Integrated Medical Imaging
Annual Report
2011/12
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Message from Mike Nader, Executive Director

Integration of Medical Imaging Services - An Incredible Journey

This Integrated Medical Imaging Report is a testament to the tremendous efforts, activities and achievements of our dedicated Medical Imaging (MI) Team. While it is an “Annual Report” it highlights the results of more than three years of planning and hard work and marks an important milestone for everyone involved with Medical Imaging services across Fraser Health, Provincial Health Services Authority, Providence Health Care and Vancouver Coastal Health.

The process began in August 2009 when health authority CEOs identified Medical Imaging as one of several programs to be included in lower mainland consolidation. This was part of an overall process to improve access and achieve efficiencies by creating one organizational structure to support services across all health authorities. In the fall of that year we conducted a service review and productivity assessment. By January 2010 we announced a new, streamlined leadership team with a goal to reduce costs by 10% while meeting increasing demands for Medical Imaging services across all health authorities.

The geographic area supported by Medical Imaging extends from Hope to Bella Coola, far beyond the boundaries of the lower mainland. We moved forward as an Integrated Medical Imaging team and initiated detailed planning for a consolidated Medical Imaging service model. A new organizational structure was announced in October 2010 and was implemented by the following April. Throughout this transition process we worked to support staff and ensure positions were available for everyone who wanted a role within the new integrated model.

The final step in the consolidation process was the transfer of all staff to Vancouver Coastal Health (VCH) in May 2011. This was an emotional process for many individuals who had worked for years as employees of another health organization. While we recognize and continue to support the strong working relationships that exist within the sites and host health organizations, the staff transfer to a common employer was essential to achieving our goals for improved efficiencies and standardization. With the staff transfer complete, a new organizational model established and a five-year strategic plan in place the journey continues. We have made tremendous progress and achieved more than $7 million in savings to-date, while serving more patients than ever and improving productivity.

These achievements are significant, but what impresses me the most is the people who have made this possible. We have more than 2500 Medical Imaging staff working at 30+ sites across the lower mainland and coastal communities. Each has demonstrated their ongoing commitment to patients and families by continuing to deliver the best possible care and service during a period of constant change and considerable challenge. I am proud to have been part of this dedicated Medical Imaging Team and thank everyone for their ongoing support and commitment.

Mike Nader
Executive Director
Integrated Medical Imaging
Excellence in Imaging, Together

As part of a strategic planning process, Integrated Medical Imaging agreed upon a vision for the new consolidated service: “Excellence, In Imaging Together” reflects a shared commitment to quality and acknowledges our new integrated service that brings all MI sites and services together under a common organizational structure.

Five Strategic Directions and four over-arching themes have been identified for Integrated Medical Imaging. The themes are:

- Sustainability
- Organizational Effectiveness & Efficiency
- Partnerships
- Research Drives Decisions

These themes are foundational to all that we do, and the Strategic Directions focus what we do.

Strategic Directions

Access Quality and Safety

Improve access to and enhance quality of Medical Imaging services at Fraser Health, Providence Health Care, Provincial Health Services Authority and Vancouver Coastal Health.

Great Workplaces

Create a positive culture that provides opportunities for meaningful work by welcoming and valuing individual contributions and fostering great relationships.

Enhancing Research and Education

Actively foster, develop and maintain a culture that enhances continuing intellectual and professional growth through research and education. This encompasses a broad-based, multi-disciplinary and collaborative approach that translates knowledge into meaningful practice.

Facility, Equipment and Informatics Development

Plan and develop sustainable state-of-the-art facilities*, equipment*, and informatics for the delivery of patient care, research and education. (*appropriate to the site)

Fiscal Stewardship

Maximize the value of the resources invested in Medical Imaging and ensure that our total funding is focused on achieving the greatest good for the populations we serve.

Did you know?

Integrated Medical Imaging staff performed over 2 million exams in 2011/12
Medical Imaging Snapshot

Integrated Medical Imaging delivers services to more than one million people, or one quarter of British Columbia’s population. This includes: BC Central Coast, Fraser Valley, North and West Vancouver, Richmond, Sea-to-Sky Corridor, Sunshine Coast, Surrey and Vancouver. The annual gross operating budget for Integrated Medical Imaging in 2011/12 was over $209 million.

MI modalities include:

- General Radiology
- Mammography
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Interventional Radiology (IR)
- Nuclear Medicine (including Bone Density)
- Ultrasound
## Our Sites and Services

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Medical Imaging Leadership Team

Sue Avery
Sites: LMH, MMH, CGH, ARH, FCH
“A great example of collaboration and workplace engagement is Lean activities in my jurisdiction. These events have brought energy to the front line staff as they experience improvements in process and have the opportunity to share their great ideas with the team.”

Pam Berekoff
Sites: C&W
“To me ‘Excellence in Imaging Together’ means collaboration to provide the best outcome for patient’s imaging with the least amount of radiation and reduced cost. It also includes maximizing our resources to improve the quality of imaging services we provide”

Jennifer Elliot
Sites: UBCH, MSJ, SPH
“It is fantastic to work with a group of individuals who are passionate and dedicated to ensuring high quality patient centered health care. I appreciate the opportunity to meet and learn from front line staff and leaders about different practices from sites across the lower mainland and up the coast. We have had an intense year of change and the huge progress we have made is a testament to the dedication and resilience of all staff.”

Carrie Green
Sites: RH, BH, DH, PAH
“The greatest opportunity for Medical Imaging past, present or future lies in our ability to collaborate.”
Dennis Hummerston  
Sites: LGH, St. Marys, SqH, Pemb, WHCC, PRGH  
“There are opportunities in all areas and at all sites. Any improvement in access no matter how big or small is an additional patient that will receive their much-needed imaging.”

Vicki Kerschbaumer  
Sites: VGH, BCCA, BCCDC  
“Our staff have a tremendous amount of knowledge, expertise and commitment to patients, and when we engage them (whether through a Lean event, or more informally), they always come up with innovative, patient-centric solutions that keep quality at the forefront.”

Susan Larson  
Sites: RCH, EH, RMH  
“What I like best about being a member of the Integrated Medical Imaging Leadership Team is the people. We have a dynamic and unique blend of individuals with varying professional backgrounds. Each person’s strengths contribute to creating a strong team; it is a privilege to work with and learn from them.”

Sandra Sewell  
Sites: SMH, JPOCSC  
“Ongoing dialogue, connections, openness, willingness to think outside of the box, support for each other and commitment is what will make us successful as a TEAM and sustain us through our journey in defining and creating ‘Excellence in Imaging, Together’. We need everyone to bring their talent and ideas and partner with us to create and deliver our vision.”
Medical Imaging Committees

Executive Committee
This group of operational and radiologist leaders provides oversight and leadership to guide the development and implementation of our Integrated Medical Imaging Strategy. Representing the broad interests of the consolidated services, the Executive Committee makes key decisions to support the achievement of integration goals associated with:

- Quality and Safety
- Standardization
- Productivity Savings
- Organizational Restructuring
- Equipment Utilization/Service Contract Management
- Supply/Non-Labour Savings
- Revenue Management

Members:
- Dr. Bruce Forster, Regional Medical Director/Department Head, VCH/PHC
- Dr. Spencer Lister, Program Medical Director and Regional Department Head, FH
- Dr. Jonathon Leipsic, Medical Imaging Medical Director, St. Paul’s Hospital
- Dr. Monty Martin, Medical Imaging Medical Director, BC Cancer Agency
- Sue Avery, Medical Imaging Operations Director
- Pam Berekoff, Medical Imaging Informatics and Operations Director
- Jennifer Elliott, Medical Imaging Operations Director

The Medical Imaging Executive Committee has provided tremendous leadership to facilitate the consolidation of services across the lower mainland and coastal communities over the past year. This has included establishing regional committees, policies and processes to create a more standardized, accessible and sustainable system.

Customer Service Committee
The Customer Service Committee includes senior representatives from the four health organizations served by Integrated Medical Imaging. This group meets 3-4 times a year to establish and monitor service delivery and quality targets and address issues, opportunities or concerns as required. With particular emphasis on quality and standardization, the Customer Service Committee receives regular reports on Medical Imaging Performance Metrics.

Members:
- Chair: Mike Nader, Executive Director, Integrated Medical Imaging
- Dr. Jeff Coleman, Vice President, Vancouver Coastal Health
- Larry Gold, President, BC Children’s Hospital and Sunny Hill Health Centre for Children
- Marc Pelletier, Vice President, Fraser Health
- David Thompson, Vice President, Providence Health Care

The Customer Service Committee provides an important link between Integrated Medical Imaging and Health Authority operations. This is essential to maintaining required service expectations and ensuring a consistent approach to service delivery and quality standards.
Physician Advisory Council

The Physician Advisory Council was established in fall 2011 as an advisory body to the Medical Imaging Executive Committee. This group of Medical Imaging medical site leads provides valuable input into discussions and decisions relating to policy development, practice changes and other priorities aimed at improving the quality, safety and accessibility of Medical Imaging services across the lower mainland and coastal communities. They also help recruit and involve other members of the medical staff to participate on working groups and committees to ensure clinical input into initiatives and projects as required.

Members:
Chair: Dr. Ciaran Keogh, BH
Dr. Amarjit Bajwa, CGH
Dr. John Lai, ARH, MMH
Dr. Emil Lee, LMH
Dr. Stuart Cocquyt, RMH
Dr. Suzanne Degruchy, PAH
Dr. Juan-Carlos Guijon, DH
Dr. Dennis Janzen, SMH
Dr. Rob Van Wiltenburg, RCH/ERH
Dr. Spencer Lister, FH
Dr. Richard Lee, MSJ
Dr. Jonathon Leipsic, SPH
Dr. Marty Jenkins, RH
Dr. Simon Bicknell, LGH/PRGH/St. Mary’s
Dr. Bill Schramm, S2S
Dr. Bruce Forster, VCH/PHC
Dr. John Mawson, C&W
Dr. Monty Martin, BCCA

The Medical Imaging Physician Advisory Council meets 3-4 times per year with agendas reflecting priorities and initiatives requiring clinical input.
MI/IMITS Strategic Steering Committee

Integrated Medical Imaging (MI) and VCH/PHSA Information Management/Information Technology Solutions (IMITS) and Fraser Health Authority (FHA) IMITS are collaborating on a number of MI Informatics Projects. These initiatives are essential to achieving the benefits intended through Integrated Medical Imaging. Key business drivers for these MI Informatics Projects include:

- Improved clinical care through access to required MI data and information when/where required to support timely and appropriate decision making and improved collaboration among clinicians across all Integrated Medical Imaging sites.
- Improved business decisions and resource management with access to MI data and information as required.
- Reduced costs resulting from improved workflow, system integration and increased efficiency enabled through technology solutions.
- Compliance with required privacy and security standards to ensure safe and secure access to/sharing of MI data and information.

The MI/IMITS Strategic Steering Committee meets monthly to provide high level oversight and guidance to all MI Informatics Projects. Priorities for the past year included:

Speech Recognition Project

This initiative was focused on establishing requirements and selecting a vendor for a technology solution to improve report turnaround times by enabling radiologists to dictate and create reports in real time. Vendor selection is underway and the Speech Recognition Solution will be rolled out in 2013.

VCH/PHC PACS RFP Project

In February 2012 it was decided that a new PACS system is required for all VCH/PHC sites. This would address existing risk associated with outdated technology and would also create a common system for accessing/sharing images and reports. A Request for Proposals (RFP) was initiated in summer 2012 to select a PACS solution for all VCH and PHC sites and establish a common PACS platform, and closer alignment with a lower mainland and possible provincial PACS strategy.

Agfa PACS Upgrade

An upgrade is underway of the Agfa PACS at VGH, UBCH, MSJ, RH, and LGH to address system crashes associated with these beyond end-of-life systems. This upgrade is focused on stabilizing the existing PACS, any enhancements will be addressed via the RFP process that is underway. This upgrade will be completed within the standard operating budget allocated to PACS system maintenance.

Members of the MI/IMITS Strategic Steering Committee overlap with the MI Executive Committee membership to ensure strategic alignment and continuity between these two leadership groups.

Members:

Mike Nader, Executive Director, Integrated MI, Chair (alternate: Pam Berekoff)
Philip Barker, VP, Information Management, FH (alternate: Corey Tillyer)
Barry Rivelis, CIO, PHSA/VCH/PHC (alternate: Jackie Holloway)
Dr. Bruce Forster, Regional Medical Director/Department Head, VCH/PHC
Dr. Spencer Lister, Program Medical Director and Regional Department Head, FH
Regional Education Committee
The Regional Education Committee was established in January, 2012 to establish an equitable and standardized process for managing education requests from staff at all sites. This includes ensuring all staff have access to funding and are aware of how to apply for it. The committee also guides decision-making processes concerning staff education requests and is working to establish a formal mechanism for knowledge dissemination across all sites.

Members:
Egidio Pasin, Medical Imaging Site Coordinator for Lions Gate Hospital, Co-chair
Laurier Nobert, Medical Imaging Site Coordinator for Burnaby Hospital, Co-chair
Elizabeth Jongedijk, ARH
Michael Zeng, SMH/JPOCSC
Robin Day, PAH
Lara Wing, RCH
Maureen Jennings, Regional IT
Charmaine Nathan, SPH
Trudy Pel, C&W
Karen Locken, BCCA
Donna Sheppard, VGH
Rosalin Chiu, VGH
Jan Howe, UBCH
Lien Ho, RH

The Education Committee meets at least two times a year and is committed to promoting and facilitating education and knowledge opportunities for all Medical Imaging staff.

Extended Leadership Committee
The Medical Imaging Extended Leadership Committee includes site coordinators, regional practice leads, nuclear medicine supervisors and other Medical Imaging leaders who supervise staff and have operational responsibilities. This group is intended to meet 4-6 times a year and is still in the development phase.

Given the geographic distances between sites, Committee meetings provide an opportunity for these Medical Imaging leaders to connect face-to-face and discuss topics of common interest or concern. It is also an opportunity to hear from senior leaders, ask questions and provide feedback with regards to changes and new programs. Agendas reflect operational priorities and presentations are aimed at ensuring members are updated on new initiatives.
Regional Quality and Safety Committee
A Program Quality Committee will be forming under Dr. Patrick Vos and expected start in fall 2012. The committee will have primary responsibility to monitor and advise on medical or technical issues related to quality of care and patient safety within Integrated MI.

Radiation Safety Committee
In conjunction with Occupational Health and Safety (OH&S), a radiation safety manual has been created. A Radiation Safety Committee for Nuclear Medicine started in fall 2011. A Radiation Safety Committee for X-ray emitting devices is starting in fall 2012.

Other Integrated Medical Imaging Committees and Working Groups
In addition to the many standing committees established to guide the planning and support the progress of Medical Imaging programs and services, there are other groups created as required to support specific projects or initiatives. These include Clinical Advisory Groups with radiologists and other clinical stakeholders participating for a specific period of time to focus on a task or important decision such as the purchase of new technology systems or other capital equipment. Other committees are established to support operational initiatives such as the new timekeeping and payroll system that was implemented one year ago. These committees function for the duration of the project or as long as they are needed and are then disbanded.

Eight Medical Practice Leads positions have been created to support and augment our six Regional Technical Practice Leads in standardization of best practice across LMC MI. They include:

- Dr. Charlotte Yong-Hing (General Radiography/X-ray) BCCA
- Dr. Jason Clement (Magnetic Resonance Imaging) SPH
- Dr. Mike Dowie (Nuclear Medicine) SMH
- Dr. Christine Wilson (Mammography) BCCA
- Dr. Stephen Ho (Interventional Radiology) VGH
- Dr. Kenneth Wong (Computed Tomography) RCH
- Dr. Kapil Bhagirath (Echocardiography) SMH
- Dr. Simon Bicknell (Ultrasound) LGH

Some Professional Practice Working Groups (PPWG) have begun in interventional radiology, ultrasound, echocardiography, nuclear medicine and magnetic resonance imaging. Mammography and general radiography and computed tomography are starting in fall 2012.
Accountability

There are many ways to assess the efficacy of Medical Imaging programs services and procedures – it could be how well we manage our financial resources, the efficiency of our processes, or how long it takes to access our services. In fact, it is all those things – and more.


Key Performance Indicators by Quality Dimension

Financial

• Budget Performance /Savings
• Cost per Exam

By monitoring these two performance indicators we have determined that Integrated Medical Imaging has made tremendous progress towards financial savings targets established for the consolidation of services. In fact, the significant efforts of all Medical Imaging staff and clinicians have achieved almost $7 million in savings to-date. Equally impressive, is the reduction in the overall cost per exam by more than $4.40.

Efficiency

• Productivity
• Lean

Each site has productivity targets based on established benchmarks. The past year of change and transition has been challenging for everyone, but in spite of this, the majority of Medical Imaging sites have met or exceeded their productivity targets. These efficiencies have resulted in more than $2.05 million of avoided costs. This means we have created capacity to provide more services within existing resources. Much of these improvements have resulted from more than 27 Lean events that were held in 2011/12 at 14 sites. Lean initiatives provide specific data to help us measure results and monitor progress as we move forward.

Access/Availability

• Exam Volumes
• Wait Times
• Turnaround Times

Improving access is an ongoing challenge for all health services as we work to address increasing demands. In the past year, Integrated Medical Imaging has increased the number of exams provided by 7.5% which translates to more than 150,000 additional exams. As well, the wait times to receive those procedures has dropped for most modalities. Reporting for turnaround times, which is the time between when the exam is ordered to when it is completed and reported, continues to be refined. While there were significant challenges for transcription turnaround times in the latter half of 2011, these issues have been addressed and targets for 24hr report turnaround times are being met consistently across the majority of sites.
Acceptability/Satisfaction

- Customer Surveys
- Staff Education

The experience we provide our patients and their families is of utmost importance. This is why we monitor our success through their feedback provided during annual surveys, and throughout the year via letters, emails, phone calls and comments. Annual surveys are also distributed to referring physicians and results from these surveys (patient and physician) help us to refine our processes and improve our services.

Last year more than $172,000 was allocated for staff training and education. One of the ways we measure staff satisfaction is through the level of response to educational opportunities provided. This funding supported more than 117 Medical Imaging staff to attend education programs and professional development opportunities in 2011/12.

Safety/Risk

- Worksafe BC Incidents
- Sick Hours
- Overtime Hours
- Diagnostic Accreditation Program (DAP)/Safety Code 35

Safety is a top priority and eliminating risk an ongoing concern. Safety Code 35 is a national standard aimed at improving radiation safety in large facilities. Four physicists are working towards 100% compliance with Safety Code 35, the Diagnostic Accreditation Program and the Canadian Nuclear Safety Commission. As well, a new radiation safety manual has been created for all staff, and physicians are encouraged to complete an online radiation safety program. We also measure safety through the number of incidents reported, the amount of sick time taken by staff and the hours of overtime worked. In all of these areas Integrated Medical Imaging is below the VCH average, and we continue to work towards further improvements. A Program Quality Committee was also formed under Dr. Patrick Vos and expected to start in fall, 2012. The committee will have primary responsibility to monitor and advise on medical or technical issues related to quality of care and patient safety within Integrated MI.

Effectiveness

- Peer Review

Integrated Medical Imaging initiated a radiologist Peer Review Program in fall 2011. This pilot project involves radiologists at all facilities agreeing to have 2% of their Computed Tomography (CT) studies reviewed by colleagues as a quality assessment initiative. The Peer Review Program has been implemented at 80% of sites to-date and is currently focused on CT reporting. This will continue to expand and ultimately align with a Provincial Peer Review Program that is being developed.

Committed to Continuous Improvement

While the quality dimensions will remain the same year to year, the performance indicators we decide to measure will change to ensure we are learning and evolving to create a more effective and efficient Medical Imaging program that is sustainable for the future.
Interventional Radiology Service Expansion

Interventional Radiology (IR) is a specialized service that uses minimally-invasive image-guided procedures for patients with a variety of health concerns. These procedures include venous access for dialysis and chemotherapy patients, angioplasties for renal access and peripheral arterial disease and embolization procedures for active bleeding, tumors and fibroids. Other examples of IR procedures include chest tube placements, percutaneous drainages of abscesses, biliary drainages and feeding tube insertion.

Interventional Radiology services have higher associated costs than other MI services due to the specialized nature of the procedures and the medical and surgical supplies required. Medical Imaging developed a business case in 2011 to address increasing demand for IR services in Fraser Health and at BC Children’s Hospital. In addition to rising costs, both Surrey Memorial Hospital and BC Children’s Hospital were unable to meet growing patient needs for IR procedures.

Medical Imaging received a total of $1.2 million in additional funding to address IR cost pressures. This funding will establish a renal vascular access IR service at Surrey Memorial Hospital and fund more than 500 IR cases at BC Children’s Hospital.

Benefits of Interventional Radiology

Interventional Radiology provides an alternative to more costly, complex surgical procedures and frees up OR time for other surgical priorities. It is also a less invasive procedure, which is easier on patients and supports faster recovery. Other benefits of IR include reduced need for general anesthesia, shortened hospital stays, reduced patient risk, less pain and improved health outcomes.
Improving Transcription Report Turnaround Times

Over the past year significant challenges affected Medical Imaging transcription report turnaround times at various sites across the lower mainland. These were attributed to a number of factors, including staffing shortages, unplanned absences, system downtimes and increased activities. These factors came to a critical point in summer 2011 when report turnaround times averaged 4-7 days, well above the 24 hour standard.

A number of actions were taken to address these reporting delays. This included sharing staff across sites, overtime etc. Resources were distributed efficiently to the areas of greatest need and almost immediately the backlog of reports began to decrease. By the end of October 2011, Medical Imaging was caught up with the backlog of reports.

Thanks to staff commitment and improved processes the majority of Medical Imaging sites are consistently meeting the 24 hour turnaround time.

Peer Review Program for Radiologists Initiated

A new Peer Review Program is a key initiative underway to support the quality and safety of our Integrated Medical Imaging services. This is an internal radiologist led process that is positioned within the context of our overall Quality Assurance Program. It will link to the provincial peer review program when it is rolled out.

The radiologist Peer Review Program was phased in over the past year. It started with UBC Hospital and Peace Arch Hospital and now includes all Providence Health Care sites, North Shore sites, and all Fraser Health Authority sites. The remainder of the sites at Vancouver Coastal Health and Provincial Health Services Authority are scheduled to go live in fall 2012.

Peer Review Program Highlights

- 2% random sample of CT studies will be reviewed each week.
- All radiologists participate as part of their site QA activities.
- Process is protected under Section 51.
- Privacy is protected with anonymized and encrypted data.
- Only Integrated Medical Imaging Medical Directors have access to data.
- Process ensures timely follow-up with patients and physicians when necessary.
- Over 500 CTs reviewed to date.
MRI – Improving Access and Reducing Costs

Integrated Medical Imaging performed 27% more magnetic resonance imaging (MRI) exams in 2011 than they did in 2009 while decreasing the overall cost per exam. This achievement was possible with increased funding and considerable staff commitment to improve patient access and operational efficiency.

In 2010 the Health Services Purchasing Organization (HSPO) of BC provided patient focused funding in order to decrease the wait associated with elective MRI exams. At that time, the longest waitlist for MRI exams was over 160 days. Integrated Medical Imaging received $5.4 million in funding from HSPO in 2011 to provide an additional 18,000 exams. As a result, average wait times decreased between 20-30%.

Congratulations to all Medical Imaging staff and clinicians for your hard work and this significant improvement in patient wait times for MRI procedures.

Did you know?

- A key benefit of MRI is the scope of detail captured in the images that can show both bones and soft tissues in the body. By means of the computer, the ‘slices’ can also be obtained in any direction. Detailed MRI images allow physicians to better evaluate parts of the body and certain diseases that may not be assessed as adequately with other imaging methods such as x-ray, ultrasound, or computed tomography (also called CT or CAT scanning).

![MRI - Average Wait by Clinical Priority](image)

*See Appendix C for details on Clinical Priority*
Kudos to Medical Imaging Staff

Bonnie Papuc, Langley Memorial Hospital
“Just wanted to say that I went to Langley and was so impressed... The lady who did my exam was Bonnie. She was truly amazing. Hip Hip Hooray for her...”

Donna King, Nuclear Medicine, Lions Gate Hospital
“...the patient found Donna very enthusiastic and friendly. She explained everything and made her feel comfortable. She was very personable and took the time to explain the procedure. Donna is one of the best employees the patient has seen in large institutions.”
Great Workplaces

The recruitment and retention of the best people while enhancing the quality of work-life is an ongoing priority for Integrated Medical Imaging. This involves:

- Promoting Medical Imaging as an employer of choice for recruitment efforts.
- Fostering and further developing relationships with partner organizations such as educational institutions.
- Providing continuing education opportunities for Medical Imaging staff.
- Providing internal leadership development and succession planning.
- Creating standardized performance planning process and measurement tools.
- Continually developing engagement strategies to establish, build and maintain a great workplace.

Over the past year, there have been many staff achievements and staff led initiatives that celebrate great workplaces. Here are some examples:

- In May, site coordinators and other medical imaging leaders came together at the World Cafe forum to brainstorm how to create great workplaces.
- 27 staff-led Lean events were held at 14 sites in 2011/2012. Medical Imaging staff drove the creation of process improvements that were meaningful to their job and that will help contribute to enhancing patient care in the long term.
- Organizational development workshops were held with staff at the Jim Pattison Outpatient Care and Surgery Center (JPOCSC) in April, 2012. These workshops provided a forum for staff to share ideas, and ask questions about the amalgamation of Surrey Memorial Hospital and JPOCSC. Ideas on how to create great workplaces that support staff, and improve service delivery through Lean projects were discussed and captured in an illustration by a graphic artist.
- Kudos goes out to the many Medical Imaging staff who celebrated length of service milestones and retirements after many years of service. Celebrations were held at each site in addition to regional events.
Staff Awards and Special Recognition Highlights

KERRY MACEY, Supervisor, Nuclear Medicine, Lions Gate Hospital
- Nominated for the LGH Foundation Leadership Award
- Completed Masters in Leadership from Royal Roads, February 2012

SANTHA NAIDU, Clinical Instructor for General Radiography, Ridge Meadows Hospital
- Healthcare Excellence Award, Ridge Meadows Hospital, June 2012

EGIDIO PASIN, Site Coordinator, Lions Gate Hospital
- VCH People First Award, Celebrating Success, October 2011
- Foundation Applause Award in support of the LGH Foundation, March 2012

GISELA PARKINS, Supervisor, Ultrasound, Lions Gate Hospital
- Nominated for LGH Foundation Workplace Inspiration Award

DR. DAVE SPOUGE, Radiologists, Lions Gate Hospital
- Nominated for LGH Foundation Clinical Practice Award

Tandice Domingues and Sherida Lee Mahood, Abbotsford Regional Hospital
“Dear superb Breast Health Program Staff. I just wanted to send along a note of sincere thanks for your support during my recent mammogram and ultrasound experience. Your kindness, understanding and responsiveness is very much appreciated. You provide a very valuable service and deliver that service with excellence.
Karen Smith wins CAMRT, Life Membership Award

Karen Smith received the Life Membership Award from the CAMRT (Canadian Association of Medical Radiation Technologists) in Toronto on June 9, 2012.

The Life Membership Award
The Life Membership Award represents the highest form of recognition by one’s peers and is designed to honor a member of CAMRT whose professional activities have promoted the MRT profession nationally or internationally, whose leadership serves to motivate others to become involved in professional activities, and who has been involved in raising the profile of the CAMRT. Karen was selected for the award in March 2011.

About Karen Smith
Karen Smith (MSc, RTMR, ACR, RTR) has contributed greatly to her profession, as an educator, researcher and innovator in the field of MR. She is recognized in particular for her extensive work on the CAMRT Education committees. Karen initiated that MRI be recognized as a distinct discipline for technologists in Canada in the early 1990’s. She was also involved in the committee that set up the first national MR certification exam and competency profile, and continued as a participant and advisor on that committee for many years.

As an educator, Karen has taught in the MRI program at BCIT for over 17 years, and acted as the clinical coordinator for most of that time. As the co-charge MRI technologist at UBC Hospital for over 23 years, Karen led by example through her team style approach and emphasis on patient focused care. She has acted as an MR consultant for UBC MS/MRI Research group (a Multiple Sclerosis analysis centre) and has given presentations and international site visits for this MS research. Through teaching, she has touched many new MR technologists by mentoring and encouraging them. Karen was also CAMRT’s Olympian-imaging team leader for the Olympics/Paralympics 2010. She organized the volunteers that provided all medical imaging and took the initiative to coordinate live blogging from the Olympic site so that CAMRT members could share the excitement. Karen is currently the Regional Practice Lead of Magnetic Resonance Imaging for Integrated Medical Imaging and an instructor of the MRI program at BCIT.

“I am very honoured to receive this life membership award as it means so much to me to be acknowledged by my peers and CAMRT. I have been very fortunate to be surrounded by a great team: my family, friends and professional colleagues who have made it possible for me to make these professional contributions in MRI. It has been a wonderful experience in so many ways. My mother was the best example of a volunteer so it has come naturally to me.”

-Karen Smith, winner of the Life Membership Award from the CAMRT
Karen Takahashi is honored with the W.Q. Stirling Award BCAMRT

Karen Takahashi received the W.Q. Stirling Award BCAMRT (British Columbia Association Medical Radiation Technologists) at the BCAMRT conference in April, 2012.

The W.Q. Stirling Award

The W.Q. Stirling Award is presented annually to a technologist who is a member of the BCAMRT “most deserving of honour for service to the art and science of medical radiation technology” who has “contributed to the scientific and professional advancement of the members of the BCAMRT”.

“Karen is most deserving of the WQ Stirling award as she is very hard working, provides great patient care and believes strongly in her profession. She is a great role model for both her students and peers. She has served on numerous committees, organizing education sessions and conferences for many years for the BCAMRT and other medical imaging meetings in BC. She has contributed significantly to the advancement of medical imaging in BC with her focus on pediatric imaging. I have been fortunate to work with her on a volunteer capacity and admire how she has great ideas and works hard to make things happen.”
- Karen Smith Regional Practice Lead of Magnetic Resonance Imaging, Integrated Medical Imaging

About Karen Takahashi:

Karen Takahashi’s career as a radiology technologist has taken her all over our province beginning at Nanaimo Regional Hospital, Prince Rupert, Creston Valley and finally at BC Children’s Hospital where she is currently a MR/CT/Angiography supervisor.

“It is an honour to be recognized by the BCAMRT for my contributions to the field. For more than 35 years I have committed myself to continuing education which has played an important role in my career. Although preparing and delivering the W.Q. Stirling address at the BCAMRT Annual General Conference was intimidating for me, I have always believed in the importance of sharing knowledge and connecting with others in my field.”
- Karen Takahashi, winner of the W.Q. Stirling Award BCAMRT
Regional Practice Leads - Improving the Quality of Medical Imaging Services

The Regional Practice Lead (RPL) is often the first point of contact when it comes to communicating standards of practice to Medical Imaging stakeholders. The RPL portfolio is specialized per modality and spans all sites across Integrated Medical Imaging.

The expansive scope that is covered by RPLs in their daily work involves working closely with a variety of site staff and being a key resource for answering questions that often go beyond the specialized modality. Their involvement delves into many areas including: equipment acquisition, participation in committees and Lean events, standardization, working with specialists, auditing sites, conducting interviews, liaising with colleges and professional organizations, and much more. These duties bring to light the vital role RPLs play in supporting quality assurance of MI services on multiple levels.

Integrated Medical Imaging Regional Practice Leads 2011/12

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<thead>
<tr>
<th>Regional Practice Leads</th>
<th>Magnetic Resonance Imaging</th>
<th>Karen Smith</th>
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<td></td>
<td>Nuclear Medicine</td>
<td>Lori Hook</td>
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<td></td>
<td>General Radiography / Mammography</td>
<td>Annemarie Bymoen</td>
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<td>Interventional Radiology</td>
<td>Sheila Pettypiece</td>
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<td>Computed Tomography</td>
<td>Bruce Hartnett / Harp Senghera</td>
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<td>Ultrasound/Echocardiography</td>
<td>Brent Barton</td>
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Spotlight on Annemarie Bymoen

Annemarie Bymoen’s career in healthcare spans over 23 years. Throughout her career she has held numerous positions as an X-ray technologist, CT technologist, interventional radiographer, clinical instructor, BCIT instructor, mammographer, OR, evening and weekend supervisor and PACS/RIS coordinator. Since the integration of Medical Imaging in 2011, she has been the Radiography & Mammography RPL. Annemarie’s current portfolio includes general radiography, intraoperative radiography, fluoroscopy, and diagnostic mammography. In addition to this, she liaises with the BC Screening Mammography Program.

When asked about the key challenges associated with her role, Annemarie immediately notes that time is an issue in juggling how to balance the demands of her extensive portfolio. The issue of limited time relates to the challenge of trying to be more proactive than reactive to the many changes that integrating Medical Imaging has brought forth. In light of these challenges, she also recognizes the opportunities that have resulted such as standardizing supplies where RPL’s are assisting with the comparison of current products to the new products for quality assurance.

One of the key highlights of being an RPL for Annemarie is facilitating collaboration. An example is starting the Mammography & Radiography Professional Practice working groups and coordinating the logistics. Her passion for collaboration is clearly evident when discussing what is most rewarding about her role as a RPL “I enjoy being involved on varying levels of the organization. Being involved with discussions of future goals, projects and visions affords me with a deeper insight to the direction of Medical Imaging as a whole in the lower mainland and beyond.”
Lean Highlights

The Lean program continued through the past year with strong momentum. There was a total of 27 events held in 2011/12.

The overarching goal for 2012 is to have an excess of 50 events within the region and to increase the general knowledge of Lean methodology within Medical Imaging staff including: the tools and methods we use and the ways that these events are benefitting patients and staff. These events present an opportunity for Medical Imaging staff to participate in process improvement relevant to their workflow and experience.

Medical Imaging staff enthusiastically joined the events and accommodated the Lean groups by hosting events in and around the various Medical Imaging departments. An average of 6-8 Medical Imaging staff participated in each event. While Lean facilitators have been great resources in guiding the process, staff engagement and participation has been instrumental in creating process improvements and increased capacity at the respective sites to meet the ever growing demand for Medical Imaging procedures.

Lean initiatives support the Medical Imaging pursuit of an improved collaborative service model that leads to more efficient processes through:

- alignment and integration across the organizations
- standardization
- less duplication
- more buying power
- sharing of resources and knowledge

Here is a brief snapshot of some of the key Lean highlights over the past year.

Workplace Satisfaction

Royal Columbian Hospital Nuclear Medicine (September 2011)

Team: Sukhi Maheem, Greg Siebert, Joanne Soltesz, Lori Hook and Wendy Reaume

With only one injection room, staff and patients at this department were required to wait until it was free. A second injection room was created by reorganizing offices to decrease wait times & improve flow for both technologists & patients. By repositioning the wall bracket for patient’s paperwork the 40 meter walk technologists had to make for each newly arrived patient was eliminated.

A 5S event is a Lean tool for creating good workflow in a physical workspace. The changes through implementation of this tool improved the workflow for technologists within the hotlab, increased the shelf and floor space by 50%, and decreased radiation exposure levels within certain areas of the hotlab by 60%.
“I think more Lean 101 courses should be taught to staff (all staff, not just the staff going through a Lean event). The staff that hesitated were the ones who didn’t understand Lean and thought the “Lean Team” was just coming in and taking over, not understanding that Lean is based on getting input from the front-line workers.” - Joanne Soltesz, Team Leader

Before and After Solutions Implemented: removed cart, empty boxes and improved access to eye wash station and emergency shower

Ridge Meadows Hospital Central Workspace (February 2012)

Team: Henry Ross, Lori Partington, Christina Sullivan, Diana Vandenbrink, Caroline Clarke, Santha Naidu, Karen Swinnard, Lesley Walters, Joanne Soltesz and Henry Ross

It is hard to improve a process if the workspace itself will not support it. With ongoing construction for new equipment and changes from previous designs over the years, the process owners of the central technical and clerical area at RMH needed time and bodies to create an improved workspace. A lot of energy and enthusiasm went into reorganizing this area of the department and to improving work processes. All materials were scrutinized for usefulness and many items were cleared out so that overall workspace was dramatically increased. Communication to staff on the bulletin boards was consolidated to fewer and more concise locations. High use and more important items were relocated to areas for improved access to facilitate good workflow. The energy at the report out for this event was very positive and the team’s work was universally acclaimed by the rest of department.

“The Lean event had a positive impact on staff morale. Having a de-cluttered and more streamlined workspace definitely helped staff cope better with all the confusion and chaos around the renovations to two of our x-ray rooms. We have established regular reporting and auditing in several areas and as a consequence of the Lean event were much better prepared for our Diagnostic Accreditation Program review.” - Leslie Walters, Greenbelt Facilitator
Quality and Best Practice

Vancouver General Hospital (VGH) Gastrointestinal (GI) and Genitourinary (GU) (March 2012)

Team: Rina Patel, Roz Chiu, Shannon Coleman, Sheila Pettypiece, Leonard Tong, Krystle Hurtubise, Juvena Burns, Satwant Grewal, Dr. Stephen Ho, Dr. Raj Heran and Dr. Michael Page

With delays in turnaround times and patient no shows the GI and GU team were experiencing issues impacting their workflow. After analyzing the cycle time with and without anesthesia key problems were identified that included the fluctuations with turnaround time for housekeeping services and gaps with room turnover time. Consistency in communications around following booking guidelines was also identified as another major issue. The team set about to address the issues that caused delays in the exams. This included observation of the process and collaboration with the radiologist and anesthetist. Immediate improvements are the development of a standardized procedure bookings protocol and review that is expected to improve the workflow and turnaround times with exams. Long term goals are focused on reducing the cycle times.

Savings

- 1.5 hrs time saved daily for technologists and nurses resulting in annual savings of over $42,000.
- Capacity for an estimated 270 added interventional radiology procedures performed annually at VGH.

St. Paul’s Hospital MRI Booking (November 2011)

Team: Karen Smith, Sheila Boyd, Joyce Umlas, Wayne Patola, Lisa Lennie and Scott McCarten

This event improved the quality of MRI bookings at St. Paul’s Hospital. The department was experiencing MRI no shows and the waitlist for the procedure was increasing. The team focused on long-term sustainable changes. These efforts will help improve delivery of service and productivity by improving MRI booking workflow and improving utilization/capacity. The quality of service delivery is enhanced through better communication with patients that results in fewer no-shows, decreased waitlists and altogether is improving patient care.

Savings:

- 37% of space was reclaimed which provided a safer working environment.
- A new, more secluded booking area for the clerical staff is expected to greatly increase the efficiency of booking MR studies at the site.
Financial and Productivity

Peace Arch Hospital Nuclear Medicine and Cardiology Reception (August 2011)

Team: Annette Westendorf, Debbie Lewis, Stacey English, Dana Patterson, Lisa Weir, Lindsay Bozzer, Diane Wood and Kelly Keitel

This department had an average of 5 no-show Myocardial Perfusion Imaging patients per week. By implementing reminder calls, this was decreased by 80%, eliminating 200 wasted imaging spots annually and improving capacity. By creating a separate area with less interruption for the booking clerk, there was an increase in the efficiency of booking exams.

Savings:

• Annually, this initiative is expected to result in 416 more exams and $122,000 in additional revenue.

BC Cancer Agency CT Booking (October 2011)

Team: Karen Locken, Stephanie Richmond, Sheila Pettypiece, Sandeep Nizar, Carmella Rees, Dr. Colin Mar, Leonard Tong and Marilyn Pickwell

This department was finding that a portion of their Computed Tomography (CT) technologist’s time was consumed on using an iStat device to determine patient blood chemistry when this data was not supplied externally. Through the Lean event, changes were made that allowed this practice to be discontinued. On top of the savings found by eliminating the need for the device, the department was able to turn that time into added productivity, increasing access for patients and increasing exam numbers by 12%.

Savings:

• Annually, this initiative is expected to result in an increase of 446 exams and over $10,000 in savings.
Other Lean Activities at Medical Imaging Sites

Delta Hospital Cardiology (August 2011)
- 5S Lean event improved patient workflow, cardiology technologist record keeping and work space.

Jim Pattison Outpatient Care and Surgery Center Mammography (August/Sept 2011)
- Notification to referring physicians, clerical paper flow and outside film protocol/process streamlined.

Burnaby Hospital Clerical (October 2011)
- Improved workflow and communication with clerical staff.
- Better efficiency and reduced wait times to process patients at reception.

BC Children’s Hospital IR add-on Urgent and Emergent Cases (October 2011)
- Improved communication between requesting physician to radiologist and within the team through space reconfiguration in the interventional radiology (IR) department.

Abbotsford Regional Hospital Turn Around Time (November, 2011)
- Improved procedure start time and turn around time.
- Improved communication between IR team members, wards, patients, other sites and physicians to decrease delays.
- Improved patient safety by using various checklists and IR pause to ensure the correct procedure is being performed on the correct patient at the correct site.

Surrey Memorial Hospital Computed Tomography (CT) (February 2012)
- Improved accessibility, client-centered continuity, and efficiency in the requesting, protocoling and scheduling of emergency patients at Surrey Memorial Hospital.
- Annual savings of $2500 achieved by process improvements.

Lions Gate Hospital Angiography/IR Booking (March 2012)
- Reviewed booking process and utilization of resources.
St. Mary’s Hospital Ultrasound (March 2011) 5S Lean supply (April 2011)
- Ultrasound cycle time reduction to clear egress.
- Annual savings of $50,000 achieved through this initiative.

UBC Hospital 5S Medical Supply Room (April 2012)
- This project was undertaken to make stock room items locations more intuitive.
- Approximately 10 items from “top up” inventory and another 8-10 from “ordered” inventory were deleted as they were no longer used which reduced unnecessary inventory and allowed for space saving.

Langley Memorial Hospital 5S Interventional Supplies (April 2012)
- A new space was selected which was accessible to all and a new storage board was created.
- A Kanban process was initiated, which will help keep items topped up.

Eagle Ridge Hospital In-Patient and Emergency-Patient Flow to CT (April/May 2012)
- Increased Computed Tomography (CT) capacity.
- Reduced CT staff triaging patients to improve work flow.

Overall Learning Outcomes from Lean Activities
- Change can be difficult but improvements are always exciting.
- It is the people who actually perform the process that best know how to improve it. You must include the subject matter experts in the Lean process.
- Including subject matter experts from other sites helps to bring fresh ideas to the project and disseminates the positive Lean outcomes around the region.
- We have a very talented group of facilitators in the Lean program and a ton of good ideas at the sites waiting to be acted upon.
- Sustainment of Lean initiatives is crucial to the success of any project and needs as much support as the event itself.

For more information:
If you have an idea of how to improve workflow or would like to get involved in a Lean initiative discuss with your site supervisor/coordinator and contact Jeffrey Chabot, Regional Manager, email: jeffrey.chabot@vch.ca
Lean Opportunities

Greenbelt Facilitators
Our largest Lean training session to date was held in fall 2011. Congratulations goes out to the 14 Medical Imaging staff who graduated from the Lean Greenbelt courses. This brings our Integrated Medical Imaging total of Lean Greenbelt Facilitators to 51. There will be further training opportunities in fall 2012.

The growing network of Lean facilitators over the past year demonstrates the dedication of Integrated Medical Imaging staff to not only build new skills but also commit to stakeholder engagement to collectively enhance the quality of our services and access of care for our patients.

“The Lean Greenbelt program has given me a new perspective. Lean allows staff the opportunity to make positive changes within their own work environments. Lean provides a level playing field where frustrations are heard and seen as opportunities for improvement. Within Integrated Medical Imaging, most often what frustrates us also proves to be inefficient and wasteful. Lean tools identify the root cause of these frustrations which then can be eliminated, making a more efficient and enjoyable work environment.”
- Cameron McCune, Lean Greenbelt Facilitator, Magnetic Resonance Technologist at Royal Columbian Hospital

Lean Greenbelt Graduating Class of 2011/12:
- Karen Locken - Clerical Supervisor at BCCA
- Harp Senghera - Magnetic Resonance Technologist at ARH
- Annemarie Bymoen - RPL for Gen Rad & Mammography
- Scott McCarten - Regional Manager, MI
- Karen Smith - RPL for Magnetic Resonance Imaging
- Henry Ross - Regional Quality Coordinator
- Anne Massey - Site Coordinator at LMH
- Joanne Soltesz - Nuclear Medicine Supervisor at RCH
- Erica Pigeon - Gen Rad Technologist at BUH
- Cameron McCune - Magnetic Resonance Technologist at RCH
- Lesley Walters - CT, Gen Rad & Mammo Supervisor at RMH
- Sukhi Maheem - Nuc Med Technologist at JPOCSC
- Kevin Hammerstrom - Regional Quality Coordinator
- Eliza Davies - GenRad/CT/Mammo Supervisor at CGH
- Jeff Chabot - Regional Manager, MI
- Dave Bissoondatt - Site Coordinator, MMH
Medical Imaging Lean Team

- 50 Greenbelts
- 2 Blackbelts

Blackbelt Facilitators:

Congratulations also goes out to staff who after receiving their green belt are advancing to blackbelt training. Brent Barton, Regional Practice Lead for Ultrasound and Echocardiography, was the first member of the Integrated Medical Imaging services team to achieve this level. Brent received his Lean Blackbelt on May 6, 2011. Jeff Chabot, Regional Manager also completed his blackbelt in May 2012.

Blackbelt training raises Lean methodology to the next level, teaching the student to apply Lean principles on a wider scale across the organization. The student learns a new set of Lean tools focusing on strategy, vendor/supplier relationships and advanced problem solving.

“Facilitating the design discussion for the upcoming BC Children’s Hospital Tower was a valuable opportunity to apply Lean principles at such a formative stage of development with a focus on improved flow of materials and people while maximizing space utilization and balancing the clinical standards required.”

-Jeff Chabot, Regional Manager

For More Information:

For staff interested in learning about Lean training opportunities please email Jeff Chabot, Regional Manager: jeffrey.chabot@vch.ca

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What is a Green Belt?

Medical Imaging Lean Greenbelt training lasts 3 weeks. Greenbelts undergo training to become a part-time Lean project facilitator running related improvement projects that look at improving workflow within a department. This involves facilitating Lean events at the various Medical Imaging sites and working with all relevant process owners to identify root causes of issues and develop ideas for improvement. The Greenbelt project facilitator leads or co-leads a minimum of 2 events a year.

What is a Black Belt?

Medical Imaging Lean Blackbelt training lasts 4 weeks. A Lean Greenbelt is the prerequisite for Lean Blackbelt training. Blackbelt level Lean projects look at supply chain efficiencies for the organization, strategy and tool development for the organization’s Lean program, and Lean training. Blackbelt trained facilitators will continue to run the point Lean projects around the region but will also work on projects of greater scope, mentor other Lean facilitators and develop strategy, Lean training and Lean tools for the organization as required.
Enhancing Research and Education

Medical Radiography and Sonography Program Expansion

Integrated Medical Imaging expanded support for post-secondary students in B.C. This includes BCIT’s restructured medical radiology program and sonography program. It also supports the upcoming medical radiography program expansions at the College of New Caledonia and Camosun College.

Under the new BCIT program clinical practicum rotations will require additional training and orientation. The BCIT sonography program has recently changed to a 2 year structure, necessitating that lower mainland teaching sites accommodate students for a longer duration throughout the year. The College of New Caledonia and Camosun College will be implementing their new medical radiography classes in 2012 and 2013. An additional 12 lower mainland positions were added for 2013.

The expansion of these programs required Integrated Medical Imaging to increase capacity for student placements. An additional $483,000 was required to support program expansion. In addition, Integrated Medical Imaging is accommodating 6 additional sonography students. More students means more graduates, and this will help address staffing shortages across all Integrated Medical Imaging sites.

Did you know?
BC Cancer Agency Diagnostic Imaging Department supports world class clinical oncology research performed at the agency.
Scholarly Awards and Distinctions

ALISON HARRIS, Radiologist, VGH, Medical Head, Division of Abdominal Imaging, Clinical Assistant Professor, Faculty of Medicine, UBC

- Burhenne Scholarship Award for Abdominal Radiology Research. April 2009 to present.
- Award of Merit, Society of Interventional Radiology Annual Scientific Meeting The Role of Contrast Enhanced Ultrasound in Guiding Radiofrequency Ablation of Liver and Renal Tumors Chan AK1, Liu DM2, Ho SGF2, Harris AC2, 1Department of Radiology, University of British Columbia, Vancouver British Columbia, CANADA; 2Department of Radiology, Vancouver General Hospital, Vancouver, British Columbia, Canada. March 2011.
- Award of Merit, ARRS Meeting Autoimmune Pancreatitis (AIP). Pancreatic and Extrapancreatic Findings with an Emphasis on Intervention - Chandler TM, MacDonald D, Zwirewich, CV, Harris AC. May 2011.

PAULA GORDON, Radiologist, Clinical Professor, Medical Director, C&W


MANRAJ HERAN, Radiologist, VGH, Medical Head, Division of Neuroradiology, Clinical Assistant Professor, Faculty of Medicine, UBC

- “Young Investigator’s Award” Canadian Association of Radiologists Annual Meeting. April 2011.
- Newspaper article on the introduction of a new Neuroangiography suite featured in the Vancouver Sun. August 17, 2011

AYANO KIKUCHI, Registered Technologist, Nuclear Medicine, St. Paul’s Hospital

- CAMRT Award for achieving the highest aggregate mark in the 2011 Nuclear Medicine Certificate Examination – 2011

DAVID LIU, Staff Interventional Radiologist, VA, Clinical Assistant Professor, Faculty of Medicine, UBC

- Nominated Fellow, SIR 2011.

SAVVAS NICOLAOU, Radiologist, VGH, Medical Head, Division of General Radiology, Associate Professor, Faculty of Medicine, UBC

- Recipient of the UBC Medical Undergraduate Society Teaching Excellence Award. April 2011.
- Recipient of the Bobby Miller Award for Excellence in Teaching Presented at the Vancouver Medical, Dental & Allied Staff Awards, Vancouver Coastal Health. November 2011.
- Certificate of Merit for Teaching Excellence, Canadian Association for Medical Education. March 2012
Publications & Funded Research and Grants

Medical Imaging staff research achievements are also captured through the numerous publications published over the past year along with funded research and grants awarded in 2011/12. These achievements reflect the dedication by Medical Imaging staff involved in research and are often the result of many years of hard work.

Refer to Appendix D for more details on our Integrated Medical Imaging research achievements that include Publications and Funded Research and Grants awarded in 2011/12.
Kudos to Medical Imaging Staff

Stuart Gibbs, Gogi Sidu and Kim McCool, Abbotsford Regional Hospital and Cancer Clinic
“...I cannot begin to express my appreciation to all of you for the wonderful care you provided my husband. He was comfortable there; you made him feel relaxed as we went through extremely trying and painful times. From the bottom of my heart, I say thank you!”

Medical Imaging Staff, Royal Columbian Hospital
“...I am sincerely grateful that I will be delivering my baby at Royal Columbian, because I am looking forward to continued excellent care. In a time when the health-care system is being mentioned so often in connection with negative news, I thought it important to bring attention to the fine work of so many wonderful people.”
Continuing Education

The Medical Imaging Education Committee (MIEC) distributed over $172,000 for continuing education activities 2011-2012. Funds for conferences and courses were distributed to staff throughout Integrated Medical Imaging sites. MIEC was established in fall 2011 and exists to recognize and promote continuing education opportunities throughout the Integrated Medical Imaging departments.

The Committee’s purpose is:

- To outline the procedure for applying for educational leave and funding.
- To ensure all staff have access to available and appropriate educational funding.
- To fairly distribute the budgeted education funds in all areas.

The Education Committee has worked towards establishing an equitable, standardized process for managing education requests across all sites. This includes the development of Integrated Medical Imaging guidelines for funding that were rolled out in December 2011. Committee members represent the diversified Medical Imaging staff across the health authorities. Egidio Pasin, Medical Imaging Site Coordinator for Lions Gate Hospital and Laurier Nobert, Medical Imaging Site Coordinator for Burnaby Hospital are the co-chairs of the Integrated Medical Imaging Education Committee which is comprised of ten committee members representing a wide cross section of modalities and sites. The committee is further supported by Scott McCarten, Regional Manager.

“This year the committee was challenged by an extremely ambitious time frame from its formation, to deadlines for application submissions, review and approvals. The need to define a uniform method of fund disbursement had to be overcome in dealing with multiple authorities and legacy methods. We were faced with many challenges but took them in stride and will improve the process for 2013-2014.” - Egidio Pasin, Co-Chair

The Committee is continually looking at new ways to engage Medical Imaging staff to think about educational funding as an opportunity to expand their knowledge base and develop new skills. Educational funding is intended to facilitate succession planning to help identify and develop internal staff with the potential to fill key leadership positions as they become available. This is a collaborative process that starts with the employee taking initiative to apply for funding and coordination between the Education Committee and the Site Coordinators for distribution of funds.
2011/2012 Stats

- $172,000 budgeted for continuing education activities, 70% of budget was allocated to conferences and 30% was allocated to courses.
- 117 Medical Imaging staff received funding and/or approval for continuing education activities.
- See Appendix E for a list of staff who received continuing education funding for 2011/12

Education Committee Members

Egidio Pasin, Co-Chair; Laurier Nobert, Co-chair; Elizabeth Jongedijk, ARH; Michael Zeng, SMH/IPOCSC; Robin Day, PAH; Lara Wing, RCH; Maureen Jennings, Regional IT; Charmaine Nathan, SPH; Trudy Pel, C&W; Karen Locken, BCCA; Donna Sheppard, VGH; Rosalin Chiu, VGH; Jan Howe, UBCH; Lien Ho, RH

“I had heard so many good reports about Dr. Tabar’s conferences and wanted to attend one for years. His expertise and experience are world renowned and when the opportunity presented itself, I was eager to apply for the funding and very pleased to receive acceptance. This conference included technologists and radiologists, which made it especially interesting and allowed us to learn more about breast pathology and breast MR from new perspectives. I found the experience to be extremely rewarding. It was very enriching to be in a room full of people as interested in the speaker and topics as I was. I would highly recommend this course to my colleagues.

- Ann Spangler, ARH, Diagnostic Mammography Technologist. Conference Name: “Multimodality Detection and Diagnosis of Breast Disease”, Las Vegas, Nevada

For More Information

For any questions or comments about educational funding please contact Egidio Pasin, Medical Imaging Site Coordinator for Lions Gate Hospital at egidio.pasin@vch.ca or Laurier Nobert at laurier.nobert@fraserhealth.ca, Medical Imaging Site Coordinator for Burnaby Hospital. You can also find out more more information on the VCH Intranet under the Integrated Medical Imaging section.
Facility, Equipment and Informatics Development

Equipment Purchases and Upgrades

Funding for equipment purchases and upgrades came from a variety of sources most notably hospital foundations and the BC Ministry of Health. A special thanks goes to foundations for their ongoing support.

St. Mary’s Hospital

- An Ultrasound Unit was purchased in January 2012 to replace an older machine. Key benefits are better quality images and improved patient experience and staff satisfaction.

Powell River General Hospital

- Acquired a new GE portable x-ray unit in March 2012 to replace an older unit. Key benefits are a smaller, more compact unit for tighter spaces as well as decreased maintenance and equipment costs.

Vancouver General Hospital

- Two Siemens Aera MRI scanners were installed in July 2011 and October 2011. Key benefits are improved patient experience through a larger bore that results in fewer patients experiencing claustrophobia. In addition patient exam times have been reduced and there is better quality imaging.

- A new state of the art Philips Biplane Angiography suite was installed in July 2011. Key benefits are improved reliability, reduction of case times and better quality imaging

Ridge Meadows Hospital

- A digital General Radiography Carestream unit was installed in March 2012 to replace end of life equipment. A Toshiba Digital Multipurpose Fluoro will also be installed later this year to replace two old units. Key benefits range from enhanced ergonomics for the technologists and improved patient flow to lower dose radiation for patients and improved quality imaging.

Chilliwack General Hospital

- A Mini C-Arm was installed earlier this year. New equipment was required for fine bone work in the OR, as well as a back up should the regular C-arm fail during an OR case. Key benefits include lower dose radiation and improved staff and patient safety.

Peace Arch Hospital

- A Hologic Secureview radiologist workstation was installed in June 2012. This equipment will allow the Peace Arch Hospital radiologists to report Digital Screening Mammography images taken at Delta Hospital when they are at Peace Arch Hospital.
Mount Saint Joseph Hospital

- A new multipurpose Toshiba fluoro unit replaced end of life equipment earlier this year. Key benefits include lower dose radiation, meeting increased patient volume and improved patient experience.

- The team at Mount St. Joseph organized a lip dub video in May 2012 to support a 2nd digital mammography machine through the Tapestry Foundation for Health Care. Check out the “Pink Glove Breast Cancer Dance at Mount Saint Joseph Hospital” on YouTube.

St. Paul’s Hospital

- A Nuclear Medicine Siemens Gamma Camera Symbia S was installed in April 2012 replacing an older gamma camera. Key benefits are increased patient volume, improved image quality and functionality.

- In addition, an angiography Toshiba Infinix-“i” Single Plane Angio Suite was installed in April 2012 replacing old equipment that didn’t have sufficient capacity to perform new standard procedures and interventions. Key benefits are increased patient safety, patient volumes, improved image quality and functionality.

Royal Columbian Hospital

- Approval for a second digital mammography unit was received in the past year. In addition, a new Hologic Digital Mammography unit was installed in 2012. This unit was funded through the RCH Foundation with substantial donation from the RCH Auxiliary. A new Ultrasound Logic 9 machine and a new INVIVO Patient Monitor for cardiac monitoring of patients in MRI were installed to replace end of life equipment. Key benefits include improved quality of ECG tracings. In addition, a new mini c-arm for the RCH operating theatre was installed.

Jim Pattison Outpatient Care and Surgery Center

- A MRI Sentinel Table for breast biopsies was installed in December 2011. Key benefits include increased access and quality of diagnoses.

Lions Gate Hospital

- A new hologic full field DR Mammography unit was installed in June 2012 to replace an older machine through funding from the LGH Foundation. Key benefits include removal of the last chemical film processor within the department in addition to the ability to perform stereotactic core biopsy. The equipment also provides accurate guidance and sampling of biopsy site(s) as an alternative to surgical procedure to gain similar results.

- A MRI-dedicated Sentinelle breast imaging table was installed in April 2011 to meet increasing referrals for breast imaging through funding from the LGH Foundation. Key benefits include better resolution in imaging, reduced scan time by approximately half versus conventional methods. In addition, this equipment allows for biopsy access if required.

Eagle Ridge Hospital

- A new Toshiba multipurpose unit was installed in June 2012 to replace an older unit. Key benefits include improved technology for better patient outcomes.
Mission Memorial Hospital

- A radiography chair and pediatric chair (peripheral equipment) were acquired in July and August 2011. Key benefits are an improved patient experience as well as a safer environment for both patients and staff. The chairs also enable increased patient volume by reducing the time taken to complete examinations.

Richmond Hospital

- Four new ultrasound units were received in January 2011: 2 GE General units and one Cardiac (Logiq and Vivid respectively) and a Philips 3-D echo unit. A MRI-Safe patient monitor was also acquired in March of 2012 that will allow better provision of patient care for patients requiring MRI.

Delta Hospital

- A digital mammography unit was installed in May 2012 replacing an “end of life” analogue (film based) unit. This unit was purchased through funding from the Delta Auxiliary. Key benefits include reduced “chemical processing” resulting in efficiency and improved department air quality. In addition, patient exam time has decreased because the image is visible within seconds.

Burnaby Hospital

- An AGFA compact multi-digitizer was installed in May 2012 replacing a solo digitizer. This is a trade between 2 sites (Ridge Meadows Hospital and Burnaby Hospital) to better utilize existing assets. Key benefits are increased capacity of CR cassettes, decreased technologist waiting time for the solo digitizer and more efficient workflow.
- A mobile x-ray unit was purchased through Burnaby Hospital Foundation funding in 2011. Receipt of the machine will be in September 2012.

Surrey Memorial Hospital

- Two new Phillips DR mobile units were installed earlier this year to replace unreliable existing equipment. Key benefits include state of the art systems, improved reliability of systems, lighter detector size, ease of use, improved staff morale due to improvements in reliability. Efficiency of systems is also increased through decreased downtime of equipment.

Langley Memorial Hospital

- A Hologic Dimensions digital mammography unit was installed to replace the analog (film based) mammography unit which was 12 years old. This unit services predominantly the Screening Mammography Program of B.C. Key benefits are increased patient volume, better image quality and vastly improved ergonomics for the technologist, which reduces the chance of overuse injury.
- A new digital specimen unit was installed earlier this year. Key benefits are reduced patient travel time between the clinic and hospital.
University of British Columbia Hospital

- The first Digital Radiography (DR) room installed earlier this year. The advantage of the DR system is faster image appearance on the monitor, and “auto positioning” which will make it safer for the technologist to use.

BC Children’s Hospital

- A Siemens’ Computed Tomography (CT) Scanner Somatom Flash replacement was installed earlier this year. This unit brings numerous benefits including: high quality imaging with ultra-fast scanning techniques and at a lower radiation dose. The equipment also provides the ability to do CT cardiac angiography (image of the heart and coronary arteries) therefore reducing the number of cardiac catheterizations that need to be done. CT cardiac angiography has the added benefit of a much lower dose than catheterization and also being a non-invasive procedure. The machine also has the potential of reducing the number of anaesthetic cases in CT.

- A Cardiac Monitor Replacement was installed to replace end of life equipment earlier this year. The hemodynamic monitoring system is of critical importance for the Cardiac Sciences Program and was in urgent need of replacement.

- A new Radiology Information System (RIS) replacement is being implemented at Children’s & Women’s. This system replaces the previous RIS installed in 1999.
Service Expansions

St. Mary’s Hospital
- As part of the St. Mary’s Hospital expansion, Medical Imaging will be moving into a new department within the expansion. The key benefits will be an improvement in workflow from the current cramped quarters, an improvement in privacy and staff satisfaction.

Abbotsford Regional Hospital
- A Breast Health Clinic (Designated Fraser Health Hub) opened at Abbotsford Regional Hospital in May 2012. The expansion offers a full range of breast health services including stereotactic breast biopsy. Patients no longer need to travel to another community and there is a decrease in the patient wait time.

Royal Columbian Hospital
- A new Phillips Biplane angiography room is being installed and will be operational in Sept of 2012. It will allow the physician to see the anatomy of the patient in 2 views at the same time - saving time and providing greater accuracy for neuro-interventional procedures such as placement of stents and coiling of aneurysms.
- The new EP (Cardio Electrophysiology)/Neuro Interventional Suite is a shared room between Cardiology and Medical Imaging.

Jim Pattison Outpatient Care and Surgery Center
- Expansion of Computed Tomography (CT) – intro of virtual bronchoscopy in May 2012 allows patients at high risk for lung biopsy to potentially avoid biopsy. This results in a less invasive procedure, no increase to costs and a decreased waitlist.

Delta Hospital
- Addition of a 3rd ultrasound room primarily supporting outpatient volume has been approved as a budgeted room. This will reduce the patient wait time for ultrasound appointments.

BC Children’s Hospital
- The business plan for interventional radiology service augmentation was approved. The department is in the process of implementing the changes including training nursing and technical staff as well as hiring additional porters. The expanded operating hours will ensure a more reliable service for patients and less stressful work environment for the staff.

Did you know?
In April Powell River General Hospital extended its general radiography hours during the week to allow for better coverage.
Fiscal Stewardship

2011/12 Savings Highlights
A total savings of $8.1 million was targeted for 2011-2012 through a variety of initiatives to increase operating revenue and optimize operational efficiency. As illustrated in the table below, these initiatives achieved a bottom line savings of just over $4 million dollars. This left a savings shortfall of $4.1 million. However, this shortfall is made up when factoring in the $2 million in costs avoided as a result of productivity gains, some through the increase in incremental exams. Technologies to be deployed in the upcoming year are also expected to provide a savings of $2.5 million, and supplies standardization/normalization will provide an additional $2.0 million in savings.

Financial Savings

<table>
<thead>
<tr>
<th>2011/2012 YTD P13*</th>
<th>Actuals</th>
<th>Budget</th>
<th>Variance</th>
<th>Savings Target</th>
<th>Bottom Line Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$(110,420,674)</td>
<td>$(106,362,333)</td>
<td>$(4,058,341)</td>
<td>$(8,112,205)</td>
<td>$(4,053,864)</td>
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</tbody>
</table>

*Strictly bottom line: Does not account for productivity savings or unfunded cost pressures and 1 million of savings through restructuring bio medical engineering service contracts and Jim Pattison Outpatient Care and Surgery Center.

<table>
<thead>
<tr>
<th>2009-2012 YTD Savings Initiatives</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Modifications</td>
<td>$ 2.2</td>
</tr>
<tr>
<td>Biomedical Service Contracts</td>
<td>$ 1.0</td>
</tr>
<tr>
<td>Non Resident Revenue</td>
<td>$ 0.75</td>
</tr>
<tr>
<td>Process Improvement (LEAN)</td>
<td>$ tbd</td>
</tr>
<tr>
<td>Nuclear Medicine MIBG</td>
<td>$ 0.1</td>
</tr>
<tr>
<td>Productivity Gains</td>
<td>$ 2.0</td>
</tr>
<tr>
<td>Total</td>
<td>$ 6.1</td>
</tr>
</tbody>
</table>

It is important to highlight the savings initiatives undertaken over the past year. These initiatives have served to streamline our resources in a way that will effectively meet the growing demand for our services and sustain financial viability. Collaboration with Medical Imaging stakeholder groups was essential to developing the savings targets and facilitating solutions to improving access to information across Integrated Medical Imaging sites.

The savings initiatives detailed here aim to not only avoid costs but also provide opportunities for staff to participate in change that is relevant to their experience and beneficial to improving patient outcomes in the long-term.
New Organizational Structure
A new organizational structure was implemented in spring, 2011. This provided a more consistent model across all medical imaging sites and achieved annual savings of $2.2 million.

Non-Labour/Supplies Savings:

Standardization of Supplies
Contrast Supply: Medical Imaging worked with Health Shared Services BC to identify $1.4 million in savings. These savings will be realized through the standardization of CT and MRI contrast across all medical imaging sites and through consolidation of purchasing power.

Interventional Supplies: By virtually pooling lower mainland interventional radiology inventory, substantial savings were identified through group purchasing of interventional supplies. Supply availability was maintained and $500,740 in annual savings will be realized.

In-House Metaiodobenzylguanidine MIBG
Iodine-123-MIBG is used to image neuroendocrine tumours such as phaeochromocytoma, paraganglioma and neuroblastoma. This initiative started in March 2011 to implement the in house production of ~100 doses per year at a cost savings of ~$1500 per dose (this does not include net new production costs). For 2011/2012, over $46,000 in savings have been realized through the production of MIBG in-house for integrated medical imaging use. The majority of savings with this initiative are through BC Children’s Hospital, as they are the largest user of MIBG. An added value to this product compared to the product previously used is that there are fewer reactions/side effects. In addition to the access and safety benefits, the quality of MIBG scans are improved by better image distribution.

Contract Savings

Bio Medical Engineering Service Contracts
A restructuring of Bio Medical Engineering service contracts allowed Bio Medical Engineering to assume responsibility for Medical Imaging. A balance of $1 million will be transferred from Bio Medical Engineering from cost savings achieved to Medical Imaging through the reduction in multiple service contracts.

Revenue Generation

Non-Resident of Canada Billing
New non-resident rates went into effect at a number of medical imaging sites in July 2010 resulting in an increase of 54% in non-resident of Canada revenue. The new rates resulted in $313,588 in additional revenue for 2011-2012. Cumulative total from this initiative is $756,000. Plans are underway to further standardize rates across all sites.
Productivity

The annual productivity savings target is $2 million. By increasing capacity with existing resources almost $1.4 million in costs were avoided for 2011-2012. This savings strategy also led to a reduction in the net cost of exams at most sites by an average of $4.40.

<table>
<thead>
<tr>
<th>Health Authority</th>
<th>Increase YOY</th>
<th>YOY % Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC</td>
<td>18,183</td>
<td>9.0%</td>
</tr>
<tr>
<td>FHA</td>
<td>84,049</td>
<td>8.0%</td>
</tr>
<tr>
<td>VCH</td>
<td>42,106</td>
<td>6.2%</td>
</tr>
<tr>
<td>PHSA</td>
<td>9,473</td>
<td>7.2%</td>
</tr>
<tr>
<td>Total</td>
<td>153,811</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Establishing Benchmarks for Productivity

Overview

In 2009, the AHRA (The Association for Medical Imaging Management) released the results of a staff utilization survey that included data from 328 hospitals across North America. These hospitals included representatives from every State and Province, with equal distributions of urban, suburban, and rural facilities that had capacities ranging from <100 to >500 beds.

One of the key metrics produced by the AHRA survey was the “Procedure Volume By Technologist FTE” or more simply: Exams/FTE. Integrated Medical Imaging made it a goal for every department at every site to reach the 75th percentile for this metric. This meant that each department would strive to be better (in terms of Exams/FTE) than 75% of the facilities that responded in the AHRA survey.

The reason that the 75th percentile was chosen as a target is:

- We want to continually improve access for our patients.
- Productivity in the United States is historically lower than in Canada, so striving for a lower percentile would have provided a falsely deflated target, which would have been unfair to our patients.
Productivity by Modality

General Radiology experienced a year by year increase in productivity due to numerous Lean events that helped improve technical and clerical workflow and streamlined processes.
- VGH – has increased capacity with existing resources by over 20% since 2009

Mammography is a modality where productivity for the Integrated Medical Imaging as a whole is above the benchmark in the past year. This modality has experienced a significant increase in productivity from 2010-2012 due to the high volume of exams combined with the increased speed of mammography exams and screening mammography programs.
- St Mary’s Hospital – has increased capacity with existing resources by 92% since 2009

Interventional Radiology has experienced fluctuations on a year by year basis since 2009 due to lower exam volumes combined with increasingly longer, complex procedures.
- Surrey Memorial Hospital – has increased capacity with existing resources by over 190% since 2009

MRI productivity has experienced an increase of exams per FTE on a year to year basis since 2009. This increase in productivity is due to the significant increase in HSPO-patient focused funding.
- Richmond Hospital – has increased capacity with existing resources by over 155% since 2009
- Peace Arch Hospital – has increased capacity with existing resources almost 70% since 2009
Exams/FTE

Ultrasound productivity experienced a significant increase in exams per FTE from 2010 forward. Focused process improvements through Lean activities at numerous sites was a significant contributor to this increase.

- Burnaby Hospital – has increased capacity with existing resources by over 46% since 2009
- Surrey Memorial Hospital – has consistently maintained a productivity average higher than the benchmark from 2009-2012

Productivity decreased for Nuclear Medicine over the past year in comparison to the previous year. Lean events over the past year have focused on process improvements.

- Children’s and Women’s MI department– has consistently maintained a productivity average higher than the benchmark from 2009-2012

Computed Tomography productivity has experienced an increase in exams per FTE on a year to year basis since 2009. This improvement is due to scheduling changes to accommodate increasing demand and hiring a CT Hybrid Tech for some sites. Lean events also contributed through improvements in inpatient workflow and streamlining workflow with other departments such as ER.

- Abbotsford Regional Hospital – has increased capacity with existing resources by over 25% since 2009 maintaining higher than benchmarked levels for productivity in 2011
Financial Statements for 2011/2012

Statement of Operations for year to date ending March 31, 2012*

<table>
<thead>
<tr>
<th></th>
<th>2011/12 Budget</th>
<th>2010/11 Actual</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Revenue</td>
<td>114,564,988</td>
<td>98,047,636</td>
<td>16,517,352</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Compensation</td>
<td>196,058,514</td>
<td>181,455,638</td>
<td>-14,602,876</td>
</tr>
<tr>
<td>Total Non-Compensation</td>
<td>31,142,862</td>
<td>27,175,171</td>
<td>-3,967,691</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>227,201,377</td>
<td>208,630,810</td>
<td>-18,570,567</td>
</tr>
<tr>
<td>Excess/(Deficiency) of Revenue over Expenses</td>
<td>-112,636,389</td>
<td>-110,583,174</td>
<td>-2,053,215</td>
</tr>
</tbody>
</table>

*Unaudited-For Information Only
Annual Report Appendices

Appendix A Medical Imaging Contact Information

The Medical Imaging Corporate Office is located at:
11th Floor, 601 West Broadway
Vancouver, BC V5Z 4C2

Information – lower mainland: 604-736-2033
Information – Outside the lower mainland (toll free): 1-866-884-0880

TTY: 604-736-2659
Web: www.vch.ca
Email: feedback@vch.ca

Information on specific Medical Imaging programs, services and locations can be found online at: http://www.vch.ca/locations_and_services/
# Appendix B Glossary of Acronyms

## Sites

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCH</td>
<td>Vancouver Coastal Health</td>
</tr>
<tr>
<td>VGH</td>
<td>Vancouver General Hospital</td>
</tr>
<tr>
<td>UBC</td>
<td>UBC Hospital</td>
</tr>
<tr>
<td>RH</td>
<td>Richmond Hospital</td>
</tr>
<tr>
<td>LGH</td>
<td>Lions Gate Hospital</td>
</tr>
<tr>
<td>St.Marys</td>
<td>St. Mary’s Hospital</td>
</tr>
<tr>
<td>SqH</td>
<td>Squamish General Hospital</td>
</tr>
<tr>
<td>WHCC</td>
<td>Whistler Health Centre</td>
</tr>
<tr>
<td>Pemb</td>
<td>Pemberton Health Centre</td>
</tr>
<tr>
<td>PRGH</td>
<td>Powell River General Hospital</td>
</tr>
<tr>
<td>PHC</td>
<td>Providence Health Care</td>
</tr>
<tr>
<td>MSJ</td>
<td>Mount Saint Joseph Hospital</td>
</tr>
<tr>
<td>SPH</td>
<td>St. Paul’s Hospital</td>
</tr>
<tr>
<td>FH</td>
<td>Fraser Health</td>
</tr>
<tr>
<td>LMH</td>
<td>Langley Memorial Hospital</td>
</tr>
<tr>
<td>RCH</td>
<td>Royal Columbian Hospital</td>
</tr>
<tr>
<td>ERH</td>
<td>Eagle Ridge Hospital</td>
</tr>
<tr>
<td>RMH</td>
<td>Ridge Meadows Hospital</td>
</tr>
<tr>
<td>BH</td>
<td>Burnaby Hospital</td>
</tr>
<tr>
<td>SMH</td>
<td>Surrey Memorial Hospital</td>
</tr>
<tr>
<td>JPOCSC</td>
<td>Jim Pattison Outpatient Care and Surgery Centre</td>
</tr>
<tr>
<td>DH</td>
<td>Delta Hospital</td>
</tr>
<tr>
<td>PAH</td>
<td>Peach Arch Hospital</td>
</tr>
<tr>
<td>MMH</td>
<td>Mission Memorial Hospital</td>
</tr>
<tr>
<td>CGH</td>
<td>Chilliwack General Hospital</td>
</tr>
<tr>
<td>ARH</td>
<td>Abbotsford Regional Hospital</td>
</tr>
<tr>
<td>FCH</td>
<td>Fraser Canyon Hospital</td>
</tr>
<tr>
<td>PHSA</td>
<td>Provincial Health Services Agency</td>
</tr>
<tr>
<td>C&amp;W</td>
<td>Children’s and Women’s</td>
</tr>
<tr>
<td>BCCA</td>
<td>BC Cancer Agency</td>
</tr>
<tr>
<td>BCCDC</td>
<td>BC Center for Disease Control</td>
</tr>
</tbody>
</table>
### Modalities

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen Rad</td>
<td>General Radiology</td>
</tr>
<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
</tr>
<tr>
<td>US</td>
<td>Ultrasound</td>
</tr>
<tr>
<td>CT</td>
<td>Computed Tomography</td>
</tr>
<tr>
<td>IR</td>
<td>Interventional Radiology</td>
</tr>
<tr>
<td>Nuc Med</td>
<td>Nuclear Medicine</td>
</tr>
<tr>
<td>Mammo</td>
<td>Mammography</td>
</tr>
<tr>
<td>MI</td>
<td>Medical Imaging</td>
</tr>
<tr>
<td>RPL</td>
<td>Regional Practice Lead</td>
</tr>
<tr>
<td>S2S</td>
<td>Sea to Sky</td>
</tr>
<tr>
<td>RVA</td>
<td>Renal Vascular Access</td>
</tr>
<tr>
<td>GI</td>
<td>Gastrointestinal</td>
</tr>
<tr>
<td>GU</td>
<td>Genitourinary</td>
</tr>
<tr>
<td>MPI</td>
<td>Myocardial Perfusion Imaging</td>
</tr>
<tr>
<td>ADD</td>
<td>Add-on</td>
</tr>
<tr>
<td>SME</td>
<td>Subject matter expert</td>
</tr>
<tr>
<td>BC SMP</td>
<td>BC Screening Mammography Program</td>
</tr>
<tr>
<td>BCAMRT</td>
<td>British Columbia Association Medical Radiation Technologists</td>
</tr>
<tr>
<td>CAMRT</td>
<td>Canada Association Medical Radiation Technologists</td>
</tr>
<tr>
<td>DAP</td>
<td>Diagnostic Accreditation Program</td>
</tr>
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</table>
Appendix C BCRS MR Priority Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Where the imaging is critical for the immediate management of the patient/case should be directly discussed with the Radiologist. This includes Inpatients, Outpatients and Emergency patients.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Lesions/Disease processes in which the diagnosis is known and immediate treatment is not necessary, or lesions/disease processes which by history and physical findings do not require immediate treatment but do require prompt evaluation. The results of the MRI study will likely alter patient management and provide additional information for surgical or medical management</td>
</tr>
<tr>
<td>Level 3</td>
<td>Lesions/Disease processes in which the diagnosis is known and immediate treatment is not necessary, or lesion/disease processes which by history and physical findings do not require immediate treatment and delays in MRI evaluations will not negatively affect treatment outcomes. The results of the MRI study will likely alter patient management and provide additional information for surgical or medical management.</td>
</tr>
<tr>
<td>Level 4</td>
<td>This category includes cases where MRI is required for follow-up on patients with stable findings or patients in whom lesions/disease processes may undergo slow progression or those for which surgery is not required or limited therapeutic options are available</td>
</tr>
</tbody>
</table>
Appendix D Publications and Funded Research Projects and Grants

Book Chapters

FORSTER, Bruce (UBC, VGH)


HERAN, Manraj (UBC, VGH)

- “Neuroendovascular Therapies in Pediatric Interventional Radiology” TA Abruzzo, MKS Heran. Techniques in Vascular and Interventional Radiology, March 2011: 14(1);50-56 Guest Editor: Dr. Manrita Sidhu.
- “Diagnostic Cerebral Angiography and the Wada Test in Pediatric Patients”
- “Preoperative Embolization of Spinal Metastatic Disease: Rationale and Technical Considerations” MKS Heran. Seminars in Interventional Radiology, 2011: 15(2);135-142. Department of Radiology, Vancouver General Hospital, University of British Columbia.
- “Imaging in Adult Scoliosis: Preoperative Assessment and Postoperative Complications”
- JM Yeo, AT Vertinsky, JB Chew, MKS Heran, J Shewchuk, D Malfair, DA Graeb, JT Street
- Seminars in Interventional Radiology, 2011: 15(2);151-162. Department of Radiology, Vancouver General Hospital, University of British Columbia.

GORDON, Paula (BCW)


MACDONALD, David (BCCA)

Manuscripts in Refereed Journals

- The prevalence of radiographic femoracetabular impingement in younger individuals undergoing total hip replacement for osteoarthritis. Forster BB
- Clin Rheumatol. 2012 May 3. [Epub ahead of print]
- Alkowaiter SS, Brahmania M, Kim E, Madden M, Harris AC, Yoshida EM, Gray J. Clinical and Endoscopic Significance of Bowel Wall Thickening Reported on Abdominal Computed Tomography Scans in Symptomatic Patients with No Previous History of Gastrointestinal Disease. Accepted for publication to the Canadian Association of Radiologists Journal. 2011.
- “Combination radiofrequency ablation and cementoplasty for palliative treatment of painful neoplastic bone metastasis: experience with 53 treated lesions in 36 patients” MD Lane, HB Le, S Lee, C Young, MKS Heran, M Badii, PW Clarkson, PL Munk Skeletal Radiology 2011;40(1):25-32 (Epub 2010 Aug 5).
• “Percutaneous retrieval of an intravascular foreign body in the left atrium via a transpulmonary arteriovenous malformation approach” C Young, PL Munk, MKS Heran, MD Lane, HB Le, M Badii, PW Clarkson, OC Hugue Skeletal Radiology 2011 April 9 (Epub ahead of print).


• LECORROLLER T, HARGUNANI R, KHASSHOOGGI K, HAYES MM, CLARKSON PW, OUTELLETTE HA, MUNK PL. Primary Intravenous Glomus Tumor in a Middle Phalanx. Skeletal Radiology 2012;41:227-30 http://dx.doi.10.1007/s00256-011-1217-0


Recent Papers, Posters & Abstracts:

- Elena Scali MPhil, Patricia Hassell MD. Calcifications detected on Mammography: Should the size of calcification clusters be used as a criteria for Biopsy?, RSNA poster, Nov. 2011
- Reka Pataky, Linlea Armstrong, Stephen Chia, Andrew J. Coldman, Charmaine Kim-Sing, Barbara McGillivray, Jenna Scott, Christine M Wilson, Stuart Peacock, Cost-effectiveness of MRI for breast cancer screening in BRCA1/2 mutation carriers Submitted to CMAJ June 2012
- Culham, G. “Superior Herniation of the Mediastinum presenting as an Anterior Mediastinal Mass on Straining”. Pediatric Pulmonology online April 2012


Jessica N. McAlpine, Osama Al-Agha, Gulisa Turashvili, Hal Hirte9, Steve Kalloger, Debbie Jepson, Monty Martin, Sam Aparicio, C. Blake Gilks,, Karen Gelmon, David G. Huntsman, Feasibility and accuracy of image-guided tissue biopsies: preparing for a shifting paradigm in the management of ovarian cancer, poster presented at 5th Canadian Conference on Ovarian Cancer Research May 2010, CCOCR, Toronto, ON, Canada


Jessica N. McAlpine, Osama Al-Agha, Gulisa Turashvili, Hal Hirte9, Steve Kalloger, Debbie Jepson, Monty Martin, Sam Aparicio, C. Blake Gilks,, Karen Gelmon, David G. Huntsman, Feasibility and accuracy of image-guided tissue biopsies: preparing for a shifting paradigm in the management of ovarian cancer, poster presented at 5th Canadian Conference on Ovarian Cancer Research May 2010, CCOCR, Toronto, ON, Canada

Twiss,Megan, Madler, Burkhard, MacKay, Alex, Ma, Roy, Martin, Montgomery, Shaffer, Richard, Mckenzie, Michael, Nicho,J Alan, Hsu, Fred, Reinsberg, Stefan. Functional magnetic resonance imaging of acoustic neuromas for assessment of response to stereotactic irradiation, to be presented at the Canadian association of Radiation Oncology, Sept., Oct., 2009


Warren Li, Gordon PB: Poster presentation, UBC Medicine Undergraduate Research Forum, Mar 15, 2012


• Stefan Toggweiler, Ronen Gurvitch, Ronald Binder, David Wood, James Min, Cameron Hague, Mark Madden, Jonathon Leipsic The Importance of Aortic Annular Area and Eccentricity on Balloon Expandable Aortic Valve Sizing, Geometry and Paravalvular Regurgitation, Journal of the American College of Cardiology, Volume 58, Issue 20, Supplement, 8 November 2011, Pages B211-B212, ISSN 0735-1097


• Shaikh, A. Handbook of Breast MRI [Book Review]. Canadian Association of Radiologists Journal 2012 (manuscript has been accepted for publication).


• Chapman E, Leipsic J, Satkunam N, Churg A. Pulmonary alveolar proteinosis as a reaction to fentanyl patch smoke Chest. 2012 May;141(5):1321-3


• Man SF, Leipsic JA, Man JP, Sin DD. Is Atherosclerotic Heart Disease in COPD a Distinct Phenotype? Chest. 2011 Sep;140(3):569-71


• Leipsic J, Al Hussein M, Scheske J, Kiess M, Barlow A, Chakrabarti S, Ellis J, Grewal J. Dual Energy CT Angiography to Detect Silent Thromboembolic Events in Adults Post Fontan. 6TH Annual SCCT ASM 2011

• LaBounty T, Koo BK, Erglis A, Doh JH, DeFrance T, Leipsic J, Min JK. Non-Invasive Fractional Flow Reserve Computed from Typically-Acquired Coronary Computed Tomographic Angiograms: Relationship of Image Quality to Diagnostic Performance. 6TH Annual SCCT ASM 2011


• Ronald Karl Binder1, Jonathon Leipsic1, David A Wood1, Teri Moore2, Stefan Toggweiler1, Alex Willson1, Ronen Gurvitch1, John G Webb1. Prediction of Optimal Deployment Projections in Transcatheter Aortic Valve Replacement: Angiographic 3-Dimensional Reconstruction of the Aortic Root versus Multidetector Computed Tomography, Journal of the American College of Cardiology, Volume 58, Issue 20, Supplement, 8 November 2011, Page B206, ISSN 0735-1097


• Leipsic J, Koo BK, Erglis A et al. Non-invasive Fractional Flow Reserve Derived from Coronary CT Angiography vs CCTA Alone for the prediction of Lesion Specific Ischemia for Intermediate Coronary Artery Stenosis: results from the prospective multicenter DISCOVER-FLOW study. RSNA Annual ASM 2011. Chicago, III.


Jonathon Leipsic, Alexander Willson, Stephan Achenbach, James Min, Troy LaBounty, Ronen Gurvitch, Stefan Toggweiler, Ronald Binder, Robert Moss, Ricardo Cury, Christopher Thompson, bjarne norgaard, Rohan Poulter, David Wood, and John Webb COMPARISON OF MDCT MEASUREMENTS OF AORTIC ANNULUS SIZE IN SYSTOLE AND DIASTOLE: A MULTICENTER EVALUATION J. Am. Coll. Cardiol., March 27, 2012; 59: E1200


Stefan Toggweiler, David A Wood, Josep Rodes-Cabau2, Samir Kapadia3, Jian Ye1, Anson Cheung1, Jonathon Leipsic1, Ronen Gurvitch1, Alexander B Willson1, Ronald K Binder1, Murat E Tuzcu3, Eric Dumont2, Lars G Svensson3, John G Webb1. Transcatheter Valve-in-Valve Implantation for Failed Balloon Expandable Transcatheter Aortic Valves, Journal of the American College of Cardiology, Volume 58, Issue 20, Supplement, 8 November 2011, Pages B36-B37, ISSN 0735-1097

Scali Elena Hassell Patricia, Ali R, Hayes Malcolm Low Grade Adenosquamous Carcinoma of the Breast: Imaging and Histopathologic Characteristics of this rare disease and Implications for treatment. RSNA poster Nov. 2011

Shaikh A, Hayes M, Wilson C. MRI Findings and Histopathology Correlation of mammographically and sonographically occult lesions which underwent Breast MRI-guided biopsy in BRCA gene mutation carriers. RSNA 2012 (manuscript in review 2012).


Nadel H. “18-F-DOPA in Neuroendocrine Disease? Alternative to FDG.” Presentation at the Fifth Annual Symposium of Best Practices in PET/CT, Sonoma, CA, April 13, 2012


• ROBINSON AJ. “THE AETIOLOGIC SPECTRUM OF FOETAL BRAIN INJURY” PEDIATRIC RADIOLOGY 2011; 41: S324


• Noor M. Alnaimy, MD Nuha Khoumains, MD Role of Ultrasonography in Breast Cancer Imaging PET Clinics - Volume 4, Issue 3 (July 2009) - Copyright © 2009 Saunders, An Imprint of Elsevier


• Prasloski T, Madler B, Xiang QS, MacKay A, Jones C. “Applications of Stimulated Echo Correction to Multicomponent T2 Analysis.” Magnetic Resonance in Medicine, early view, Epub 19 Oct 2011


• Yewchuk, L. “Unsafe at School: Advocating for children with Type 1 Diabetes”, BCMJ, Vol. 54, No. 5, Jun 2012:53-54
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<td>Liu, David</td>
<td>Improving vena caval filter retrieval rates at VGH: A quality improvement project. VCHRI Team Grant Competition. (We ranked #3 out of the 3 successful applications)</td>
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