assistant Professor Abdominal Imaging Hospital for Sick Children
Zelovitzky, J.L. Assistant Professor Cardiothoracic Imaging University Health Network

Cross Appointments

Bronskill, M.J. Medical Biophysics
Foster, S. Medical Biophysics
Freedom R. Pediatrics
Henkelman, R.M. Medical Biophysics
McLaughlin, P.R. Medicine
Meindok, H. Medicine
Noyek, A.M. Otolaryngology
Pharoah, M.J. Dentistry
Plewes, D.B. Medical Biophysics
Trachtenberg, J Surgery
GRANTS


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.

Massicotte P (Primary Investigator), Chait P (Co Investigator). Determination of the sensitivity and specificity of ultrasound and linograms vs. venography for the diagnosis of deep venous thrombosis in the upper venous system in symptomatic paediatric patients. Heart and Stroke Foundation. $64,600.00. 1998-2000.

Massicotte P (Primary Investigator), Chait P, Connolly B (Co Investigator). PROTEKT Trial CL055 - Prophylaxis of Thromboembolism in Kids. Knoll Pharma Inc. 1998 - Ongoing


Mikulis D (Principal Investigator). Characterization of adaptive changes in the brain of individuals with cervical spinal cord injury. Associations between fMRI,


Stewart P (Principal Investigator), Mikulis D (Co-investigator). Functional neuroanatomy. Information Technology Development Fund University of Toronto. $54,100.00 /year. May 1998-April 2000.


PUBLICATIONS: PEER-REVIEWED PAPERS AND ABSTRACTS


Chen JC, Moriarty JA, Derbyshire JA, Peters RD, Trachtenberg J, Bell SD, Doyle J, Arrelano R, Wright GA, Henkelman RM, Hinks RS, Lok SY, Toi A, Kucharczyk W.


Hill MD, Cooper PW, Perry JR. Chasing the dragon--neurological toxicity associated with inhalation of heroin vapour: case report. CMAJ. 2000;162(2):236-8.


Khan A, Williams T, Manson D, Baskin K. “Pediatric Oncology CD-ROM in Body Imaging” Funding/ Support: Sheridan College, The Hospital For Sick Children (Department of Radiology) April 2000


PUBLICATIONS: NON-PEER-REVIEWED, BOOKS, CHAPTERS


SCIENTIFIC PRESENTATIONS: ORIGINAL PEER-REVIEWED PAPERS, POSTERS AND EXHIBITS


Baskin K, Chait PG, Connolly B, Muraca S. “Fluoroscopically guided esophageal balloon dilatation in epidermolysis bullosa dystrophica”. CAR, Toronto, Ontario (June)

Baskin K, Chait PG, Connolly B, Muraca S. “Lymphocele in pediatric renal transplant patients: percutaneous ablation or surgical internalization?” CAR, Toronto, Ontario (June)


Baskin K, Chait PG, Connolly B, Temple M. “Combined ultrasonographic and fluoroscopic guidance for transjugular liver biopsies in children” CAR, Toronto, Ontario (June)


Chait P, Geary D, Connolly B, Temple M. “A new technique for the management of severe Takayasu’s disease involving both renal arteries”. CIMIT, Boston, MA, September 1999

Chait P, Geary D, Connolly B, Temple M. “A new technique for the management of severe Takayasu’s disease involving both renal arteries”. CIMIT, Boston, MA, September 1999

Chait P, Nykanen D, Benson, Connolly B, Baskin K. “Transcatheter management of intrahepatic IVC interruption by means of perforation, dilatation and stent placement”, CIMIT, Boston, MA, September 1999

Chait P, Nykanen D, Benson, Connolly B, Baskin K. “Transcatheter management of intrahepatic IVC interruption by means of perforation, dilatation and stent placement” CIMIT, Boston, MA, September 1999


Chait PG, Baskin K, Connolly B, Temple MJ, Richards H. “Percutaneous cecostomy: a five year follow-up”. CAR, Toronto, Ontario (June)


enterostomy access across the spectrum of pediatric care”, Pacific Association of Pediatric Surgeons 33rd Annual Meeting, Las Vegas, Nevada, May 2000


Chuang S. 1st Chinese Neurology Forum, 2nd Symposium of World Association of Chinese Epileptologists (WACE), 12th Annual Scientific Meeting of The Hong Kong Neurological Society. Hong Kong, Dec. 4-5.

Chuang S. ASNR Symposium and Annual Meeting. Moderator. Atlanta, Georgia. April 2-8, 2000

Clark JA, Pugash RA. Angiographic demonstration of parabiliary venous system. 63rd annual meeting of the Canadian Association of Radiologists, Toronto, Ontario, June 2000


Connolly B, Chait PG, Temple M, Baskin K “Mediastinal seromas secondary to modified Blalock-Taussig shunts – imaging and successful management by percutaneous drainage”


Foltz WD, Merchant N, Wright GA. Characterizing the myocardial blood oxygen state in vivo using MRI. 45th Scientific Meeting of Canadian Organization of Medical Physicists Conference. 1999.


Sussman MS, Robert N, Kerr AB, Pauly JM, Merchant N, Wright GA. Artifact-free MR fluoroscopic coronary image combination with the correlation coefficient technique. 8th Scientific Meeting of the International Society for Magnetic Resonance in Medicine. April 2000.


Webster CA, Merchant N, Kucey DS, Wright GA. Toward an objective measure of image quality for peripheral vascular MRA. 8th Scientific Meeting of the International Society for Magnetic Resonance in Medicine. April 2000.


INVITED PRESENTATIONS AND VISITING PROFESSORSHIPS


Asch M. Local tumour ablation. OSDIN. Toronto, Ontario, Canada. April 15, 2000.


Bret P. PACS How to get there. 14th Annual Organ Imaging Review. University of Toronto, Toronto, Ontario, Canada. October 5-6, 1999.

Bret P. PACS is there a business case? 14th Annual Organ Imaging Review. University of Toronto, Toronto, Ontario, Canada. October 5-6, 1999.


Chait P. “Pediatric Interventional Radiology – Current Uses”, Organ Imaging, Toronto, Ontario, October 1999
Chait P. “Lectures on Interventional Radiology (Cecostomy tube insertions)” Brazilian meeting of Pediatric Surgery, Brazil, October 1999

Chait P. Visiting Professor, “Percutaneous cecostomy”, John Hopkins Hospital, January 2000

Chait P. Visiting Professor, “Percutaneous cecostomy”, D.C. Children’s Hospital, January 2000


Chuang, S. “Contrast Agents in Radiology; Special Clinical Considerations”, Foundation of Medical Professionals Alliance in Taiwan (FMPAT), Taipei, Taiwan, June 16-17, 1999.


Daneman A. 2000 “Disappearing masses in fetuses, neonates and infants”. 37th Congress of The European Society For Pediatric Radiology And 23rd Post-Graduate
Course Lisbon, Portugal, May 22-26,

Daneman A. "Neonatal Abdominal Ultrasound" “Disappearing Masses in Pediatric"

Daneman A. “Adnexal Masses - Neonatal, Adolescent”, Women’s Imaging: Advances in Gynaecological Imaging and Transvaginal Ultrasound Continuing Education, Faculty of Medicine, University of Toronto, February 2000.


Khan A, Williams T, Manson D. Baskin K. “Pediatric Oncology CD-ROM in Body Imaging” Funding/ Support: Sheridan College, The Hospital For Sick Children (Department of Radiology) April 2000, SPR and CAR.


Jong RA. Breast Imaging. Clinical Imaging for Physics Scientists Course. Department of Medical Biophysics, University of Toronto, Sunnybrook Health Science Centre, Toronto, Ontario, Canada. February 7, 2000.


Kassel E. Visiting Professor. Pathology of the internal auditory canal and cerebellopontine angle cistern. Department of Medical Imaging, University of Alberta, Edmonton, Alberta, Canada. February 24-25, 2000.


Kassel E. Visiting Professor. An approach to sinonasal mass lesions. Department of Medical Imaging, University of Alberta, Edmonton, Alberta, Canada. February 24-25, 2000.


MacDonald C. “Spinal Ultrasound”, Advanced Pediatric Ultrasound, The Michener Institute, March 2000


Manson D. “Chronic or Recurrent Pneumonia in Children”. Organ Imaging Review Course, University of Toronto, Toronto, Ontario, October 1999.
Manson D. “Imaging of Pediatric Blunt Thoracic Trauma, Chronic or Recurrent Pneumonia in the Child, and An Approach to Congenital Abnormalities of the Pediatric Chest”. Visiting Professor, McGill University, Montreal, Quebec, February 2000.


Salem S, Murphy J. Workshop. Adnexal masses and ovarian cancer screening.


Toi A. 1) The fetal brain and spine. 2) Bring your cases to an expert. 3) Bright echoes in the fetus – What to do. 4) Debate: 3D of the early fetus – diagnostic or dilettante? Obstetrical Ultrasound: From Conception to Delivery. CME University of Saskatchewan, Saskatoon, Saskatchewan. October 22-23, 1999.


Williams T. “Abdominal Masses” The Michener Institute for Applied Health Sciences March 12, 2000

Williams T. “Evaluation of Contrast-Enhanced Sonography with Harmonic Imaging in Experimental Acute Pyelonephritis in Piglets”. Research Day, Medical Imaging, University of Toronto, Mt. Sinai Hospital, April 12, 2000


**AWARDS AND SPECIAL RECOGNITION**

RESEARCH PROGRAM

Research is an important mission of the Department of Medical Imaging. The Department supports research through several projects, 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 each of these projects is presented below. Also listed below are research grants held by Department members and the publications and teaching efforts of those faculty who are not listed under one of the affiliated hospitals.

Protected Research Time

Protected Research Time allows a select group of radiologists to devote at least one day each week to a particular research project. This initiative is managed by the Protected Research Time Committee, which was chaired by Dr. Michael Wood and includes Dr. Alan Daneman, Dr. Joel Rubenstein, and Dr. Robert Willinsky as members. The radiologists listed in the table below were awarded Protected Research Time in 1999-2000.

<table>
<thead>
<tr>
<th>Award Holder</th>
<th>Hospital</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Andrew Common</td>
<td>SMH</td>
<td>Uterine Artery Embolization for Symptomatic Fibroids: Initial Results of a Multicentre Trial</td>
</tr>
<tr>
<td>Dr. Richard Farb</td>
<td>S&amp;WCHSC</td>
<td>Evaluation of Intracerebral Arterial Venous Malformations Using a First Pass Gadodimide Enhanced MR Angiographic Technique</td>
</tr>
<tr>
<td>Dr. Masanori Ichise</td>
<td>UHN</td>
<td>SPECT/PET Imaging of Dopamine Transporters In Healthy Humans and Patients with Parkinson's Disease</td>
</tr>
<tr>
<td>Dr. Naeem Merchant</td>
<td>UHN</td>
<td>MRA of Peripheral Vascular Disease</td>
</tr>
<tr>
<td>Dr. Derek Muradali</td>
<td>UHN</td>
<td>Echogenic Ovarian Foci, Phase II: Physical Basis in Normal Ovaries, Clinical Significance in Ovarian Masses</td>
</tr>
<tr>
<td>Dr. Marilyn Ranson</td>
<td>HSC</td>
<td>Detection of Steroid Induced Changes in Bone Marrow Fat Content and Perfusion Using MRI</td>
</tr>
<tr>
<td>Dr. Lawrence White</td>
<td>UHN</td>
<td>MR Imaging in the Evaluation of the Post Operative Meniscus</td>
</tr>
<tr>
<td>Dr. Tara Williams</td>
<td>HSC</td>
<td>Comparison of Total Body Echo-Planar Imaging vs. Conventional Methods in the Staging of Neoplasms Especially Neuroblastoma</td>
</tr>
</tbody>
</table>

HSC: Hospital for Sick Children
S&WCHSC: Sunnybrook and Women's College Health Sciences Centre
UHN: University Health Network

Faculty Research Award

In addition to the Protected Research Time program, 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. Mayank Goyal was unanimously selected for the Award.

**Research Day**

Our Research Day, which was held on April 12, 2000, consisted of presentations from senior residents, the faculty who received Protected Research Time, and other members of the Department. An excerpt from the Program for Research Day is included later in this Report.

**PET 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. In the realm of psychiatry, ongoing work is directed at elucidating the role of serotonin in schizophrenia and depression. The interaction of the dopamine and serotonin systems is of particular interest for the understanding of the current treatment of schizophrenia and for the development of new antipsychotic therapy. A special focus of interest is the investigation of optimal treatment with typical and atypical antipsychotic medications and the understanding of the brain mechanisms underlying antidepressant drugs.

Collaboration between the Rotman Research Institute, the Department of Psychology at the University of Toronto and the Centre for Addiction and Mental Health has continued in the field of cognitive neuroscience, and particularly memory research.

The PET Methodology Group is actively pursuing the development of new PET radiotracers for the dopamine and serotonin systems. The radioligands will provide new tools for the investigation of these neurotransmitter systems in health and disease. Over the last year, the Centre has developed a new PET radioligand for the serotonin transporter which will allow us to study selective serotonin reuptake inhibitors, one of the main class of drugs used to treat depression.

Construction has started on a new advanced PET tomograph as a result of the CFI and OIT award to the University of Toronto Functional Imaging Research Network. Installation is expected next summer.

**Imaging/Bioengineering Research, S&WCHSC**

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**

*(Academic Rank as of July 1, 1999)*

<table>
<thead>
<tr>
<th>Name</th>
<th>Academic Rank</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>John A. Rowlands</td>
<td>Professor</td>
<td>Senior Scientist, S&amp;WCHSC</td>
</tr>
<tr>
<td>Martin J. Yaffe</td>
<td>Professor</td>
<td>Senior Scientist, S&amp;WCHSC</td>
</tr>
<tr>
<td>Sylvain Houle</td>
<td>Associate Prof</td>
<td>Director, PET Centre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Centre for Addiction and Mental Health</td>
</tr>
<tr>
<td>Michael L. Wood</td>
<td>Associate Prof</td>
<td>Director, Research Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior Scientist, S&amp;WCHSC</td>
</tr>
<tr>
<td>Curtis B. Caldwell</td>
<td>Assistant Prof</td>
<td>Physicist, S&amp;WCHSC</td>
</tr>
<tr>
<td>Gaylene Pron</td>
<td>Assistant Prof</td>
<td>Epidemiologist</td>
</tr>
</tbody>
</table>

S&WCHSC: Sunnybrook and Women's College Health Sciences Centre
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.


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].

Kennedy SH, Houle S. A comparative positron emission tomography study of 5HT2 receptors in patients with major depression (before and after treatment) and in healthy volunteers, Medical Research Council of Canada, $152,270, 1997-1999.


**Publications**

*(a) Peer-Reviewed:*


(b) Books or Book Chapters


**Original Scientific Papers**

(a) Peer-Reviewed:


(b) Non-Reviewed:


Pisano ED, Cole EB, Major S, Hemminger BM, Muller KE, Johnston RE, Brown ME, Conant E, Fajardo LL, Feig SA, Yaffe MJ, Williams MB, Niklason LT, Maidment ADA,


**Invited Papers and Professorships**

**Caldwell CB.** Integrating hybrid FDG-PET images in radiotherapy planning. Annual Meeting of the Canadian Society of Nuclear Medicine, Mt. Tremblant, Quebec, April 2000.

**Caldwell CB.** Integration of PET with CT for radiotherapy guidance. Molecular Imaging: Improve Your Practice Now Meeting, John Hopkins University School of Medicine, Baltimore, Maryland, March 2000.

**Houle S.** Imaging the 5-HT1A receptors with PET: WAY 100635 and analogues. Meeting organized within the COST Project Serotonin 5-HT1A Receptor Imaging in the Human Brain with PET. Coordination and the Standardization and Dissemination of Methodology, Karolinska Institute, Stockholm, October 1999.


**Yaffe MJ.** Harold Johns Memorial Symposium. 41st Annual Meeting of The American Association of Physicists in Medicine, Nashville, TX July 25, 1999.

**Yaffe MJ.** The design of full field digital mammography systems. 41st Annual Meeting of The American Association of Physicists in Medicine, Nashville, TX July 25, 1999.

## Teaching

Hours of Lectures

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Students</th>
<th>Residents, Fellows, Faculty</th>
<th>Technologists</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.B. Caldwell</td>
<td>0</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>S. Houle</td>
<td>20</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>G. Pron</td>
<td>12</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>J.A. Rowlands</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>M.L. Wood</td>
<td>3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>M.J. Yaffe</td>
<td>10</td>
<td>38</td>
<td>0</td>
</tr>
</tbody>
</table>
**Annual Research Day**

Date: Wednesday, April 12, 2000  
Location: Sadowski Auditorium, 18th floor of the Mount Sinai Hospital  
Starting Time: 1:30 pm with welcome from Dr. Walter Kucharczyk

**Residents, Fellows, and Faculty**  
**Moderator: Dr. David Mikulis**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35</td>
<td>Chris Guest</td>
<td>Normal Appearance of Arachnoid Granulations in the Dural Venous Sinuses on Contrast-Enhanced CT</td>
</tr>
<tr>
<td>1:47</td>
<td>Tarang Sheth</td>
<td>Rotational Changes in the Morphology of the Vertebral Artery: Correlation with the Site of Artery Dissection</td>
</tr>
<tr>
<td>1:59</td>
<td>Mark Fruitman</td>
<td>Interobserver Agreement in the Diagnosis of Renal Colic using Helical CT</td>
</tr>
<tr>
<td>2:11</td>
<td>Korosh Khalili</td>
<td>Focal Nodular Hyperplasia: Confirmatory Diagnosis with Microbubble Contrast Agents?</td>
</tr>
<tr>
<td>2:23</td>
<td>Ofer Benjaminov</td>
<td>The Rate of Visualization and Features of the Normal Appendix on Helical CT - Examination Without Intravenous or Bowel Opacification</td>
</tr>
<tr>
<td>2:35</td>
<td>Mayank Goyal</td>
<td>Embolization of Small (&lt; 3cm) Brain Arteriovenous Malformations: Correlation of Angiographic Results to a Proposed Angioarchitecture Grading System</td>
</tr>
<tr>
<td>2:47</td>
<td>Gaylene Pron</td>
<td>Surgical Conversions Following Post-Uterine Fibroid Embolization - Are We Still OK?</td>
</tr>
<tr>
<td>2:59</td>
<td>John Clark</td>
<td>Hereditary Hemorrhagic Telangiectasia: Mesenteric Duplex Ultrasound Screening for Vascular Malformations of the Liver</td>
</tr>
<tr>
<td>3:11</td>
<td>Rene Shumak</td>
<td>MRI Surveillance of Women at High Risk for Hereditary Breast Cancer: Preliminary Results</td>
</tr>
<tr>
<td>3:23</td>
<td>Murray Asch</td>
<td>Radiofrequency Ablation of Liver Tumours</td>
</tr>
</tbody>
</table>

**3:35 Break**

**Faculty with Protected Time for Research**  
**Moderator: Dr. Michael Wood**

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00</td>
<td>Andrew Common</td>
<td>Interim Results of the Ontario UFE Trial</td>
</tr>
<tr>
<td>4:12</td>
<td>Mas Ichise</td>
<td>Differential Diagnosis of Parkinsonism using Dopamine Transporter and D2 Receptor SPECT</td>
</tr>
<tr>
<td>4:24</td>
<td>Naem Merchant</td>
<td>MR Oximetry: Development of Tools for a Functional Measure of Ischemic Heart Disease</td>
</tr>
<tr>
<td>4:36</td>
<td>Richard Farb</td>
<td>Evaluation of Intracerebral Arterial Venous Malformations using a First Pass Gadodiamide Enhanced MR Angiographic Technique</td>
</tr>
<tr>
<td>4:48</td>
<td>Derek Muradali</td>
<td>Echogenic Ovarian Foci Caused By Cysts: The Physical Basis</td>
</tr>
<tr>
<td>5:00</td>
<td>Tara Williams</td>
<td>Comparison of Total Body Echo-Planar Imaging vs. Conventional Methods in the Staging of Neoplasms Especially Neuroblastoma</td>
</tr>
<tr>
<td>5:12</td>
<td>Larry White</td>
<td>Prospective Comparison of Conventional MR, Indirect MR-Arthrography and direct MR-Arthrography in the Diagnosis of Recurrent Meniscal Tears</td>
</tr>
<tr>
<td>5:24</td>
<td>Stephanie Wilson</td>
<td>Hilar Biliary Obstruction: The Utility of Levovist Delayed Sonography</td>
</tr>
<tr>
<td>5:36</td>
<td>David Mikulis</td>
<td>A Simple, Effective Method to Control End Tidal PCO2 for Mapping MRI Cerebrovascular Reactivity</td>
</tr>
<tr>
<td>5:48</td>
<td>Shi-Joon Yoo</td>
<td>Gadolinium-Enhanced 3-Dimensional MR Angiography in Children</td>
</tr>
</tbody>
</table>
RESIDENT TRAINING PROGRAM

General description
There were 49 residents in our program in the 1999-2000 year. The five-year program consists of one year of preliminary clinical training (PGY1), followed by four years of training in medical imaging.

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 1999-2000, the core teaching hospitals have been Mount Sinai Hospital and St. Michael’s Hospital. Community training is principally done at North York General Hospital. The content of the PGY1 program included three months of Medicine (General Medicine, Respirology, and Neurology); four months of Surgery (General Surgery, Orthopaedics, Urology, Obstetrics and Gynaecology); one month of Paediatrics; one month of Anatomy at the University of Toronto Anatomy Department; and two months of elective choices. In the final month of the PGY1 year, 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 1999-2000, a PGY2 trainee spent the entire year at one of the three core teaching Departments (Mount Sinai – University Health Network, Sunnybrook and Women’s College Health Sciences Centre or St. Michael’s Hospital). There is a graduated increase in responsibility over the course of the year as well as close assessment of progress by one group of educators. 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 1999-2000, residents in this training year divided their rotations into two to nine 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.

PGY4
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 cardiac imaging and 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. The department’s epidemiologist, Dr. Gaylene Pron, who is responsible for the design and delivery of the course curriculum, organizes 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 and PGY3 courses.
- 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.

   1999-2000 winner: Dr. Raymond Chan

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.

   1999-2000 winner: Dr. Louis Wu

3) **Research Awards:**
   Each year a second-year resident is nominated to attend the RSNA/AUR/ARRS program entitled 'Introduction to Research'.

   1999-2000 winner: Dr. Godfrey Kim

   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.

**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.
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 fulfil 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, 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:

1) **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

General Requirements
• 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**

*General Requirements*
• 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. In total, residents in Medical Imaging receive over 30 hours of course instruction: PGY1 - full-day workshop on critical appraisal; PGY2 - two, 2-hour workshop sessions on computerized literature searches; PGY3 - six, 2-hour lectures/tutorials on research methodology; PGY4 - four, 2-hour lectures/tutorials on technology assessment, quality assurance and clinical audits.

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 two full days per month for one year for their work. Generally the 12-month period corresponds to a calendar year. 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 12th annual Department of Medical Imaging Research Day held at the Sadowski Auditorium, 18th Floor of the Mount Sinai Hospital on April 12, 2000 was the venue for six excellent resident and fellow research presentations. Support for the event was provided by Nycomed Amersham (Canada) Inc. The presentations included:

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<tr>
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<th>Name</th>
<th>Title</th>
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<tr>
<td>1</td>
<td>Chris Guest (resident)</td>
<td>Normal Appearance of Arachnoid Granulations in the Dural Venous Sinuses on Contrast-Enhanced CT</td>
</tr>
<tr>
<td>2</td>
<td>Tarang Sheth (resident)</td>
<td>Rotational Changes in the Morphology of the Vertebral Artery: Correlation with the Site of Artery Dissection</td>
</tr>
<tr>
<td>3</td>
<td>Mark Fruitman (resident)</td>
<td>Inter-observer Agreement in the Diagnosis of Renal Colic using Helical CT</td>
</tr>
<tr>
<td>4</td>
<td>Korosh Khalili (fellow)</td>
<td>Focal Nodular Hyperplasia: Confirmatory Diagnosis with Microbubble Contrast Agents?</td>
</tr>
<tr>
<td>5</td>
<td>Ofer Benjaminov (fellow)</td>
<td>The Rate of Visualization and Features of the Normal Appendix on Helical CT - Examination Without Intravenous or Bowel Opacification</td>
</tr>
<tr>
<td>6</td>
<td>Mayank Goyal (fellow)</td>
<td>Embolization of Small (&lt; 3cm) Brain Arteriovenous Malformations: Correlation of Angiographic Results to a Proposed Angioarchitecture Grading System</td>
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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.
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 For Brain and Behaviour Course
Dr. Bruce Gray provided 48 hours of on-line tutoring time, plus an additional 48 hours of preparation and debriefing time for the tutorials.

PBL Tutor: Foundations of Medical Practice Course
Drs. Wayne Deitel and Danny Marcuzzi provided 60 hours of teaching time as a tutor plus an additional 24 hours of preparation for this course.

Year II

Teaching
Year II teaching generally centres 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.

Radiobiology Lecture
A full class lecture is given to the Year II students as part of the Pathobiology of Disease Course. This is coordinated by the Department of Medical Biophysics and the coordinator of the Pathobiology of Disease and is given at the beginning of the course. This lecture is complimented by a second full class lecture, given to the Year III students, as part of the Determinants of Disease Course.

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 discussion which are centred at each of the Academy radiology departments.

**Seminars**

*Chest Seminars*
A number of Chest seminars, generated as part of the Year II Foundations course “Respiratory Week” were given on March 30, 2000 at the various teaching hospitals. Up to 10 radiologists served as seminar leaders, with a total teaching time of about 20 hours.

*PBL Foundations of Medical Practice Full Class Teaching*
Dr. David Salonen delivered a full class lecture on the “Essentials of Skeletal Radiology” as part of the Foundations program.

*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 University of Toronto medical students took electives in radiology at the various teaching hospitals for the 1999-2000 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
A total of 86 University of Toronto students took an elective in their clerkship year in radiology at the various teaching hospitals.

Visiting Elective Students
Thirty-nine non-University of Toronto students, many of these overseas foreign students in their senior undergraduate year, took part in visiting electives during the 1999 - 2000 academic year.

Total Undergraduate Elective Students
More than 125 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. Nasir Jaffer, and Dr. Daniel Rappaport, and Dr. David Salonen delivering the lectures.

The final year students have had access to a series of notes, the MCCQE Study Guide. The lecture series has undergone a major update and revision under the direction of Dr. David Salonen, and a new series of lecture note is available.

Other Teaching Activities

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

**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 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 radiologic 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 will be databased, 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 Department of Medical Imaging, under the authorship of Dr. W.J. Weiser has developed several more interactive radiology teaching programs. One of these, The Radiology of Pneumonia is available for student use at the Fitzgerald Academy.

Other Radiology-interactive teaching computer programs authored by Dr. W.J. Weiser, entitled Cardiovascular Anatomy, and Abnormal Cardiovascular Calcifications are currently available for student use at all the teaching hospitals.

**Case of the Month CD Rom**

A prototype series of teaching case material has been presented to the residents on a monthly basis. The material has been initially presented in the form of an interactive computer program and distributed on CD Rom to our residents. This material will be linked to the Department of Medical Imaging site and posted on the Internet.

**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. There is considerable interest 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
radiologic material and interesting case material. It is primarily aimed at radiology residents and senior medical students. It will be developed on a continuing basis.

**Practical Radiology: the Chest X-ray**

A bedside teaching manual has been developed by Dr. Fred Lan, and Dr. Robert Yu, in collaboration with Dr. W.J. Weiser. This manual teaches practical chest diagnosis using the plain chest X-ray. We believe it will be a valuable adjunct to clinical diagnosis. It is hoped that this will be available on the Department of Medical Imaging web site in the future.

**Web Based Teaching Profile Database**

A web based database has been developed by Victor Yang (2nd year University of Toronto) and has been in place since May 2000. This is a prototype and further development is underway. This program allows for on line collection of various teaching data including teacher and program evaluation and is a useful vehicle for improving our overall teaching program.
ORGAN IMAGING REVIEW

October 3 – 7, 1999

Course Description
This four day course focuses on aspects of primary interest to both radiologists and radiologists-in-training. The course content includes concepts of both review nature and newer concepts of recent advances in medical imaging. Topics include fetal, gynecologic, abdominal, chest, musculoskeletal and spinal imaging. A half day focus session on electronic imaging and PACS is highlighted.

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

University of Toronto Faculty
Armstrong, Derek, M.B., B.S. Assistant Professor
Atri, Mostafa, M.D. Associate Professor
Becker, Edna J., M.D., Associate Professor
Bret, Patrice, M.D., Professor
Chait, Peter, M.B., B.Ch., Assistant Professor
Chung, Dae-Gyun, M.D., Lecturer
Cooper, Perry, M.D., Assistant Professor
Couch, Gregory, M.A.Sc., Lecturer
Christakis, Monique, M.D., Assistant Professor
Fong, Katherine, M.B., B.S., Assistant Professor
Haider, Masoom, M.D., Assistant Professor
Hamilton, Paul, M.D., Assistant Professor
Hanbidge, Anthony, M.B., B.Ch., Assistant Professor
Herman, Stephen J., M.D., Associate Professor
Kachura, John, M.D., Assistant Professor
Kucharczyk, Walter, M.D., Professor and Chairman
Laughlin, Suzanne, M.D., Lecturer
Manson, David, M.D., Assistant Professor
Margolis, Myles, M.D., Assistant Professor
Merchant, Naeem, M.D., Assistant Professor
Montanera, Walter, M.D., Associate Professor
Noël de Tilly, Lyne, M.D., Assistant Professor
O’Malley, Martin, M.D., Lecturer
Ranson, Marilyn, M.D., Assistant Professor
Rappaport, Daniel, M.D., Assistant Professor
Rubenstein, Joel, M.D., Associate Professor
Salem, Shia, M.D., Associate Professor
Salonen, David, M.D., Assistant Professor
Shulman, Harry, M.D., Professor
Stewart, Lori, M.D., Lecturer
terBrugge, Karel, M.D., Professor
Toi, Ants, M.D., Associate Professor
Weisbrod, Gordon, M.D., Professor
White, Lawrence, M.D., Assistant Professor
Willinsky, Robert, M.D., Associate Professor
Wilson, Stephanie R., M.D., Professor
Yoo, Shi-Joon, M.D., Ph.D., Professor

Invited Clinical Speakers
Johnson, Jo-Ann, M.D., Associate Professor
Division of Fetal and Maternal Medicine
Department of Obstetrics and Gynaecology

Ryan, Greg, M.B., Associate Professor
Division of Fetal and Maternal Medicine
Department of Obstetrics and Gynaecology

Rosen, Barry, M.D., Associate Professor
Division of Gynaecologic Oncology
Department of Obstetrics and Gynaecology

Guest Faculty
Gore, Richard M., M.D., Professor and Vice Chairman,
Department of Diagnostic Radiology
Director, Section of Gastrointestinal Radiology
Evanston Hospital – Northwestern University,
Evanston, Illinois

Henri, Chris, Ph.D., Assistant Professor
Department of Diagnostic Radiology
McGill University Health Centre
Montreal, Quebec

Reinhold, Caroline, M.D., Associate Professor
Department of Diagnostic Radiology
McGill University Health Centre
Montreal, Quebec
6th ANNUAL INTERVENTIONAL/VASCULAR RADIOLOGY COURSE

November 4 – 6, 1999

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 also benefit from the excellent audiovisual presentation and the informal nature of the discussion.

Course Director: Andrew Common, M.D.
Co-Director: Eric Saibil, M.D.

Invited Clinical Faculty
Asch, Murray, M.D., Assistant Professor
Bell, Stuart, M.D., Assistant Professor
Benko, Andrew, M.D., Assistant Professor
Chait, Peter, M.B., B.Ch., Assistant Professor
Cheung, Gordon, M.D., Assistant Professor
Clark, John, M.D., Assistant Professor
Ho, C.S., M.B., B.S., Professor
Jaffer, Nasir, M.D., Associate Professor
Kachura, John, M.D., Assistant Professor
Lossing, Alan, M.D., Assistant Professor
Maggisano, Robert, M.D., Assistant Professor
Pugash, Robyn, M.D., Assistant Professor
Simons, Martin, M.D., Assistant Professor
Sniderman, Kenneth, M.D., Associate Professor
Stroz, Peter, M.D., Lecturer
Thurston, Wendy, M.D., Assistant Professor
Vanderburgh, Leslie, M.D., Assistant Professor

Guest Faculty
Dake, Michael, M.D.
Chief, Cardiovascular and Interventional Radiology
Assistant Professor of Radiology and Medicine
Stanford University Medical Center

Katzen, Barry T.
Medical Director
Miami Cardiac and Vascular Institute

Machan, Lindsay, M.D.
Joachim Burhenne Scholar
in Abdominal Radiology
University of British Columbia
INVITED LECTURERS, VISITING PROFESSORS & CITY-WIDE ROUNDS

October 18-19, 1999  Dr. C. Daniel Johnson  
Department of Radiology  
Mayo Clinic  
- CT colonography: a vision of the future?  
- Benign liver lesions: refining your diagnostic skills  
- Non-ductal pancreatic tumours: unusual neoplasms with specific imaging features

November 1-2, 1999  Dr. David G. Disler  
Department of Radiology  
Medical College of Virginia  
- Radiographic evaluation of bone tumours  
- MR imaging of articular cartilage  
- MR imaging of the knee

January 10, 2000  Dr. Kieran Murphy  
Department of Radiology  
Johns Hopkins Medical Center  
- Vertebroplasty in benign and malignant disease

February 1, 2000  Dr. Olof Flodmark  
Department of Radiology  
Karolinska University, Stockholm  
- CSF circulation and hydrocephalus—new concepts

March 6-7, 2000  Dr. W. Dennis Foley  
Department of Radiology  
Froedtert Memorial Lutheran Hospital  
- Hepatic sonography: fundamental/harmonic imaging with conventional and matrix array probes  
- Multidetector row CT: a new paradigm  
- Role of sonography and CT in blunt abdominal trauma

April 3-4, 2000  Dr. Sanjay Saini  
Department of Radiology  
Massachusetts General Hospital  
- CT and MR of liver tumours  
- Contrast enhanced MRI of the liver—what to use, when to use it and how to use it  
- Multislice CT—how it works and what it shows
May 1-2, 2000  Dr. Igor Laufer
Department of Radiology
University of Pennsylvania Medical Center

- Principles of double contrast diagnosis
- Screening for colorectal cancer
- A detailed examination of the small bowel
JOURNAL CLUB

August 26, 1999: Management of intracranial aneurysms: coiling vs. surgery

October 26, 1999: Imaging of pancreatic lesions

January 25, 2000: The use of MR in the evaluation of multiple myeloma
MEDICAL IMAGING RESIDENTS

PGY1
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

PGY2 (R1)
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

PGY3 (R2)
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

PGY4 (R3)
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

PGY5 (R4)

Petrina Causer, MD...........................................................University of Toronto, 1995
Raymond Chan, MD..........................................................University of Toronto, 1995
Eric Engmann, MD.............................................................University of Toronto, 1995
Paul Hagen, MD .................................................................University of British Columbia, 1995
Eran Hayeems, MD .............................................................University of Toronto, 1995
Anu Kumar, MD .................................................................University of Toronto, 1995
Spencer Lister, MD................................................................University of Toronto, 1995
Eulla Tu, MD.......................................................................University of Toronto, 1995
Andreas von Ritschl, MD ....................................................University of Toronto, 1995
Louis Wu, MD...........................................................................McGill University, 1995
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 1999-2000 the seven divisions of the University of Toronto Department of Medical Imaging offered a comprehensive array of fellowships:

- Body Imaging
- Breast Imaging
- Magnetic Resonance Imaging
- Musculoskeletal Imaging
- Neuroradiology
- Pediatric Imaging
- Thoracic Imaging
- Vascular and Interventional Radiology
- Combined Clinical/Research fellowship

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.

1999-2000 Department of Medical Imaging Fellows

<table>
<thead>
<tr>
<th>Body Imaging</th>
<th>Before fellowship</th>
<th>After fellowship</th>
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</thead>
<tbody>
<tr>
<td>Dr. Fayez Alameddine</td>
<td>American University of Beirut</td>
<td>Private practice in Lebanon</td>
</tr>
<tr>
<td>Dr. Marianne Amitai</td>
<td>Tel Aviv University</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Giovanni Artho</td>
<td>University Bern Switzerland</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Alan Bau</td>
<td>University of Toronto</td>
<td>Staff, Credit Valley Hospital</td>
</tr>
<tr>
<td>Dr. Ofer Benjaminov</td>
<td>Technion Haifa, Israel</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Jane Crossin</td>
<td>Queens University, Belfast</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Chee-Yan Hiew</td>
<td>University of Sydney</td>
<td>Neuroradiology fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Carlos de Sequeira</td>
<td>University of Witwatersrand, South Africa</td>
<td>Staff, Markham Stouffville Hospital</td>
</tr>
<tr>
<td>Name</td>
<td>Before fellowship</td>
<td>After fellowship</td>
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<tr>
<td>Dr. Korosh Khalili</td>
<td>University of Ottawa</td>
<td>Staff, Mount Sinai Hospital-University Health Network</td>
</tr>
<tr>
<td>Dr. Rose Lee</td>
<td>University of Toronto</td>
<td>York Central and York County Hospitals</td>
</tr>
<tr>
<td>Dr. Kevin Lobo</td>
<td>University of British Columbia</td>
<td>Locum at Sunnybrook &amp; Women's College Health Sciences Centre - Sunnybrook Campus</td>
</tr>
<tr>
<td>Dr. Mark McClure</td>
<td>Queen's University, Belfast</td>
<td>Return to Northern Ireland</td>
</tr>
<tr>
<td>Dr. Sunil Mehta</td>
<td>University of Toronto</td>
<td>Staff, Humber River Regional Hospital</td>
</tr>
<tr>
<td>Dr. Elaine O’Riordan</td>
<td>Trinity College Dublin, Ireland</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Miriam Sklair-Levy</td>
<td>Hebrew University-Jerusalem</td>
<td>Women’s Imaging fellowship at University of Toronto</td>
</tr>
<tr>
<td><strong>Thoracic Imaging</strong></td>
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<tr>
<td>Dr. Jane Crossin</td>
<td>Queen’s University, Belfast</td>
<td>Abdominal Imaging fellowship at University of Toronto</td>
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<tr>
<td><strong>Magnetic Resonance Imaging</strong></td>
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<tr>
<td>Dr. Joseph Murphy</td>
<td>University College Galway Ireland</td>
<td>Consultant Radiologist, James’s Hospital, Ireland</td>
</tr>
<tr>
<td><strong>Musculoskeletal Imaging</strong></td>
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<tr>
<td>Dr. Matthew Lax</td>
<td>University of Toronto</td>
<td>Staff, Mount Sinai Hospital-University Health Network</td>
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<tr>
<td>Dr. Dawn Pearce</td>
<td>University of Western Ontario</td>
<td>Staff, Mount Sinai Hospital-University Health Network</td>
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<tr>
<td>Dr. Philip Robinson</td>
<td>Queen’s University, Belfast</td>
<td>Consultant Radiologist, United Kingdom</td>
</tr>
<tr>
<td><strong>Neuroradiology</strong></td>
<td></td>
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<tr>
<td>Dr. Justin Cross</td>
<td>University of Cambridge</td>
<td>Second year in Neuroradiology fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Cheemun Lum</td>
<td>University of Ottawa</td>
<td>Second year in Neuroradiology fellowship at University of Toronto</td>
</tr>
<tr>
<td>Dr. Mayank Goyal</td>
<td>All India Institute of Medical Sciences, New Delhi</td>
<td>Clinical Fellow, University of Ottawa</td>
</tr>
<tr>
<td>Dr. David Westman</td>
<td>University of Western Ontario</td>
<td>Staff, Medical College of Virginia in Richmond, Virginia</td>
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<tr>
<td><strong>Pediatric Imaging</strong></td>
<td></td>
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<tr>
<td>Dr. Pedro Albuquerque</td>
<td>Universidade do Rio de Janeiro</td>
<td>Return to Rio de Janeiro</td>
</tr>
<tr>
<td>Dr. Kevin Baskin</td>
<td>Creighton University</td>
<td>Instructor of Radiology, Harvard School of Medicine; Director, Section of Image Guided Therapy, Children’s Hospital, Boston</td>
</tr>
<tr>
<td>Dr. Ursula Hughes</td>
<td>University of Wales, Cardiff</td>
<td>Staff position in Manchester, United Kingdom</td>
</tr>
<tr>
<td>Before fellowship</td>
<td>After fellowship</td>
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<tr>
<td>Dr. Mary-Louise Greer</td>
<td>University of Queensland, Australia</td>
<td>Deputy Director of Paediatric Imaging, Royal Children’s Hospital</td>
</tr>
<tr>
<td>Dr. Oscar Navarro</td>
<td>Universidad Catolica de Chile</td>
<td>Staff, Clinica Alemana, Santiago, Chile</td>
</tr>
<tr>
<td>Dr. Matthias Schmidt</td>
<td>University of Toronto</td>
<td>Staff, IWK Grace Health Centre, Nova Scotia</td>
</tr>
<tr>
<td>Dr. Michael Temple</td>
<td>University of Western Ontario</td>
<td>Staff, Hospital for Sick Children</td>
</tr>
<tr>
<td>Dr. Karen Thomas</td>
<td>University of Oxford</td>
<td>Return to United Kingdom</td>
</tr>
</tbody>
</table>

**Vascular/Interventional Radiology**

<table>
<thead>
<tr>
<th>Before fellowship</th>
<th>After fellowship</th>
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</thead>
<tbody>
<tr>
<td>Dr. Ahmed Al Nammi</td>
<td>King Saud University</td>
</tr>
<tr>
<td>Dr. Sanjoy Kundu</td>
<td>University of Toronto</td>
</tr>
<tr>
<td>Dr. Noel Langhorne</td>
<td>Queen’s University</td>
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<tr>
<td>Dr. William Loan</td>
<td>Queen’s University, Belfast</td>
</tr>
<tr>
<td>Dr. Edwin Mercer</td>
<td>Memorial University of Newfoundland</td>
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</tbody>
</table>