Mission Statement

The mission of the University of British Columbia Department of Anesthesiology, Pharmacology & Therapeutics and affiliated hospital departments is to provide exemplary patient care by fostering excellence in clinical anesthesia, critical care, pain management, education, and research.
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I will begin this overview of the 2012 Annual Report of the UBC Department of Anesthesiology, Pharmacology & Therapeutics with a thanks to all of you who have helped me transition into the role of Department Head. From all the UBC staff both at the VGH site and Medicine Block C site, to local hospital site administrative assistants, as I have had to negotiate many new places of work.

The first 9 months have been good, challenging at times, but invigorating for me. It is very interesting to work with a group of excellent and passionate researchers in Pharmacology on one perspective, on another the clinical anesthesiologists outside of my home clinical base, with a bridge between that will continue to develop thanks to the work of Dr. Warriner, Dr. Fedida, Dr. Pang, and all of you over the last several years since the department was merged. Unfortunately, the Therapeutics Initiative has been very challenged since July 2012 by the suspension of access to research data by the Ministry of Health and that will continue to challenge the department into 2013.

We have a strong Anesthesia Residency program that continues to flourish under the leadership of Dr. Matt Klas, and a strong graduate program in Pharmacology under the leadership of Dr. Sastry Bhagavatula. The teaching in pharmacology provided by our department is outstanding, and we are now working on the challenge of Medical School Curriculum Renewal and how it will impact what and how we teach medical students. Dr. Oliver Applegarth for anesthesia, and Dr. Stan Bardal and Jennifer Shabbits for pharmacology have been working hard on developing exit competencies for medical students in those respective areas.

Dr. Brenda Lau has continued with the development of the new Pain Medicine residency program, which has been approved by the Royal College, and now is in process of approval by UBC Faculty of Medicine. Both our FRPCP and FPA residency programs undergo Royal College Accreditation in November 2013. Dr. Klas and Dr. Kim have put in an incredible number of hours on the required paperwork and are starting to “prep” us all for this important event. Dr. Klas has been working hard since our last accreditation visit to ensure we have corrected/will have corrected identified deficiencies – all for the betterment of our program.

Changes in leadership other than this position have been: Dr. Norbert Froese is the new department head at BC Children’s Hospital. Dr. Elizabeth Peter and Dr. David Lea have been acting department heads at BC Women’s Hospital, and Dr. Laine Bosma is the first Director of Simulation in our department. There is a formal Simulation Committee now, whose members are working diligently on a comprehensive program for simulation in our department.
There are some awards and kudos to be noted:
Cathy Pang - elected Fellowship of the British Pharmacological Society in recognition of her
distinguished service to Pharmacology and the Society
Mark Ansermino – Distinguished Achievement Award from Faculty of Medicine for Excellence
in Clinical or Applied Research
Stan Bardal – CAME Certificate of Merit Award
Stephan Schwarz – recipient of CAS Research Award

The Whistler Anesthesia Summit was a resounding success this year, thanks to everyone who
helped it happen, from the incredible organizing committee to those who gave their time to run
workshops, give lectures and just attend!

We also hosted the Royal College McLaughlin-Gallie Visiting Professor Lecture in 2012. This
prestigious visiting professorship is awarded to one recipient each year by the Royal College,
and the Department of APT was invited to host Dr. Robert W. Teasell, Professor and Former
Chair-Chief Department of Physical Medicine and Rehabilitation at the University of Western
Ontario. Dr. Teasell spent October 29th with the department, providing a lecture on “Use of
Opioids in Chronic Pain: Analgesia and Misuse” and spending time with faculty and residents.

We continue to have faculty members who are very engaged in global health initiatives, and I
hope in the near future we will have an organized department strategy for this important area of
work. Dr. Stephan Schwarz continues to work with the residency program in Hanoi, Vietnam;
Dr. Brian Warriner with Makerere Medical School in Uganda, and Dr. Mark Ansermino with his
colleague Dr. Guy Dumont from the Faculty of Engineering have continued with their innovative
work on using common electronic devices for monitoring patients in third world countries.

I would like to thank Brian for steering this department so well over the 11 years prior to my
arrival. Indeed we have challenges to overcome, but we are on solid footing to continue shaping
our merged departments’ research initiatives, excellent teaching contributions, and ongoing CME
activities for the province’s anesthesiologists. We will be engaging in a Strategic Planning
Retreat for the department in September 2013 – I look forward to what I’m sure will be a very
thoughtful and engaging conversation about where we want to go as a department.
# Academic Staff Listing (January-December 2012)

**Vancouver-Fraser Medical Program**

## BC Children’s Hospital

- **Norbert Froese (Head)**
- ANSERMINO, Mark
- BAILEY, Katherine
- BARKER, Michael
- BROEMLING, Natasha
- CHEN, James
- CSANYI-FRITZ, Yvonne
- GORESKY, Gerald
- KAHWAJI, Raymond
- LAUDER, Gillian
- LEE, Richard
- MALHERBE, Stephan
- MONTGOMERY, Carolyne
- MORRISON, Andrew
- PURDY, Bob
- REICHERT, Clayton
- REIMER, Eleanor
- SCHEEPERS, Louis
- TRAYNOR, Mike
- WHYTE, Simon

**Clinical Fellows:**
- SANDERS, Joy
  (July 2011 – June 2012)
- BROWN, Zoe
  (July 2011 – June 2012)
- MVILONGO, Eding
  (July 1, 2012 – June 30, 2013)
- GAN, Heng
  (July 1, 2012 – Dec 31, 2013)

## BC Women’s Hospital

- **Elizabeth Peter (acting Head)**
- BRIGHT, Susan
- CHOW, Frances
- DOUGLAS, Joanne
- GUNKA, Vit
- KAMANI, Ali
- KILPATRICK, Nevin
- KLIFFER, Paul
- KRONITZ, Naomi
- LEA, David
- MASSEY, Simon
- McTAGGART, Rod
- MONEY, Phyllis
- PETER, Elizabeth
- PRESTON, Roanne
- SAHOTA, Paul
- VILLAR, Giselle

**Clinical Fellows:**
- BROWN, James
  (July 2011 – June 2012)
- Benavides-Pena, Sandra
  (Sept 2011 – Aug 2012)
- KAVANAGH, Trevor
  (July 1, 2012 – June 30, 2013)
- BENAVIDES-PENA, Sandra
  (Sept 2011 – Dec 2012)
- JEE, Robert
  (July 2012 – June 2013)
- SEBBAG, Ilana
  (Jan 2012 – June 30, 2013)
ST. PAUL'S HOSPITAL

MOORE, Randy (Head)
ABBOTT, Bill
BACH, Paul
BELL, Scott
BEREZOWSKYJ, Jennifer
BOWERING, John
CHAN, Peter (Gus)
COLE, Colm
COLEY, Matthew
DEL VICARIO, Joe
DOYLE, Aeron
DUMITRU, Ioana
ELLIOTT, Mark (MSJ)
HEAD, Stephen
HELLIWELL, James
KLAS, Matt
KLIMEK, Alex
LEE, Bobby
LAU, Brenda
MCDONALD, Ken
McDONALD, William
MONTEMURRO, Trina
OSBORN, Jill
PHILLIPS, William
PRASLOSKI, Bruce
PRENTICE, Jim
REE, Ron
RUPESINGHE, Lalitha
SCHWARZ, Stephan
SETTON, Debbie
SIROUNIS, Demetrios
WARRINER, Brian
WONG, Clinton
WOODHOUSE, Dorothy
YARNOLD, Cynthia

Clinical Fellows:
PETRAR, Steven
(July 2012 – June 2013)
KUZAK, Nick
(July 2012 – Dec 2012)

RICHMOND GENERAL HOSPITAL

DRAPER, Paul
LEE, Laurence
NAVSARIKAR, Anup

LIONS GATE HOSPITAL

MCALPINE, John (Head)
AHMADI, Hazhir
CHATTERSON, Kelly
FINGLAND, Robert
HEWGILL, Randy
KIM, James
KUBLIK, Harry
LIPOWSKA, Magda
McCARTER, Bryon
McDIARMID, Adam Pope
MORRISON, Clare
PANTEL, Richard
THOBANI, Shafik
VRANA, Andrea
WALKER, Jamie M

VANCOUVER GENERAL HOSPITAL

UMEDALY, Hamed (Head)
ANSLEY, David
APPLEGARTH, Oliver
ATHERSTONE, Juliet
AU, Calvin
BITTER-SUERMANN, Bjorn
BLACHUT, Jan
BOULTON, Tony
BRODKN, Igor
BROVENDER, Andrea
CHOI, Peter
DHALIWAL, Baljinder
DOLMAN, John
FLEXMAN, Alana
FINLAYSON, Gordon
FITZMAURICE, Brett
GIFFIN, Mitch
GRANT, Raymer
GRIESDALE, Donald E.G.
HARPER, Jon
HENDERSON, Cyndi
HERD, Stuart
HUGHES, Bevan
HUTTUNEN, Henrik
ISAC, George
KAPNOUDHIS, Paul
KIM, Alice
KLEIN, Rael
LAMPA, Martin
LENNOX, Pamela
LOHER, Jens
MALM, David
MARTIN, Lynn
MEACON, Kelly
McEWEN, Jonathan
McGINN, Peter
MEIKLE, Andrew
MILLS, Keith
MOULT, Michael
NEGRAEFF, Michael
O’CONNOR, Patrick
OSBORNE, Penny
PAGE, Michael
PARSONS, David
PRICE, James
RANDALL, Tom
RIES, Craig
SAWKA, Andrew
SUNG, Henry
SWART, Pieter
TANG, Raymond
THÖLIN, Mats
UMEDALY, Hamed
VAGHADIA, Himat
VU, Mark
WATERS, Terry
WEIDEMAN, Theo
WHITE, Adrian
YU, Patrick

Clinical Fellows:
J Barnbrook
(March 2011 – March 2013)
B Kaur
(July 2011 – June 2012)

ROYAL COLUMBIAN HOSPITAL
EAGLE RIDGE HOSPITAL

HO, Cedric (Head)
BAKER, Paul
BAKER, Simon
BANNO, Dean
BERGMAN, Grace
BOISVENU, Guy
BURRILL, Dean
CARRIE, Doug
DUGGAN, Laura (DSSL)
FOULKES, Ellen
FOULKES, Marc
GRACIAS, Gavin
HODGSON, Alyssa
HOSKIN, Rob
JOHNSON, Patricia
LAW, Michael
LIPSON, Adrienne (DSSL)
LOW AH KEE, Patrick
MACLENNAN, David
MacLEOD, Wendy
MERCHANT, Richard
MEYLER, Paula
MOHAMEDALI, Feisal
MORTON, Roy
NICKEL, Krista
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<tr>
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<td>ORFALY, Roland</td>
<td>ABBOTSFORD REGIONAL HOSPITAL &amp; CANCER CARE</td>
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<td>PHU, Tom</td>
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<td>RAMSDEN, John</td>
<td>(MATSQUI, SUMAS, ABBOTSFORD)</td>
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<td>VALIMOHAMED, Farah</td>
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<td>BREDEN, Michael</td>
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RELF, Tim
RUTA, Thomas
SEROWKA, Paul
SHANDRO, John
SHAW, Lorne
STEVENSON, Kim
SVORKDAL, Nelson
SYLWESTROWICZ, Anna
TAGGESELL, Richard
TOWNSEND, Gary
VAN DER WAL, Michael
WEBSTER, Anne
WOLLACH, Jeffrey
WOOD, Gordon

SOUTHERN MEDICAL PROGRAM

KELOWNA GENERAL HOSPITAL-

EGER, Robert (Head)
BADNER, Neal
COLLINS, Ron
DE SOUZA, Gregory
JEFFERYS, Stephen
KUZAK, Nick
LUTSCH, Peter
YUDIN, Mark

VERNON JUBILEE HOSPITAL

SMITH, Kevin (Head)
GREEN, Jennifer
HONEYWOOD, Kallie
KENNEDY, David
LEMARY, Eric
MARKS, Richard
SMITH, Andre
VISKARI, Dan
WEDENSKY, Alex

PENTICTON REGIONAL HOSPITAL

HAMILTON, Andrew
HARDER, Kenneth

ROYAL INLAND HOSPITAL
(Kamloops)

CAMERON, Roderick J. (Head)
DIEHL, Eberhard
GUY, John
JADAVJI, Nadeem
KOWBEL, Michael
MANS, Pierre
MORROW, Farrah
SAAYMAN, Marius
TAKEUCHI, Lawrence
WHITEHEAD, Michael

KOOTENAY BOUNDARY REGL HOSP

McCASKILL, Kenneth R
ASSOCIATE MEMBERS

CHEUNG, Anson Wai-Chung
Department of Surgery

CHURCH, John
Department of Cellular & Physiological Sciences

DUMONT, Guy
Dept. of Electrical & Computer Engineering

EICH, Eric
Department of Psychology

LEPAWSKY, Michael
Department of Family Practice

TSANG, John
Intensive Care Unit
Vancouver General Hospital

HONORARY PROFESSORS

DONEN, Neil
STEWARD, David
PACEY, John

OTHER FACULTY

CALVERT, Tigger

DALINGHAUS, Kathleen
Whitehorse

GODLEY, Mark Brian
Vancouver

GORCHYNSKI, Zen
Vancouver

RENWICK, Jamie
Vancouver

ROSTON, Christine
Vancouver

VRETENAR, Doris
Vancouver

WAECHTER, Jason
Vancouver
EMERITUS FACULTY

RLD Adams MD FRCPC  
Clinical Associate Professor
JR Crosby MBBS D Obst. RCOG  
FRCPC  
Clinical Associate Professor
JA Dowd MD FRCPC  
Professor
S Karim PhD DSc LLB  
Clinical Professor
EA Gofton MD FRCPC  
Clinical Professor
AP Goumeniouk BSc MD FRCPC  
Clinical Professor
TM Lau MB CRCPC FRCPC  
Clinical Associate Professor
GT Manning MD LMCC CRCP FRCPC  
Clinical Associate Professor
GAR O’Connor MB ChB FRCPC  
Clinical Associate Professor
DV Godin BSc PhD  
Professor
BM Olson BSc MD FRCPC  
Clinical Associate Professor
E Puil BSc MSc PhD  
Professor
DMJ Quastel BSc MD CM PhD  
Professor
TC Queree LRCP MRCS FRCPC  
Clinical Associate Professor
RE Rangno MD FRCPC  
Associate Professor
B Saunders, MD FRCPC  
Clinical Professor
CA Stephenson MD FRCPC  
Clinical Associate Professor
MC Sutter BSc MD PhD  
Professor Emeritus
JE Swenerton MD FRCPC  
Clinical Associate Professor
KW Turnbull BA Sc MD FRCPC  
Clinical Professor
C van Breemen DVM PhD  
Professor
RA Wall AB PhD  
Associate Professor
MJA Walker BSc PhD

Professor

DHW Wong MB BS FRCPC  
Clinical Professor

PHARMACOLOGY & THERAPEUTICS

CCY Pang BSc PhD  
Professor and Associate Head
AM Barr BA PhD  
Associate Professor
PN Bernatchez BSc MSc PhD  
Assistant Professor
SSR Bhagavatula MSc PhD  
Professor
SL Borgland BSc MSc PhD  
Assistant Professor
CR Dormuth MA SM ScD  
Assistant Professor
D Fedida PhD MB ChB  
Professor
A Horne PhD  
Instructor
D Knight, PhD  
Professor
H Kurata BS MSc PhD  
Assistant Professor
I Laher BSc MSc PhD  
Professor
JG McLarnon BSc MSc PhD  
Professor
BA MacLeod, BSc MD FRCPC  
Associate Professor
Jean Templeton Hugill Chair
B Mintzes BA PhD  
Assistant Professor
V Musini MBBS DPH MSc  
Assistant Professor
T Perry MD FRCP  
Clinical Assistant Professor
J Shabbits PhD  
Instructor
JM Wright MD PhD FRCPC  
Professor
Director-Therapeutics Initiative
EXECUTIVE SUMMARY

2012 saw Dr. Eleanor Reimer step down from her role as Department Head after 12 years of leadership. The Department has benefited enormously from Dr. Reimer’s steady leadership and with her guidance has grown in stature within the organization. Dr. Reimer has stepped into an institutional leadership role with the hospital’s acute care centre redevelopment project. She will also continue as an active member of the Children’s Hospital anesthesia team.

The successful candidate to replace Dr. Reimer as Department Head was Dr. Norbert Froese. Dr. Froese joined UBC and the Pediatric Anesthesia Team in 1996 and had been acting as the Director of Cardiac Anesthesia. Dr. Froese plans to build on Dr. Reimer’s work and continue to move the Department of Anesthesia into a more prominent position within BC Children’s Hospital.

An annual general meeting was held in November. This helped set the agenda for the upcoming year. High priority issues included maintaining the excellent pediatric anesthesia research program, continuing to grow pediatric anesthesia education, develop a functional pre-anesthesia patient review process, consolidate the function of the acute pain service and clarify the management of Anesthesiologists’ academic and administrative contributions within the Department.

PRELIMINARY ACUTE PAIN SERVICE REPORT
Gill Lauder, MB BCh, FRCA, FRCPC, Director, Acute Pain Service

The Anesthesiology-based Acute Pain Service (APS) has now completed its 23rd year of operation, caring for a number of patients and families during 2012. The APS is currently active in the management of acute medical and postoperative pain.

The APS falls under the mandate of the Department of Anesthesia. APS personnel include a Medical Director, Dr. G. Lauder July 2010 to date. 17 Pediatric Anesthesiologists provided rotating clinical coverage 24 hours per day, 7 days per week. 1.0 FTE Nurse Clinician (Sarb Randhawa) and a 0.6 FTE Administrative Assistant (Erin Lowe). Nursing and administrative FTE’s are shared with both the APS and the Complex Pain Service (CPS).

APS STATS FOR 2012: Pending
Database statistics are not available at the present time until Decision Support Services (DSS) provide APS data. Patient data, outcomes and complications are collected via point-of-
care hard copy service record, and transposed to a database by the nurse clinician to enable DSS to analyze, develop and produce the yearly summary. The data/details for 2012 are pending.

APS CRITICAL INCIDENTS IN 2012: Pending
A summary of the years self report critical incidents through PSLS has been requested from the department of Quality and Safety. The data/details for 2012 are pending.

APS SUCCESSES DURING 2012:
Implementation of Standard Opioid Concentrations and Orders
BCCH Accreditation in June 2012 required compliance with standard concentrations throughout the institution, including continuous opioid infusions (COI). APS, pharmacy and the nurse educators undertook the requisite changes and education to ensure that this occurred smoothly without critical incidents.

Techniques:
Ongoing utilization of Ultrasound technology within the operating room (OR) environment for Continuous Peripheral Nerve Block (CPNB) analgesia has continued during 2012. Transversus Abdominal Plane (TAP) catheters continue to be used for unilateral urological surgery.

Anesthesia Residents On Call For the Pain Service:
The anesthesia resident’s role is as a first responder to gain APS experience and knowledge but ALL decisions re pain management are channeled through the APS physician or fellow. This has proven very successful with residents more aware of pain issues and medications.

Epidurals on 3M CHU:
APS supported cardiac anesthesiologists in implementation of epidurals on CHU 3M. Clinical epidural management, protocols and education come under the responsibility of the cardiac anesthesiologists.

Ketamine Infusion Orders:
Ketamine infusion orders have been implemented to help with pain management on the wards. Dose ranges differ depending on whether used alone or when used in conjunction with other opioids. This has proved a particularly effective strategy for some children on 3F with abdominal pain and on 3B for the oncology patients.

Education:
APS staff were involved with many institutional and external educational pain management lectures and educational projects throughout 2012.

List of Educational Activities by APS Delivered in 2012:

- Point of care teaching Medical students, Residents, Nurses in OR, on APS and in CPS clinic.
- Point of care teaching of children and parents re pathophysiology of chronic pain.
• Point of care teaching for nurses in Canuck Place re interventional pain strategies.
• APS Departmental Rounds; 5 per annum.
• Pediatric Epidural Analgesia for Nurses; BCCH, Bi-annual sessions
• Pediatric Burn Pain Analgesia for Nurses; BCCH, Vancouver, Bi-annual sessions
• Pediatric Acute Pain Management for Oncology Fellows, BCCH, Annual
• Pediatric Pain Management for PICU Fellows; Annual
• Edu-Quicks on 3R for nurses on Pain management issues; Regular Tue am
• PACU nurse pain teaching; regular Tuesday sessions.
• Pain management for Ambulance Personnel 2012.
• Tonsillectomy pain management for ENT department 2012
• Pain BC Educational Conference Lecture “Getting Kids Back to School; An Interdisciplinary Approach to managing Persistent Pain in Young People” Vancouver, October 2012.
• Pain BC Society Parent Open Forum Lecture on Development and Management of Chronic Pain in Children and Adolescents June 2012

Research:
Research projects specifically designed to explore pediatric pain management issues have been initiated in 2011. See Pediatric Anesthesia Research Team (PART) report for details.

Publications:
Publications produced by the APS service specifically centered on pediatric pain management in 2011 are highlighted in the Pediatric Anesthesia Research Team (PART) report.

Pain BC Society:
The APS director is a board member of the Pain BC Society (www.painbc.ca). Pain BC Society is a non-profit organization made up of Healthcare providers, patients and others with a passion to reduce burden of pain and to make positive change in the health care system.

Pain BC has been the catalyst to a tremendous amount of growth and activity since inception in 2008 but particularly in the last twelve months.

2012 Achievements:
• Launched social media plan to create online peer support network for people in pain and their supporters. Increased Facebook fans from 30 to over 3200 active participants since April 2012.
• Launched blog talk radio - an online radio show - to provide background on topics relevant to people in pain and then to take calls to discuss their issues. The first four episodes have logged more than 10,000 listeners.
• Co hosted monthly self management webinar series for people in pain, with an average of 250 people participating, as well as in-person workshops on themes such as Acceptance.
• Donated top pain management books to public libraries across BC.
• Sold out a second annual health care providers’ pain management conference with 285 people across disciplines attending.
• Advocated successfully for the development of a Pain Practice Support Module through the BCMA - the first to target both GPs and specialists. Content and system redesign working groups are now meeting with delivery expected in mid to late 2013.
• Supported the development of pain management training for physios in collaboration with Physio Association of BC.
• Advocated with health regions to enhance pain services; Interior Health recently had their comprehensive stepped care plan approved in principle by their Senior Executive. Work is underway to undertake a similar collaborative planning approach in the North in 2013.
• Developed and supported the implementation of the Nurse Pain Champion program in Fraser Health where 20 post surgical RNs will be trained in pain management, with hopes of providing improved acute pain management and reducing transition to chronic pain.

ONGOING APS CHALLENGES

Structure of APS Physician Week.
Acute care pediatric pain specialist physician time is restricted by commitments to pre-assessment clinic and the operating room, minimizing point of care management and teaching on the wards and other units within the institution.

Audit.
There is no electronic database to easily analyze quality control issues. No resources are available to implement ongoing follow up of patients leaving hospital after discharge from day surgery exists in this institution. There is no tracking of the quality of pain management for non-APS patients neither within the institution nor after discharge.

Personnel.
The nurse clinician role is restricted to 0730-1630 Tuesday to Friday. The Nurse clinician has a significant commitment to the complex pain service and a large administrative minimizing time for APS point of care management and teaching on the wards.

Lack of nursing resources prevents:

• Change of the present referral practice where only physicians can refer children to the APS. Denies and ignores expertise of other clinicians and family members.
• Enhanced point of care management and education
• Enhanced continuity of patient care.
• Expansion/adoptions of more non-pharmacological techniques for individual patients.
• Development of other pain management education packets/guidelines
• Enhance collaboration with other areas in the institution such as NICU and ER
• Development of ongoing quality of care projects
• Enhanced integration with Quality and Risk
• Enhanced integration with Childlife
• Expansion of invasive techniques to other wards
• Nurse led research projects.
• Nursing involvement in Provincial and National Pain Education Meetings

Psychology.
Lack of an APS dedicated psychologist ignores the fact that pain perception is a complex biopsychosocial problem (mix of nociceptive responses to the trauma of surgery and psychological components). In some APS patients postoperative pain control can be problematic, especially in children who are not opioid naïve, who have a history of chronic pain or who have an ongoing chronic disease process. Lack of trained psychological support causes persistence of psychological suffering and a maladaptive anxious response that worsens outcome.

QUALITY OF CARE
Dr. Simon D. Whyte

Departmental Quality of Care (QoC) meetings took place on 7 occasions in 2012, with 10 staff members reviewing 14 cases. 6/7 meetings were quorate & all department members bar two attended 50% or more of the meetings, confirming the value of these rounds to department members. This year also saw the presentation of a number of audits and quality improvement initiatives by department members, both in this forum & beyond, & ongoing department representation in Surgical Suite Rapid Process Improvement Workshops (RPIWs).

Outcomes from the 14 cases are summarized in Table 1. Figures for 2011 & 2010 are for comparison.

<table>
<thead>
<tr>
<th>Outcomes*</th>
<th>2012 (n=14)</th>
<th>2011 (n=15)</th>
<th>2010 (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Injury requiring medical/surgical management</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Injury not requiring medical/surgical intervention</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Prolonged anaesthesia</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Prolonged recovery</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Unanticipated hospital admission</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unanticipated ICU admission</td>
<td>3</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Unanticipated post op IPPV</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>No sequelae</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Near miss</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* not mutually exclusive

Practice & resource changes arising from QoC case reviews in 2012 (contributing department members):
• Protocol for running dexmedetomidine infusions in PACU (CM/SW)
• Protocols around standard concentrations of inotropes in OR (CM)
• Rapid infuser primed in OR7 for VCRs
• Changes in scheduling of spine anaesthetists, to reduce out-of-OR commitments during spine procedures, and to promote continuity of anaesthetic care (i.e. same anaesthetist) for split procedures.
• Recommendation for plain or low-dose hydromorphone epidurals in CP patients undergoing complex major hip surgery.
• Working group to standardise OR-PICU handovers (CR)
• Appointment of a lead clinician for neuroanaesthesia (pending)

Other QoC Initiatives in 2012.
• Staff-staff liaison with endocrinology to optimize individualized perioperative care to children with IDDM and steroid dependency (SW)
• Extension of pre-warming in SDCU to all non-cardiac patients > 10kg undergoing >2hr procedures (AM)
• Reduction of fluid fasting times by active fluid prescribing 2.5 hrs pre-op (SW)
• Screening & triage of booked surgical patients for necessity of pre-operative anaesthesia assessment visit – early planning activity (SW/JC/ER)

Departmental Audit Activity.
• Dr. K. Bailey presented her audit of post-op nausea & vomiting & departmental adherence to published prophylaxis guidelines in several hundred patients at the 2012 SPA meeting in Washington, DC.
• Dr K Bailey undertook an audit of postoperative tonsillectomy pain & its management in PACU. Her findings will be reported in 2013.
• Dr. S. Whyte continued & extended his work with Matthias Gorges to review intraoperative temperature profiles of scoliosis patients, with a retrospective audit of the incidence and severity of intraoperative hypothermia before & after the introduction of pre-operative warming. Their findings quantify the benefit of ‘pre-warming’ in daycare & support extension of the practice to other lengthy surgeries. Their data were presented at the province’s Surgical Quality Action Network meeting, & will be discussed at the hospital’s Surgical Suites Grand Rounds in 2013.
• Dr. S. Whyte led a prospective audit of fluid fasting times in elective surgical patients, in conjunction with Jordan Cheng (OPSEI Quality Improvement Research Assistant) & Trish Page (SDCU CNC). The findings, which were presented at the Surgical Quality Action Network meeting, & at Surgical Suite Grand Rounds, prompted a change in practice, to active pre-op fluid prescribing. The intervention is being re-audited in early 2013.
• Drs. E. Reimer & S. Whyte planned, & submitted for IRB approval, an iACT-funded QI project to evaluate the impact on perceived quality & value of pre-operative anaesthesia assessment visits of introducing a pre-operative anaesthesia screening questionnaire, and an anesthesia-team-led triaging process for determining the need for pre-operative anaesthesia assessment. This will report in 2013.

With regard to the department’s role in QoC activities beyond anaesthesia services provision per se, in June 2012, Dr. S. Whyte assumed the role of Co-Chair of the hospital’s Child Health Safety & Quality of Care (CHSQtC) committee, whilst continuing to represent the
department on the QoC committees of Surgical Suites, and Surgery & Neurosciences. He also represents the department at the P-NSQIP forum, which has been examining BCCH’s risk-adjusted data for UTI and Surgical Site Infection. Surgical Suites Grand Rounds, incepted in 2011, continued its quarterly fixture, with good attendance & feedback; I’m grateful to Nathan O’Hara & Damian Duffy of OPSEI for ongoing co-ordinating & advertising activities, & for financial support in the guise of coffee & muffins. We are exploring ways of webcasting & archiving SSGR content, to make it accessible to those unable to attend. Dr. Reimer assumed the Co-Chair of the Site Wide Sedation Committee, which reports to CHSQoC; Drs. Chen & Whyte are members of this group. Amongst other things, it has been occupied with developing & implementing a Sedation Safety Checklist for out-of-OR sedation procedures, & has been considering ER proposals for propofol use in the ER. The Surgical Safety Checklist continued to evolve, with a major focus on performing Sign-Out. Dr. Chen represented the department in an RPIW that focused on OR slate scheduling.

This is my annual opportunity to thank everyone who contributes to & facilitates the quality assurance and quality improvement work of this department, whether by volunteering cases for discussion, contributing to the healthy debate that always accompanies case reviews, undertaking to implement actionable recommendations that arise from these reviews & from PSLS reports, or scheduling my time to undertake the QoC portfolio. The coming year will feature new RPIW initiatives, ongoing feedback data from NSQIP & local QI initiatives arising from our risk-adjusted data, further gradual implementation of data-driven OR booking, which includes anaesthesia induction & emergence times, & department-member led audits. I hope we will continue to support each other in performing continuous quality improvement in the care we provide.

**CARDIAC ANESTHESIA**

*Dr. Clayton C. Reichert, Head Cardiac Anesthesia*

The cardiac anesthesia providers were joined by an additional experienced anesthetist in late 2012, Dr. Chris Chin. Currently this is a locum position and ongoing efforts to have this position filled long term are under way.

The addition of a fourth provider has enabled the group to supply more consistent coverage for interventional cardiology procedures. We continue to provide care for all electrophysiology studies and interventions; to see our patients in the preoperative clinic; and provide consultative services or direct care for cardiac patients undergoing non-cardiac procedures.

We have increased our presence at cardiac team rounds during the case conferences, during debriefing and at ICU bedside rounds.

Case volume in 2012 was at 200, down from 236 as we have a very short waitlist and many booked slots were not filled in the latter half of 2012. The anesthesiology skills should still be maintained for each provider with this case volume, as we are also involved in interventional procedures on a higher frequency basis.
During 2012, Dr. Norbert Froese moved on to become departmental head. The new director is Dr. Clayton Reichert. Dr. Louis Scheepers continues as the fourth clinician on the anesthesia care team for cardiac patients.

Educationally we continued to provide the BCCH fellowship pediatric anesthesiology trainees with core rotations in cardiac anesthesia. We also offered this rotation for the first time to returning anesthesia residents who want to consider this an area of specialization. As yet have not had any trainees avail themselves of the opportunity.

**PAEDIATRIC ANESTHESIA SPINE TEAM**

*Dr Andrew B. Morrison, Spine Team Coordinator*

The Pediatric Anaesthesia Spine Team was formed two years ago with the intention of providing a specialized, consistent, and coordinated approach to the provision of anaesthesia for our scoliosis patients.

Scoliosis patients comprise of three groups based upon aetiology: congenital, neuromuscular, and idiopathic. They encompass a broad range of age groups from toddler to adult, occasionally with complex medical conditions. Our small expert group of anaesthetists is able to focus on the individual requirements of each patient while delivering a high level of care specific to the requirements of scoliosis surgery.

Communication, understanding and interaction between care providers in the operating room is essential in complex and lengthy surgery and these parameters have been improved with the move to a smaller team.

Quality of care indicators such as maintenance of patient temperature, time to incision, transfusion rates and others have been improved and the implementation of new policies such as patient prewarming, and streamlined pre operative clinic consultations have been facilitated.

The team comprises six members drawn from the Department of Paediatric Anaesthesia with rotation into and out of the team approximately every six months. As part of the larger Paediatric Spine Team we are actively involved in ongoing multidisciplinary education sessions to maintain, advance and promote understanding of the challenges these patients face.

**CLINICAL FELLOWSHIP PROGRAM**

*Dr Carolyne J Montgomery, Fellowship Director*

**Introduction:**

This annual report is prepared for the Chief of the Department of Pediatric Anesthesiology at BCCH to summarize the activities and directions of the Fellowship Program for the period of January 2012 to December 2012.
Recruitment and Structure Update:
Since the last fellowship report, Drs Joy Sanders and Zoe Brown (July 2011- June 2012) completed our 12 month clinical fellowship program. Both have returned to positions in the UK. In addition, Dr Zoe Brown has accepted an offer of a staff position at BCCH effective July 2013.

The current 12-month fellow is Dr Eding Mvilongo (July 2012 – June 2013), a Canadian trained graduate from the McGill program after the late withdrawal of an International applicant. It was anticipated that Dr Mvilongo would have been an excellent fit for the PART research program as she also has a biomedical engineering background.

Dr Heng Gan started a two-year fellowship effective January 2012, using the 6/12/6 month format of mainly research then clinical and then a final completion of 6 months (July-Dec of 2013) of research under the supervision of the research director Dr J. Mark Ansermino. This is a similar model that was used with Dr John Chandler. There is currently negotiation with Dr Gan over the possibility of continuing one clinical cardiac day per week during his remaining research block to allow for ongoing clinical experience and maintenance of competence.

There is confirmed recruitment for the July 2013 start both from Canadian training programs. Dr’s Jeff Sampson from the Queens program and Dr David Summerfreund, who is from the University of Western Ontario. Dr Summerfreund has some irregularities in his RCPSC training calendar such that he will be funded and accredited as a resident by his program (UWO) during his first three months at BCCH but will be functioning clinically at the Fellowship level. He will be certified for a 9 mos Pediatric Anesthesiology Fellowship.

There is an arrangement with Calgary Children’s to provide one of their trainees, Dr Jon McMann to do a six month fellowship for the period of January to June, 2014. The Calgary program will be providing funding and will be hiring him at Calgary Children’s.

In terms of ongoing recruitment, both the offers to Canadian graduates for the July 2014 cycle were refused due to the candidates personal geographic constraints. Two alternate International graduates, Dr Lindsay Rawlings from the UK and Dr Peter Harper from the Republic of Ireland have been recruited. The program is currently recruiting for the July 2015 start.

The method of continuous rolling acceptance appears to be more efficient in providing early acceptance for outstanding candidates rather than having a fixed calendar date for closing applications. Recruitment continues with pre-application review of electronic CV and subsequent invitation for full application.

The ongoing goal is to appropriately match the trainees learning needs with the clinical, administrative and academic teaching resources available at BCCH. The current criteria for admission to the 12 month clinical and research Pediatric Anesthesiology Fellowship at BCCH are:

1. A Specific interest in PEDIATRIC ANESTHESIOLOGY
2. An appropriate level of training (recent graduate) within 1-5 years (max)
3. The clinical experience available at BCCH (the teaching material) will add to previous training.
4. An ability to work independently in English speaking environment
5. An interest in and usually previously demonstrated ability for level of training in evaluative work (research) with an emphasis on the PART areas of development.
6. Priority is given to Canadian or Landed Immigrants.

If there is not a Canadian Applicant and there is also a substantially more qualified International candidate who meets all of the above the position is awarded to that applicant. The applications reviewed annually exceed 100 in number. At least half of these are unqualified using the above criteria. Canadian or Landed Status Applicants are still rare (less that 5 per year) from a pool of an annual Anesthesiology residency graduation number exceeding 100.

Candidates are recruited by personal communication and from applicants responding to any of the annual CJA Canadian Anesthesiology Fellowship listing (http://www.cas.ca), the APABGI Fellowship directory (http://www.apagbi.org.uk), the CPAS site, (https://cpas-sapc.ca) the UBC Anesthesiology site (http://www.anesthesia.med.ubc.ca) and the PART site (http://www.part.cfri.ca). Two clinical trainees are chosen annually. The 2013 CAS meeting is also running a Fellowship recruitment fair.

The current Fellowship Selection Committee consists of the Fellowship Director, the Department Head, Dr N Froese, the Research Director, Dr M Ansermino, the APS Director, Dr G Lauder, the Cardiac Director, Dr Clayton Reichert, the PAC director (position open), the Scheduler, Dr L Scheepers and Dr M Traynor, the site residency training director who participates in daily clinical scheduling of the fellows and residents. In addition he manages the case mix that the Fellows are exposed to. The Financial Officer, Dr M Barker is copied on issues that concern changes in funding.

I am grateful to the other interested staff members that participate in reviewing the CV’s and ranking the candidates in particular Dr’s Whyte, Chen, Malherbe, Cassidy and Chin.

The department secretary, Ms D Taylor is responsible for the management of the applications, and provides assistance with immigration, provincial licensing, hospital and university privileges. In addition, she maintains the annual information package, updates the Web Site and manages the fellows schedules with respect to vacations, conference leave and specialty rotations.

In addition, Mr D Duffy, OPSEI, has been essential in providing access to application for additional funding for the extended two year fellowship of Dr Gan through the Foundation Fellowship Committee of the BC Children’s Foundation.

**Funding and Budget:**

The Fellowship Expenses, beyond the hospital salary and benefits package are remunerated on an ad hoc basis from department funds from various sources. With the current Clinical Service Contract Fellows are remunerated by BCCH according to their PGY status in the 2009 PAR-BC (http://www.par-bc.org/) collective agreement. A typical British Fellow is usually a PGY7 or greater ($77,758.74). Most Canadian Fellows qualify for PGY6 status.
Typical Anesthesiology Department expenses related to the Fellowship Program include UBC processing fees, CPSBC licensing, CMPA coverage, office materials, presentation and conference costs, the annual Fellows Recognition Dinner and educational materials. BCCH supplies academic space and workstation access. These expenses vary from year to year depending on whether the Fellows require presentation funding but range from $10,000 to $20,000 per year. The most expensive item is the annual Recognition Dinner. All expenses are recorded by Ms. Taylor and discoverable by all department members. Recognition of the need to clarify and confirm the ongoing sources of funding for the Fellowship program has been identified as a priority and a draft budget is attached to this report.

**Clinical, Academic and Research:**
The Fellows participate in the Acute Pain Service (APS) 1/6-week rotation, 1/6-weekend call and an alternating Wednesday night call. This allows for the use of the Thursday as a post-call/academic day. They are expected to and to date have been very flexible regarding these assignments accommodating the needs of the UBC residents. The OOW (more urgent cases) daytime scheduling allows for daytime exposure to more complicated patients with more teaching opportunities. It is not recommended by this Fellowship director that the Fellows participate in an “in-house” based on the current intensity, timing and complexity of the current emergency cases after 23:00 h.

Data from the 2011-2012 year based on data from Dr’s Brown and Sanders log-book showed a decrease. Case exposures for completed data from 2011-2012 year are similar to previous years. (See FIG)

Formalized exposure to specific clinical scenarios is an ongoing challenge for the fellowship program. Specific scheduled 4-week blocks in PICU, Cardiac, and a 5-7 clinical day experience in International Health have been well established over the last few years.

**Ongoing challenges remain:**
1. **Peripheral Nerve Block / Epidural Exposure** are now possible as Dr Lauder (and others) perform US guided-blocks each Thursday. There is a regular Hip day on Wednesday to ensure ongoing epidural exposure.
2. **Spine Specialty Team Exposure.** This should improve the teaching and research opportunities related to this specialty. Should specific G&O be developed? How many spines should be done in the 12 mos period?
4. An **Administration Rotation** was trialed in 2011 with Fellows updating an MH policy and developing a Dexmedetomidine PPO set for PACU. This years Fellows were invited to do a Trauma Cognitive Aid for the Surgical Suite and an Emergence Delirium Protocol for PACU.
5. **A Difficult Airway Rotation.** This has been partially implemented with the use of a Difficult Airway Electronic Dictation Template and the Fellows Self-Selecting for Difficult Airway / Advanced Airway Management Cases. The Fellows are participating as staff in the Annual UBC Department of Anesthesiology Difficult Airway Day supervised by Dr Theo Weideman.
7. **Innovative Teaching Methods/ Simulation:** Ideas surrounding the Fellows taking the lead in development of OPSEI teaching
DVD tools. (e.g. Medication safety, CVC insertion, caudal and epidural anesthesia) should be pursued. With further local advancement of simulation at BCCH, future Fellows should be active in this area.

8. The PAC exposure is in flux and the model should allow Fellows to see their own PAC patients where feasible. A PAC worksheet and dictation template is available for the Fellows.

International Health Initiatives and Training in Pediatric Anesthesiology:
The Department maintains relationships with Operation Rainbow Canada (ORC) Pediatric Facial Plastic Surgery. Funding for these trips for the fellows is provided from the Chief of Anesthesia Fund. In February 2013, Dr Mvilongo participated in a trip to Cambodia with Dr Purdy.

We are continuing through OPSEI and UBC with the leadership of Dr B Warriner to continue to develop our relationship with Mulago Hospital in Uganda. Dr Gan will be working with Dr Reimer and the OPSEI group to provide clinical service and teaching in March of 2013. In addition, he will be involved in PART oximetry research. We are hoping in collaboration with the PART there to develop future clinical training and research liaisons.

Academic and Research activities:
The responsibilities of the Fellows include attendance at include 3 journal clubs per year, presentations to residents, participation in Department teaching rounds, QA rounds and research rounds. The detailed list is available on One45. (https://www.one45.med.ubc.ca)

These documents are being updated for the start of the 2013 cycle with more specific and detailed expectations. Please see the Annual Department Research Report (http://www.part.cfri.ca) for details regarding research activities including presentations, reviews, case reports and investigations from Drs Brown and Sanders in addition to listings of current projects by Drs Gan, and Mvilongo. Details of successful grants due are also provided. Both Drs Brown and Sanders presented successfully (award winning presentation) at the UBC APT day and at the June 2012 CAS.

Drs Ansermino, Whyte, Lauder, Froese, Malherbe and other members have been involved in supervising the Fellows research with the assistance of the PART members. It is an ongoing goal to continue to attract other staff to supervise fellows in clinical research projects, review articles and case reports.

Dr Bailey has agreed to help develop a document outlining a process for anesthesiology staff to develop project proposals for collaborative review and allocation of department resources like PART staff and Fellows.

In addition, under the leadership of Dr’s Froese and Whyte with the support of the PART resources, new Fellows will be encouraged to pursue a feasible audit project as a core requirement of the program.

As Fellowship director, I use my academic time to actively participate in the PART and am currently supervising Dr Sanders in completion of the Morphine plasma levels study and in the initiation of a Bolus Dexmedetomidine Study that we have continued into 2013. Dr Brown was supervised by Dr Ansermino in a Cardio-Q study.
Curriculum Development, Evaluation and Data Tracking:
Dr’s Whyte, Traynor and myself are reviewing options for ongoing case tracking for CPD by both staff and residents. The British Fellows use the RCA web diary (http://www.logbook.org.uk) and most Canadian residents and Fellows use the ACUDA recommended logbook. (https://www.residentlogbook.com/). A more refined data base tracking PEDIATRIC SPECIFIC diagnosis, interventions and anesthetic procedures was established in July 2011 on One-45 (https://www.one45.med.ubc.ca) The current format while sensitive is cumbersome and formatting the data into an effective presentation format has not been successful. We will continue to review options for appropriate Pediatric Anesthesia Procedure and Experience tracking that reflects the CanMeds process. This may be integrated in a future anesthesia information system. A local trial of portfolio management in 2013 will be undertaken to assess feasibility of the use of ANZCA Mini-CEX and DOPS formats.

One45 system remains a useful repository for any electronic materials related to the Fellowship that can easily be updated, stored in one location and is widely accessible by both trainees and staff. (See Handouts and Links at (https://www.one45.med.ubc.ca). Electronic Evaluation using One45 is efficient and has improved compliance. It allows the Fellow to review and reflect on staff comments and gives the staff an opportunity to provide the feedback in a constructive open manner. Reverse evaluation still remains a “to-do” topic and will be revisited.

A National Group led by Dr Gail Wong and her colleagues at HSC at the University of Toronto and several national collaborators, including myself, continue to define and develop a National Fellowship Curriculum in pediatric anesthesia. In addition to curriculum goals, evaluation tools will also be reviewed. There has been little progress in this regard.

Challenges and Changes:
The challenges remain to improve the relevance and quality of the candidates prior to formal application by pre-screening and counselling as to the appropriateness of the application to BCCH and this includes the ongoing recruitment of appropriate Canadian candidates. The successes and productivity of Drs Joy Sanders and Zoe Brown during the 2011 cycle was outstanding and I would say the best of any year I can remember with respect to both clinical and academic achievements.

There have been more challenges during the 2012 cycle that have provided an opportunity to further clarify expectations, increase supervision strategies and evaluation styles and intensity. A revision of the expectations of the Fellows and the staff has been revised for the start of the July 2013 group.

It may be appropriate with expanding staff and decreased individual exposure to develop a daily evaluation format for the Fellows to provide more accurate feedback on their progress. It is hoped that the portfolio approach will improve learning, teaching and appraisal by both Fellows and staff.
The importance of “pre-fellowship” preparation for project design, IRB approvals and funding will continue to be emphasized by early acceptance of applicants, and the assignment of staff research mentors to facilitate planning prior to the fellowship year. Continuity and productivity will be further enhanced by the use of a 2-year fellowship model that combines a research year and a fellowship year. We are continuing to search for the exceptional candidates for that type of position. Other goals include increased academic interactions of the Fellows with the UBC Anesthesiology Fellows and the BCCH Pediatric Fellows. In addition, increased Fellow participation in organized didactic sessions pertaining to research basics from CFRI (http://www.cfri-training.ca/calendar/calendar.asp) and UBC (http://www.apt.ubc.ca/UBC_Anesthesiology, Pharmacology_and_Therapeutics.htm) should be encouraged. Succession planning for the Fellowship director should also be addressed.

Summary:
The Fellowship program is healthy with a history of strong candidates who are excellent clinicians and reasonably productive with the support of PART and the BCCH clinical and academic staff. Our challenge is to motivate and support the average Fellow who requires more supervision and direction to meet the goals of the fellowship program. The Fellowship program director is deeply indebted to all the anesthesiology staff that contributes to the training and supervision of the fellows in all these activities.
Figures: Fellows Case Count and Mix (12 month periods from July 2011 to June 2012)
RESIDENCY PROGRAM
Dr Michael Traynor, Residency Coordinator

Consolidation of pediatric training
In 2010, Dr. Cathy Stephenson initiated an effort to consolidate all core pediatric anesthesia training into a continuous block at BCCH during the two senior years. In 2011 there were still some junior residents at BCCH and many residents had two shorter rotations rather than one continuous block at BCCH. All residents at BCCH in 2012 were in the R4 year or higher with the exception of the three family practice anesthesia (FPA) trainees. Almost all of these residents completed their four months of pediatric anesthesia and one month in the pediatric intensive care unit (PICU) in a solid block. This change has enabled us to provide much greater autonomy to residents nearing the end of their rotation, as intended.

In-hospital call
Anesthesia residents have been on call from within the hospital rather than from home since January 1, 2012. This change has been very well received at all levels. Residents now have a much greater sense of ownership over cases coming to the operating room (OR) after hours: They are the usually the first anesthesia providers to see such patients and are now composing and implementing a management plan, with appropriate support from the staff on
call, in most instances. In addition, the switch to in-hospital call has enabled participation on the acute pain service, the trauma team and the vascular access service as discussed below under "further expansion out of the operating room”.

**Further expansion out of the operating room**
Residents are now active members of the Acute Pain Service (APS) under the guidance of Dr. Gillian Lauder. They participate in evening APS rounds and are the first team member on call for APS issues. The feedback from residents has been very positive so far: The APS is seen as a very good learning environment and many residents have commented that they feel much more confident handling this relatively high-risk area of anesthesia practice after completing their BCCH rotation.

Through the efforts of Dr. Andrew Morrison, we were able to integrate the anesthesia resident on call into the BCCH trauma team in 2012. Although the number of traumas at any children's hospital is predictably low, the opportunity to participate when they do occur has proven invaluable to our residents.

Vascular access after hours has long been a difficult problem at BCCH. The entire hospital has warmly welcomed the presence of in-hospital anesthesia residents who are often able to obtain vascular access in very difficult situations where others have not been successful. The current generation of residents has a familiarity and faculty with ultrasound imaging that enables them to provide a very valuable service, and the challenging patients in our pediatric environment provide them with a useful opportunity to hone their skills.

In 2011 we began having residents work with us in the radiology suites (usually MRI lists). We have continued this initiative in 2012 based on positive resident feedback and have also begun having residents help with sedations in the oncology clinic. We will continue to actively look for new opportunities for our residents to gain experience outside the OR setting.

**Scheduling**
The scheduling of trainees is now done by the residency site coordinator, rather than the staff scheduler. This has resulted in greater attention to the specific needs of the trainees. In particular, off-service residents are more reliably scheduled in high-turnover lists with more frequent opportunities for airway management, anesthesia residents spend a greater proportion of their time in lists with infants and toddlers, and medical students are no longer always scheduled in the dental room. Anesthesia residents are exposed to a few spinal fusion cases during their rotation, but are no longer put in these cases by default every time they are on call.

**Pediatric cardiac anesthesia**
Dr. Clayton Reichert took over duties as head of cardiac anesthesia at BCCH in 2012. This year has seen a continuation of the slow trend towards allowing senior trainees back into the cardiac OR after a period of very tightly restricted access. Anesthesia fellows complete a one-month cardiac anesthesia rotation early in the year and are subsequently given one day per week in the cardiac OR. Senior residents requesting some exposure to cardiac anesthesia have been permitted to assist in the cardiac OR near the end of their pediatric anesthesia block if their performance in the general OR has been good. Sometime in 2013 we anticipate
beginning to offer a formal rotation in pediatric cardiac anesthesia to selected, motivated senior residents.

**Off-service residents**
Our department continues to provide pediatric anesthesia rotations for pediatrics residents, PICU fellows, pediatric emergency medicine (EM) fellows, EM residents, family practice residents following the EM track as well as medical students. In 2012 we also offered a trial rotation for pediatric dental residents. There have been some concerns about this initiative and it is currently under review by the pediatric anesthesia executive. There are plans to offer a limited maintenance of competency experience for the staff EM physicians at BCCH beginning in 2013.

**External anesthesia residents**
We had the pleasure of welcoming one visiting resident this year: Dr. Erika Bock completed a one-month rotation in general pediatric anesthesia at BCCH. Residents from London, Sherbrooke, and Calgary have already booked elective rotations with us in 2013.

**PALS**
We have begun discussions with the PICU team on training a number of anesthesia staff as Pediatric Advanced Life Support (PALS) instructors according to the American Heart Association (AHA) criteria. The long-term goal for our department to offer PALS provider courses specifically tailored to the unique skill sets of anesthesia residents, fellows, and staff. We anticipate having approximately one-half of our department certified as PALS instructors by the end of 2013.

**Morning tutorials**
Our department members provide practical case-based tutorials for residents three mornings per week. In 2012 the tutorial topics were revised and updated and distributed more evenly among the members of the department. With the increase in the size of our department, we anticipate being able to provide an additional tutorial on Monday mornings beginning sometime in 2013.

**Simulation**
Our department welcomed two new staff members in 2013. Dr. Myles Cassidy and Dr. Chris Chin both have extensive experience in simulation and anesthesia crisis resource management and have been working with our existing simulation team to establish a robust program at BCCH. The timing of their arrival is fortuitous as it coincides with the establishment of a UBC-wide simulation program overseen by Dr. Laine Bosma. We anticipate beginning simulation days specifically for residents rotating through BCCH in early 2013.

**Review of evaluation process**
The poor response rate using the internet-based tool currently used to solicit evaluations of resident performance from staff members is hampering the site coordinator’s efforts to provide accurate, broadly-based feedback to anesthesia trainees. In addition, the system has no practical facility to solicit feedback at the midpoint of a rotation. For these reasons, a decision has been taken to switch to daily paper evaluations beginning January 1, 2013. Discussions are ongoing between the residency site coordinator, the fellowship director and
the residency training committee (RTC) about how best to implement evaluations of the staff by the residents (“reverse evaluations”). This is a sensitive task and will require significant planning. It is likely best that a system is established at a residency-wide level rather than independently at each site.

**Education working group**
A working group of department members with an interest in medical education has been formed. Those involved include myself, Dr. Carolyne Montgomery, Dr. Katherine Bailey, Dr. Yvonne Csanyi-Fritz, Dr. Michael Barker, Dr. Stephan Malherbe, Dr. Natasha Broemling, Dr. Myles Cassidy, and Dr. Chris Chin. We hope to advance a number of initiatives relating to education as well as to assign the ongoing operational management of certain items (medical students, continuing medical education, etc.) to specific group members.

**GLOBAL HEALTH**
*Dr. F. Robert Purdy*

The BCCH anesthesia group has been supportive of more than 40 surgical missions to developing nations over the past two decades. This work has included Cambodia, the Philippines, Guatemala, China, Mexico, Lebanon, India and Africa. Department members have used vacation time and personal resources to participate in the provision of pediatric peri-operative care to impoverished children in these countries and added much needed medical education for their health care providers. The BCCH department of anesthesiology has encouraged participation in these missions and financially supported pediatric anesthesia fellows to take part as an important component of their fellowship training. Most missions have included support from many other health care providers from BCCH including, nurses, surgeons, pediatricians, anesthesia assistants, pharmacists, biomedical engineering and administrative support personnel who have donated their valuable time and energy.

**Mission Summary for 2012**
- Cambodia February 2012
  Pediatric Plastic Surgery
  Department Members Dr. Clayton Reichert, Dr. Bob Purdy, Dr. Zoe Brown
  Sponsoring NGO “Operation Rainbow Canada”

- Uganda March 2012
  General Surgery and Hernia Camp
  Department Member Dr. Eleanor Reimer, Dr. Joy Saunders
  Support from the BCCH Foundation

- Guatemala November 2012
  Pediatric Plastic Surgery
  Department Member Dr. Bob Purdy
  Sponsoring NGO “Health 4 Humanity”
Missions Planned for 2013
Cambodia February 2013 Dr. Bob Purdy, Dr. Eding Mvilongo
Uganda March 2013 Dr. Eleanor Reimer, Dr. Heng Gan
Cambodia September and October 2013 Dr. Clayton Reichert
Guatemala November 2013 Dr. Bob Purdy

Publications – please refer to page 144

Pediatric Anesthesia Research Team

Overview
The Pediatric Anesthesia Research Team (PART; www.part.cfri.ca), with the full cooperation and participation of all members of the Department of Pediatric Anesthesia staff, has created an environment where new ideas have been met with support and encouragement. We maintain our close links with the Office of Pediatric Surgical Evaluation and Innovation (OPSEI; www.opsei.bc.ca) and we are active members of the Innovations in Acute Care and Technology (iACT) Research Cluster at the Child & Family Research Institute (CFRI; www.cfri.ca).

This year, the Department has published, or has in press, 22 peer reviewed manuscripts and has submitted an additional 9 manuscripts for consideration. We have presented 24 abstracts at local, national, and international meetings and plan to present many in the coming months.

Numerous new grant applications were completed by team members this year as Principal Investigators (PI) and Co-Investigators (CI). New grant funding totals close to $1M with more than $1M pending, but we have unfortunately experienced a higher than usual grant failure rate. We are still challenged with sustainable funding for the core infrastructure of the PART. This has been significantly supported this year by a grant from the Safe and Comfy Kids Fund, which was established by the physicians in the Department of Pediatric Anesthesia. While we have garnered more than $20M over the last three years in PI and CI funding, much of this funding is allocated to support our international research collaborators. Our overall conference participation was lower than typical this year, due to the decreased level of funding to support attendance. Despite this lower attendance, many of our team members were recognised through fellowship and conference presentation awards. We also continue our industry research partnerships and look forward to making our research endeavours a clinical reality.

The PART and the Electrical & Computer Engineering in Medicine (ECEM; http://ecem.ece.ubc.ca) group at The University of British Columbia (UBC; www.ubc.ca) moved to our combined home in the new Clinical Support Building in September 2012. After many years scattered throughout the hospital campus and UBC, we have finally been provided a space to bring the team together. We have comfortably settled in and plan to use this opportunity to its fullest!

Our full-time funded staff positions now include three anesthesia clinical/research fellows, four research assistants, a research manager, research engineer, two software developers, a
knowledge broker, and a research grant facilitator. Our team also includes four engineering post-doctoral fellows and several graduate students, along with summer students and visiting students.

As the PART has grown throughout the years, we have been fortunate to recruit some of the very best and brightest. We are grateful to all of our investigators, staff and students for contributing to the success of our once-little team!

New Faces

The Pediatric Anesthesia Research Team (PART) welcomed new faces in 2012. Peter Chen joined us as a Junior Software Developer in July. Peter is a recent engineering graduate and has been a tremendous asset to the technical development team. Leah Harrison started in October as the Knowledge Broker, specifically for the *KidsCan/MobileKids* project. Her background in science and business has been a great strength to this project.

Patricia Bernal joined the team in January as a co-op student from the School of Interactive Arts and Technology at Simon Fraser University. Patricia worked on the *PIERS on the Move* project, using her skills as a graphic designer to help us create and test the graphical user interface. Patricia also created different logos for our mobile apps.

Terri Sun was our medical summer student this year. She spent her time working on the *Panda* project, conducting postoperative pain assessments and comparing digital to hard-copy pain scales. Terri will present her work at the Western Regional Meeting of the American Federation for Medical Research and Participating Societies conference.

A new engineering post-doctoral fellow arrived in June, Dr. Ainara Garde, from Spain. The PART’s close connection with the University of British Columbia (UBC) Electrical & Computer Engineering in Medicine (ECEM) group provides us with a steady stream of exceptional engineers.

Drs. Joy Sanders and Zöe Brown completed their clinical fellowships with our team during 2012. Their research contributions were greatly valued and we wish them every success. In July, Dr. Eding Mvilongo joined us as the new clinical fellow. Dr. Heng Gan spent the first half of the year concentrating on research and the second half clinically. In July, Heng will begin another six months with us focused on research.

In November, we bid a fond farewell to Chris Brouse, as he completed his PhD studies. Chris has been the “senior” member of the team, with the PART since September 2004. We wish him the best as he continues his career in Boston, MA, with our industry collaborator Dräger Medical.

Awards

The PART continues its success at various local, national and international venues:
• Srinivas Raman, Chris Brouse, Walter Karlen, Mark Ansermino and Guy Dumont for winning the 1st prize in the Computers in Anesthesia Engineering Competition for their work entitled “A data fusion approach for RR estimation from PPG” at the Society for Technology in Anesthesia (STA) Annual Meeting in Palm Beach, FL.

• Chris Brouse, Walter Karlen, Guy Dumont, Dorothy Myers, Erin Cooke, Jonathan Stinson, Joanne Lim and Mark Ansermino for winning the Best Clinical Application of Technology with their work on “Measuring adequacy of analgesia with cardiorespiratory coherence” at the STA.

• Walter Karlen for being awarded a Rising Stars in Global Health grant from Grand Challenges Canada for his Camera Oximeter project. For more, visit: Editorial in the Globe & Mail, Article in The Province newspaper, Grand Challenges Canada video.

Collaborations and Partnerships
Our research projects continue to foster strong collaborations among anesthesiologists, as well as developing strong partnerships with other departments and disciplines within BC Children’s Hospital (BCCH) and beyond. Specifically, in 2012:

• As we enter our 12th year of collaboration with the ECEM group working to build safer clinical monitoring systems, we have received support from psychology, computer science, interactive arts and technology. This year, the work of Mark Ansermino and Guy Dumont led to the first clinical trial of computer controlled intravenous anesthesia in children (iControl).

• With the success of the Phone Oximeter project, we have forged international collaborations with study sites in South Africa, Uganda, India, and Bangladesh.

We are in talks with multiple industry collaborators to establish research agreements in the upcoming months. We continue to work with a number of monitoring companies who have shown interest in collaboration for further development of software solutions to enhance clinical monitoring.

News of 2012

The Big Move
In September, the PART and ECEM moved to the new Clinical Support Building. After many years of having office space scattered throughout BCCH and the ECEM at the UBC campus, we have finally been provided with a space where we can all be together. In the past few months in our new space, the team has really enjoyed the opportunity to bring together the engineering and clinical teams to facilitate our research efforts. We are very grateful to all those involved who made our move possible, and our transition go as smoothly as it did. We look forward to many more productive years in our new space!
**Spin-off Company**
With the success of the Phone Oximeter, we have partnered with RaceRocks Management Inc., forming a spin-off company to further develop and commercialize the Phone Oximeter. The new company, LionsGate Technologies (LGTmedical; [http://lgtmedical.com](http://lgtmedical.com)) will bring its first product to market in 2013. The flagship audio-based interface (VitalSigns DSP) will be the basis of many applications (pulse oximetry, thermometry, and blood pressure).

**KidsCan Initiative**
The PART and ECEM have branched into a new area of research. With support from the Michael Smith Foundation for Health Research and the Peter Wall Institute, we have embarked with our collaborators on an initiative to engage youth in research. The *KidsCan* initiative will bring young people together with researchers to educate youth in all aspects of research. As an example project, *MobileKids* will study how mobile device applications and technologies can encourage youth to adopt healthier and more active lifestyles.

**iControl**
In what could be a world first, the PART and ECEM completed our study of computer-controlled intravenous anesthesia in children. After many years of research and development, iControl (aka “Jon 2.0”) was tested in the clinical environment at BCCH. The data collected and analysed shows promising results for the future of automated anesthesia. We thank everyone who helped to make this happen! The engineering and clinical manuscripts are currently under review for publication.

**The Phone Oximeter Goes Global**
The Phone Oximeter went global in 2012. As our international collaborations have grown and flourished, we have initiated projects in South Africa, India, Bangladesh, and Uganda (3 projects).
Our data collection thus far has focused on childhood pneumonia, sepsis and maternal pre-eclampsia, but the possibilities are endless with where and how the Phone Oximeter could be used.

Several of our conference abstracts presenting on this topic have been awarded for their excellence, with more presentations on the Phone Oximeter planned in 2013.


Research Environment

PART research meetings take place on the first and third Tuesday of each month. Wednesday morning Departmental Research Rounds are well attended and useful for the review of new study protocols, recruiting clinician subjects, and practicing presentations. This forum allows department members an opportunity to present study ideas and voice any concerns or questions that may arise from a research project.

In conjunction with the Pre-Admission Clinic (PAC), we have been able to speak with potential subjects in advance of their surgery date, to more timely inform them of research studies. The PART website is also linked from the main BCCH website, so patients and families are able to read about our current studies.

Funding

The research team has grown to 11 full time research employees and more than 15 students. The lack of secure funding to maintain the key administrative and infrastructure support is a real risk to the long term viability of the PART. This year has seen a significant reduction in funding to support students and staff to participate in national and international meetings. We have been very fortunate this year to have received funding from the Safe and Comfy Kids fund, which was established by the physicians in the Department of Pediatric Anesthesia. We would not have been able to support operations this year without this funding.

We submitted a record number of grant applications in 2012, in terms of number (24) and level of funding requested ($3,374,026). However, our success rate was lower than previous
years. We have carefully evaluated reviews from these applications, and the main issues identified were the increase in high value (and high competition) for grants submitted as well as an overall increase in competition due to a reduction in funding levels.

We have attempted to increase our level of industry collaboration to compensate for this reduction in the availability of sustainable grant funding. We will continue to explore all avenues to support students and key PART personnel within the coming year.

**Current Projects Led by PART Members**

<table>
<thead>
<tr>
<th>Project Title</th>
<th>PI</th>
<th>Project Team</th>
<th>Description</th>
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<tbody>
<tr>
<td>Real-time assessment of the Intelligent Anesthesia Navigator</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Chris Brouse, Dustin Dunsmuir, Joanne Lim, Matthias Görges</td>
<td>The overall purpose of this study is to contribute to the development of a decision support system for clinical anesthesiologists that integrates the steady stream of data produced by patient monitoring systems.</td>
</tr>
<tr>
<td>Evaluation of the intubating laryngeal airway in children</td>
<td>Simon Whyte</td>
<td>Erin Cooke, Stephan Malherbe, Mike Traynor, Mark Ansermino</td>
<td>The aim is to rigorously evaluate the Air-Q® intubating laryngeal airway (Air-Q® ILA). This LMA has features that encompass the characteristics of the ideal LMA.</td>
</tr>
<tr>
<td>Evaluation of a mobile anesthesia assistant messaging and monitoring device</td>
<td>Mark Ansermino</td>
<td>Matthias Görges, Guy Dumont</td>
<td>To improve information exchange and simplify communication between anesthesia team members. To optimally facilitate communication and information exchange using a novel mobile device.</td>
</tr>
<tr>
<td>Project Title</td>
<td>PI</td>
<td>Project Team</td>
<td>Description</td>
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</table>
| 4  | **Panda**: Evaluation of a Smartphone-based perioperative pain assessment tool | Gill Lauder   | Mark Ansermino, Nick West, Dorothy Myers, Aryannah Umedaly, Terri Sun         | 1) The usability of the *Panda* interface.  
2) Whether pain assessment using *Panda* is preferable to traditional methods.  
3) Whether pain scores obtained from *Panda* agree with existing pain assessment tools; primarily, we aim to show that FSP-R and CAS scores collected in *Panda* are reproducible. |
<p>| 5  | Pharmacokinetics of oral morphine and pharmacogenomics of CYP2D6 and UGT2B7, in an urban pediatric population (2-6 years of age) presenting for elective surgery | Carolyne Montgomery | Gideon Korey, Michael Rieder, Katharine Brand, Gillian Lauder, Bruce Carleton, Erin Cooke, Pamela Winton, Joy Sanders | To determine the pharmacokinetic properties of morphine, following the oral administration of one of three recommended doses, in a cohort of 2-6 year old healthy children undergoing elective surgery under general anesthesia. |
| 6  | Storage bank of monitored physiological clinical events                        | Mark Ansermino | Guy Dumont, Erin Cooke, Matthias Görges                                    | To collect a sample of significant clinical events to evaluate the performance of the physiological monitoring systems that detect them.                                                                       |
| 7  | Screening for sleep apnea in children using a mobile device                     | Mark Ansermino | Walter Karlen, Dorothy Myers, Erin Cooke, Nick West, Joanne Lim, David Wensley, Ainara Garde | To record and evaluate overnight pulse oximeter data for identifying sleep apnea in children using the Phone Oximeter.                                                                                       |
| 8  | <strong>KidsCan/MobileKids</strong>                                                          | Guy Dumont    | Mark Ansermino, Ainara Garde, Leah Harrison, Anne Junker, JP Chanoine        | To engage youth in all aspects of research. To determine if mobile device applications and technologies will encourage youth to lead more active lifestyles.                                                |</p>
<table>
<thead>
<tr>
<th>Project Title</th>
<th>PI</th>
<th>Project Team</th>
<th>Description</th>
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<tbody>
<tr>
<td>9 Online monitoring of physiological parameters in critical care: iAssist</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Dustin Dunsmuir, Chris Brouse, Chris Petersen, Jonathan Stinson</td>
<td>To use data from 200 children and 100 adults undergoing routine surgery to produce software algorithms to automatically highlight significant changes to the overall trend of physiological parameters (such as BP, HR, SpO2, ETCO2, etc.).</td>
</tr>
<tr>
<td>10 Pilot data for optimization of closed-loop control of anesthesia in children</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Chris Petersen, Nick West, Aryannah Umedaly</td>
<td>The objective of this pilot study is to collect a sample of clinical data to optimize the control system tuning parameters for use in children.</td>
</tr>
<tr>
<td>13 Camera oximeter</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Walter Karlen, Heng Gan, Dorothy Myers</td>
<td>To use the built in camera of a smartphone as a pulse oximeter</td>
</tr>
<tr>
<td>14</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Chris Petersen, Heng Gan, Dorothy Myers</td>
<td>To develop the audio based interface for pulse oximetry and other applications</td>
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<tr>
<td>Project Title</td>
<td>PI</td>
<td>Project Team</td>
<td>Description</td>
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<tr>
<td>15. The bolus dose of dexmedetomidine (ED50) that avoids hemodynamic compromise in children</td>
<td>Carolyne Montgomery</td>
<td>Joy Sanders, Dorothy Myers, Mark Ansermino</td>
<td>To determine the dose of dexmedetomidine (ED50) that can be given as a rapid bolus (over 5 seconds) following induction of anesthesia and insertion of a laryngeal mask airway (LMA) without causing significant hemodynamic compromise in healthy children.</td>
</tr>
<tr>
<td>16. An ethnographic observational study to evaluate and optimize the use of respiratory acoustic monitoring in children receiving postoperative opioid infusions</td>
<td>Mark Ansermino</td>
<td>Matthias Görges, Gill Lauder, Eding Mvilongo, Dorothy Myers</td>
<td>To determine the optimum alert thresholds and the causes of false alarms associated with RRa monitoring for children on the postoperative ward receiving opioid infusions.</td>
</tr>
</tbody>
</table>

Recently Completed Projects Led by PART Members

<table>
<thead>
<tr>
<th>Project Title</th>
<th>PI</th>
<th>CI(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Critical incidents in pediatric patients receiving parenteral opioid infusions in the acute care setting at BC Children's Hospital</td>
<td>Gillian Lauder</td>
<td>Jonathan Stinson, Nick West</td>
<td>To conduct a retrospective chart review of critical incidents related to morphine and hydromorphone infusions at BCCH and employ a modified root cause analysis (RCA) methodology to evaluate factors that led to critical incidents in patients receiving PCA or COI opioids infusions.</td>
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<tr>
<td>Project Title</td>
<td>PI</td>
<td>CI(s)</td>
<td>Description</td>
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<tr>
<td>A pilot study to compare two anesthesia methods to improve child patient</td>
<td>Simon Whyte</td>
<td>Mary Ensom, Dorothy Myers, Diane Decarie</td>
<td>To compare plasma bupivacaine concentrations between two general anaesthesia groups (intravenous vs. inhalational) whose patients all receive caudal epidural anaesthesia with bupivacaine.</td>
</tr>
<tr>
<td>safety</td>
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<tr>
<td>eVENT: an expert system for detecting ventilatory events during anesthesia</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Nicola Shaw, Peter Choi,</td>
<td>This study has several specific goals. Primarily, through structured interviews with anesthesiologists, we will generate specific rules for identifying three dangerous ventilatory events. Secondarily, we hope to reach a consensus among a panel of expert anesthesiologists over the rules for identifying the three critical events using the Delphi method.</td>
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<tr>
<td></td>
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<td>Sidney Fels, Matthias Görges, Pamela</td>
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<td></td>
<td></td>
<td>Winton</td>
<td></td>
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<tr>
<td>Pilot data for optimization of closed-loop control of anesthesia in children</td>
<td>Mark Ansermino</td>
<td>Guy Dumont, Simon Whyte, Chris Petersen,</td>
<td>The objective of this pilot study is to collect a sample of clinical data to optimize the control system tuning parameters for use in children.</td>
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<tr>
<td></td>
<td></td>
<td>Nick West, Aryannah Umedally</td>
<td></td>
</tr>
<tr>
<td>A study to examine the changes in cardiac output and arterial blood pressure</td>
<td>Mark Ansermino</td>
<td>Zöe Brown, Stephan Malherbe, Erin Cooke,</td>
<td>To measure cardiac output and blood pressure changes when scoliosis patients are positioned from supine to prone.</td>
</tr>
<tr>
<td>when positioning children prone during scoliosis surgery</td>
<td></td>
<td>Matthias Görges, Andrew Morrison</td>
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</tbody>
</table>
### New Salary Awards

<table>
<thead>
<tr>
<th>Recipient</th>
<th>Supervisor</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heng Gan</td>
<td>Mark Ansermino</td>
<td>BC Children’s Hospital Foundation - Fellows Award</td>
</tr>
</tbody>
</table>

### Current Salary Awards

<table>
<thead>
<tr>
<th>Recipient</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthias Görges</td>
<td>CIHR Post-Doctoral Fellowship</td>
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<tr>
<td>Walter Karlen</td>
<td>Swiss National Science Foundation</td>
</tr>
</tbody>
</table>

### Grants Currently Held by PART Members

<table>
<thead>
<tr>
<th>Project Title</th>
<th>PI(s)</th>
<th>Year Awarded</th>
<th>Granting Agency</th>
<th>Amount Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Eclampsia Monitoring, Prevention and Treatment (PRE-EMPT) – mHealth application development</td>
<td>Mark Ansermino, Guy Dumont</td>
<td>2012</td>
<td>Gates Foundation</td>
<td>$250,000</td>
</tr>
<tr>
<td>A mobile diagnostic and advisory device for management of children with sepsis in developing countries</td>
<td>Heng Gan</td>
<td>2012</td>
<td>Thrasher Foundation Research Fund</td>
<td>$26,750</td>
</tr>
<tr>
<td>A mobile diagnostic and advisory device for management of children with sepsis in developing countries</td>
<td>Heng Gan</td>
<td>2012</td>
<td>iACT Seed Grant</td>
<td>$4,000</td>
</tr>
<tr>
<td>n/a</td>
<td>Mark Ansermino</td>
<td>2012</td>
<td>CFRI Clinical Research Capacity Building Award</td>
<td>$40,000</td>
</tr>
<tr>
<td>KidsCan: Involving youth in research to create mHealth solutions for improved youth health</td>
<td>Mark Ansermino, Guy Dumont</td>
<td>2012</td>
<td>Peter Wall Solutions Initiative</td>
<td>$300,000</td>
</tr>
<tr>
<td>KidsCan: Knowledge Translation Supplemental Funding</td>
<td>Mark Ansermino, Guy Dumont</td>
<td>2012</td>
<td>Michael Smith Foundation for Health Research</td>
<td>$223,430</td>
</tr>
<tr>
<td>Project Title</td>
<td>PI(s)</td>
<td>Year Awarded</td>
<td>Granting Agency</td>
<td>Amount Awarded</td>
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<tr>
<td>mHealth application development laboratory</td>
<td>Guy Dumont, Mark Ansermino</td>
<td>2012</td>
<td>NSERC</td>
<td>$46,000</td>
</tr>
<tr>
<td>Camera Oximeter</td>
<td>Walter Karlen</td>
<td>2012</td>
<td>Rising Stars in Global Health, Grand Challenges Canada</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

**Anesthesia Fellows**

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Dr. Zöe Brown, 2011 – 2012</th>
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<tbody>
<tr>
<td>Title of Project:</td>
<td><em>A study to examine the changes in cardiac output and arterial blood pressure when positioning children prone during scoliosis surgery</em></td>
</tr>
<tr>
<td>Present Position:</td>
<td>Registrar, United Kingdom (to return to BC Children’s Hospital 2013)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Dr. Joy Sanders, 2011 – 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project:</td>
<td>The bolus dose of dexmedetomidine (ED50) that avoids hemodynamic compromise in children</td>
</tr>
<tr>
<td>Present Position:</td>
<td>Registrar, United Kingdom</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Dr. Eding Mvilongo, 2012 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project:</td>
<td><em>Acoustic respiratory rate measurement</em></td>
</tr>
<tr>
<td>Present Position:</td>
<td>Clinical Fellow (UBC Dept of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Dr. Heng Gan, 2012 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project:</td>
<td><em>Phone Oximeter</em></td>
</tr>
<tr>
<td>Present Position:</td>
<td>Clinical and Research Fellow (UBC Dept of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
</tbody>
</table>

**Graduate Student Research Projects**

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Chris Brouse, 2004 – 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project:</td>
<td>Skin conductance fluctuations and heart rate variability as measures of intraoperative nociception in children</td>
</tr>
<tr>
<td>Present Position:</td>
<td>Research engineer, Dräger Medical (Boston, USA)</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Name and Yrs. Supervised:</strong></td>
<td>Sara Khosravi, 2009 – Present</td>
</tr>
<tr>
<td><strong>Title of Project:</strong></td>
<td>Safe administration of propofol for sedation in children</td>
</tr>
<tr>
<td><strong>Present Position:</strong></td>
<td>PhD Candidate (UBC Dept of Electrical and Computer Engineering)</td>
</tr>
<tr>
<td><strong>Name and Yrs. Supervised:</strong></td>
<td>John Maidens, 2010 – 2012</td>
</tr>
<tr>
<td><strong>Title of Project:</strong></td>
<td>The effect of a target controlled infusion of propofol on predictability in recovery from anesthesia in children</td>
</tr>
<tr>
<td><strong>Present Position:</strong></td>
<td>Employed</td>
</tr>
<tr>
<td><strong>Name and Yrs. Supervised:</strong></td>
<td>Parastoo Dehkordi, 2012 – Present</td>
</tr>
<tr>
<td><strong>Title of Project:</strong></td>
<td>Sleep apnea</td>
</tr>
<tr>
<td><strong>Present Position:</strong></td>
<td>PhD Candidate (UBC Dept of Electrical and Computer Engineering)</td>
</tr>
</tbody>
</table>

**Medical/Undergraduate Research Projects**

| **Name and Yrs. Supervised:** | Jonathan Stinson, 2010 – Present |
| **Title of Project:** | Sleep apnea |
| **Present Position:** | Nursing student (UBC) |
| **Name and Yrs. Supervised:** | Terri Sun, 2012 |
| **Title of Project:** | Panda |
| **Present Position:** | UBC medical student |

**Engineering Post-Doctoral Fellows**

| **Name and Yrs. Supervised:** | Ainara Garde, 2012 – Present |
| **Title of Project:** | MobileKids |
| **Present Position:** | Post-doctoral Fellow (UBC Dept of Electrical and Computer Engineering) |
| **Name and Yrs. Supervised:** | Klaske van Heusden, 2011 – Present |
| **Title of Project:** | iControl |
| **Present Position:** | Post-doctoral Fellow (UBC Dept of Electrical and Computer Engineering) |
### Name and Yrs. Supervised

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Matthias Görges, 2010 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>The monitoring messenger: Mobile patient monitoring for the intensive care unit</td>
</tr>
<tr>
<td>Present Position</td>
<td>Post-doctoral Fellow (UBC Dept of Electrical and Computer Engineering)</td>
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<tr>
<th>Name and Yrs. Supervised</th>
<th>Walter Karlen, 2009 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>Phone Oximeter</td>
</tr>
<tr>
<td>Present Position</td>
<td>Post-doctoral Fellow (UBC Dept of Electrical and Computer Engineering and Stellenbosch University, South Africa)</td>
</tr>
</tbody>
</table>

## Research Personnel

<table>
<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Joanne Lim, 2004 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>PIERS on the Move</td>
</tr>
<tr>
<td>Present Position</td>
<td>Research Manager (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
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<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Chris Petersen, 2009 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>iControl</td>
</tr>
<tr>
<td>Present Position</td>
<td>Director of Technical Development (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
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<tr>
<th>Name and Yrs. Supervised</th>
<th>Erin Cooke, 2009 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>Evaluation of the Intubating Laryngeal Airway</td>
</tr>
<tr>
<td>Present Position</td>
<td>Research Assistant (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
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<thead>
<tr>
<th>Name and Yrs. Supervised</th>
<th>Dorothy Myers, 2009 – Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Project</td>
<td>Present Position</td>
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<td>---------------------------------------------------------------------------------</td>
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<tr>
<td>Emergence delirium (ED) in children: total intravenous anesthesia with propofol-remifentanil versus inhalational sevoflurane anesthesia</td>
<td>Research Assistant (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Research Assistant (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Phone Oximeter</td>
<td>Grant Facilitator (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Phone Oximeter</td>
<td>Research Assistant (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Phone Oximeter</td>
<td>Software Developer (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Junior Software Developer (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
<td>Junior Software Developer (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
<tr>
<td>Name and Yrs. Supervised:</td>
<td>Leah Harrison, 2012 – Present</td>
</tr>
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<td>---------------------------</td>
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</tr>
<tr>
<td>Title of Project:</td>
<td>KidsCan</td>
</tr>
<tr>
<td>Present Position:</td>
<td>Knowledge Broker, (UBC Department of Anesthesiology, Pharmacology &amp; Therapeutics)</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

BC Women’s continues with a strategic plan that puts quality and safety at the forefront, with breakthrough goals established for the next 3-5 years that include eliminating all preventable serious safety events. Monthly multidisciplinary Safety Rounds led by Dr. D. Shaw review ongoing cases that have been problematic. The focus is on “real world” solutions and a refining of team practice. All program quality/safety goals as well as ongoing “imPROVE” processes work toward this goal. In addition, BC Women’s Executive has taken on the MOREOb program for teambuilding. MOREOb also provides a common evidence based approach (developed by SOGC) to frequent obstetrical emergencies. BC Children’s Simulation Centre has been opened on-site. BCW Anesthesia, with DR. Kliffer as the BCW Lead, has been very active in integrating Simulation into the MOREOb program as well as current ongoing practice in preventable safety events.

New Initiatives
C&W Site Redevelopment has moved to Integrated Facilities Design process for designing the new acute care building. The majority of the new building function will be for the Children’s Hospital, however Women’s will be getting new LDR/obstetrical OR space as the new very large NICU will be in the new acute care building. This very challenging phase of reconstruction will be happening over the next 4-5 years. The opening is projected to be 2016-17.

Staffing/Recruitment
We continue to work without a formal contract from PHSA, and the “negotiation” is ongoing. Dr. Paul Sahota is our able negotiating lead.
Dr. Michael Wong has been taken on as a full-Time member of the Department and is presently working on his Master of Medical Education. Dr. James Brown who completed our Fellowship Training 2 years ago will come on as full-Time staff as of October 2013. Dr. Roanne Preston stepped down from Headship of Department to become the UBC Department Head in October 2012. She continues to work clinically at BCW as .5 FTE. Dr. Joanne Douglas retired December 2012 but remains as an Honorary Staff member and continues to be a presence in our Fellowship program. Dr. David Lea was Acting Head from October to January 2013. Dr. Elizabeth Peter retired from clinical practice Dec. 2012 but assumed the Acting Headship until July 31st, 2013. The search for a permanent Head is on hold. Dr. Trevor Kavanagh, who is finishing our fellowship in June 2013, has agreed to remain in our locum pool for 1 year. We are continuing to do the work of 16-17 FTE with 13.5 FTE due to lack of a contract. Our after-hours burden of work sits at 43%.
Anesthesia Assistant
We have 1.25 FTE positions for daily anesthetic help from Monday to Friday. We have been requesting 24/7 coverage to help with on-going request for safer anesthetic delivery.

Clinical Fellowship Program

Our fellowship program is sought after nationally and internationally. We have capacity for three to four clinical-research fellows in the department. In 2012 Dr. Rob Jee (Ottawa), Dr. Sandra Benavides (Mexico), Dr. Ilana Seebag (Brazil) Dr. Trevor Kavanagh (Ireland) were Fellows with our department. Dr Branavan Retnasingham (UK) started as SBenavides finished January 2013. The fellowship is 40% research and each fellow is expected to complete a prospective clinical trial during the fellowship year and are expected to submit research abstracts to SOAP and the CAS for presentation. Fellows are expected to work as junior staff after the initial month, and to date our fellows have all proven themselves capable and all find the experience of having to organize activities in our busy LDR and OR very useful for their future careers. Fellows are scheduled into internal medicine, hematology and high risk ultrasound clinics as part of their rota in order to expose them to the work of our colleagues in obstetrical and maternal-fetal medicine. In addition, they take a clinical epidemiology course at UBC and are invited to be part of monthly cardiac obstetrical rounds hosted by Dr. Marla Keiss at SPH.

Education:

The department continues to be involved in resident and medical student education. We missed having Dr. Paloma Toledo as the Visiting Professor early 2013, but hopefully she will be able to come January 2014. Many departmental members participated in our Resident academic days in January 2013, but Dr. Wong is to be congratulated for organizing this important month of activity. We continue to have weekly Thursday morning resident seminars which are mandatory for residents and involve case-based discussion on pre-assigned topics each week, facilitated by a staff person or fellow. Dr. Paul Kliffer with the help of our Fellow BRetnasingham is planning to make Sim a bimonthly approach to these morning rounds.

We continue to work on how to incorporate the new practice of pre-puncture ultrasound before epidural and spinal placement, without undermining the importance for residents to be able to develop the “feel” of epidural placement. Dr. PSahota actively continues to provide expert help to both staff and residents in this field.

Monthly Interdisciplinary rounds with Obstetrics, Family Practice, Midwifery and Nursing continue to explore controversial topics of interest to all departments with various departmental members presenting. Drs. Paul Kliffer, David Lea, Frances Chow and Elizabeth Peter have spear-headed a PPH and Massive Transfusion Protocol Development using High Fidelity Simulation in the OR. This was videotaped and presented to the Hospital Accreditation Team with rave reviews as a result. The department continues to reach out to the community by providing expertise and consultation in the area of obstetric anesthesia. The OB Div News written monthly by Dr. Joanne Douglas continues to reach out to a broad audience of anesthesia providers. Dr. Roanne Preston has worked with a team of stakeholders on a pamphlet on Pain Relief during Labour. There are plans for this to be distributed by Obstetricians, family Practitioners and Midwives antenally in their offices.
Research:

We continue our active research program with the assistance of our invaluable research assistant. We typically have 3-4 research projects active at any given time. Dr. Douglas stepped aside as Dr. Gunka took over her role as research/fellow director. The challenge of having non-clinical time for research activity is one of the recurring departmental issues. In the meantime, more staff have been engaged to be PIs for fellow research projects.

Research Projects in Progress in 2012:

1. The Effect of Ondansetron on Cardiac Output in Elective Cesarean Deliveries under Spinal Anesthesia: A Randomized Controlled Trial
   P.I: Dr Vit Gunka
   Co-investigators: Dr Robert Jee, Dr Simon Massey, Ms Alison Dube

2. Comparison of arm and forearm non-invasive blood pressure measurements during elective cesarean delivery under intrathecal anesthesia
   P.I: Dr Simon Massey
   Co-investigators: Dr Ilana Sebbag, Dr. Joanne Douglas, Dr. Susan Bright, Ms Alison Dube

3. Prospective observational study, maternal effects of magnesium sulphate for neonatal neuroprotection in women having cesarean section under neuraxial anesthesia
   PI: Vit Gunka
   Co-investigators: James Brown, Amanda Skoll, Joanne Douglas, Su Bright

4. Is this the way to go? Comparing ease of use and safety of two neuraxial anesthesia kits on an epidural-spinal training model
   PI: Roanne Preston
   Co-investigators: Sandra Benavides, Joanne Douglas, Danielle Murray

5. Pronto-7: accuracy of non-invasive hemoglobin measurements in parturients
   PI: Dr Vit Gunka
   Co-Investigators: Dr Branavan Retnasingham, Ms Alison Dube

6. 3D Ultrasound for Epidural Needle Insertion in Parturients
   PI: Dr. Allaudin Kamani
   Co-Investigators: Dr. Robert Rohling, Dr. Vit Gunka, Dr. Allan Kliffer, Dr. Simon Massey, Dr. Paul Sahota, Ms Alison Dube

Projects in REB Submission stage:

1. The efficacy of topical amethocaine gel in reducing pain of local anesthetic infiltration prior to neuraxial anesthesia in non-labouring pregnant women:
   A randomized controlled trial.
   PI: Dr Vit Gunka
   Co-investigators: Dr Trevor Kavanagh, Ms Alison Dube
Quality Improvement

The department has an ongoing, active QA committee, chaired by Dr. Elizabeth Peter. Department members actively participate in hospital quality activities including the Best Practice Committee, Quality Surveillance and Analysis Committee and the Patient Safety Committee. Peer Review is now part of our required work with each member undergoing an in-depth assessment every 3 years. We have chosen to include procedural observation as well as chart audit as part of the department’s process.

BC Women’s continues to use “imPROVE” – a LEAN strategy of continuous quality improvement for improving efficiency without compromising quality of care. Site redevelopment is now using a LEAN strategy – Integrated Facilities Design, to create the high level spaces in the new critical care building.

The Department holds Morbidity and Mortality rounds once a month – difficult cases are discussed, as well as items such as airway protocols which have arisen from a case.

Current Audits:
1. Anesthetic complications (ongoing annual review)
2. Participation in high risk patient management care plans at a multidisciplinary level at BCW for high risk parturients.
3.

The Future

We continue to be challenged by our clinical workload given the high proportion of after-hours work and ageing workforce. Over the next 2 years I expect 2 staff to retire with an additional 2-3 over the subsequent few years. The hope for a contract from PHSA that provides for appropriate coverage on evenings and weekends remains a hope.

The new acute care building expansion of the C&W site offers the opportunity to expand the Gynecology Daycare Surgical Program from 1 OR to 5 ORs. We look forward to this opportunity to have more regular daytime work hours. However, the new building and renovation to the existing building will not be completed until 2018-19.

Committee Memberships:

University:

Dr. Paul Kliffer:  UBC Promotions Committee
UBC Anesthesia Simulator Group
R5 Seminar Series

Dr. Roanne Preston:  APT Department Head/Chair
Faculty Executive
Residency Training Committee
Journal Club Organizing Committee
R5 Seminar series
Obstetric Division Head

Dr. Joanne Douglas:  Member, APT Faculty Executive Committee
Selection committee – Faculty Recruitment
Mentoring Program Working Group
Tutor: Faculty of Medicine First Year PBL and DPAS – Ethics
Member CPD-KT Advisory Committee

Dr. Naomi Kronitz: Member, Residency selection committee
Dr. Paul Sahota: Undergraduate Site Coordinator
R5 Seminar Series
Dr. Elizabeth Peter: Faculty Executive
Member Visiting Professor Program
Dr. Giselle Villar: Site Resident Coordinator
Residency Training Committee
Dr. Michael Wong Residency Training Committee

Hospital:

Dr. Roanne Preston:
- Senior Medical Director Acute Perinatal Program
- Past-President C&W Medical Staff Association
- Acting VP Medicine BCW to July 2011
- Member, BC Women’s Executive Leadership Council
- Member, Executive Quality Committee
- Co-chair Acute Perinatal Program Leadership Committee
- Chair Acute Perinatal Quality Committee
- Member, Surgical Services Committee
- Member, Medical Advisory Committee
- Member, C&W Pharmacy, Therapeutics and Nutrition Committee
- Member, C&W Clinical Information Systems Advisory Committee
- Member, C&W Echart project
- Member, C&W Redevelopment committee (MSA Working Party, Expert Panel and Project Advisory Committee)
- Member, C&W Emergency Disaster Management Committee
- Member, Best Births Committee and Active Management of Labour Committee (both from Cesarean Task Force work)
- Member, Perinatal Epidemiology and Population Health Outcomes group
- Member Core Team Integrated Facilities Design for site redevelopment C&W

Dr. Frances Chow:
- Member C&W Transfusion committee
- Anesthesia representative for BCCA OR as of December 2011

Dr. Joanne Douglas:
- Case Review committee
- Advisory Board Women’s Health Research Initiative

Dr. Vit Gunka:
- Member, C&W Transfusion Committee

Dr. David Lea:
- Assistant Department Head Anesthesia
Dr. Phyllis Money:
  - member, RT Advisory Committee
  - member, BCW Multidisciplinary Rounds Organizing Committee

Dr. Paul Sahota
  - medical Student Coordinator for BCWH

Dr. Giselle Villar:
  - member, Acute Perinatal Best Practice Committee

Dr. Elizabeth Peter:
  - Acting Head – BCW Dept.of Anesthesia
  - member BCW Patient Safety Committee

Dr. Simon Massey:
  - member, DVT/PE working group

**Departmental:**

Dr. Elizabeth Peter: Chair, Departmental QA Committee
Dr. Susan Bright: member, Department of Anesthesia QA committee
Dr. David Lea: Department of Anesthesia Equipment Manager
Dr. Naomi Kronitz: Omni Negotiator
Dr. Frances Chow: Department Scheduling committee
Dr. Joanne Douglas: Research and Fellow Director
Dr. Vit Gunka: Omni Chair
Dr. Phyllis Money: Medical Information Technology Liaison
Dr. Simon Massey: Departmental M+M rounds coordinator
Dr. Paul Sahota: Chair of OMNI Anesthesia,

**Outreach Activities:**

Dr. Joanne Douglas: North American Editor International Journal of Obstetric Anesthesia (IJOA)
  Reviewer: CJA, RAPM, Anesthesia and Analgesia, PSI
  Associate Editor: Regional Anesthesia and Pain Medicine
  Member CE PD committee CAS
  Member SOGC VTE in pregnancy Guideline Committee
Member SOGC Hypertensive Disorders in Pregnancy Guideline Working Group
Associate Editor: International Journal of Obstetric Anesthesia

Dr. Roanne Preston: Editorial Board CJA
Guest reviewer IJOA
Member, Perinatal Services BC Guidelines Committee
Member, Provincial Perinatal Mortality Review Committee
Member, Perinatal Co-ordinating Council Vancouver Coastal
OB Anesthesia outreach for Rural BC – member of Organizing Committee for Rural Coordinating Committee
Conference in Kelowna
Canadian Airway Focus Group June 2011 – present
Royal College Examiner in Anesthesia

Dr. Paul Sahota: BCAS Chair of Obstetric Anesthesia

Dr. Frances Chow Phone consultations with the patients and MD’s regarding postop GA or regional related problems or with preop anesthetic consultations in the parturient.

Dr. Giselle Villar CAS – Obstetric Anesthesia Secretary/Treasurer
Whistler Anesthesia Summit Organizing Committee
Society of Obstetric Anesthesia and Perinatology

Presentations:
1. Morbidity and Mortality rounds a case of clinical Anaphylaxis in the Full term parturient who was Breech presenting for C section after receiving IV ancef – Frances L. Chow

Service to the community:

Dr. Su Bright:
- Marriage Officer for the Baha’i community of Abbotsford
- teach Baha’i children’s classes, Junior youth classes, facilitate Ruhi study circles for adults
- on an interfaith committee for Abbotsford...Bridges of Faith.
Dr. Frances L. Chow:

- BCW Anesthesia lead at the BC Cancer Agency Anesthesia Dept I started this in, 2012. Formulate the anesthesia rota per month, review patient charts, consults, preop assessments, clinical audits, chart reviews and give anesthesia input into new and existing surgical programs such as the dental surgical program.

- Massive Transfusion Protocol Committee
  BCW Anesthesia Representative to the BCW Hospital Massive Transfusion Protocol Committee. Formulated a protocol re management of massive transfusion for obstetrical hemorrhage to be reviewed first by our group of anesthetists, then to be reviewed by the Transfusion Committee.

*Publications – please refer to page 144*
EXECUTIVE SUMMARY

Royal Columbian Hospital

As the tertiary care centre for the entire Fraser Health Authority, the Royal Columbian Hospital provides for a wide spectrum of surgical services. Included in these services, is a special focus on trauma, neurosurgery, and cardiac surgery. The Neonatal Intensive Care Unit was once again ranked number one across the country and allows for a busy tertiary care obstetrical program. Despite significantly limited physical space and operating budget, the eight operating rooms at RCH, (two Cardiac and six multi-use) continue to see a large volume of high acuity work. The Royal Columbian Hospital participates in the National Surgical Quality Improvement Program which consistently affirms that not only is the level of patient acuity at RCH amongst the highest in North America, but our surgical outcomes are significantly better than those of the majority of hospitals studied.

The coming year will see the addition of a state-of-the-art hybrid operating room that will allow for radiologically guided interventional surgery as well as other minimally invasive procedures.

As in other major centers, severe limitations in critical care capacity have resulted in an ‘ongoing crisis’ in the Authority’s ability to manage critically ill patients.

Acute and Chronic Pain

The Acute Pain Service under the direction of Dr. Dean Burrill continues to provide care for approximately 3000 patients annually. Daily rounds conducted by a dedicated department member in conjunction with Ms. Brenda Poulton, the APS full-time Nurse Practitioner, help ensure an on-going high quality of care that consistently receives positive feedback from patients and staff. Dr. Dean Burrill and Ms. Brenda Poulton are also responsible for the development, implementation and weekly management of a Chronic Pain Clinic at RCH.

Cardiac Anesthesia Subgroup

RCH has managed to consistently increase case load such that they have annually surpassed their funded cardiac surgery case numbers for more than five years running.

Eagle Ridge Hospital

No update

Research

The department remains committed to participation in research and applauds the University’s initiatives in this regard.
Teaching
Our entire department plays an active role in the perioperative clinical instruction of both medical and Paramedical personnel. This includes teaching airway management to members of the BC Ambulance Training Program, Military Search and Rescue Teams, Dental Residents and Fellows, and Respiratory Therapy students. The wide variety of surgical cases that occur at our two hospitals enriches the learning experience for our residents and medical students. The current Discipline-Specific Site Leaders (DSSL) are Dr. Laura Duggan and Dr. Adrienne Lipson. Dr. Duggan is in charge of the Post-graduate medical program and Dr. Lipson oversees the undergraduate medical program at RCH Department of Anesthesia. Dr. Richard Gardiner started with RCH in September 2012, has taken over the post-graduate DSSL role from Dr. Laura Duggan while she is away for a year.

Future Planning
Our objectives for the upcoming year include:
*The retention and expansion of a chronic pain clinic working in conjunction with a region-wide chronic pain program
*Continued participation in clinical teaching of various groups, with special emphasis on UBC affiliated programs and students
*Development of an Anesthesia Assistants service at RCH

Committee Membership
University
Dr. G. Boisvenu  UBC Department of Anesthesia Visiting Professor Program
Dr. D. MacLennan  Site Representative for Critical Debriefing of Anesthesia Residents
Dr. R. Merchant  Clinical Department Heads and Directors
Dr. P. Scoates  Anesthesia Residency Training Committee
Dr. F. Valimohamed  Mentor for Anesthesia PGY1, Royal Columbian Hospital
Dr. L. Duggan  UBC Residency Selection Committee
Dr. R. Gardiner  Discipline Specific Site Leader – Postgraduate Program
Dr. A. Lipson  Discipline Specific Site Leader – Medical Undergraduate Program

Hospital
Dr. P. Baker  Director, Neuro-anesthesia
Dr. G. Boisvenu  Continuing Medical Education Committee
Dr. D. Banno  Professional Practice Council, RCH Post-Anesthetic Care Unit
Dr. D. Carrie  Equipment Manager, Cardiac Anaesthesia Services RCH
Dr. L. Duggan  Pharmacy and Therapeutics Committee
Dr. R. Gardiner  Director, Pediatric Anesthesia
Dr. M. Foulkes  Professional Practice Council, RCH OR
Dr. C. Ho  Regional Co-Chairman, Fraser Health Research Ethics Board
Dr. R. Hoskin  Deputy Head, Department of Anesthesia and Perioperative Medicine
Dr. L. Duggan  Anesthesia Scheduling Committee
Dr. A. Lipson  Medical Quality Assurance Committee
Dr. P. Johnson  Trauma Advisory Committee
Dr. D. MacLennan  Head, Department of Anesthesia and Perioperative Medicine
Surgical Committee
Dr. W. MacLeod  Director, Obstetric Anesthesia
Dr. R. Merchant  Clinical Research Committee
Dr. R. Morton  Medical Director, Royal Columbian Hospital
Dr. J. Ramsden  Council of Surgical Chiefs, Fraser Health Authority
Chair, Credentials Committee, RCH
Chair, Quality Review Committee, RCH
Dr. M. Roos  Equipment Manager, RCH and ERH
Dr. R. Sharpe  Director, Cardiac Services Intensive Care Unit
Surgical Safety Collaborative, Fraser Health Authority
Dr. T. Sveinbjornson  Director, Regional Anesthesia
Dr. L. Vonguyen  Director, Cardiac Anesthesia

Other
Dr. F. Mohamedali  Economics Representative, BCAS
Dr. R. Merchant  Chair, Patient Safety Committee,
Canadian Anesthesiologists’ Society
Dr. R. Orfaly  Chair, Physician Resources, BCAS

Publications – please refer to page 144
ST. PAUL’S HOSPITAL
Providence Health Care

Randell L Moore MD FRCPC
Head – Department of Anesthesia

EXECUTIVE SUMMARY

St. Paul’s is a Clinical Medical Academic Centre in downtown Vancouver that is integral to the University of British Columbia Faculty of Medicine. It is part of Providence Health, which comprises St. Paul’s Hospital, Mt. St. Joseph’s Hospital, and a number of residential facilities. The main foci of tertiary care is in Cardiac Sciences, Respiratory, HIV, and Renal disease. The Department of Medicine houses major initiatives in Respiratory, Cardiac, HIV, and Nephrology areas. The Department of Surgery aside from Cardiac sciences also has components including Urology, Otolaryngology, General, Gynecologic, Plastic, and Orthopedic surgery as well as Thoracic and Vascular surgery.

Anesthesiology at St. Paul’s Hospital is a major Department comprising over 30 anesthesiologists. The Department also delivers anesthetic services at Mt. St. Joseph’s hospital (a community hospital) where 4 Operating Rooms and 3 Ophthalmology Procedure Rooms are in operation. The Department supports a Trans-esophageal Echo Program as well as various initiatives in interventional cardiology and radiology. At present 2 anesthesiologists have sub-specialty training in Intensive Care as the Department continues to evolve care in the Cardiac Surgery Intensive Care Unit, and increase connections with ICU. Recruitment has resulted in two anesthesiologists with fellowships in regional anesthesia advancing the regional anesthesia program.

A number of divisions within the department of anesthesia will be highlighted.

Cardiac Anesthesia:

Dr. John Bowering continues as Head of the UBC Division of Cardiac Anesthesia and directs the Cardiac Anesthesia program at St. Paul’s Hospital. The Cardiac Anesthesia Fellowship program continues to attract good interest. 2012 has seen the ongoing development of a research program in percutaneous endovascular aortic valves, and trans-apical aortic valves, where Anesthesia has participated both in the combined interventional and cardiac OR and post-operative care. There continues to be a number of research initiatives in the planning phase in Cardiac Anesthesia. Cardiac transplantations and heart failure devices continue to evolve and increase.

In the past fiscal year there were 765 Open Heart Procedures with 21 Cardiac Transplants, 165 percutaneous valves and 22 VADs. The Trans-esophageal Echocardiography group comprises 7 anesthesiologists who cover a call group in conjunction with Cardiology. This multi-disciplinary approach to Trans-Esophageal Echo has proven to be useful. TEE rounds have become increasingly popular with Surgeons and Cardiologists.
joining Anesthesia for these. Anesthesiologists continue to play a crucial role within the Cardiology/Cardiac surgery combination of care.

Anesthesia involvement with Electrophysiology procedures has resulted in 300 Cardiac Defibrillators, 375 Pacemakers and 910 Electrophysiology procedures. As well Laser Lead Extraction continues to increase.

**Division of Acute and Interventional Pain Management:**

This division is staffed by Dr. Bill McDonald as Division Head, as well as Dr. Colm Cole, Dr. Clinton Wong, Dr. Jill Osborn, and Dr. Brenda Lau. The Acute Pain service portion of this division treated over 1000 inpatients with PCA, regional and epidural analgesia in the last year. Increasing use of various nerve catheters continues to grow.

The chronic pain diagnosis and management portion of this division had over 400 fluoro assisted and over 1600 non-fluoro injections in the last year. Increasing numbers of Spinal Cord Stimulators are being inserted in conjunction with Neurosurgery, and 416 intrathecal pumps. Neuromodulation is becoming a growth industry. This is the only multidisciplinary chronic pain clinic in the province, and provides services with outreach to many areas outside the lower mainland. Given its unique and well-planned efficiency this is hoped to be used as a model for the evolution of various chronic pain programs in the province. Dr. McDonald is co-director of the St. Paul’s Hospital Chronic Pain Program along with Dr. Roger Shick from Psychiatry. Resident involvement in this division continues at regular intervals with all anesthesia residents spending at least 1 month at time in the program. Dr. Christine Cleary has been recruited to do a Fellowship in Acute Pain Research.

**Regional Anesthesia:**

In an attempt to fast track Orthopedics peripheral procedures, the Department is participating in the operation of 2 minor OR’s created in the Outpatient area at SPH, as well as 2 surgical OR’s. This novel approach with anesthesiologists and anesthesia assistants has shown promise in safety improvements and the throughput of patients. This is being led by three Anesthesiologists with regional training to allow for the evolution of regional anesthesia as part of the fast track approach. The general level of Regional anesthesia expertise continues to rise in the Department along with interest in ultrasound as an aid to nerve/catheter localization

**Obstetrics:**

The department participates in the care of obstetrical patients. The number of obstetrical patients continues to be 1700-1800 per year at St. Paul’s with some increased pressure to monitor high risk pregnancies and pregnancies with coexisting cardiac disease. An epidural PCEA service has now been implemented. Anesthesia continues its involvement with the perinatal services committee.
Pre-Admission Clinic:

The Department continues to evolve a state of the art Pre-Admission Clinic. The latest initiatives include website development with patient education being a focus. A LEAN process has completely revamped this area leading to improvements in patient flow and care. Over 3000 anesthetic consults occurred in the last year.

High Acuity Beds:

The Development of four high acuity beds using a unique blend of medical-surgical nurses and Par nurses is slated to start soon. This helps address the need for some type of surgical step-down beds. Management by anesthesia should allow an increase in numbers of patients flowing through the PACU as well as an opportunity to improve patient care peri-operatively.

CSICU:

The CSICU continues to evolve under a small subset of anesthesiologists including 2 with intensivist backgrounds. The increasing number of heart failure patients receiving surgical intervention continues to increase. This change in the demographics of the cardiac patients is a particular challenge given the workload in the CSICU. This is a fruitful area of research. The major research focus in the CSICU however continues to be that of delirium and to that end a significant research group has evolved. They are in the process of creating a retrospective data base that will hopefully inform future prospective trials.

Fellowships: Cardiac Pain/Regional:

2012 has had 2 Resident Regional Anesthesia Fellowships and 1 in Cardiac Anesthesia. Increasing interest in Fellowships from outside the program continues to grow.

Research Activity:

Dr. Stephan Schwarz as Research Director continues to bring a rigorous rational approach to the department. His association with our Pharmacology colleagues has resulted in cooperation and joint research interest. The department now has 2 graduate students in its employ as well as a cardiac anesthesia fellowship candidate.

Publications – please refer to page 144

Research Highlights

1) Principal Investigator, Providence Health Care Technology Innovation Fund (Start-up Fund) Recipient, 2011, Extracorporeal Membrane oxygenation (ECMO) in the Intensive Care Unit, St. Paul’s Hospital, 2012-ongoing

Principal Investigator, A Canadian Experience of Extracorporeal Membrane Oxygenation (ECMO) for ARDS in the Intensive Care Units at St. Paul’s, Vancouver General and Royal Columbian Hospitals, 2012-ongoing

Submitted but not published:

D Sirounis, H Kanji, McCallum J. A Canadian Experience of Extracorporeal Membrane Oxygenation (ECMO) for ARDS in the Intensive Care Units at St. Paul’s, Vancouver General and Royal Columbian Hospitals, 2012 [Pending]

N Ayas, D Sirounis, H Allen et al The Impact of Work Schedules on Sleep Duration of Critical Care Nurses, 2013 (Submitted to American Journal of Critical Care, AJCC)

2) Spinal Cord Stimulation in Pregnancy:
A Literature Review
Ingrid C. Fedoroff, PhD*, Ekin Blackwell, PhD*, Louise Malysh, MSN*, William N. McDonald, MD*, Michael Boyd, MD†

Objective: Currently, the use of spinal cord stimulation (SCS) therapy is not recommended in pregnancy because the effects of SCS on the pregnancy and developing fetus are unknown. However, many SCS recipients are women of childbearing age who may later become pregnant. The purpose of the present report is to review and summarize the existing literature on the use of SCS therapy during the prenatal period.

Methods: We first present the case of a 38-year-old woman from our center who became pregnant after receiving an SCS implantation. We then provide a synopsis of previous reports that were identified in a literature search. We highlight the key findings from these cases as they relate to the course of pregnancy, fetal development, labor and delivery management, fertility, and technical complications.

Results: In our literature review, we identified 12 cases of pregnancy in 8 women. To these we add the present case.

Conclusions: Women of childbearing age who are candidates for SCS implantation should be tested for pregnancy prior to implantation surgery. They also should be informed about the limited state of our scientific knowledge regarding the impact of this technology on reproductive health. For patients already implanted with SCS, decisions about ongoing use in the event of pregnancy should be made on an individual basis after a careful consideration of potential risks and benefits.

Keywords: Chronic pain, pregnancy, spinal cord stimulation

Conflict of Interest Statement: This work was supported by a MITACS grant, which includes three sources of funding: government (provincial and federal), industry (Medtronic of Canada Ltd), and the St. Paul’s Hospital Chronic Pain Centre

3) A regional anesthesia-based “swing” operating room model reduces nonoperative time in a mixed orthopedic inpatient/outpatient population
Teaching

All members of the Department are actively involved in the teaching of medical students and residents. By necessity most of this takes place in the OR, however there are also many sessions outside of the OR especially for oral exam practices. This now involves third and fourth year students rotating through the department. Dr. John Bowering has finished his last year as Royal College Examiner. The anesthesia residents have uniformly found the teaching experience at St. Paul’s Hospital valuable. Dr. Clinton Wong continues as Program Director for the UBC Department of Anesthesia Residency Program as does Dr. Matt Klas as Program Director for Resident training at SPH. Dr. Ron Ree continues to be an advisor for the GP anesthesia-training program as well as direct medical students at SPH. Various members participate in the residency selection process.

Members of the department are also involved in teaching residents from Medicine, Emergency Medicine, and Family Practice in addition to respiratory therapists and OR nursing students. Dr. Scott Bell and Dr. Kevin Rondi coordinate the Anesthesia CME Program given to GP Anesthetists each year.

Anesthesia Assistants

The Anesthesia Assistants at St. Paul’s now consist of 9 members with seven being certified and 2 are in process. Dr. Jim Prentice continues in his role as a liaison with Tri-Rivers University, which administers a course for anesthesia assistance, and he continues to provide guidance for the anesthesia assistance who are part of the St. Paul’s Hospital Department of Anesthesia.

Quality Assurance

Quality Assurance within the Department is increasing in both nature and scope to reflect the changes that the organization is going through and to support the initiatives of the BC Anesthetists’ Society in terms of the Critical Incident Reporting Service. Regular Quality Assurance meetings occur at least 4 times yearly, with review of critical incidents and morbidity led by Dr. Bobby Lee.

Future Directions

The Department of Anesthesia at St. Paul’s Hospital will continue to develop as one of the larger departments in Providence Health Care. This will certainly bring changes to the department both as a result of external pressures as well as internal changes within the organization. Expansion of the Cardiac Surgery Program into trans-apical values has resulted in an endovascular OR suite where Trans-femoral aortic valves are also performed. This also supports vascular surgeries involved in endovascular stents. The CSICU continues to evolve under a small subset of departmental anesthesiologists. Future evolution of the surgical
approach to heart failure as well as research initiatives in delirium promise to take it in new
directions.

The Department continues to explore opportunities in alternative funding of anesthesia
delivery. It views itself as a leader in innovative solutions and is attempting to work within
the greater provincial funding to find new ways of allowing anesthesiologists to practice.

The Department therefore continues to recruit and energize its membership. Despite
continuing changes the next year or two should show great evolution in our involvement with
UBC, hospital and research.

COMMITTEE MEMBERSHIPS

UNIVERSITY

Dr. John Bowering Research Committee
Residency Training Committee

Dr. Randell Moore Clinical Promotions Committee, UBC
Executive Committee, UBC

Dr. Matthew Klas UBC Resident Program Director
Chair, Resident Selection Committee
Chair, Residency Training Committee

Dr. Bruce Prasloski Clinical Faculty Committee

Dr. Brian Warriner Professor and Former Head
UBC Department of Anesthesia
Residency Training Committee
Resident Selection Committee

Dr. Clinton Wong UBC Department of Anesthesia
Residency Training Committee
Resident Selection Committee

Dr. Ron Ree GP Anesthesia Training Program
Program Director of Anesthesia Residents at SPH

Dr. Paul Bach Medical Student Coordinator, SPH
Dr. Brian Warriner  Professor  UBC Department of Anesthesia
Dr. John Bowering  Director of Cardiac Anesthesia  Co-Director of CSICU
Dr. Randell Moore  Chair, Department of Anesthesia  Medical Advisory Committee  Surgical Areas Committee  Pharmacy and Therapeutics Committee
Dr. Ioana Dumitru  Transfusion Committee
Dr. Matt Klas  Echo Rounds Coordinator
Dr. William McDonald  Pain Advisory Committee  Pharmacy and Therapeutics Subcommittee on Pain
Dr. Kevin Rondi  Organizer, SPH GP Anesthesiology Course
Dr. Scott Bell  Organizer, SPH GP Anesthesiology Course
Dr. Jim Prentice  Technical Officer  Coordinator, SPH/Cariboo College Anesthesia Assistants Program  Anesthesia Assistants Program
Dr. Paul Bach  Co-Director of the Pre-Admission Clinic  Program Director for Medical Student Anesthesiology rotation at St. Paul’s.
Dr. Laine Bosma  Perinatal Care Committee
Dr. Stephan Schwarz  Research Director
Dr. Jill Osborn  Co-Director of the Pre-Admission Clinic

Dr. Matt Klas  BCMA Specialists Council Member
Dr. Randell Moore  BCMA Tariff Committee  Transfusion Medical Advisory Group (TMAG) Provincial P & T Committee
Dr. S. Head  BCAS Exec Committee
Dr. T. Montemurro  BCAS Safety Committee
Dr. Brian Warriner  Reviewer, Canadian Journal of Anesthesia, Resident Selection Committee  ACUDA  Surveyor, Accreditation Canada
Dr. Clinton Wong  Resident Selection Committee  ACUDA
Executive Summary

In 2012, the Department of Anesthesia continued to provide teaching, training and mentorship to medical students, residents, and fellows. The Department continues to provide high quality clinical care to patients at the major referral centre for British Columbia. 57 staff anesthesiologists comprise the Department of Anesthesia, most contributing to more than one sub-specialty.

Academic activity culminated in 25 peer-reviewed publications. Of these publications, 15 were interdisciplinary in nature, including collaborations with pharmacology, chemistry, engineering, hematology and intensive care. In addition, ten invited book chapters and/or editorials were written, reflecting expertise in thoracic anesthesia, neuroanesthesia, trauma patient care, perioperative critical care and clinical investigation. For these and other publications, please refer to Appendix 2, beginning on page 24.

The plans to rejuvenate the entire OR suite at VGH is ongoing, including two hybrid interventional ORs. Renovations are expected to commence in 2015, and reach completion within 2-3 years. The pan includes a total of 24 right sized OR’s, as well as co located PACU and PCC which will include block and procedure bays. A renovated CSICU and ICU is also a significant component of the project.

The volume and complexity of work presented to anesthesiologists at VGH and UBCH particularly for emergency cases continues to be a challenge and is the basis for the development of clinical expertise and thereby teaching of residents, medical students and fellows, and presents quality improvement opportunities.

The department is planning to institute the rotation of a Perioperative anesthesiologist in April 2013, and a corresponding funding model is secure. This out-of-OR-anesthesiologist role will evolve, certainly at the outset, and will include the care of patients in the PACU and iPACU, in-patient consults as well as support the care of emergencies in and out of the OR. This will support the education of residents as part of the very successful perioperative resident rotation.

Management Structure

Important and significant contributions have been made to clinical practice and teaching by all anesthesiologists within the department. The department would like to recognize the
significant administrative contributions and leadership by Drs Sawka (Clinical Director), Klein (Associate Head) and Lennox (Head of Ambulatory Anesthesia).

The department executive is comprised of: Drs Rael Klein (Executive Chair Associate Head) Andrew Sawka (Clinical director), Pamela Lennox (Head of Ambulatory Anesthesia, UBC), Lynn Martin (Chair, VH Anesthesia Services), Kelly Mayson (Head of Quality Assurance, VA Anesthesia), Calvin Au (Head of Cardiac Anesthesia) and Alana Flexman (Elected Member at Large). Significant input is also sought from the Director of Research, Dr Craig Ries and the Co-directors of the fellowship program, Drs Bevan Hughes and Kelly Mayson.

Dr Patrick O’Connor continues his role in upper level administration at the health authority level, as VP Medicine for the Vancouver Coastal Health Authority.

**VGH UBCH Hospital Foundation**
The anesthesia department continues to engage the hospital foundation, which has generously supported a significant replacement of the fleet of anesthesia delivery units and monitors, transport monitors as well as physiologic monitors in the CSICU and iPACU. A second 3D Echocardiography platform and probe has been secured.

Dr Raymer Grant is the department lead in foundation relations and engagement.

**New, Returning Staff and Retirements**
For the first time in many years, the department did not require recruitment of new members due to few retirements, and the return of staff from fellowships.

Dr Roanne Preston joined the clinical department in September 2012 in addition to her appointment as Head of the UBC Department of Anesthesiology, Pharmacology and Therapeutics, and will continue her clinical work at BC Women’s Hospital.

Dr Andrea Brovender is near completing fellowship/masters program at the University of Toronto in Health Policy, Management and Evaluation. We look forward to her contributions upon her return in August 2013.

Dr Warriner retired from the Department of Anesthesia at Vancouver Acute after a strong 12-year part-time clinical contribution in addition to his work as a UBC professor and Departmental Head, and as an anesthesiologist for Providence. His career was commemorated at the VA summer event.

Dr Edward Gofton retired after a 35-year career with immense clinical and academic contribution, the highlights of which were serving as the Residency Program Director and the visionary institution of the Acute Pain Service.

**Anesthesia Sub-specializations**
Most members of the department contribute to one or more subspecialty. The department divisions include: thoracic anesthesia, neuroanesthesia, cardiac anesthesia, vascular anesthesia, trauma, ambulatory and regional anesthesia. Members are expected to enhance clinical care through emphasis on quality improvement, conduction and facilitation of research, and contributions to teaching.
**Blood Conservation**

Dr Terry Waters presently is the chair of the VA blood utilization committee. Coordinating a team comprised of Drs Atherstone, Klein, Lampa, Kapnoudhis and a member of the nursing staff, Dr Waters manages an effective perioperative blood utilization program. The pre-admission clinic/anesthesia consultation clinic identifies patients with anemia or those who refuse blood products. The etiology is determined and causes are corrected with iron or erythropoetin respectively. Recommendations for acute normovolemic hemodilution, cell salvage, antifibrinolytics and appropriate transfusion triggers all contribute to decreased transfusion rates.

**Education**

The education program for medical students continues to develop under the leadership of Dr Applegarth through the use of case-based learning seminars, one-to-one teaching of airway management principles, pain management, resuscitation, anesthesia pharmacology in the OR, as well as the relevant technical skills. The use of high fidelity simulation for medical student education is being studied and instituted. Dr Applegarth coordinates anesthesia teaching for the province-wide distributed learning model.

The second annual Whistler Anesthesia Summit was held in February of 2012, and was a great success. Dr Atherstone participated on the organizing committee. Several departments contributed with presentations and moderators. The third annual Whistler Anesthesia Summit (2013) was also planned during 2012.

**Anesthesia Assistants**

The VA department of anesthesia has the support of a complement of 14 skilled and hardworking anesthesia assistants. Continuing education is being provided and encouraged both within the department and at various conferences. The AA’s are an invaluable resource in reinforcing patient safety, particularly in medical and surgical emergencies, and assist in securing difficult airways, and invasive hemodynamic monitoring when required. The AA’s play a pivotal role in the acquisition and maintenance of enhanced anesthesia technology. They are “super-users and resource personnel” for the anesthesia workstations and ultrasound devices used in regional blockade, vascular access, echocardiography as well as fiberoptic and video-laryngoscopy devices.

All AA’s have obtained accreditation from Thompson Rivers University and are involved in the training of respiratory therapy students.

**Quality Assurance**

Review of Critical Incidents continues to be major QA focus, with a group of reviewers—Dr’s Stuart Herd, Mitch Giffin, Mike Moult, Jon Harper, Alice Kim and Kelly Mayson responsible for chart review and presentation of the cases.

An 8-week audit of preoperative screening and ACC consults was performed in January and February of 2012. Our goal was to assess whether our current method of screening was
satisfactory, and if not, what proportion of cases would have benefitted from a preoperative consultation. The department aimed to look for areas of improvement with regard to optimization of patients that were seen in ACC. Staff anesthesiologists were asked to evaluate all elective cases that they managed on the day of surgery.

A total of 2275 patients out of potential 2926 cases were assessed, resulting in a 78% compliance rate. All staff participated in the audit. 1108 TPAC were reviewed, and 8.8% were deemed “unsatisfactory”. In the major of these cases, the reviewing anesthesiologist felt that the patient required a prolonged assessment in PCC, and which resulted in a delay in processing the patient (2.4% incidence). On one third of the cases, which received an unsatisfactory rating, the concern was that there was insufficient information on the chart at the time of review. The cancellation rate for surgery on TPAC cases was 0.3%. The satisfaction rate was much higher for patients that had ACC visit. (94%), only 0.2% of cases were felt not to have required an ACC visit, and there was 0.2% cancellation rate day of surgery. The most common problem were related to anticoagulation and anti-platelet agents, inappropriate or unclear instructions regarding medications, and investigation results not on chart or that had not been reviewed prior to surgery. This resulted in the creation of a “Guideline for the interruption of Anticoagulation or anti-platelet therapy prior to elective invasive procedures or surgery”

The department of anesthesia has been involved with reviewing and collecting additional variables with the National Surgical Quality Improvement Program (NSQIP) since February of 2012.

The Semi-annual risk adjusted report identified a higher incidence of postoperative pneumonia in general surgery patients. Our department has been working with preoperative, PACU, and ward nurses to implement the “ICOUGH” initiative. “I”—incentive spirometry and “C”—coughing and deep breathing require good postoperative analgesia. In addition “O”—oral care, and “H”—head elevation is also being started in PACU. We also completed a retrospective chart review of all pneumonia cases and their perioperative management to look for additional areas of improvement.

We also tracked our incidence of inadvertent hypothermia in PACU. We used a modified SQIP definition of normothermia in which the patient must have a documented temperature of >36 degrees in the last 30 minutes of anesthesia or in upon arrival to PACU. Previous audits by the PACU nursing staff (2001-2008) when hypothermia was defined as less than 35.5 documented only a 1.6% of hypothermia. A detailed chart review of 870 NSQIP non-cardiac cases found that approximately 15% cases had no intraoperative temperature monitoring, 30% developed some degree of inadvertent intraoperative hypothermia and typically it lasted > 120 minutes. Furthermore, 21% of patients did not meet the normothermia definition at the end of their surgical procedure. A normothermia initiative will be starting in May 2013.

Other quality indicators reviewed are anticipated admissions following ambulatory surgery, transfers from UBC PACU to VH PACU. OR and PACU code blues are reviewed. The incidence of complications after regional blocks, and review of “STAT anesthesia” calls are tracked
Best practices that have been introduced in the last year include
1) Introduction of Standard perioperative care practices for OSA patients and the identification and management of the high-risk patients
2) “Time-out”/ “debriefing” as part of the Check-list
3) Standard operating procedures at Anesthesia emergence (“sterile cockpit”)
4) POPS order sheets with standardization of the supplemental medications available for all services
5) Optimization of glycemic control in the perioperative period
   • Pre-printed orders for insulin infusions and sliding scales
   • Use of HBA1c screening in ACC, with patients with levels >8 getting an automatic referral to endocrinology
6) Guidelines for the interruption of anticoagulation or anti-platelet therapy prior to elective invasive procedures or surgery

The remainder of this report highlights educational and research based initiatives of divisions within the Department of Anesthesia, and identifies issues pertaining to improvement of training and quality of care.

**Division of Neuroanesthesia**
(Head - Dr Cynthia Henderson)

*Please refer to UBC Division Report on page 98*

The collection of relevant Neuroanesthesia articles and Neuroanesthesia Rounds distributed to residents and Fellows has been expanded and placed on the G-drive for staff access. Guidelines and summaries of Neuroanesthesia considerations for various cases are being developed for residents and staff anesthesiologists assigned to the Neurosurgical theatre.

The biennial Residents’ Academic Days in Neuroanesthesia took place November 21 and 28, 2012 and lectures were given or supervised by Dr.’s Bali Dhaliwal, Alana Flexman, Donald Griesdale, Henrik Huttunen, and Jon McEwen. Members of the Division of Neuroanesthesia were actively involved in the R5 Seminar series and UBC Anesthesia Departmental Residents’ Oral exams.

**Research**
During the 2012 academic year, the Division of Neuroanesthesia undertook a number of research initiatives, providing opportunity for residents and fellows to become engaged in clinical research.

As a resident, Dr. L Thibodeau participated in the Development and validation of an airway management course based on an expert consensus driven airway checklist under the supervision of Dr. Oliver Applegarth.
Dr. Alana Flexman completed data collection for five different projects in 2012, with all currently either in the process of data analysis or publication. Study titles include: Anesthetic complications of pregnant patients undergoing neurosurgical procedures, respiratory complications and death after infratentorial tumor resection, the pharmacokinetics and pharmacodynamics of dexmedetomidine in patients with seizure disorders, mentorship among anesthesia residents in Canada and web-based educational activities developed by the Society for Neuroscience in Anesthesiology & Critical Care (SNACC): the experience of process, utilization, and expert evaluation.

Dr. Flexman is currently also in the process of obtaining ethical approval for a protocol entitled: The efficacy and safety of tranexamic acid in complex skull base neurosurgical procedures: a retrospective cohort study. This project will be the subject of a medical student summer studentship in 2013.

**Division of Regional Anesthesia**  
*(Head - Dr Ray Tang)*

**Clinical Practice**
The regional program predominantly cares in the tertiary programs of vascular surgery and orthopedic upper limb surgery, including upper limb blocks during shoulder and hand surgery. Some lower limb blocks are performed for foot and below knee amputations and occasional rescue blocks for knee arthroplasty. Based on the number of completed block forms, there are about 250 regional anesthesia blocks done annually. It is known that some practitioners have not been filling out the forms, and so it has been reinforced that all blocks should have a block form filled out. This task is important for both follow-up and for future data analysis.

**Novel Procedures and Changes to Practice**
With the assistance of ultrasonography, practitioners are able to use lower doses of local anesthetic. In particular with interscalene blocks, we have observed a lower incidence of symptomatic phrenic nerve blockade resulting in unplanned admission.

With regard to research, ultrasonography has increasingly been used in neuraxial blocks. A real time GPS guided approach was developed and demonstrated in cadavers; later being translated into a case series report of usage in patients. The Division of Regional Anesthesia continues to use ultrasound assisted neuraxial approaches in patients with challenging anatomy.

This group was the first to successfully identify the superior laryngeal nerve through ultrasonography in cadavers and in volunteers. We have a case series of patients we have performed ultrasound guided SLN blocks in. Ultrasound was also used to identify the inferior alveolar nerve for dental anesthesia in cadavers and volunteers. The second phase of the study is currently being conducted, with ultrasound guidance being used for dental blocks.

**Education**
With regard to resident level education, the majority of residents now go through St. Paul’s Hospital for their regional rotation. Several residents, however, were involved in research
projects within the division during 2012. Roop Randhawa and Lisa Li both were involved in the GPS studies. Jason Wilson has been involved with the PICRA vs stump catheter study for BKA and is also currently conducting a study looking at the effect of hand position on needle visualization by ultrasound.

The effect of having fewer residents at VA and UBC is that there is more time for fellows and staff interested in performing blocks to do so. Kanchan Umbarje, Bal Kaur, Silke Brinkmann, Genevieve Germain, and Neil Ramsay have all been involved in performing regional blocks. All of the aforementioned fellows have also been involved with generating manuscripts for the division’s research with publications that have either been accepted or are in progress.

Research
For completed projects, please see the listed publications in Appendix 2. The Division of Regional Anesthesia has collaborated with the UBC anatomy department, UBC dentistry, and vascular surgery during 2012. Currently, there are a number of projects ongoing, involving collaboration with various other departments:

The perineural catheter vs stump catheter study is being conducted by Drs Tang, Sawka, Vaghadia, Bitter-Suermann, plus fellow Genevieve Germain and resident Jason Wilson, in collaboration with Dr Keith Baxter (Vascular Surgery). The goal of this study is to determine if one catheter modality is superior to the other with regard to postoperative pain control and prevention of phantom limb pain.

Drs Tang, Sawka, Vaghadia, Germain and Wilson are conducting a hand positioning study with to do determine if an in-line hand position is better for needle visualization when compared with perpendicular position in novices. The findings of this study will help determine which approach we should be teaching beginners.

A spine positioning study is being conducted by Drs. Sawka, Tang, Vaghadia, fellow Neil Ramsay and Joanne Walker, a visiting resident from UK. We have collaborations in progress with Peter Cripton (Spine Biomechanics) and Raju Heran (Radiology). We have found that an ipsilateral rotation of the thoracic spine increases the visibility of the posterior longitudinal ligament during ultrasonography and this may translate into a better window for the placement of thoracic epidurals. We are in the process of seeking approval to do an MRI component of this study in an open MRI suite to confirm our findings.

Lastly, an inferior alveolar nerve block study is being conducted by Drs. Tang, Sawka, Vaghadia in collaboration with Brian Chanpong of The Dept of Dentistry. We have successfully identified the inferior alveolar nerve on cadavers subsequently volunteers. This study has been published, with progress into the volunteer phase of the study, with the aim of determining if the success of the blocks may be increased with ultrasound.

Quality Improvement
The division continues to follow up with all block patients via the block forms which is why it has been reinforced to all members that a form be filled out for all block procedures. At a later date, we intend on performing a chart review of all blocks to document any issues that
arise. Currently if there are any issues, the anesthesia assistant alerts the anesthesiologist, who is responsible for determining if any interventions are necessary.

Establishing a block room in JP OR is an ongoing challenge. Appropriate resources are, however, being advocated for and leveraged to improve the utilization, safety, efficacy and efficiency of Regional anesthesia.

Events
There is a yearly regional day for residents organized by Dr Tang at the Centre of Excellence for Simulation Education and Innovation (CESEI). In 2012, the event and particularly the workshop component were well received. This year, Regional Day is to be held on May 8, 2013. A similar format with lectures and workshop is being organized with participation from SPH, BCWH, BCCH, and LGH.

Regional rounds have not been regularly taking place due to the small number of residents that come to VGH for their regional rotation. A combined regional rounds with SPH has been proposed and conducted on one occasion in 2012 at the home of Dr Andy Meikle. No upcoming meetings have been organized to this date.

Presentations have been also given to the postoperative nurses at VGH and UBC, and most recently to British Columbia’s Operating Room Nurses Association of Canada (ORNAC BC) about regional anesthesia topics.

Conferences
Our group has been well represented at meetings as noted in the presentations and publications section (Appendix 2). Drs. Sawka and Tang have been workshop instructors at the CAS meeting 2012, and will do so in 2013 as well. Dr. Tang has also been involved with the organization of the Whistler Anesthesia workshops and will continue to be involved on an ongoing basis.

Division of Anesthesia for Spine Surgery
(Head Dr Jonathan McEwen)

Clinical Activity
For the period January 1, 2012 to December 31, 2012, the department of anesthesiology’s spine division provided perioperative care to 760 operative patients. The diagnosis categories for these patients included: trauma (118 patients), oncology (79 patients), infections (18 patients), deformity (148 patients), degenerative (306 patients) and complications requiring re-operation (72 patients). The spine program is the Provincial adult referral centre for Spine Trauma, Spine Tumours and Major deformity

Education
Academic and education activities within the division included teaching of residents, medical students in the operating room and the perioperative environment. Excellent educational opportunities benefit the residents and fellows in these cases involving trauma, oncology and deformity as they relate to core anesthesia training including management of the difficult airways, unstable cervical spine injuries, management of the spinal injured patient, major bleeding and massive transfusion.
Members of the spine division contributed to a book chapter submitted for "The Spine" textbook. Authors include Drs McEwen, Waters, Griesdale, Huttunen, Froehlich, Negraeff, Giffin (names of division members are underlined).

**Divisional Guidelines**

Based on a case review, an assessment of relevant departmental policies was undertaken.

Communication improvement was a priority for the Division of Anesthesia for Spine Surgery in 2012. The division reaffirmed the plan for Nancy Henderson, PSC Ortho/Spine, to bring upcoming “difficult/unusual” spine cases to the division head’s attention via email. He/she would then make appropriate arrangements with the slating anesthesiologist to schedule a member of the spine group.

Criteria for such would include, but not be limited to: cases of prolonged duration, cases involving significant co-morbidities (Ankylosing Spondylitis, Kypho-Scoliosis with respiratory impairment etc.), cases identified by the surgeon as having a spine anesthesiologist requested, resection of spinal tumours, cases requiring lung isolation, cases requiring neuromonitoring with evoked potentials, patients refusing transfusion where there is an expectation of significant intraoperative blood loss and anterior cervical spine procedures involving multiple levels.

With regard to cases of prolonged duration, the spine surgeons at Vancouver Acute have undertaken a growing number of particularly complex and extensive spine surgeries that span more than one operative day. It was agreed to make every attempt to have the slated anesthesiologist look after ALL 2+ day spine cases on both days, and remain with that case until its completion.

On the second or subsequent days of a multiday case, it was agreed that the attending anesthesiologist and staff surgeon are to meet at the patient’s bedside in the intensive post anesthesia care unit prior to going to the OR. They will review the patient’s course overnight, and their suitability for proceeding to the planned OR that day. This consultation and the issues identified are to be documented in the record.

A policy of confirming central line and endotracheal tube position by x-ray prior to commencing surgery in cases of prolonged duration was discussed. This is facilitated by the fact that radiologic services are already routinely involved at the start of these surgeries.

After consultation with ICU attending staff, it was agreed that patients undergoing multiday staged surgeries should proceed immediately to the ICU for care at the conclusion of the final operative day. It was agreed that members of the department of anesthesiology would continue to be directly involved with decision making with regard to extubation, and would be expected to be present at the time of extubation whenever concern existed with respect to a increased risk to the airway.
The importance of maintaining a collaborative and professional interaction with colleagues is reaffirmed in the interest of excellent perioperative care.

**Cardiac Surgery Intensive Care Unit**  
*(Medical director Dr Rael Klein)*

**Clinical Practice**
During the Academic Year 2012 eight hundred and eighty Cardiac Surgical cases were recovered in the CSICU. These cases included coronary bypass, valve replacement/repair surgery and major thoracic aortic surgery (including endovascular stents).

**Education**
Residents and fellows were exposed the management of the acute post cardiac surgical patient, focusing on hemodynamic and arrhythmia management, correction of bleeding and coagulation as well as post ventilation strategies and weaning. There is also significant exposure to patients with existing or acquired renal dysfunction requiring renal replacement therapy. The residents and fellows were encouraged to spend time in the operating room during their rotations to achieve a better understanding of the intraoperative management of this surgical population.

During the year we had four ICU fellows, two cardiology residents, two anesthesia residents and one cardiac anesthesia fellows rotate through the unit. They were expected to partake in formal morning rounds which included x-ray and lab review. Each patient was individually assessed by the resident and daily progress notes documented in the patient’s charts.

The resident and fellows were also encouraged to partake in echocardiographic assessment of the patients under the supervision of the attending CSICU Director. Informal teaching sessions are held on a daily basis in the unit where relevant topics pertaining to post cardiac surgical management are covered.

**Research**
The following research projects were undertaken during the year with the involvement of our Cardiac Anesthesia Fellow under the supervision of the co-investigators (CSICU Directors):

The first of these studies is entitled “An Open-Label Study Evaluating the Hemodynamic Effect of Differing Loading Regimens of Dexmedetomidine in a Post-Surgical Intensive Care Patient Population”.

Also, the Normosat Trial commenced in 2012. This study examines the ability to correct decreases in brain oxygen saturation levels using a near-infrared monitor (NIRS) in Cardiac Surgical patients with Euroscore > 3.

Lastly, a multicentre randomized controlled trial was started, comparing the efficacy and safety of perioperative infusion of 6% hydroxyethyl starch 130/0.4 in an isotonic solution using (Volulyte™) versus 5% human serum albumin as volume replacement therapy during cardiac surgery in adult patients.

**Quality Assurance**
2012 saw active participation in the National Surgical Quality Improvement Program (NSQIP). Data is regularly reviewed and quality improvement initiatives are implemented as a result of this initiative. These included ventilation strategies to reduce ventilator acquired pneumonia, review of antibiotic prophylaxis perioperatively and postoperative anticoagulation practice.

New Programs
During the next academic year, a continuous veno-hemodialysis “PRISMA” program is being introduced to the CSICU to improve the current management strategies for patients with acute kidney injury.

Division of Cardiac Anesthesia

Clinical Practice
Cardiac surgery patients with complex pathology undergoing equally complex and ground-breaking procedures has led to the necessary evolution of specialized anesthesia care. Almost all the members of this Division have undergone training above and beyond the five-year residency in anesthesiology. All members have also qualified for the Advanced Level Perioperative Examinations in Transesophageal Echocardiography, which has become a standard monitor in cardiac surgery.

This year saw a slight drop in the number of patients cared for (from close to 900 down to 800) by the Division of Cardiac Anesthesia, due to the expected opening of a new cardiac surgical centre in British Columbia. However, due to demographic pressures, the volume of patients requiring cardiac anesthesiology services will continue to grow through the years. The anesthesia department has supported an electro-physiology program three days per week which includes the full spectrum of ablations including RF and cryoablations for VT, A Fib, Flutter, and SVT, implantable defibrillators and testing cases.

We continue to be the provincial referral centre for robotically assisted cardiac surgery. Also, we do a major portion of the major elective and emergency aortic reconstruction cases in the province.

Education
Our team of echocardiographers continues to maintain its status amongst the highest ranked educators in the entire University of British Columbia. The team routinely teaches residents and fellows both in the operating room and in the Cardiac Surgery Intensive Care Unit.

Research
Dr. Ansley has continued to produce a substantial volume of articles in the cardiac anesthesia literature, particularly in the areas of cardiac ischemia. However, bolstering the Division are physicians involved in other clinical studies such as Drs. Lohser, Finlayson, Klein, Herd, Waters and Au who are looking at such diverse areas as blood transfusion, blood factor replacement, lung ultrasound, the safety of starch as volume replacement.
Clinical Practice
The Pre-Admission clinic processes the vast majority of elective surgical procedures at Vancouver Acute, 18 200 patients per year. The traditional Pre-Admission system has been for the OR Booking package to stay within OR Booking until the day of surgery approaches. All charts would then be reviewed by a screening nurse using an algorithm determined by Anesthesia. Under this algorithm, one third of patients would have no further interaction with Anesthesia until the day of their surgery, approximately 40% of patients would have an Anesthesia paper triage performed, and 48% of patients would come into Pre-Admission at Vancouver General Hospital for an in person Anesthesia consultation. These consultations would be booked by an NUA the day prior to the actual consultation date, leaving limited time for the patient to schedule their affairs or NUA’s to retrieve investigations and old charts from other hospitals.

A satisfaction survey of staff Anesthesiologists revealed frustration about performing consults without adequate lead time prior to surgery, frustration at the absence of relevant previous investigations, and inadequate actual consult time leading to production pressure.

Novel Management
The Pre-Admission clinic has brought forward a proposal to the surgical executive to standardize the contents of an OR Booking package. The OR Booking package is now processed by Pre-Admission directly after receipt of the package in OR Booking, as opposed to the previous system in which Pre-Admission worked backwards from the proposed day of surgery. Pre-Admission’s goal is to now have all patients charts reviewed, relevant investigations retrieved and Anesthesia consults performed farther in advance from the day of surgery.

For those procedures which require an Anesthesia paper triage or in-person consultation a NUA is designated to retrieve relevant hospital records, and previous investigations. This has lead to an improved capture of relevant medical records. The screening nurse algorithm has been rewritten, and those charts with a surgical procedural indication for an Anesthesia paper review or consult now bypass the screening nurse. This has relieved a step in the Pre-Admission process and traditional bottleneck in the patient chart’s progress. This redesign has lead to booking patient consultations in Pre-Admission a week ahead of their actual appointment, leading to a greater patient convenience and increased chance for NUA’s to retrieve relevant previous records and investigations.

To allow more time for the patient to interact with Anesthesia, and minimize perceived production pressure the time allocated for each consultation has been increased from 30 to 35
minutes, the MSP billing process simplified, and the patient’s vitals are now transcribed directly onto the Anesthetic record by support staff.

In those instances where an Anesthesiologist elects to delay a surgical procedure to allow further optimization a new delay of surgery process has been implemented. The Anesthesiologist performing the initial consult will define the required interventions prior to proceeding with surgery and will personally review these investigations as they become available.

**Education**

From the Anesthetic perspective, a plethora of clinical issues, required attention to practice guidelines as well as surgical and subspecialty anesthesia requirements make each day in the Anesthesia Consultation Clinic “ACC” a challenging assignment with excellent teaching opportunity. We are able to accommodate regular rotations of residents and fellows through the ACC. Reports thus far indicate that this provides invaluable exposure and rare opportunities for our future colleagues to focus and develop their skills in perioperative assessment, optimization and management.

**Quality Improvement**

Due to the growing awareness of the dangers of perioperative withdrawal of aspirin, guidelines have been written and endorsed by the Department of Surgery regarding the perioperative management of anticoagulants. Pre-Admission has initiated an educational program for surgical office support staff to promote the continued perioperative use of aspirin.

The perioperative period requires the management of multiple physicians, to promote this collaboration a new referral processes have been established with both the Thrombosis clinic (for patients on dabigatran), and BC Diabetes for the optimization of glycemic control.

**The Post Anesthetic Care Unit**  
*(Medical Director Dr Pieter Swart)*

**Clinical Practice**

This is the largest such Unit in the Province of British Columbia, serving the largest Operating Room suite in the Province. Phase 1 recovery is provided to the full spectrum of adult patients, undergoing the full spectrum of adult surgical procedures, excluding obstetrics. Critical Care is also provided to postoperative patients where that level of care is not projected to be required for more than 48 hours.

Phase 1 recovery is also provided to patients after procedures under general anesthesia performed in the Jim Pattison Pavilion outside of the main OR suite (e.g. Radiology Suite). In addition, on occasion, the procedures of electroconvulsive therapy and electrocardioversion are also performed in a suitably separated, and appropriately monitored environment within the VGH PACU.

**Education**

All anesthesia fellows, residents and medical students are exposed to teaching in the PACU environment by the staff anesthesiologists, when patients are transferred from the OR to the
PACU and has served as the basis for excellent learning opportunities in Perioperative Care for the residents as a rotation and has received positive reviews. Also included is the opportunity for the residents and fellows to be involved in preoperative consultation, optimization and resuscitation.

In May 2013, staff perioperative anesthesia rotation was introduced at VGH, scheduled on weekdays from 1 pm to 9 pm, coinciding with the busiest time in the PACU. This new rotation has significantly increased the opportunity for teaching of our anesthesia residents and fellows on perioperative anesthesia duty. Learning experience for these trainees includes the provision of excellent patient care in the PACU, and also supervised experience with performing inpatient consults and follow-up.

The VGH Anesthesia Staff has also provided presentations to the VGH PACU Nursing Staff on selected clinical management topics, including code management, and topics like OSA.

The Perioperative Pain Service (POPS)
(Heads Drs Bali Dhaliwal and Raymond Tang)

Clinical Practice
On average, the POPS cares for with 80 patients a week with PCAs, epidurals, paravertebral catheters, and perineural catheters. In addition, POPS is involved in providing sedation and analgesia to patients in the Burns/Plastics/Trauma Unit undergoing skin debridements and dressing changes.

New Changes
The new order sets for POPS were released recently. They incorporate many changes to facilitate a smooth transition of pain management from POPS to the attending service. In addition, the new orders are more standardized and allow other services to use some of the same forms for pain management. This offers more consistency in nursing care between wards, and may reduce medication errors. As part of the new orders for continuous peripheral nerve catheters, the patient control feature has been introduced which improves patient comfort, particularly for upper limb surgery.

Current Challenges
There has been a shortage of Hospira hydromorphone PCA syringes which is ongoing. This is due to a leak in their syringe delivery system. A suitable replacement continues to be unavailable. Notices have been sent to all departments that prescribe PCA. As a result, most patients are started on morphine PCA rather than Hydromorphone PCA. No adverse effects from switching to morphine have been documented. Unfortunately, because we have the Hospira PCA pumps, we continue to be dependent on their proprietary syringes and must therefore wait for Hospira to resolve the issue with their leaky syringe delivery system.

Education
Residents are incorporated into the POPS service for a week during their junior years and sometimes in their senior years. The teaching has been reviewed well and is thought to be worthwhile preparation for practice. Resource material is available for reference of standards in safe perioperative pain care. Teaching sessions have been also been provided to several groups. A presentation on perioperative pain management was given to the surgical residents,
regarding considerations of regional blocks and catheters for the nurses in the Perioperative Care Centre (PCC), and management of perineural catheters for the ward nurse educators. The last presentation was for the introduction of the patient control feature added to the perineural catheters.

**Fellowship Education Program**  
*(Co-directors Dr Kelly Mayson and Dr Bevan Hughes)*

Fellowships at VH/UBC have been organized to include a cardiac fellowship, two regional/ambulatory fellowships, one neuro-anesthesia fellowship, and typically two general fellowships positions each year. Our department provides clear definition on which days are serviced based, and has fellows assigned a minimum of two days in the OR a week in their area of interest. The fellows are allotted one day a week for academic projects, but may have access to up to two depending on the number of projects they are involved with.

VHAS funded a total of 8 fellows during Jan-December 2012.

The fellowship clinical training in anesthesia, subspecialty anesthesia as well opportunities for productive research has been highly effective. The fellows are also given the opportunity to present their work, as well as teach medical students and residents.

**Cardiac Fellowship**  
The cardiac fellowship runs from July to June. Justin Wong from Australia completed his fellowship in June 2012, and James Drew from New Zealand started in July 2012. Justin Wong completed a nine year retrospective chart review of cardiac arrests in the OR and PACU. Fellows are asked to complete at least one case report from Perioperative Echocardiography. Cardiac fellows have scheduled assignments in TEE, CSICU, the OR, and cath lab cardiac cases.

**Regional/Ambulatory Fellowship**  
The Department has two fellows in this area, commencing with a 6-month interval between them. Kanchan Umbarje from the UK worked from September 2011 to August 2012. Silke Brinkman’s term (Perth Australia) was Jan 2012 to Dec 2012, and Genevieve Germain from Laval Quebec, commenced in July 2012. All three fellows have been very active in regional/ultrasound guided research projects. Mentoring regional staff aims to strengthen the fellow’s skill in regional anesthesia within six months of arrival, with the goal of fellows performing regional blocks independently. The ambulatory component of the fellowship has diminished partially due to the decreasing volume of ambulatory cases being performed at UBC.

**Neuroanesthesia**  
Julian Barnbrook from England completed his two ICU/neoaraneesthesia fellowship, where he did 6 month rotations of each, completing this program in March 2013. Gregory Kroeczyk from Ottawa, Ontario commenced the fellowship in July 2012 and has particular interest in neurophysiological monitoring as well as the use of jugular bulb monitoring. The fellows are active in participating in neuroanesthesia rounds and journal club.
**General Fellowship**

There are typically two positions for this fellowship, with the fellow starting either in January or July. The fellows are rotated through 4-week rotations of emergency cases, major plastics/burns, hepatobiliary, vascular, urology (transplant and oncology), and major ENT. Fellows have the option of requesting more time in one particular area once they have completed all required rotations. Dr Kenneth Ryan from London Ontario, and Dr Balvindar Kaur from Australia both completed the fellowship in June 2012. Neil Ramsay from Ireland commenced his position in January 2012. Dr Ramsay has participated in NSQIP projects reviewing the relationship of anesthetic management and postoperative complications focusing particularly on inadvertent hypothermia.

Starting in January 2014, the regional and ambulatory rotations will be incorporated into the General fellowship for those that have an interest in these areas.

The BC College of Physicians and Surgeons require all fellows from non-English speaking programs (even Quebec French residents) to pass a Test of English as a Foreign Language exam. That has resulted in no further Thai fellowship positions at VH since 2010.

All fellows are involved in the roles of perioperative medicine. They are slated in ACC typically once every 6 weeks, and are responsible for U1 and D1 calls at UBC and VH respectively on Wednesday. The fellows are also slated for the perioperative anesthesiologist shift in VH PACU on Wednesday.

Dr Bevan Hughes completed his term of fellowship director in February 2013, and Dr. John Dolman has taken over his role as co-director with Dr. Kelly Mayson. Details regarding research projects, posters and publications of the fellows can be found in the VGH Anesthesia Research Program section.

**Resident Education Program Summary**

Vancouver Acute continues to provide General Anesthesia and Subspecialty Anesthesia education in Neuroanesthesia, Cardiac anesthesia and CSICU, Transesophageal Echocardiography, Vascular, Regional and Airway rotations. The department also hosts multiple academic days, providing lectures and problem based learning supervision for residents. Residents are invited to participate in and give lectures during subspecialty rounds when currently participating in the applicable rotation. During 2012, Dr Alana Flexman updated the Residency Goals and Objectives for the neuroanesthesia rotation.

Residents rotating through their Transfusion Medicine Rotation participate in our daily Blood Utilization Meetings and learn about perioperative blood conservation. This year we solidified the additional assignment for residents at Vancouver Acute in Perioperative Anesthesia. The residents now have an expanded role caring for postoperative patients and assessing inpatients coming for emergency surgery. This has been very well received by residents and is seen as a great learning opportunity.

Anesthesia Residents on call at Vancouver Acute are now carrying an airway pager and are participating on the Code Blue Team as an airway and resource member. This has vastly
improved their exposure to emergency airway management and improved the code team by having an airway expert available.

Rotation Evaluations for Residents have been changed and switched back to a paper evaluation system, which has greatly improved compliance with filling out evaluations. This change has been received positively.

In compliance with UBC Resident Radiation Exposure policy, we have developed a system to allow residents who are pregnant to not be assigned to operating rooms with high use of fluoroscopy when possible.

In 2012, Drs Juliet Atherstone and Ray Tang participated on the Organizing Committee for the UBC Whistler Anesthesiology Summit 2013. We had over 200 participants and helped run workshops and speaker sessions. In addition, we had faculty speakers including Dr Tang, Dr Swart and Dr Finlayson as well as contributions to the workshops and session moderation by Dr Umedaly. This year, Resident Academic Day was incorporated, and extra workshops were conducted for residents on transthoracic ultrasound of the heart and thorax. This addition to the program was well received.

**VGH Anesthesia Research Program**  
*(Director Dr Craig Ries)*

The Department recognizes that important and potentially practice changing research of its own clinician-scientists. In the past, members have used significant amounts of personal time and energy to conduct clinical and bench research. In the future, the department’s Research Committee and Research Manager will strive to support these efforts.

The creation of non-clinical time by our fellowship program is essential to research productivity.

The VHAS Anesthesia Research Foundation has been created to provide fiscal support to departmental research. Funded by the financial arm of the Department, support will be awarded based on peer review and managed with close follow-up to ensure accountability. Grants from the Foundation will be intended for salary support of departmental members to accomplish research. Grants may allow selected members to pursue their research up to one day per week. As funding levels stabilize for this foundation, the number of awards and time frame may increase.

Research partnerships with industry provide an additional level of fiscal support, primarily through equipment and pharmaceutical companies. As this activity becomes more commonplace within the department the creation of further research infrastructure is anticipated.

VHAS and the department awarded four merit awards to Drs Applegarth, Flexman, Griesdale and Tang to support academic endeavours.

Expansion of space and personnel resources is expected to increase the capacity with which the department can facilitate resident and fellow initiated projects.
Appendix 1: Staff Division Memberships

**Cardiac Anesthesia**
Drs. Au (Head), Ansley, Atherstone, Brodkin, Dolman, Finlayson, Fitzmaurice, Giffin, Harper, Herd, Hughes, Isac, Kapnoudhis, Kim, Lampa, Lohser, Tholin, Umedaly, Waters

**Cardiac Surgery Intensive Care (CSICU)**
Drs. Klein (Head), Atherstone, Au, Brodkin, Harper, Hughes, Kapnoudhis, Lampa, Umedaly

**Neuroanesthesia**
Drs. Henderson (Head), Applegarth, Dhaliwal, Flexman, Griesdale, Huttunen, Mayson, McEwen, Page, Ries

**Thoracic Anesthesia**
Drs. Lohser (Head), Finlayson, Fitzmaurice, Hughes

**General Anesthesia**
Drs. Bitter-Suermann, Blachut, Choi, Gofton, Grant, Lennox, Malm, McGinn, Meikle, Moul, Negraeff, Osborne, Sawka, Sung, Swart, Tang, Vaghadia, Vu, Warriner, Weideman, White

**Spine Anesthesia**
Drs. McEwen (head), Giffin, Gofton, Grant, Henderson, Huttunen, Lennox, White

**Regional Anesthesia**
Drs. Tang (Head), Bitter-Suermann, Blachut, Froehlich, Lennox, Meikle, Sawka, Swart, Vaghadia, Yu

**Vascular Anesthesia**
Drs. Bitter-Suermann (Head), Au, Applegarth, Osborne, Sawka, Swart, Tang, Vu, Weiderman

**Ambulatory Anesthesia**
Drs. Lennox (Head), Blachut, Grant, Malm, Mayson, Moul, Page, Ries, Tang, Vaghadia

**Liver Transplant**
Dr Waters (Head), Drs Bitter-Suermann, Boulton, Brodkin, Dolman, Giffin, Isac, Klein, Osborne, Parsons, Randall, Sawka, Sung, Vu

**Intensive Care**
Drs. Finlayson, Griesdale, Isac

**Trauma**
Drs. Vu (Head), Ansley, Applegarth, Choi, Dhaliwal, Meikle, Randall, Weiderman, Vaghadia
Member Roles

UNIVERSITY of BRITISH COLUMBIA

Dr. Oliver Applegarth  Director, UBC Anesthesia Undergraduate Program
Dr. John Dolman  Member, RC Written/Oral Examination Committee
Dr. Gord Finlayson  Anesthesia Resident Selection Committee
Dr. Raymer Grant  Residency Site Coordinator for VGH UBCH
Dr. George Isac  UBC Clinical Faculty Promotion Committee
Dr. Peter Choi  Royal College Examiner
Dr. Donald Griesdale  UBC Anesthesia Clinical Research Director Committee
Dr. Cynthia Henderson  Member, UBC Research Ethics Board
Dr. Stuart Herd  Member, UBC Therapeutics Initiative Scientific Inquiry and Education Committee
Dr. James Price  Member, UBC Anesthesia Journal Club Committee
Dr. Jens Lohser  Head, Division of Neuroanesthesia
Dr. Penny Osborne  Visiting Professors Committee
Dr. David Parsons  Coordinator, UBC Anesthesia Undergraduate Program
Dr. Jon McEwen  Chair Continuing Medical Education Committee

VGH/UBCH

Dr. Juliet Atherstone  Head, Division of Thoracic Anesthesia
Dr. Bali Dhaliwal  Anesthesia Resident Selection Committee
Dr. Jon McEwen  Clinical Faculty Implementation Committee
Dr. Martin Lampa  Anesthesia Resident Selection Committee

Dr. Michael Moult  Member, Blood Utilization Committee
Dr. Calvin Au  Co-director Perioperative Pain Service
Dr. Stuart Herd  Medical Director Anesthesia Assistant Program
Dr. George Isac  Head, Division of Spine Anesthesia
Dr. Rael Klein  Chair, Resuscitation Committee
Dr. Martin Lampa  Chair, Executive Committee, Department of Anesthesia
Dr. Pamela Lennox  Chair, Organ Donation Committee

Medical Manager, CSICU
Member, Cardiac Surgery Advisory Committee
Head, VA TEE Group
Member, Blood Utilization Committee
Chair, Executive Committee, Department of Anesthesia
Member, Blood Utilization Committee
Chair, Executive Committee, Department of Anesthesia
Member, Blood Utilization Committee
Head, VA TEE Group
Member, Blood Utilization Committee
Head, Ambulatory and Short Stay Anesthesia
Head, Administration and Program Development
Dr. Andrew Meikle  
Member, Resuscitation Working Group

Dr. Peter McGinn  
Anesthesia Liaison Eye Care Centre

Dr. Michael Negraeff  
Member, VA Acute Pain Steering Committee

Dr. Tom Randall  
Medical Director, Perioperative Services
Member, Surgical Executive Team
Member, Medical Advisory Committee
Member, Senior Leadership Team

Dr. Pieter Swart  
Medical Manager PACU

Dr. Lynn Martin  
Chair, VA Anesthesia Services
Member, Resuscitation Committee
Member, Credentials Committee

Dr. Raymond Tang  
Head, Section of Regional Anesthesia
Associate Director, Perioperative Pain Service

Dr. Hamed Umedaly  
Head, Department of Anesthesia
Member, VA Executive Committee
Member, Surgical Executive Committee
Member, Medical Advisory Committee

Dr. Mark Vu  
Member, VGH Trauma Advisory Committee

Dr. Terry Waters  
Chair, Blood Transfusion Service Committee
Member, Blood Utilization Committee
Member, Transfusion Medicine Fellowship Committee
Head, Liver Transplant Anesthesia

VANCOUVER COASTAL HEALTH

Dr. Patrick O'Connor  
Vice President, Medicine, Clinical Quality and Safety
Chair, Quality of Care, VCH HAMAC
Member, Credentials Committee, VCH HAMAC
Member, VCH Senior Executive Team
Chair, VCH Executive Medical Group

Dr. Terry Waters  
Chair, Regional Blood Transfusion Committee

Dr. Mark Vu  
Member, Burns and Trauma Advisory Committee

Dr. Lynn Martin  
VCH Credentials Committee

VA DEPARTMENT OF ANESTHESIA

Dr. Calvin Au  
Head, Division of Cardiac Anesthesia
Associate Medical Director, CSICU
Member, Staff Selection Committee

Dr. Bjorn Bitter-Suermann  
Head, Section of Vascular Anesthesia

Dr. Igor Brodkin  
Associate Medical Director CSICU
Staff Computing Resources

Dr. Peter Choi  
Head, Section of Spine Anesthesia

Dr Alana Flexman  
Member at Large VA Anesthesia Executive
Member selection committee
Associate Director Research

Dr. Mitch Giffin  
Critical Incident Committee
Co-Director, Anesthesia Technology and
Systems/Equipment

Dr Donald Griesdale
Director VA Department of Anesthesia Research

Dr. Jon Harper
Grand Rounds Coordinator
Critical Incident Committee
Associate Medical Director, CSICU
Member, Executive & Selection Committees

Dr. Cynthia Henderson
Head, Division of Neuroanesthesia
Member, Staff Selection Committee

Dr. Bevan Hughes
Lead VA ECT Anesthesia Program
Associate Medical Director, CSICU
Co-director VA Fellowship Program
Call schedule Author

Dr Henrik Huttunen
Vacation schedule Coordinator

Dr. Paul Kapnoudhis
Associate Medical Director CSICU
Member, Staff Selection Committee

Dr. Rael Klein
Medical Director CSICU
Chair VA Department of Anesthesia Executive
Member Staff Selection Committee

Dr. Martin Lampa
Head, Perioperative Echocardiography
Associate Medical Director, CSICU
Medical Staff Executive

Dr. Pamela Lennox
Member, Staff Selection Committee
Head, Division of Ambulatory and Regional
Anesthesia

Dr. Jens Lohser
Head, Division of Thoracic Anesthesia

Dr. Kelly Mayson
Chair, QI Committee
Member, Staff Selection Committee
Co-Director Fellowship Program

Dr. Peter McGinn
Anesthesia Allergy Clinic, Coordinator

Dr. Penny Osborne
Vacation Coordinator

Dr. Andrew Sawka
Clinical Director, Department of Anesthesia
Call Schedule Administrator

Dr. Andrew Meikle
Medical manager Anesthesia Consult Clinic and
VGH Perioperative Care Center

Dr. Michael Moult
Co-Director, Anesthesia Technology and
Systems/Equipment
Critical Incident Committee

Dr. Michael Page
Radiology Liaison

Dr. David Parsons
VA Research Administrator

Dr. Hamed Umedaly
Head Department of Anesthesia
Associate Medical Director, CSICU
Chair Staff Selection Committee

Dr. Mark Vu
Head, Trauma Anesthesia
Member, Staff Selection Committee

OTHER
Dr. David Ansley  CJA Guest Reviewer
Dr. Calvin Au  CJA Guest Reviewer
Dr. Igor Brodkin  CJA Guest Reviewer
Dr. Peter Choi  Chair, ACUDA Research Committee
                  CJA Consultant Epidemiologist and Reviewer
                  Cochrane Anesthesia Review Group, Cdn Editor
                  CAS Perioperative Medicine Executive Chair
Dr. John Dolman  CJA Guest Reviewer
Dr. Cyndi Henderson  Executive Chair, CAS Neuroanesthesia Section
Dr. Pamela Lennox  CJA Guest Reviewer
Dr. David Malm  CJA Guest Reviewer
Dr. Lynn Martin  CJA Guest Reviewer
Dr. Kelly Mayson  CJA Guest Reviewer
Dr. Peter McGinn  CJA Guest Reviewer
Dr. Andrew Meikle  CJA Guest Reviewer
Dr. Michael Negraeff  Chair, Pain BC Society
                  Member, BC Provincial Pain Initiative Committee
Dr. Patrick O’Connor  CJA Guest Reviewer
                  Member, BC Quality Council Advisory Group (MoH)
                  Member, Physicians Services Advisory Group (MoH)
Dr. David Parsons  Member, Royal College Credentials Committee
Dr. Craig Ries  CJA Guest Reviewer
Dr. Andrew Sawka  CJA Chair, Section of Regional Anesthesia and Acute
                  Pain Management
Dr. Hamed Umedaly  CJA Guest Reviewer
Dr. Himat Vaghadia  CJA Guest Reviewer

Publications – please refer to page 144
EXECUTIVE SUMMARY

2012 has been a notable year for the Lions Gate Hospital Anesthesia Department. We are very fortunate to continue to attract additional new members and have grown significantly over the past few years. We have benefited greatly from the energy, expertise and enthusiasm they contribute both clinically and academically. We continue to have a broad scope of practice including pediatric, obstetric, and adult procedures with a significant proportion being orthopedic and neurosurgical. Due to increasing surgical volume we are running at near full capacity.

Our relationship with UBC is strengthening, fueled and embraced by our department’s enthusiasm for teaching. We have a continuous presence of 3rd year medical students for their two week anesthesia rotation and a growing presence of anesthesia residents who seem to appreciate the scope of practice and the collegial environment. We were very pleased and excited to host our first resident academic day. This year we have been recognized formally as a teaching hospital within the UBC residency training program and will participate on the RTC committee. We believe rotations at our site are a valuable clinical experience, reflective of many community and regional hospitals, and can balance perspective beyond tertiary hospital confines.

The addition of a skilled and experienced anesthesia assistant to LGH in 2011 continues to benefit many aspects of patient care but it has particularly enhanced our regional anesthesia program. In addition to our monthly M&M rounds we have regular CME events within our own department. We also continue our tradition of having combined rounds with our surgical colleagues on a variety of topics relevant to both specialties. These have been very successful and reinforces what I believe is one of LGH’s great strengths which is the collegiality and supportive relationship that exists between anesthesia and our surgical colleagues.

We will be losing an experienced department member this year when Dr. Harry Kublik retires after 32 years of service to LGH. We are thankful for his tremendous contribution to LGH and the North Shore community over his career and wish him great health and happiness in his retirement.

Our greatest challenge this year was the sudden tragic death of Dr. Doug Fugger, our friend and colleague, on August 5th, 2012. He will always be remembered fondly for his extraordinary kindness and warmth in addition to his clinical competency. He is greatly missed. An educational trust fund has been established for his 2 young sons Hugo and Rainer. Contributions can be made through the LGH anesthesia department.
Department Members:
Dr. Hazhir Ahmadi                         Dr. Kelly Chatterson
Dr. Rob Fingland                   Dr. Jim Kim
Dr. Randy Hewgill                        Dr. Magda Lipowska
Dr. Harry Kublik                 Dr. Bryon McCarter
Dr. John McAlpine               Dr. Renata Matthias
Dr. Adam McDiarmid                Dr. Rick Pantel
Dr. Clare Morrison                  Dr. Yasmin Rajan
Dr. Francis Ping               Dr. Annika Vrana
Dr. Shafiq Thobani              Dr. Jamie Walker

Portfolios:
Head of Department – Dr. John McAlpine
Equipment – Dr. Jim Kim
Schedule – Dr. Rob Fingland
Family Practice Anesthesia Residency Program Director – Dr. James Kim
UBC Academic Liaison – Dr. Randy Hewgill
Treasurer – Dr. Shafik Thobani
UBC Academic Liaison/P&T – Dr. Kelly Chatterson
Rota – Dr. Adam McDiarmid
CME – Dr. Bryon McCarter
Finances/CME – Dr. Clare Morrison
Regional Anesthesia – Dr. Annika Vrana

Publications – please refer to page 144
EXECUTIVE SUMMARY

There have been some major changes in the department since last year.

Medical Director of Anesthesia:
Dr. Craig Bosenberg had assumed the role of Medical Director, Anesthesia Service, but had stepped down from the headship effective April, 2012. Dr Alan Meakes is the current acting Medical Director.

Site Chiefs:
Drs Tom Ruta and Maureen Murray are the site chiefs for the South Island. (Dr Jonathon Watson hold the position for Comox and Dr Jean Gelinas for Campbell River). All the other Site Chief positions are currently vacant.
Dr Gordon Wood continues as Victoria Chief for Intensive Care.

Human Resources:
The locum pool has become very small and this means that we frequently have to reduce service in order for anesthesiologists to have time off. We are still working much too hard. Dr. Gary Townsend left us for other activities within Victoria, but still active in supporting the medical teaching of medical undergraduate and postgraduates.

Education:
Dr Trevor Herrmann continues as the undergraduate medical student and resident coordinator (DSSL). He is ably assisted by Drs Leo Quon and Paul Serowka. In addition to the mandatory rotation in anesthesia for IMP students, we continue to host many medical students for electives. We also provide a pediatric anesthesia rotation for senior anesthesia residents from UBC who spend 1 month at Victoria General Hospital. The addition of another pediatric anesthesiologist will facilitate and enhance this. We also continue to accept senior residents from other programmes for elective rotations. This has proved a good source of recruitment for us. It is also refreshing to meet these well-trained, smart young people who educate us in different ways of doing things.

CME:
Dr Leo Quon organizes our rounds and we have had some very interesting discussions with other departments and amongst ourselves. We also participate where possible, with the Visiting Professor Programme from UBC.
QA/QI:
Dr Craig Bosenberg took over the management of this portfolio. It is an area of particular interest to him and he has brought lots of new ideas. Unfortunately VIHA’s support for QA/QI at the department level has disappeared so it is increasingly difficult to continue the good work we had been doing over the years. Nevertheless we undertook a short study of blood sugars of patients arriving in the Recovery Room. As a result of this, we have introduced new protocols for better management of intraoperative blood sugar. We look forward to more new initiatives. Drs Susan Leacock and Gordon Wood represented anesthesia during the trial of early feeding, early ambulation after colon resection. The project was pilot tested at VGH and was very successful. It will begin shortly at RJH.

Dedicated Obstetric Anesthesia Service:
Unfortunately, in spite of major efforts from the department and from the BCAS, we are no further ahead with this than years ago. In spite of years of letters and documentation which we have sent to VIHA re the danger to patients, in spite of discussions and meetings, in spite of massive support from the surgeons and obstetricians, no solution has been reached. There have been discussions with the Ministry for Health and the Health Authorities but it seems that they are unmoved enough by the patient risks to open the purse strings and provide what is required to run a full and complete obstetric anesthesia service for a tertiary care unit. This dispute became public recently and VIHA administration basically said that there was no risk to the patients and that we were just a bunch of greedy doctors. This was repeated in the newspapers and on the radio by VIHA’s Chief Medical Officer and by the Chief Operating Officer. The CEO of VIHA sent a formal letter of complaint to the College of Physicians and Surgeons of BC about anesthesiologists who had spoken to the press. This confirms what we have always believed, i.e. that VIHA does not support the concept of full time anesthesia service for tertiary care obstetrics. Their allegations and actions also make for great teamwork and cooperation!

Pay for Performance:
This has posed many problems for us. We are anxious to support efficiency of service but, without some fiscal flexibility and other support, there are very limited options available to us. The Health Authority does not see that any of the fiscal benefit of PPP needs to be directed to physicians. We continue with the same old mantra, “Do more with less”.

Outreach Activities:
Members of the department continue to be active in this area. Dr Larry Dallen spent 9 weeks in Fiji working and teaching specialist anesthesia registrars. He presented two lectures at the Pacific Society of Anaesthetists’ annual conference. Dr Lorne Porayko spent time in Vietnam teaching an advanced airway workshop. Drs Tim Relf, Susan Leacock and Gordon Wood continue their Operation Smile involvement. Dr Angela Enright continues her international work with the World Federation of Societies of Anaesthesiologists and the WHO. This involves in particular the development of a low cost, full service pulse oximeter for use in areas in development. Dr Enright and her team were responsible for the production of all educational materials for the oximeter which include a manual, PowerPoint presentations, a video and instructions for running workshops on oximetry. They have produced all of these in 6 languages. They have also been running workshops around the world.
Committee Memberships:

International Organizations:
Larry Dallen: Member, Human Factors Engineering Committee AAMI
Angela Enright: President WFSA
Executive Committee WFSA
WHO Global Pulse Oximetry Project Leadership Team

National organizations:
Craig Bosenberg: CAS Standards of Practice Committee
Canadian Patient Safety Institutes national working group
CPSI expert advice and speakers’ bureau sub committee
CPSI computer simulation sub committee
Safer Health Care Now's Checklist Action series initiative
Angela Enright: Member Board of Trustees CASIEF

University:
Trevor Hermann: Resident Selection Committee

Provincial:
Ian Courtice: Specialists Services Committee BCMA
PSP (physician support program) End of Life/Palliative Care Committee
P4P Committee (pay for performance) BCMA
Larry Dallen: Chair, PAN-BC Steering Committee
Director for Anesthesia Information & Technology, BCAS Board
Member, Anesthesia & Respiratory Equipment Clinical Liaison Committee, Health Supply Services BC.
Consultant to Health Pro Group Purchasing Organization for Anesthesia & Respiratory Equipment.
Gavin Sapsford: Executive Committee BCAS

Health Authority:
Craig Bosenberg: Chair, Anesthesia Quality Assurance Committee
South Island Medical Advisory Committee
VIHA Surgical Executive Committee
Karem Chana: Anesthesia Quality Assurance Committee
Peter Duncan: Pediatric Committee
Angela Enright: Health Authority Medical Advisory Committee
VIHA Surgical Executive Committee
Anesthesia Quality Assurance Committee
Trevor Herrmann: Surgical Selection Committee
Michael Kinahan: Cardiac Quality Assurance Committee
Maureen Murray  South Island Surgical Executive Committee
Anesthesia Quality Assurance Committee
Carol Pattee: Anesthesia Quality Assurance Committee
Obstetric Quality Assurance Committee
Tom Ruta: Anesthesia Quality Assurance Committee
South Island Surgical Executive Committee
Anesthesia Quality Assurance Committee
Paul Serowka: Anesthesia Quality Assurance Committee
Peter Smith: Credentials Committee
Anna Sylwestrowicz: Anesthesia Quality Assurance Committee
Gordon Wood: Anesthesia Quality Assurance Committee
Cardiac Surgery Quality Assurance Committee
ICU Quality Assurance Committee
Heart Health & Programme Quality Council
South Island Medical Advisory Committee

**Department:** Executive Committee
Craig Bosenberg:
Karem Chana:
Ian Courtice:
Larry Dallen:
Trevor Herrmann
Maureen Murray
Tom Ruta

**Other:**
Trevor Herrmann: Discipline Specific Site Leader Anesthesia, IMP
Resident oral exams
Maureen Murray: Mentor IMP students
Anna Sylwestrowicz: Resident oral exams
Anne Webster: Mentor IMP students
Jeff Wollach: Resident oral exams

**Community:**
Maureen Murray: Island Swimming Board

*Publications – please refer to page 144*
NANAIMO REGIONAL GENERAL HOSPITAL

Alan Berkman MD FRCPC
Sarah Hall MD FRCPC
Discipline Specific Site Leaders
Vancouver Island Medical Expansion Program

EXECUTIVE SUMMARY

Nanaimo Regional General Hospital (NRGH) is a 288 bed hospital which serves as a regional referral centre for mid-Vancouver Island. A broad range of surgical specialties is offered with the exception of neurosurgery, cardiac, thoracic and vascular. There are 8 operating rooms in the main surgical suite with approximately 13,000 surgeries performed per year. The Anesthetic Department covers a busy Obstetric ward (more than 1200 deliveries per year) where approximately 34% patients receive epidurals. Residents can experience pediatric anesthesia with ENT and dental cases. A wide range of general, urologic, plastic maxillofacial and orthopedic surgeries is performed with an emphasis on regional and neuraxial techniques. Department members staff a weekly Preadmission Clinic and monthly Morbidity and Mortality rounds are held. Three anesthesiologists are involved in the Interventional Interdisciplinary Pain Program where 7000 patients are seen annually. We are one of three centres in the province with a neuromodulation program.

Our staff includes 14 members: Drs. Alan Berkman, Hans Babst, John Riendl, Scott Neilson, Frank McCormack, Paul Castner, Sarah Hall, Judy Coursley, James Lindsay, Bob Gaultois, Georgia Hirst, Michael Seltenrich, Jim Capstick and Trevor VanOostrom. Dr. Karl Muendel is an anesthesiologist with a fellowship in chronic pain and works exclusively in the pain clinic. In addition, we have a full-time Anesthesia Assistant, Paul Gear, for technical support. Dr. Hirst has taken on the challenge of Department Head in a turbulent time.

Initiatives:

- NRGH now hosts a Renal Dialysis unit, bringing interesting and complex patients to the operating room on a regular basis.

- A state-of-the-art Emergency department opened its doors September 2012.

- The modern Maternity wing is attached to the OR complex. It consists of 15 perinatal bedrooms, 2 isolation rooms and 3 prenatal rooms. It has a 9 bed-level 2b neonatal unit, which can manage short-term ventilation or CPAP. There is a dedicated OR with easy access to the main OR.

- A Sonosite ultrasound machine for regional anesthesia is available for ultrasound guided regional techniques.
NRGH is one of three centres in the province to perform spinal cord stimulator implantation for the management of complex pain.

Monthly Morbidity and Mortality Rounds co-ordinated by Dr. Hall have been expanded to incorporate Quality Assurance.

Dr. Hall has undertaken the role of coordinating medical student electives while Dr. Berkman oversees Anesthesia residents.

Funding has been applied for to complete two additional operating rooms in the main OR.

Once the new ORs have been installed, trauma time, currently allocated to the orthopedic room between 13:00 and 18:00, will be expanded to a full day of emergencies for all specialties.

New anesthesia machines/work stations are to replace our current equipment within the year.

An Anesthesia Information Management System (AIMS) is likely to follow the arrival of the new machines.

Funding has been applied for a second Anesthesia Assistant to expand the coverage to afternoon/evenings and weekends.

Teaching Involvement
The department continues to enjoy the presence of residents and students at our institution. We welcome students from all over the world for 4-week period rotations through our hospital. We tend to host final year medical students doing electives in anesthesia as well as residents in various stages of training, however we welcome anyone who wishes to apply.

Specific areas of teaching and learning opportunities:

- Onsite teaching of BCIT and Vancouver Island University nurses.
- Airway management: Video equipment to record complex cases for resident teaching has been acquired. Awake intubations as well as multiple airway adjuncts are employed routinely. Dr. Alan Berkman has been involved in the Resident Airway Day at VGH from its inception.
- A wide range of regional anesthesia techniques is employed at NRGH and residents rotating through the hospital will gain valuable experience.
- Drs Alan Berkman, Scott Neilson, Jim Capstick and Sarah Hall participate as examiners for in-house resident exams.
- Videoconference link with UBC for the Visiting Professor lecture series.
Comprehensive anesthesia library that is regularly updated, including textbooks and journal subscriptions.

“Topics of the Day” have been introduced for medical students rotating through anesthesia.

Supplemental areas of exposure to complement the experience in the operating room include ICU, Emergency, Obstetrics, Preadmission Clinic and Pain Clinic.

Interventional Pain Clinic: Exposure to both acute and chronic pain including flouroscopy-assisted procedures, chronic back and neck pain, complex regional pain syndromes and management of patients on intrathecal pumps and spinal cord.

“Human Factors Lab” with Simulator available.

Resident and Medical Student Rotations
The quality of students rotating through our hospital has been of a high standard. Residents and students typically spend one month at our institution. Our department members appreciate the interaction and the challenge that students bring to our community. The members request that if you plan to join them for the day that you contact them the day before to confirm that arrangement works for both of you. Call expectations for residents include one day a week and one weekend call for the month’s duration. Call for students are based on personal preference and students are welcome to join the staff, but call is not mandatory.

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Contact Information:

NRGH
1200 Dufferin Crescent
Nanaimo, BC. V9S 2B7
Telephone (250) 755-7691

All inquiries about the hospital and rotation can be directed to either:

- Residents: Deb Bartley- Email: Deborah.bartley@viha.ca , Telephone: (250) 755-7691 X 5300
- Medical Students: Debbie Hagen, Email: Debbie.Hagen@viha.ca , Telephone: (250) 755-7691 X 55971
- Dr. Alan Berkman, Resident Coordinator, NRGH Email: alan.berkman@viha.ca Telephone: (250) 755-7605
- Dr. Sarah Hall, Medical Student Coordinator, NRGH Email: halljonson@gmail.com Telephone: (250) 755-7605
Medical Administration will be able to supply residents with information pertaining to accommodation, transport, hospital parking, email and computer accounts, rotation details, security and library access.

**OR Information**

OR start time is 0745 and rooms run between 15:30 and 17:30. On the first day, the student should connect with Deb Bartley or Debbie Hagen at 8:00. They will facilitate completion of administrative details and assist with entrance to the OR. Ensure all privilege requirements are up to date well prior to your arrival to avoid delay and bring any hospital ID with you. Please identify yourself on initial arrival in the OR to staff as the new resident/student.

Dr. Berkman or a designate will connect with the resident on the first day of rotation. Residents will be given the choice of the slate which can be reviewed the day prior.

Students will meet with Dr. Hall or a designate on the first day of the rotation. They will be assigned to an anesthesiologist every day of their rotation.
University Hospital of Northern BC  
(Prince George Regional General Hospital)

Dr. Pal Dhadly  MBChB BMedSci FRCA  
Head, Department of Anesthesia

EXECUTIVE SUMMARY

The University Hospital of Northern BC is a 220 bed acute care facility and is the regional referral centre for Northern BC. The surgical specialties consist of general and vascular, obstetrics and gynaecology, orthopaedics, urology, plastics, otolaryngology, dental and ophthalmology. The Department of Anesthesia at UHNBC consists of 10 specialist anesthetists. Operating capacity has now expanded to 7 rooms and we will need to recruit 2 additional staff this year to be able to staff all commitments. Surgical wait times remain longer than the provincial average and the expansion is much needed. An anesthetic pre-assessment clinic runs twice a week, staffed by department members in rotation.

The chronic pain service is staffed by two anesthetists with dedicated clinic space, clerk and an RN. The long-term goal is for a multidisciplinary pain clinic but this objective remains elusive due to funding limitations.

The BC Cancer Agency Centre for the North is scheduled to open in the fall of 2012. The facility will include two linear accelerators and a chemotherapy treatment unit. This will be of great benefit to patients as they will no longer have to travel to the lower mainland for treatment. It may also result in a greater demand for surgical services as patients receive all of their treatment in Prince George.

The departments of Anesthesia and Surgery have begun preparations for the implementation of Surginet, the surgical information system. Full implementation is likely to take 18 months to two years. In the near future the anesthetic department are due to begin evaluations of the electronic anesthetic record component of Surginet.

Dr. Marshall Richardson continues in his role as DSSL. We teach 3rd year medical students from the NMP for their mandatory anesthesia rotation, as well as many 4th years for electives, both from within BC and from other provinces. UBC anesthesia residents join us for one month rotations. They have been of a high standard and the department members continue to appreciate their presence at our facility. We also participate in the training of family practice residents.

The recent opening of the Northern simulation centre at UHNBC has enabled us to utilise high fidelity simulation for teaching airway management to medical students. The feedback from students has been excellent and they are asking for more simulation sessions from us.

*Publications – please refer to page 144*
KELOWNA GENERAL HOSPITAL

Dr. Robert P. Eger  B.Sc., M.D., FRCPC
Head, Department of Anesthesia

EXECUTIVE SUMMARY

The Kelowna General Hospital (KGH) has undergone a large expansion in the past year with the opening of our new Centennial building. This has resulted in an increase from 8 to 13 OR’s daily and brings with it a new surgical specialty: cardiac surgery. KGH is one of the few hospitals in Canada with every surgical specialty from pediatrics to cardiac surgery represented. In particular our thoracic surgery service remains very busy operating 5 days a week with 3.5 FTE surgeons. We have put forward a proposal to have this rotation recognized by the RCPSC as a core rotation and are looking forward to welcoming UBC residents to come for their thoracic training.

The Southern Medical School is now in full swing and our medical students remain actively integrated in the hospital. As we only have limited residents serving at any one time these students have “the run of the roost” and have a wonderful opportunity for focused, hands on learning. Our group is particularly impressed with the high caliber of medical student we see here and welcome them into our OR’s.

KGH is very proud to be part of the UBC family and we all look forward to helping train Canada’s future doctors.

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EXECUTIVE SUMMARY

There has been further growth and stabilization of our department since 2011, with the addition of three full time members. We are able, for the majority of the time, to have 4 operating rooms running, one consult clinic per day, and a night call person who starts in the evening and gets the next day off. We continue to have a broad scope of practice including general surgery, pediatric, obstetrics, gynecology, urology, spinal surgery, ENT and dental procedures with a significant proportion being elective and trauma orthopedics.

We moved into our new facility, the Polson Tower, in September 2011, and since then have been enjoying the larger ORs and updated equipment. There were, at the time of building completion, 2 shelled-in floors for inpatient beds. These are now going to be finished, with the expected date of move-in sometime in 2015.

We have a full time respiratory therapist who works in the OR as an anesthesia assistant. We are part of the Southern medical program, which is based in Kelowna. As such, we have elective 4th year students from UBC come for 2-4 week rotations, and also two ICC 3rd year students who do two one-week rotations during their year in Vernon.

For CME, we have 4-6 M&M rounds per year, as well as occasional didactic presentations from one of our group. We are generally able to attend other CME meetings with the use of our regular locums, who live locally and are greatly appreciated for this service.

As head of our department, I attend MAC, OR Management Committee, and Medical Quality Management meetings regularly.

I look forward to the coming year, servicing our community, and working with our excellent surgical staff.

Department Members:    Portfolios:
Dr. Kevin Smith      Head of Department – Dr. Kevin Smith
Dr. Erik Lemay                                          Schedule – Dr. Erik Lemay
Dr. Jennifer Green                      UBC Academic Liaison – Dr. Tom Cull
Dr. Alex Wedensky                     Treasurer – Dr. Kevin Smith
Dr. Tom Cull      CME Lead- Dr. Alex Wedensky
Dr. Richard Marks
Dr. Dan Viskari
Dr. Kallie Honeywood

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DIVISION REPORTS

DIVISION OF CARDIOVASCULAR ANESTHESIA – UBC/SPH

John Bowering BSc MD FRCPC
Director of Cardiac Anesthesia

Resident Training

Residents rotate through cardiac anesthesia at SPH and/or VGH for a 2 month period. Both sites offer experience with coronary artery surgery, valve repair and replacement and patients having transcatheter aortic valve implantation. SPH offers additional exposure to patients with cardiomyopathies who may require insertion of impellas, ventricular assist devices or heart transplantation. Residents will also care for patients with complex congenital heart disease. VGH allows residents to manage patients requiring major thoracic aortic vascular surgery.

CSICU

There is increasing interest amongst anesthesia residents to rotate through the CSICU at SPH. This has evolved over the past year to include medical ICU residents who have an interest in managing cardiac surgical patients. It is expected at the conclusion of the rotation that residents be able to manage both the short and long-term problems associated with all types of cardiac surgery. There has also been a significant expansion of the ECMO program in the CSICU over the past year.

TEE

Currently TEE training is offered to residents as a separate rotation from cardiac anesthesia at SPH. It is expected that at the conclusion of this rotation, residents be able to understand echocardiographic anatomy of the heart and complete a detailed TEE exam fully assessing region wall motion and evaluating valve repairs and/or replacements.

Fellowship Training

Over the past year there has been one cardiac anesthesia fellow, both at SPH and VGH. Going forward it will be difficult for both sites to provide fellowship training due to the significant number of cardiac cases transferred to Kelowna. A possible solution to this may involve having 1 cardiac fellowship position between the two sites.

Publications – please refer to page 144
The Division of Neuroanesthesia has been active in providing the education of Residents and Fellows in the subspecialty of Neuroanesthesia, continuing medical education for staff members and clinical care for neurosurgical cases. Residents in their R4 year spend one month in Neuroanesthesia at VGH gaining expertise in routine and unusual cases in Neurosurgery, Neuroradiology, and Major Spine Surgery. All residents make a presentation of an interesting case or topic at Neuroanesthesia Rounds which are held monthly and attended by the Department of Anesthesia.

In 2012, there were six core members in the Division of Neuroanesthesia - Dr. Cynthia Henderson (head), Dr. Bali Dhaliwal, Dr. Alana Flexman, Dr. Donald Griesdale, Dr. Henrik Huttunen and Dr. Jon McEwen. There were four non-core members in the Division of Neuroanesthesia – Dr. Oliver Applegarth, Dr. Kelly Mays on, Dr. Michael Page, and Dr. Craig Ries, which provided increased exposure and resulting expertise to other members of the Department of Anesthesia. The non-core appointments are two years in length and are re-evaluated every two years.

In 2012, there were three fellows in the Division of Neuroanesthesia – Dr. Julian Barnbrook from England, Dr. Ken Ryan from London, Ontario and Dr. Gregory Krolczyk from Ottawa, Ontario.

The collection of relevant Neuroanesthesia articles and Neuroanesthesia Rounds distributed to residents and Fellows has been expanded and placed on the G-drive for staff access. Guidelines and summaries of Neuroanesthesia considerations for various cases are being developed for residents and staff anesthesiologists assigned to the Neurosurgical theatre.

The biennial Residents’ Academic Days in Neuroanesthesia took place November 21 and 28, 2012 and lectures were given or supervised by Dr.’s Bali Dhaliwal, Alana Flexman, Donald Griesdale, Henrik Huttunen, and Jon McEwen. Members of the Division of Neuroanesthesia were actively involved in the R5 Seminar series and UBC Anesthesia Departmental Residents’ Oral exams.

During the 2012 academic year, fellow Dr. Julian Barnbrook spent six months working with the Division of Neuroanesthesia. Dr. Barnbrook, under the supervision of Dr. Donald Griesdale, studied airway management of critically ill patients. He presented Cardiovascular Complications of Head Injury at Neuroanesthesia Rounds.

Dr. Ken Ryan worked with Dr. Oliver Applegarth on Creating a Standard Operating Procedure for Anesthesia Emergence which he summarized and presented at Grand Rounds on June 20, 2012.
Dr.’s Henderson and Krolczyk attended the Department of Psychiatry Neurostimulation Journal Club on November 1, 2012 where Dr. Krolczyk presented several papers regarding the use of Ketamine in Electroconvulsive Therapy.

Publications – please refer to page 144

Awards

Griesdale DEG
Dimitrios Giannoulis Memorial Resident Appreciation Award 2012
People First Nomination, Vancouver Coastal Health 2012

Projects/Activities

Dr. Oliver Applegarth
Undergraduate Program Director
- Development of an online competency-based curriculum
- Yr 3 committee, Yr 4 committee, Promotions committee
- Development of a new MCQ examination
- Bi-weekly simulation team training course for yr 3, CESEI, Spring/Summer 2011

Development and validation of an airway management course based on an expert consensus driven airway checklist (resident project, L. Thibideau).
Amalgamation of a WHO-based patient safety curriculum into the undergraduate anesthesia program (resident project, S. McLean).
Development of a “Standard Operating Procedure” For emergence at VGH (fellow project, K. Ryan).
Co-chair, Procedural Skills Working Group, UBC Faculty of Medicine
Member - ACUDA
Reviewer – UBC Medical Journal

Dr. Alana Flexman
UBC Anesthesia City-Wide Journal Club coordinator (2012-present)
Neuroanesthesia Journal Club coordinator
Education committee, Society for Neuroscience in Anesthesia and Critical Care
Peer-reviewer for Journals: Anesthesiology, Canadian Journal of Anesthesia
Moderator, poster sessions, Society for Neuroscience in Anesthesia and Critical Care Annual Meeting October 2012
R5 Seminar Series

<table>
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<th>Project</th>
<th>Status</th>
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<tr>
<td>Anesthetic complications of pregnant patients undergoing neurosurgical procedures</td>
<td>Data collection complete, abstract accepted for presentation at the Society for Obstetrical Anesthesia and Perinatology Annual Meeting 2013.</td>
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<td>Title</td>
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<tr>
<td>Respiratory complications and death after infratentorial tumor resection</td>
<td>Data analysis complete, abstract accepted for presentation at the International Anesthesia Research Society Meeting 2013. Manuscript submitted.</td>
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<td>The Pharmacokinetics and Pharmacodynamics of Dexmedetomidine in Patients with Seizure Disorders</td>
<td>Data analysis complete, manuscript in preparation.</td>
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<tr>
<td>Mentorship among anesthesia residents in Canada</td>
<td>Data collection complete, analysis underway.</td>
</tr>
<tr>
<td>The efficacy and safety of tranexamic acid in complex skull base neurosurgical procedures: a retrospective cohort study</td>
<td>Ethics application awaiting VCH approval. Application submitted for medical student summer studentship (Dmitry Mebel).</td>
</tr>
</tbody>
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**Dr. Donald Griesdale**
Peer reviewer, New England Journal of Medicine, July 2012
Peer reviewer, Cochrane Collaborative, July 2012
Grant reviewer, Technology Evaluation in the Elderly Network ([www.techvaluenet.ca](http://www.techvaluenet.ca)), Nov 2012
Research Director, Critical Care Residency Training Committee, UBC
Medical Director, Respiratory Therapy, Vancouver General Hospital

**Dr. Cynthia Henderson**
Head, Section of Neuroanesthesia, Canadian Anesthesiologists’ Society
Moderator, Neuroanesthesia Lectures at Canadian Anesthesiologists’ Society Meeting June 2012
Organizational Structure
All members of the Division of Thoracic Anesthesia carry a cross-appointment in the division of cardiac anesthesia. About 60 percent of the 200-220 annual thoracic surgical days are staffed with members of the thoracic anesthesia division.

Dr. Paul Kapnoudhis has left the division to focus on cardiac care, however continues to participate in lung transplantation. Drs. Harper and Hamed Umedaly continue to participate in lung transplantation as part of the Division of Thoracic Anesthesia.

Current staffing levels may be inadequate going forward due to increasing transplantation demands and possible increases in surgical volume. The division of thoracic anesthesia may need to recruit one or two members (externally or internally) in the near future.

Clinical Practice
The Division of Thoracic Surgery at VGH performs the full complement of thoracic surgical procedures, including lung, esophageal and mediastinal surgery as well as lung transplantation. Annually, we perform about 600 lung resections, of which half are major lung resections (lobectomy, pneumonectomy). There is an increasing focus on minimally invasive techniques, with approximately half of all major lung resections being performed with thoracoscopy. The number of esophageal resections and mediastinal tumor resections has been stable around 50-70 and 30-40, per year respectively.

Vancouver General Hospital is the only site in British Columbia to perform lung transplantsations. The number of transplants is variable but has been steadily increasing over the last 5 years, in part related to surgical personnel changes. Over the last two years we have seen a further increase in the number of transplants, likely due to the increasing practice of donation after cardiac death. We performed 25 lung transplants this past year, which is the highest number ever for our program. Future plans include the development of an ex-vivo graft perfusion program and the recruitment of additional transplant surgeons. The Division’s transplant volumes are therefore expected to further increase.

All members of the thoracic division participate in lung transplantation. Due to the highly specialized care required, which entails aspects of thoracic and cardiac anesthesia, as well as transesophageal echocardiography, the division is made up entirely of members of the division of cardiac anesthesia.

We have started to further integrate ourselves in the transplant workup by attending multidisciplinary lung transplant rounds whenever feasible.

Thoracic surgery at VGH previously acts as the first Canadian site for diaphragmatic pacemaker implantations for patients with severe neuromuscular disorders.

VCH is currently recruiting a transplant surgeon with the expressed goal of establishing an ex-vivo transplant organ perfusion program. This would greatly benefit the safety of and the
expansion of the lung transplantation program, but also benefit other solid organ transplant programs.

**Education**

All Anesthesia residents rotate through thoracic anesthesia at VGH during their senior years, and may receive additional exposure at other sites (Surrey, Kelowna). As part of their VGH rotation, all residents receive pre-rotation goals suggestions regarding reading materials. Selected articles are available as pdf files on a resident-maintained website and on the departmental hard drive. All members of the division take an active role in resident education.

Residents are expected to present thoracic rounds during their subspecialty rotation. The focus of rounds is on interests common to residents and anesthesiologists, and not necessarily subspecialty members.

Residents are encouraged to attend lung transplantations. However, due to the significant perioperative risks and time pressures, resident involvement is limited to primarily observation (which is communicated to residents at the beginning of the rotation). Participation in lung transplants is therefore not mandatory.

During the past year Drs Finlayson and Lohser have sought the feedback from 19 senior anesthesia residents who completed their thoracic rotation within the last two years. As part of the survey we ensured adequate exposure levels to surgical procedures and anesthetic techniques. All residents ranked their rotation as one of their most favorite rotations throughout residency. The teaching by thoracic subspecialty members was rated as very good to excellent.

A fellowship is not routinely offered. The division did have an international research fellow in 2010-2012 who actively participated in research in thoracic anesthesia. A clinical fellowship is not currently offered for logistic reasons, however a thoracic experience is provided to our cardiac anesthesia fellows.

**Research**

With the help of a foreign research fellow (Dr Ishikawa), the division has completed a study on perioperative renal dysfunction amongst patients undergoing thoracic surgery. The study consisted of two components. One part of the study focused on lung resection surgery and was published in Anesthesia & Analgesia in 2012 (Dr Lohser). The second component, which focused on lung transplantation was recently submitted for publication in 2013 (Dr Lohser).

We completed a study evaluating a novel intubation tool for endobronchial tubes. The project was done by two residents (Drs Mike Wong and Julia Haber) in collaboration with Dr Lohser and presented at the Society of Cardiovascular Anesthesiologist meeting in Boston 2012.

**Quality Assurance**

We continue to look at the feasibility of developing a thoracic database. Postoperative care in the PACU and on the Perioperative Pain Service is of the highest quality. The division meets regularly for discussion of aspects of lung transplant care.
The Hugill Anesthesia Research Centre is a collaborative initiative within the Department of Anesthesiology, Pharmacology & Therapeutics. Using in vitro and in vivo laboratory techniques, our research explores the neuropharmacology of anesthesia and analgesia.

**PROJECT REPORTS**

1) **Trigeminal Neuralgia Model**

Bernard MacLeod

The current treatment of trigeminal neuralgia (TN) is often unsatisfactory. To improve understanding and aid in the development of new treatments we set out to develop a new model.

Glycine is involved in inhibition of pain pathways at the cord level. This is reversed by the specific glycine antagonist strychnine. Under brief halothane anesthesia the maximal tolerated dose of strychnine 0.3 µg in 5 µl was injected into the cisterna magna of a mouse. A paired mouse, in a side-by-side observation chamber, was injected with artificial CSF (aCSF). A blinded observer determined which showed an exaggerated response to light touch. In 8 of 8 pairs, the mouse receiving strychnine had the greatest allodynia (P = 0.008, Wilcoxon signed rank test). Allodynia occurred only in the trigeminal nerve distribution. To investigate the ability of this model to detect effective treatments, carbamazepine 4 ng given with strychnine 0.3 µg in 5 µl was compared to strychnine alone. Allodynia was greatest in the 6 mice injected with strychnine alone (P = 0.031).

The method is humane; no surgery is required, the mouse has no distress in the absence of touch, and even this lasts only 15 minutes. The demonstration of reversal by the most effective clinical agent predicts the ability to screen new drugs. This technique permits the use of the vast repository of transgenic mice to study the cellular and tissue-specific mechanism of drugs and diseases. The transcutaneous injection of strychnine into the area over the trigeminal nucleus results in rapid, short lasting, predictable trigeminal allodynia which was abolished by conventional agents.

2) **GABA\textsubscript{B} receptor-modulated selective peripheral analgesia by the non-proteinogenic amino acid, isovaline**

Bernard MacLeod

Peripherally restricted analgesics are desirable to avoid central nervous system (CNS) side effects of opioids. Nonsteroidal anti-inflammatory drugs produce peripheral analgesia but have significant toxicity. GABA\textsubscript{B} receptors represent peripheral targets for analgesia but selective GABA\textsubscript{B} agonists like baclofen cross the blood-brain barrier.
Recently, we found that the CNS-impermeant amino acid, isovaline, produces analgesia without apparent CNS effects. On observing that isovaline has GABA\textsubscript{B} activity in brain slices, we examined the hypothesis that isovaline produces peripheral analgesia modulated by GABA\textsubscript{B} receptors. We compared the peripheral analgesic and CNS effect profiles of isovaline, baclofen, and GABA (a CNS-impermeant, unselective GABA\textsubscript{B} agonist). All three amino acids attenuated allodynia induced by prostaglandin E2 injection into the mouse hindpaw and tested with von Frey filaments. The antiallodynic actions of isovaline, baclofen and GABA were blocked by the GABA\textsubscript{B} agonist, CGP52432, and potentiated by the GABA\textsubscript{B} modulator, CGP7930. We measured Behavioural Hyperactivity Scores and temperature change as indicators of GABAergic action in the CNS. ED95 doses of isovaline and GABA produced no CNS effects while baclofen produced substantial sedation and hypothermia.

Immunohistochemical staining of cutaneous layers of the analgesic test site demonstrated co-localization of GABA\textsubscript{B1} and GABA\textsubscript{B2} receptor subunits on fine nerve endings and keratinocytes. We determined isovaline's effects in a mouse model of osteoarthritis. Using a new assessment of mobility, isovaline restored performance during forced exercise to baseline values, Isovaline represents a new class of peripherally restricted analgesics without CNS effects, modulated by cutaneous GABA\textsubscript{B} receptors.

3) Exercise Tolerance: A Novel Distress-Free Model to Assess Experimental Osteoarthritis in Mice.

Bernard MacLeod

Osteoarthritis is a debilitating degenerative joint affecting over 80% of the human population above age 75 years. Unfortunately, there is no gold standard model to study osteoarthritis in experimental animals; hindering the understanding of the pathology and limiting the development of new treatments. Most behavioural tests measure indirectly knee joint pain rather than function. We developed a novel, non-invasive technique to assess the progression of osteoarthritis in mice which examines the function of the knee joint in terms of the ability to exercise under both forced and voluntary conditions consistent with the fact that immobility is the most debilitating aspect of osteoarthritis in patients.

To induce osteoarthritis, C57BL/6 mice were injected intra-articularly with monoiodoacetate (MIA); the control group received saline. On day 1, 3, 8 and 22 post-injection, the ability to exercise under forced and voluntary conditions were determined and compared to the commonly used limping score and mechanical pain sensitivity using von Frey filaments. Forced exercise ability was determined as the number of stumbles and slips occurring while running in motorized wheel system at a low speed. Voluntary exercise ability was measured (using modified bicycle odometers) as the time spent running on individual voluntary exercise wheels over night.

MIA treated mice demonstrated decreased forced and voluntary exercise ability compared to control; they spent significantly less time running on the voluntary wheels than control mice for the first week post injection (Day 1: 0.2 + 0.1 hr vs. 2.2 + 0.6 hr, Day 3: 2.1 + 0.3 hr vs. 4.4 + 0.4, p< 0.05, repeated measures ANOVA) and experienced more slips during forced exercise than control mice on day 3 (25.2 + 7.3 vs. 4.5 + 1.7, p< 0.05, repeated measures ANOVA). The limping score was increased for MIA treated mice only for day 1;
while the von Frey threshold showed high inter-animals variability and did not reveal any significant changes between the MIA and control group.

The use of voluntary exercise for the investigation of osteoarthritis offers several advantages over the limping score, von Frey withdrawal or forced exercise: Knee joint function is directly assessed over a prolonged time while causing no distress to the animals. In addition, it is objective, generates little variation and can be applied at low cost. This new technique could enhance our understanding of arthritis and help in developing new therapies.

4) Novel GABA$_B$ receptor agonists in treatment of addiction

Bernard MacLeod

Addiction remains a major problem in society. Costs to the individual, the health care system and society in general, related to addiction (to both legal and illegal drugs) are enormous. Yet despite numerous advances in the field of neuroscience, there are relatively few pharmaceutical therapies available to help treat people with addiction disorders. While cognitive and behavioral training techniques can be helpful, addiction fundamentally remains a neurochemical disorder, in which the addicting drug directly modifies the activity of cells in the nervous system. Therefore, it seems likely that treatments which can alter how these addicting drugs work in the brain offer promise as novel therapies.

To date, substantial progress has been made in both animal models and human clinical trials with drugs that bind to the GABA$_B$ receptors. GABA receptors are a class of receptors found on nerve cells that are widely represented in the nervous system and have been implicated in numerous neurological and psychiatric disorders. In particular, GABA$_B$ receptors are known to play an important role in regulating the nerve cells which are believed to be responsible for many of the behavioral and psychological changes that occur in addicted individuals. Principally, these nerve cells contain the neurotransmitter dopamine, and it is believed that drugs which activate the GABA$_B$ receptor can decrease the ability of addicting drugs to alter levels of dopamine in the brain, thereby preventing addiction.

The goal of the present proposal is therefore to test the therapeutic potential of isovaline as a treatment for addiction. This will be performed with state-of-the-art animal models, which have proven to be excellent predictors of therapeutic effects in humans. As we have to focus on one addictive drug in particular, we have chosen to focus on cocaine. This drug is particularly addictive, and its use spans the entire spectrum of society. There are currently no effective treatments for cocaine addiction, despite much being known about how the drug works in the brain.

Our central hypothesis is that the GABA$_B$ receptor drug isovaline will decrease addiction-like behaviors in a rodent model of cocaine addiction. Specifically, isovaline will decrease the “craving” for cocaine, which will be measured by how much the trained animal demonstrates its willingness to work for a cocaine reward.

In order to model addiction in the rodent, we will use the “gold standard” technique of IntraVenous Self-Administration (IVSA). This is widely considered to be the best model of addiction, as it allows the animal to learn to take the drug for itself, rather than be given the drug by the experimenter. Animals are taught to press a lever a given number of times, after which a computer-controlled system gives them an infusion of intravenous cocaine via a catheter that has been implanted in their jugular vein. In this model, rats can be trained to
5) GABA$_B$ agonist actions in a mammalian expression system.

Ernest Puil

Isovaline is a rare amino acid that has been found to have analgesic properties\(^1\). The \(\gamma\)-aminobutyric acid type B (GABA$_B$) receptor has been implicated in isovaline’s mechanism of analgesic action in both brain slice experiments and whole animal studies. The GABA$_B$ receptor is a G-protein coupled receptor that is responsible for inhibition in the central nervous system 2. It is an obligate heterodimer composed of a GABA$_{B1}$ and a GABA$_{B2}$ subunit. Agonists such as GABA and baclofen activate the GABA$_B$ receptor by binding to the B1 subunit inducing a conformational change which results in G-protein dissociation and cellular effects. One effect of GABA$_B$ receptor activation is opening of G-protein coupled inwardly rectifying potassium (GIRK) channels. The aim of my experiments was to test the hypothesis that isovaline acts as a direct agonist at the GABA$_B$ receptor.

A heterologous cell expression system was created to test ligand action at the GABA$_B$ receptor. A cell line derived from the anterior pituitary of a mouse (AtT-20) was chosen as these cells contain endogenous GIRK channels\(^3\). AtT-20 cells were transiently transfected with DNA for the GABA$_{B1a}$ and GABA$_{B2}$ subunits using lipofectamine 2000. Ligand action at the GABA$_B$ receptor was determined by measuring its ability to elicit a GIRK current. To measure this whole cell patch clamping in voltage clamp mode was used. The current/voltage (IV) relationship was determined by measuring the current elicited by a series of voltage pulses from -110 mV to +10 mV and the effects of applied drugs on this relationship were assessed.

Untransfected AtT-20 cells did not respond to either 1 µM GABA or 50 µM R-baclofen. When applied via the extracellular solution, both GABA (300 nM & 1 µM) and baclofen (5 µM) were able to reversibly induce a current in transfected AtT-20 cells indicative of GIRK channel activation. Both R-isovaline (50 µM – 1 mM) and S-isovaline (500 µM) did not cause any observable change in the IV relationship. R-isovaline (250 µM and 1 mM) did not affect the responses of transfected cells to GABA (10 nM, 300 nM and 1 µM). The addition of 10 µM R-isovaline to the intracellular solution did not result in a change in either the IV relationship or the response to 1 µM GABA. The GABA$_B$ receptor was expressed and was able to couple to endogenous GIRK channels in AtT-20 cells. Isovaline does not act as a direct agonist, antagonist or allosteric modulator of GABAB receptors coupled to GIRK channels in AtT-20 cells.
6) Comparison of the Systemic Toxicity of Lidocaine to That of Its Quaternary Derivative, QX-314, in Mice

Stephan Schwarz

The quaternary lidocaine derivative, QX-314, has traditionally been considered to be devoid of clinically useful local anesthetic activity. However, we recently found that QX-314, administered peripherally, concentration-dependently and reversibly produces long-lasting local anesthesia with a slow onset in animal models in vivo. As quaternary agents do not rapidly penetrate biological membranes or the blood-brain barrier, QX-314 may represent a local anesthetic with decreased systemic toxicity compared to conventional tertiary aminoamines.

Here, we conducted an in vivo animal study in mice to compare QX-314 to lidocaine in terms of its relative CNS and cardiac toxicity. We found that the relative potencies of QX-314 for systemic CNS and cardiac toxicity were significantly higher than those of lidocaine. Our data do not support the hypothesis that QX-314 per se is a safer local anesthetic compared to lidocaine in terms of systemic toxicity. Whereas our results do not rule out the possibility that QX-314 may represent a useful agent with the potential to produce long-lasting local anesthesia and nociceptive blockade after a single dose in humans, its clinical toxicity relative to the shorter-acting conventional tertiary aminoamide local anesthetics as well as the underlying mechanisms warrant further study.

7) QX-314: In Vitro Studies on a Long-Acting Quaternary Lidocaine Derivative

Stephan Schwarz

Transient receptor potential vanilloid sub-family member 1 (TRPV1) channels are important integrators of noxious stimuli with pronounced expression in nociceptive neurons. The experimental local anesthetic, QX-314, a quaternary (i.e., permanently charged) lidocaine derivative (cf. above), has recently been shown to interact with and permeate these channels to produce nociceptive and sensory blockade in animals in vivo. Little is known, however, about the specific interactions between QX-314 and TRPV1 channels. We therefore set out to examine the mechanistic basis by which QX-314 acts on TRPV1 channels.

We conducted an in vitro laboratory study where we expressed TRPV1 and TRPV4 channels in Xenopus laevis oocytes and recorded cation currents with the two-electrode voltage clamp method. We also used confocal microscopy for Ca2+ imaging in TRPV1 transient transfected tsA201 cells. Our results show that QX-314 exerts biphasic effects on TRPV1 channels, inhibiting capsaicin-evoked TRPV1 currents at lower (micromolar) concentrations and activating TRPV1 channels at higher (millimolar) concentrations. These findings provide novel insights into the interactions between QX-314 and TRPV1 channels and may provide an explanation for the irritant properties of intrathecal QX-314 previously observed in mice in vivo. Initially presented at the Biophysical Society 55th Annual Meeting (Baltimore, ML; March 9, 2011), the full-length article with these results (below) was highlighted in the Faculty of 1000 [F1000] as a Recommended Article of Interest [August 1, 2011].
8) Intravenous Lidocaine for Post-Operative and Neuropathic Pain Control: Supraspinal Mechanisms and Effects on the Hyperpolarization-Activated Mixed Cation Current, I(h)

Stephan Schwarz

The overall aim of these studies is to identify the mechanisms that lidocaine exerts on thalamocortical (TC) neurons to produce postoperative and neuropathic pain relief. Intravenous lidocaine is one of the few efficacious agents in neuropathic pain and also is useful in postoperative pain, where it markedly reduces opioid requirements and associated adverse effects. The mechanisms that underlie the concentration-dependent supraspinal central nervous system (CNS) effects of systemic lidocaine are poorly understood and not solely explained by its classic action on Na+ channels. Among the various other targets implicated in lidocaine’s actions is the hyperpolarization-activated cation current, Ih, which is blocked by lidocaine in peripheral sensory neurons. Ih is highly expressed in the thalamus, a brain area implicated in anesthesia, analgesia, and as a supraspinal site of lidocaine’s systemic actions. In this project, we conducted an electrophysiological study using whole-cell voltage- and current-clamp techniques to record from TC neurons in rat brain slices to test the hypothesis that lidocaine, at clinically relevant concentrations, blocks Ih in TC neurons of the rat ventrobasal thalamic complex in vitro.

We found that lidocaine voltage-independently blocked a slowly-activating Ih in TC neurons, with high efficacy and an IC50 of 72 µM. Lidocaine did not affect the activation kinetics but significantly delayed Ih deactivation. The Ih inhibition was accompanied by an increase in neuronal input resistance and a hyperpolarization of the resting membrane potential (max., 8 mV). The inhibition also was associated with an increased latency of rebound low-threshold Ca2+ spike bursts and a reduced number of action potentials in each burst. At depolarized potentials corresponding to the relay firing mode of TC neurons (>–60 mV), lidocaine’s actions on Ih coincided with a K+ conductance inhibition at 600 µM, resulting in depolarization of neurons (7–10 mV) and an increase in their excitability mediated by Na+-independent, high-threshold spikes.

In summary, lidocaine concentration-dependently inhibited Ih in TC neurons in vitro, with high efficacy and a potency similar or higher compared to that associated with its voltage-gated Na+ channel blockade. This drug effect would reduce the ability of these neurons to produce intrinsic burst firing and δ rhythms and thereby contribute to the concentration-dependent alterations in oscillatory cerebral activity produced by systemic lidocaine in vivo. These findings on a new supraspinal mechanism of intravenous lidocaine also emphasized on the significance of thalamic Ih as an emerging anesthetic & analgesic drug target, which we hope will serve as a basis for developing, in the future, novel and innovative drugs for postoperative and neuropathic pain treatments that are effective, selective, and safe.
FACULTY

BA MacLeod BSc MD FRCPCThe
Associate Professor and Chair

E Puil BSc PhD
Professor Emeritus

CR Ries MD FRCPCThe
Assistant Professor

SKW Schwarz MD Dr med PhD FRCPCThe
Assistant Professor

RA Wall BSc PhD
Associate Professor Emeritus

GRADUATE STUDENTS

K Pitman (PhD Student)
R Whitehead (PhD Student)
K Asseri (PhD Student)

POSTDOCTORAL FELLOWS

N Sallam (PhD)

Publications – please refer to page 144
EXECUTIVE SUMMARY

As part of the Department of Anesthesiology, Pharmacology & Therapeutics (APT), we are committed to excellence in Pharmacology and Anesthesiology education and research through creativity and dedication. Our present research strength is in areas of neural, cardiovascular, respiratory, ion channels, and clinical pharmacology as well as drug development. We have strong collaborations within the Department in Anesthesiology, Pharmacology and the Therapeutics Initiative as well as outside of the Department.

In addition to research efforts, we have maintained our excellence in teaching at the undergraduate, graduate and postgraduate levels in both pharmacology and therapeutics. The department has been offering degree programs in undergraduate and graduate pharmacology. The PCTH 514 seminar series, led by Bernie MacLeod, continue to provide opportunities for our students to share their research interests and accomplishments; and the Department Seminar Series, organized by Harley Kurata, continue to provide an opportunity for faculty and students to be exposed to other related research areas from within and outside the university.

There have been several changes in the profile and composition of faculty members the past year. Roanne Preston was appointed as Head of APT Oct 2012. Catherine Pang was elected Fellowship of the British Pharmacological Society (2012) in recognition of her distinguished service to Pharmacology and the Society. Pascal Bernatchez was promoted from Assistant to Associate Professor. Tillie Hackett has been awarded a 5-year New Investigator Award from St. Paul’s Hospital Foundation/Providence Health Care Research Institute and a grant-tenured track position from APT. Chris Ahern has relocated to the University of Iowa, Nov 2012, and Stephanie Borgland accepted a position at the University of Calgary and will be moving there sometime in 2013. Barbara Mintzes has moved her appointment to the School of Population and Public Health. Darryl Knight has accepted Head position of School of Biomedical Sciences and Pharmacy at the University of Newcastle (January 2013).

The department had our annual departmental skiing, snowboarding and snowshoeing trip at the Cypress Mountain in Jan, 2012. Several undergraduate students, graduate students and faculty members participated in this event.
MEDICAL PHARMACOLOGY

Year 1 – Principles of Medicine

Pharmacology teaching in the MD undergraduate program (MDUP) begins with Principles of Human Biology (Prin) course which runs for 14 weeks in the first term of year 1. The course overall deals with the basic sciences and is an interdisciplinary approach to the structural design and functioning of the human body, integrating major concepts from the fields of anatomy, cell-biology, genetics, physiology, immunology, inflammation and pharmacology. Recognizing that students enter the program with a diverse range of backgrounds and prior degrees, Prin is designed to provide all students with an equivalent foundation of knowledge in these key areas.

Each week contains a combination of lectures, PBL cases, labs, and other learning modalities (workshops, tutorials, etc.) that are centred around a weekly theme. Content in each week is governed by individual Week Chairs. Pharmacology is now included in nearly all of the weeks, both through dedicated lecture slots and through increased incorporation of pharmacology related material into weekly PBL cases. With the exception of the initial three weeks, when fundamental pharmacology principles must be introduced, all subsequent weeks now have direct integration between the pharmacology lecture and the weekly theme (for example, anticancer therapy in Neoplasia Week, pharmacology of neuromuscular blocking agents in the Excitable Membranes week, etc). Students consistently identify this connection as a teaching and learning strength. A list of the pharmacology lectures given in Prin is provided below:

<table>
<thead>
<tr>
<th>Lecture/Session Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Pharmacodynamics 1</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacodynamics 2</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacodynamics 3/21st Century Pharmacology</td>
<td>1</td>
</tr>
<tr>
<td>Cellular Targets of Drug Therapy</td>
<td>1</td>
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<tr>
<td>Anticancer Therapy 1</td>
<td>1</td>
</tr>
<tr>
<td>Anticancer Therapy 2</td>
<td>1</td>
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<tr>
<td>Pharmacology of Eicosanoids</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacology of Glucose Metabolism</td>
<td>1</td>
</tr>
<tr>
<td>Neuromuscular Blockers</td>
<td>1</td>
</tr>
<tr>
<td>Autonomic Pharmacology 1</td>
<td>1</td>
</tr>
<tr>
<td>Autonomic Pharmacology 2</td>
<td>1</td>
</tr>
<tr>
<td>Autonomic Pharmacology Workshop (small groups)</td>
<td>2</td>
</tr>
<tr>
<td>Qualitative Pharmacokinetics</td>
<td>2</td>
</tr>
<tr>
<td>Quantitative Pharmacokinetics</td>
<td>1</td>
</tr>
<tr>
<td>Variability in Drug Response</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacokinetics Workshop (online)</td>
<td>2</td>
</tr>
<tr>
<td>Drug Interactions</td>
<td>2</td>
</tr>
<tr>
<td>Herbal Therapies</td>
<td>1</td>
</tr>
<tr>
<td>Drug Discovery – Molecule to Clinic</td>
<td>1</td>
</tr>
</tbody>
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**Pharmacology Week:**

Of the 14 weeks of Prin curriculum, one week (Pharmacology Week) is devoted entirely to pharmacology teaching. The goal of this week is to provide a foundation of non-drug specific knowledge (for example, pharmacokinetic principles, effects of age on drug disposition) on which students will be able to build drug-specific knowledge in subsequent courses and clinical settings. Although student survey data are not yet available, students in past years have consistently rated the week very highly. Qualitative comments have indicated that students felt that guidance was clear, topics were logically organized, the PBL case and lectures were complementary and well integrated with other concepts covered in Prin, lecture delivery was clear and effective, and that students were able to achieve the intended learning outcomes.

The Pharmacology Week PBL case consistently receives positive reviews from tutors and students and undergoes continual revision and updating, both to incorporate qualitative feedback and to ensure that prescribing guidelines and regulatory information is current. Two teaching innovations in this week that have proven to be effective and well received by students include podcast lecture delivery and a self-directed pharmacokinetics workshop. The podcast lectures provide students with an opportunity to view and review quantitative pharmacokinetic principles, pausing the lecture to work through calculation-based problem solving exercises at their own pace. Over 95% of previous years’ students agreed or strongly agreed with the statement “I found it valuable to be able to pause/rewind the lecture”, and 84% agreed or strongly agreed that it was “easier to do the problem solving activities that were part of the lecture as compared to doing them during a live lecture”. The accompanying self-directed pharmacokinetics workshop has been similarly well received, with 89% of students responding that the pharmacokinetics self-directed problem set activity helped them understand how to apply the quantitative pharmacokinetics principles taught in the podcast lecture.

**Year 1 & 2 – Foundations in Medicine**

The Foundations in Medicine (FMED) course that follows Prin provides a systems-based approach to medical education from term 2 of year 1 through the end of year 2. Like Prin, teaching modalities include lectures, labs, PBL cases, and small group workshops. Content is presented as a series of 5-week blocks (Cardiovascular, Pulmonary, etc), each of which is overseen by the respective Block and Week Chairs. Because these individuals set the lecture schedule for their weeks, the extent to which pharmacology teaching is included is under their control. Through the persistent efforts of the Pharmacology Theme Directory, Stan Bardal, an increasing number of the highly sought-after lecture hours in each of these blocks is being assigned to Pharmacology and Therapeutics. A list of the pharmacology lectures given in FMED is below:

<table>
<thead>
<tr>
<th>FMED Block</th>
<th>Lecture/Session Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Host Defenses &amp; Infection</td>
<td>Antibiotics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bacterial Resistance</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Introduction to Antiviral Therapy</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Antifungals</td>
<td>1</td>
</tr>
</tbody>
</table>
Cardiovascular  Antihypertensive Pharmacology  1  
Pharmacology and Treatment of Arrhythmias  1  
Therapy of MI, Ischemia and Infarct  1  
Principles of Treatment of CHF  1  

Pulmonary  Pharmacology of Pain and Local Anesthetics  1  
A Clinical Approach to Asthma/COPD  1  
Pharmacology of Nicotine and Smoking Cessation  1  
Pharmacology of Anticoagulation  1  

Fluids, Electrolytes, Renal & Genitourinary  Diuretics  1.5  

Gastrointestinal  Gastrointestinal Pharmacology  1  
Musculoskeletal  Pharmacology of NSAIDS  1  
Approach and Treatment of Inflammatory Arthritis  1  
Pharmacology of Metabolic Bone Disease & Osteoporosis  1  

Endocrine & Metabolism  Pharmacological Management of Diabetes  1  
Scientific Basis of Treatment of Lipid Disorders  1  
Lipid Cases  1.5  
Pharmacology of Steroids  1  

Brain and Behaviour  Pharmacology of Drugs Used in Acute Pain: Opioids  1  
Pharmacology of General Anesthetics  1  
Pharmacology and Therapeutics of Chronic Pain  1  
Management of Headache  1  
Psychopharmacology of Mood and Anxiety Disorders  1  
Alzheimer’s Disease Treatment Strategies  1  
Psychopharmacology of Psychotic Disorders  2  

Reproduction  Contraception  1  
Side Effects/Complications of Hormone Therapy  1  

Nutrition, Growth & Development  Perinatal Pharmacology  1  
Substance Abuse (Risky Behaviours)  1  

**Year 3**

Pharmacology content in Year 3 continues to be delivered on a primarily ad hoc basis. This is a function of the design of the clerkship system, where students are scattered throughout the province, learning different material, at different times. Attempts are being made to work within this system, developing asynchronous learning materials such as modules and podcasts that can be accessed by students on demand.

An online case-based pharmacology learning module that includes both pharmacokinetic and pharmacodynamic concepts was introduced as part of the anesthesiology rotation last year. It was designed under the guidance of Applegarth to complement the students’ operating room learning experience.

**Year 4**
The majority of pharmacology teaching in Year 4 occurs in the Preparation for Medical Practice course. There are approximately 20 hours of pharmacology taught, and this is mostly delivered in the form of lectures. Topics covered include antibiotics, cardiovascular, respiratory, psychiatry, general therapeutics, pharmacogenetics, pain management, pharmacokinetics, drug interactions, drug use in the elderly, physician interactions with pharmaceutical industry, and prescription writing. Faculty members from APT deliver the majority of the content.

**Integration of Pharmacology Teaching**

The integration of pharmacology teaching within the core curriculum and its translation to the clinical setting have been ongoing goals of pharmacology educators within the Anesthesiology, Pharmacology and Therapeutics Department and the MDUP overall for many years. Although significant progress has been made, there is still much room for improvement. This is being pursued from a number of perspectives, some of which are highlighted below:

**Role of the Pharmacology Theme Director**

The Pharmacology Theme Director has been instrumental in liaising with FMED block chairs to facilitate increased pharmacology instruction in the first two years of the curriculum. As a result of his efforts, several lecture hours have been returned to the pharmacology department for curriculum design and/or delivery. He has also worked with the Evaluation Studies Unit to create a systematic survey of pharmacology education within the program in order to establish a baseline from which future changes and improvements can be initiated. The Pharmacology Theme Director was recently awarded the Certificate of Merit from the Canadian Association of Medical Educators, for his contributions to pharmacology education.

**The Virtual Patient**

The Virtual Patient (VP) provides students with an opportunity to gain practice integrating pharmacology knowledge by developing efficient prescribing skills while managing a (virtual) patient who presents with multiple medical problems. Through this exercise students become aware of the issues and potential harms that can arise from polypharmacy. The VP program works like a decision tree in which students are exposed to multiple potential scenarios depending on the path that is set by the students’ decisions along the way. The VP currently has over 160 different branch points, which provides considerable variety for students and allows them to re-enter the program to pursue alternative outcomes as they modify their patient management approach.

This program addresses integration at three different levels: (1) the integration of drug management between various disease states; (2) the integration of knowledge between different curricular themes, such as radiology, pathology, evidence based medicine, patient safety and interprofessionalism; (3) the integration of basic and clinical sciences, as students are challenged to explain the mechanisms behind drug side effects, how this relates to patient monitoring, and how this influences their selection of the most appropriate drug(s) for their patient.
Pharmacology Textbook
The Applied Pharmacology textbook, co-authored by a faculty member in the MDUP, was published in late 2010. The textbook was written with medical students as the target audience, and is structured to complement the UBC medical curriculum. The book integrates basic science and clinical pharmacology, as well as evidence based medicine, in a concise and easy to read format. The book is recommended for UBC medical students.

Podcast Lectures
Many pharmacology lectures are now available as recordings that students can access online. This allows them to integrate clinical encounters from their experiences on the wards with the relevant basic science pharmacology in an on-demand fashion when it is most relevant to their individual learning. The library of pharmacology lectures that is available is continually expanding.

UBC Formulary
The UBC Drug Formulary is a new initiative that debuted as a prototype during the 2012-13 academic year. The Formulary is a list of 150 drug classes that will form the backbone of the pharmacology curriculum in the MD undergraduate program. The classes must be seen/taught at least once, but in many cases multiple times, and it will be made clear to students that they must know these drugs and be able to apply their knowledge in clinical situations, particularly as they begin their clinical rotations in Year 3 (‘must-see/know/apply’). Dr. Bardal has recently been awarded a $14200 Teaching and Learning Education Fund (TLEF) grant that will be used to develop the Formulary, which currently exists as a static list, into an interactive ‘app’ that students will be able to download free of charge for use on their mobile devices, tablets, etc. The app will have database functions, allowing students to sort drugs by various queries, such as Indication. The app will also utilize a social media component, allowing students to share drug information with each other in a medium that is popular with this current generation. It is hoped that APT Faculty will get involved with monitoring this web chatter, perhaps answering questions and acting as a resource as needed. The anticipated completion date for the app is September 2013.

Curriculum Renewal
The planning process for the new UBC MDUP curriculum continues, with implementation expected for the 2014-15 academic year (one year later than originally planned). The new curriculum will again feature small group learning tutorials, although the exact format of these tutorials has not been established. It appears that the new curriculum will eliminate the PRIN course, to be replaced by a 2-3 week transition into medical school that will precede the beginning of classes in the Autumn. It is anticipated/expected that Pharmacology will have a number of lectures during this 2-3 week transition period. Once the transition into medical school period is complete, students will then begin courses that at least on the surface are similar to current content in FMED. The final term of second year will be a transition into clinical clerkships, with the intent of better preparing students for clinical rotations beginning in Year 3. An overarching goal of the new curriculum is to integrate basic science and clinical medicine throughout all four years of the curriculum, rather than simply focusing on basic science in the first two years and clinical medicine in the final two years (commonly referred to as the Flexnarian 2+2 model). For the department, this will likely mean enhanced opportunity for teaching in the ‘clinical years’ (years 3 and 4). There is still a plan to divide the Vancouver students into ‘academic learning communities’,
although for the first two years of the program, this will likely not have a major impact on lectures, small group tutorials and labs, as these will likely still be based at UBC LSC and DHCC (VGH).

**B.Sc. Pharmacology**

We have been offering the B.Sc. Pharmacology program (Major, Honours and Co-op education) for over 30 years with students accepted after finishing two years of prerequisite education in the Faculty of Science. We presently have 24 students in 3rd year and 24 students in the final year of the B.Sc. pharmacology program. For the academic year 2011-12, 12 of our co-op (internship) students have been undertaking 12-16 months of research internships in pharmaceutical and academic laboratories (Hoffmann La-Roche at New Jersey, Genentech at San Francisco, Medical University of Vienna, as well as Cardiome Pharma and QLT Inc in Vancouver and various academic labs in UBC). The quality of our undergraduate students remains strong. Pharmacology has 32 students attaining Science Scholar standing (>90% average) in 2012. In perspective, the BSc Pharmacology program admitted less than 1% of undergraduate science students (n = 7,000), but has 30% of the top science students in 2012.

In addition to the 3rd and 4th year Pharmacology courses that form the core of the B.Sc. program, we also offer two 3rd year general pharmacology courses to science students in disciplines outside of pharmacology (PCTH 305 and PCTH 325; 6 and 3 credits, respectively). In Jan 2012, we started offering a new course (MIDW 125, 3 credits) that focuses on midwifery pharmacology for students in the midwifery program. A proposal for a new second year course (PCTH 201, “Drugs & Society”, 3 credits) has been accepted by the curriculum committees of the Faculty of Science and the University’s Senate Curriculum Committee. PCTH 201 will target primarily undergraduate arts students who require 6 science credits for completion of the Bachelor of Arts degree.

*Undergraduate Pharmacology Courses taken by BSc Pharmacology students*

**PCTH 300 Introduction to Pharmacology (6 credits).** Lectures on the concepts, language and techniques of scientific pharmacology. Intended primarily for Honours and Major students in Pharmacology. Course directors: CCY Pang/S Karim.

**PCTH 302 Introductory Pharmacology Laboratory (3 credits).** A series of experimental demonstrations and individual laboratory experiments illustrating the basic principles of pharmacology. The laboratory part of the course also includes two debates on controversial topics (pharmacology related) and literature research, writing and presentations of an assigned topic to students and faculty. Course directors: S Karim/CCY Pang.

**PCTH 305 Basic Human Pharmacology (6 credits).** Lectures and assigned reading on the effects, mechanisms of action, absorption, distribution, fate and excretion of major classes of therapeutic agents. Indications for the use of particular drugs are discussed in terms of risk versus benefit for the individual and for society. Course director: CCY Pang. *(In recent years, PCTH 305 and PCTH 300 are taught concurrently).*
**PCTH 325 Rational Basis of Drug Therapy (3 credits).** The principles and applications underlying the action and disposition of therapeutic agents (including alternative medicines) in the body. Use of drugs as tools in experimental research. Course director: J Shabbits

**PCTH 398 Co-operative Work Placement I. (3 credits).** Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Technical reports are required. Restricted to students admitted to the Co-operative Education Program in Pharmacology. Course director: CCY Pang.

**PCTH 399 Co-operative Work Placement II. (3 credits).** Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Technical report required. Restricted to students admitted to the Co-operative Education Program in Pharmacology. Course director: CCY Pang.

**PCTH 400 Systematic Pharmacology (6 credits).** Lectures and discussions in scientific pharmacology. All aspects of the study of drugs will be covered, but the course will concentrate on the scientific aspects of the pharmacology of neurohumoral transmission, mathematics of pharmacology cardiovascular and clinical pharmacology and, to a less extent, on the pharmacology of various organs and tissues. Course director: BR Sastry.

**PCTH 402 Systematic Pharmacology Laboratory (6 credits).** A series of demonstrated, group and individual, laboratory experiments designed to illustrate the concepts and hypotheses of pharmacology. The course is restricted to Honours students in Pharmacology, but may be taken by others with permission of the course director(s). Course directors: CCY Pang/S Karim.

**PCTH 404 Drug Assay and Pharmacometrics (3 credits).** The techniques, including methods of statistical analysis, used to detect and measure the actions of endogenous or exogenous chemicals, using chemical and bioassays as appropriate. Enrolment limited to students in Pharmacology but may be taken by others with permission of the Department Head. Course director: JG McLarnon.

**PCTH 448 Directed Studies in Pharmacology (2-6 credits).** Advanced investigation of a specific topic in Pharmacology under supervision of a faculty member. Course director: S Karim.


**PCTH 498 Co-operative Work Placement III. (3 credits)** Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Technical report required. Restricted to students admitted to the Co-operative Education Program in Pharmacology. Course director: CCY Pang.

**PCTH 499 Co-operative Work Placement IV. (3 credits).** Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months.
Technical report required. Restricted to students admitted to the Co-operative Education Program in Pharmacology. Course director: CCY Pang.

**GRADUATE PHARMACOLOGY**

Recently, the number of students applying into our graduate program over the last 13 years has been examined. About 30 students apply every year and the intake has been around 5 per year. The overall number of graduate students in any year in the department is around 30 and on the average, about 5 students graduate with degrees every year. In recent years, the number of students graduating outpaced the incoming numbers.

We are exploring the possibility of enhancing the intake in the coming years. In addition, diversification of sources of financial support is being considered. To promote graduate studies in the department, a half page ad was placed in ASPET journal for exposure to students interested in pharmacology and therapeutics research. Faculty members with cross-appointments with other departments are encouraged to enroll their students in the pharmacology graduate program instead of in others.

Drs. Pang and Sastry are meeting with graduate students twice a year to discuss their progress and concerns.

In 2012-13, 5 students graduated with PhD and 3 with MSc. Four new graduate students were accepted in this year. We have 3 students leaving our program: 1 moved to USA along with the supervisor, 1 dropped out of the PhD portion of the MD/PhD program and 1 dropped out of the Ph.D. program with his supervisor leaving for Australia.

**Graduate awards:**

The departmental web site has the list of awards available with a description of the awards, how to apply, deadlines and how they are adjudicated.

The department’s minimum stipend for supporting graduate students has been set at the minimum stipend provided by CIHR (currently, $17,500 /year). Our Graduate Student Initiative (GSI) allocation was sufficient to cover all eligible students’ tuition for this year.

The following awards from 2011-12 are in their second year of support: 3 CIHR doctoral awards, 1 CIHR award at master’s level, 1 NSERC doctoral award, 3 4YF graduate awards and 2 Saudi Arabia government scholarships. In addition, this year, 1 student received the CIHR doctoral award 1 student the 4YF award and the Mental Health Training award, and 1 student received an industrial award. In total, graduate students in the department have 4 CIHR doctoral awards, 1 CIHR master’s award, 1 NSERC doctoral award, 4 4YF awards, 1 Mental Health Training award and 3 awards from outside Canada.

**Publications:**

The department has recently started gathering information on publications by graduate students. During 2011-12, there were a total of 9 peer-reviewed publications, 1 review article
and 4 conference abstracts. In 2012-13, 13 papers, 2 reviews and 2 abstracts were published. Publications were in journals including Anesthesiology; Biochem. Biophys. Res. Comm.; Cochrane Reviews; J. Biol. Chem.; Mol. Pharmacol; PLoS One; Prog. Brain Res.; Vascular Pharmacol.; etc. Considering that the department has about 30 students, this suggests that we have 0.3 peer-reviewed publications per student per year. Projecting to a 4 year period, our graduate students generate 1-2 peer-reviewed publications during graduate study. Students are encouraged to participate in conferences and publish in high impact journals.

Publications – please refer to page 144

Graduate Courses

The Department offers a number of graduate courses. Students can now select courses that are best suited to their particular programs – these may include some (but not necessarily all) the pharmacology graduate courses offered by the Department.

A minimum prerequisite to enrol in the following courses is PCTH 305 or its equivalent. If not already taken, PCTH 400 and 404, or their equivalent, are also highly recommended.

Compulsory courses

1. PCTH 514 (1 credit at the completion of a MSc/PhD program) Seminar in Pharmacology & Therapeutics – To give students experience in the presentation of data and to enhance communication skills in the discussion of scientific topics. All students will present at least one seminar during their graduate work and are expected to attend all seminars. Note: Students must register for this course every year.

2. PCTH 548f: Research Methods in Pharmacology. Offered yearly, split over Term 1 & 2 (Sept – Apr)
Course Structure: Five discrete modules designed to cover aspects of generic research methods common to Pharmacology and Therapeutics. Students will be expected to take a minimum of 3 modules out of the 5 provided. Note that Modules 1 and 3, and 2 and 4 will run concurrently in the Fall and Winter, respectively, but upon alternate weeks so that it is possible for students to take both modules at once if desired. Module 5 is compulsory for ALL students. Each module will be directed by a Faculty member and their mandate is to run the module as they see fit, guided by the module descriptions outlined below. The Directors could co-opt tutors for the individual modules or lead them themselves. The module director would work with the Course Director as well as the tutors to develop strategies for student evaluation and examination etc.

Modules:
1. The tissue-hardware interface: data collection and analysis (sessions 1-5)
   Module Director: D Fedida
   Good laboratory practices, research ethics, data acquisition, analysis, manuscript preparation, journal club, paper reviews.
2 Fundamentals of laboratory procedures (sessions 6-9)
Module Director: P Bernatchez
In vivo and in vitro methodologies, handling of animals, cell culture, histology, transfection, PCR, gel electrophoresis, Western blots, etc.

3 Therapeutics: How are the effects of medicines evaluated? (in parallel with sessions 1-5).
Module Director: J Wright
Evidence based medicine, experimental design, Cochrane collaboration, meta-analysis, systematic review, pharmaco-epidemiology, etc.

4 Therapeutics: Evaluating benefits and harm of drug therapy (in parallel with sessions 6-9)
Module Director: V Musini
Project work with Therapeutics Initiative groups, evaluation of clinical trial reports, submitting protocols and completing reviews with Cochrane review groups. Drug regulation in Canada; drug reviews; provincial drug benefit plans.

5 Completion- Dissemination of results (sessions 10-12) – COMPULSORY MODULE
Module Director: A Barr
Writing of manuscripts and grant applications; effective presentations and translation of research into intellectual property.

Elective courses

PCTH 500 (3 credits) Molecular Aspects of Drug Action at the Membrane Level – Lectures, discussions, and assigned reading on actions of drugs on ion channels, receptors and intracellular processes and the methodologies used including electrophysiology, cellular imaging, molecular neurobiology and micro-dialysis. (Given in the fall term of even numbered and alternate years.) Course director: JG McLarnon

PCTH 502 (4 credits) Drugs and Intercellular Communication (including Neuropharmacology) – The overall objective is to examine how excitable cells communicate with each other and how and where drugs act to affect this communication. Lectures, discussions, and assigned reading on the actions of drugs on the production, release, and cellular effects of hormones and neurotransmitters. (Given in odd numbered and alternate years.) Course director: BR Sastry

PCTH 512 (3 credits) Experimental Design and Analysis in Pharmacology – A series of lectures, tutorials and exercises designed to improve student skills in the design and statistical analyses of pharmacological experiments. (Given in odd numbered and alternate years.) Course directors: MJA Walker/C Dormuth)
PCTH 513 (4 credits) **Pharmacology of Drugs Used in Anesthesia Care** – Advances in the pharmacological aspects of anaesthesiology. Conferences, assigned reading, oral presentations and laboratory exercises demonstrating the actions of drugs as currently applied in the practice of anaesthesiology. (Given yearly). Course directors: E Puil/B MacLeod

PCTH 548 (2-6 credits) **Directed Studies in Pharmacology** – (see details below and also under compulsory courses)

Course director: PCTH Graduate Advisor

**PCTH 548 a: Directed Studies 2 credits**

1. As for Graduate Students in the Faculty of Dentistry, this is a required course for their program.

2. For PCTH graduate student, this is a course for doing literature search of a related, but not part of the student’s thesis research project with a faculty member who is not the student’s thesis supervisor. The student is required to write up a research report upon the completion of the research project. The course supervisor will mark the report and submit a score (%) to the Dept Graduate Advisor.

This is a restricted course. For enrolment, a graduate student is required to submit a research proposal to the Dept Graduate Advisor for approval and the Dept will then enroll the student in the course.

**PCTH 548 b: Directed Studies (1st Term only) - 3 credits**

**PCTH 548 d: Directed Studies (Terms 1 & 2) - 6 credits**

**PCTH 548 e: Directed Studies (2nd Term only) - 6 credits**

To conduct a laboratory research project with a faculty member who is not the student’s thesis supervisor. The project may or may not be related, but should not be part of the student’s thesis research project. The student is required to write up a research report upon the completion of the research project. The course supervisor will mark the report and submit a score (%) to the Dept. Graduate Advisor.

All of these are restricted courses. For enrolment, a graduate student is required to submit a research proposal to the Dept. Graduate Advisor for approval and the Dept. will then enroll the student in the course.

**PCTH 548c (replacing PHYL 526 –starting 2011W offered in alternate year): - 3 credits**

**Ion channels of excitable membranes.**

Instructors: E Accili, D Fedida, S Kehl, F van Petegem, D Mathers, D Steele.
Description: The course will involve the study of the biophysics of excitable membranes. This will begin with the Hodgkin-Huxley model of excitation and the classical biophysics of the squid giant axon. This section will be reinforced by a computer simulation “lab” in which a self-directed teaching program will be used to illustrate fundamental features of ion channel kinetics. We will move on from there to a more detailed study of different ion channels to consider their structures, methods of measurement and their biophysical properties such as gating kinetics and ion selectivity. Finally, we will consider some human diseases of ion channels, the so-called channelopathies, and their structural bases.

PCTH 548F: (see under compulsory courses)

PCTH 549 (12 credits) M.Sc. Thesis

PCTH 649 (0 credits) Ph.D. Thesis

Comprehensive examination

Details regarding the timing and format of the comprehensive examination are contained in the “Policies and Procedures” document. Briefly, students are required to complete their comprehensive examination no later than 18 months from the time of their entry into the Ph.D. program. This also applies to students transferring from a Master’s into a Ph.D. program – that is, the 18 month time-line begins when their transfer into the doctoral stream has been officially approved. The format of the written component of the comprehensive examination is a CIHR-type grant application. The grant proposal can be in the general area of the student’s thesis research but not solely the thesis research itself, and should not be based on a grant previously written by the supervisor. Prior to embarking on the final write-up of their proposal, students are required to submit a detailed outline of their proposal for “pre-approval” by their committee to ensure that the student is “in the right track”. The examination committee consists of the student’s supervisory committee to which is added an individual with expertise in the research area encompassed by the grant proposal. The oral component of the comprehensive examination consists of an oral presentation of the proposal by the student, followed by questioning on areas relevant to the proposed work. Students can be granted either an unconditional pass, or a conditional pass, with clearly stipulated requirements (such as a written assignment, for example). Students who are unsuccessful in passing the comprehensive examination may have their examination adjourned and can be examined again within a 6-month period. If a student is unsuccessful, he/she will be required to withdraw from the Graduate Program.
The Therapeutics Initiative (TI) was established in 1994 by the Department of Pharmacology and Therapeutics in cooperation with the Department of Family Practice at The University of British Columbia with its mission to provide physicians and pharmacists with up-to-date, evidence-based, practical information on prescription drug therapy. To reduce bias as much as possible, the TI is an independent organization, separate from government, pharmaceutical industry and other vested interest groups. We strongly believe in the need for independent assessments of evidence on drug therapy to balance the drug industry sponsored information sources.

Over the years the TI has substantially enhanced its ability to assess the clinical evidence presented in published articles, meta-analyses by the Cochrane Collaboration and scientific material presented by the pharmaceutical industry. In pace with the extensive assessment of clinical evidence, the TI has developed effective ways of knowledge translation and dissemination of this evidence to all active players involved in drug therapy: physicians, pharmacists, nurses and policy-makers (Ministry of Health) and is committed to analyzing its own impact.
1. EDUCATION

1.1. Education to health professionals:
1.1.1. Therapeutics Letters and podcasts.

- published four Therapeutics Letters:
  - Therapeutics Letter #84: A systematic Review of the Harms of Bisphosphonates. link: [http://www.ti.ubc.ca/letter84](http://www.ti.ubc.ca/letter84)
  - Therapeutics Letter #85: Clinical Pearls from Prescrire. link: [http://www.ti.ubc.ca/letter85](http://www.ti.ubc.ca/letter85)
  - Therapeutics Letter #86: Your opinions of the Therapeutics Initiative. link: [http://www.ti.ubc.ca/letter86](http://www.ti.ubc.ca/letter86)

- published five podcasts:
  - Effect of cocoa on blood pressure, link: [http://www.cochrane.org/podcasts/issue-7-8-july-2012/effect-cocoa-blood-pressure](http://www.cochrane.org/podcasts/issue-7-8-july-2012/effect-cocoa-blood-pressure)

1.1.2. Educational events to health care professionals in the province.

- held 16 educational events to healthcare professionals:
  - "Steroids for acute migraine" (Tejani AM), April 2012 at Vancouver Hospital pharmacology rounds, Vancouver, BC.
  - "Where to find best evidence" (Tejani AM) May 2102 at University of British Columbia Department of Psychiatry first and second year residents, Vancouver General Hospital, Vancouver, BC.
  - "Best Evidence" seminar (TI team), May 18 2012 in Burnaby.
  - "Best Evidence" seminar (TI team), May 18 2012 in Burnaby.
  - "Hurry up and wait (please): new oral anticoagulants for atrial fibrillation" (Tejani AM), June 2012 at Peach Arch Hospital pharmacists’ rounds.
  - "Evidence based medicine for Naturopathic Physicians" (Virani A). July 14, 2012 at Vancouver, BC.
  - "Antimicrobial Stewardship Evidence" (Virani A). September 11, 2102 at Fraser Health Antimicrobial Stewardship Committee, Vancouver, BC.
o "Practical Psychopharmacology for Nurses" (Virani A). September 17, 2012 at University of British Columbia.

o "Antipsychotics for Depression: A useful treatment or delusion?" (Virani A). September 20, 2012 at the Canadian Society of Hospital Pharmacists Clinical Symposium, Vancouver BC.

o "Evidence for High Dose or Combination Antipsychotics" (Virani A), September 21, 2012 at BC Psychopharmacology Conference, Burnaby BC.

o "Best Evidence" seminar (TI team), Nov 2 2012 in Burnaby.

o "Best Evidence" seminar (TI team), Nov 3 2012 in Burnaby.

o "Patents and Politics - How the HIV crisis changed pharmaceutical intellectual property policies" (Ellen F.M. "t Hoen) Nov 6 2102 at University of British Columbia Department of Anesthesiology, Pharmacology and Therapeutics, Vancouver General Hospital, Vancouver, BC.

o "Hurry up and wait: new oral anticoagulants for atrial fibrillation" (Tejani AM) Dec 18 2102 at Surrey Memorial Hospital Grand Rounds, Surrey, BC.

o "Harms and benefits of bisphosphonates for osteoporosis; a balanced view" (Tejani AM) Dec 20 2102 at Langley Memorial Hospital Grand Rounds, Langley, BC.

o "Antipsychotics for Depression" (Virani A), Feb 6 2013 at Royal Jubilee Hospital Lecture Theatre. Victoria, BC.

1.1.3. Systematic review summaries (after consultation with MoHS-PSD for timing of release).

- None of the systematic reviews completed this year were suitable for summary.
- Published one systematic review summary through CADTH: Fortin, P., Mintzes, B., and Innes, M. A Systematic Review of Intravitreal Bevacizumab for the Treatment of Diabetic Macular Edema [Internet]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2012 (Rapid Response Report: Peer-Reviewed Summary with Critical Appraisal). Available from: http://www.cadth.ca/media/pdf/RD0028_avastin_L3_e.pdf

1.1.4. Maintenance of a website for sharing of evidence-based information.

- TI web site http://www.ti.ubc.ca/ was maintained and updated regularly with evidence-based information.
- Over 6,300 registered users of the TI web site.
- Utilization of TI web site increased steadily throughout the year.

1.1.5. Other education to support optimal prescribing/dispensing based on the best available evidence.

- held one 2-day session on "Critical Appraisal" for BC PAD staff (TI team), May 29-30 2012 at UBC Point Grey Campus.
1.2. To enhance greater collaboration on education initiatives and to minimize redundancy, enhance complementary initiatives and optimize educational outcomes, the contractor will notify MoHS-PSD of educational topics at the time the topics are chosen as well as at least 5 days prior to launching the initiatives, MoHS-PSD and will meet periodically with MoHS-PSD staff to consider future initiatives and progress.

- Quarterly meetings did not occur due to scheduling difficulties within PSD.
- Two educational sessions were for, or conducted in conjunction with PSD staff, in the quarter Apr – Jun 2012.

1.3. Upon request, faculty members and staff will make every effort to participate on advisory committees for related educational initiatives such as but not limited to the Provincial Academic Detailing Advisory Committee and Education for Quality Improvement of Patient Care Working Group.

- No participation on committees for PAD or EQIP due to scheduling difficulties within PSD.

1.4. Education to public (defined as to the general public or patient groups) is considered out of scope.

2. PHARMACOEPIEMIOLOGY PROGRAM EVALUATION

- Pharmaceutical Services Research Team (PSRT) submission for BC Smoking Cessation Program Evaluation and Varenicline Safety.

- PSRT Submission for Benzodiazepine use and the risk of serious harm.

- Protocol and background data analysis and feasibility for studying P-GP Inhibition and the Risk of Hemorrhage During Dabigatran Therapy.

- PSRT submission, data analysis collaboration with the PSD Economics Analysis group, and completion of draft manuscript for "Opioid Analgesic Use in British Columbia".

- Completion and publication of manuscript for "Opioid Analgesic Use in British Columbia": Dormuth CR, Miller TA, Huang A, Mamdani MM, Juurlink DN. Effect of a centralized prescription network on inappropriate prescriptions for opioid analgesics and benzodiazepines. CMAJ. 2012 Sep 4.

- further pharmacoepidemiology evaluation work was impeded due to suspension of data access by PSD in Sep 2012.
UNDERGRADUATE PROGRAM

Oliver Applegarth BSc MD MEd FRCPC
Program Director

The expansion of the medical school is now comfortably behind us. Program delivery has proven to be both successful and sustainable. As always, thanks are in order for everyone province-wide who contributes to the education of these students.

The third year curriculum continues to be delivered through a 2-week mandatory rotation within the clerkship. We have numerous sites province-wide in which these students can be found. Standardization of curriculum has always been the goal. We attempt to utilize case-based online modules to augment the intra-operative experience. These modules are well thought of by students, and it is hoped that we can offer more in the near future.

At the fourth year level Dr. James Price has done a wonderful job ensuring that students have as much access to anesthesia electives as we can create. Our elective spots remain well subscribed, which I have always seen as testimony to the importance of what our specialty can offer to the undifferentiated student. Dr. Price and I are experimenting with a “longitudinal” component to our forth year experience. In this capacity the student assesses a patient in our pre-admission clinic, participates in their anesthetic, and helps manage postoperative pain the ward. Initial feedback from students has been very positive, and it is hopes that this will become a standard aspect of our elective province-wide.

The major challenge moving forward will be UBC’s “Curriculum Renewal”. Set to be rolled out in the fall of 2014, it represents the most major overhaul to medical training in this province since the introduction of PBL in 1997. The new system is an attempt to move away from a compartmentalized approach to education, and towards a system that is longitudinal, malleable, and competency-based. Exactly what this new system will look like is still unknown. For more information one can access UBC’s official site at cr.med.ubc.ca. How this transition will impact anesthesia, and vice-versa, is also up in the air. While navigating this road may seem daunting (especially to me), it also presents us with a unique opportunity to focus our educational experience and ensure that both students and the medical school understand the important contribution we make to shaping the minds of future physicians.
CONTINUING MEDICAL EDUCATION - OVERVIEW
VISITING PROFESSOR PROGRAM
James W. Price MMEd, FRCP(C)
Program Director

CME within the Department of Anesthesiology Pharmacology and Therapeutics includes both our Visiting Professor Program and the Whistler Anesthesiology Summit (WAS).

Visiting Professor Program

The goal of the Visiting Professor program is to provide anesthesiologists from around the province stimulating and thought provoking speakers throughout the academic year. Each regional hospital (Vancouver General Hospital, St. Paul’s Hospital, Royal Columbian Hospital, BC Children’s Hospital, BC Women’s Hospital) selects a speaker which best reflects that hospital’s interests at that particular time.

Our visiting professor committee consist of: Dr(s). Stephan Malherbe (BCCH), Alyssa Hodgson (RCH), Cynthia Yarnold (SPH) and Stuart Herd (VGH). Dr. Giselle Villar was welcomed as the new BCWH visiting professor representative, taking over from Dr. Elizabeth Peter who stepped down this year.

Our speakers this academic year included:

Dr.(s) Cheryl Mack, Hilary Grocott, Jacqueline Leung, Patrick MacQuillan

This year due to decreased funding compared to previous years, we were only able to invite 4 visiting professors instead of the usual 5 speakers. Unfortunately, BCWH was unable to invite a speaker this year. It was decided at the annual meeting of visiting professor representatives, that in future years if cancellations are required each hospital will take a turn not being able to invite a speaker.

The visiting professor committee has attempted to decrease the costs of each speaker in several areas: decreasing speaker honorarium, removing lunch and decreasing dinner expenses, suggesting that visiting professor representatives invite local speakers and pairing professors’ lectures with the Whistler Anesthesiology Conference.

We continue to video-conference the visiting professor lecture series with multiple sites now having access to our speakers in real time. Sites involved via video-conference link include Lions Gate, Nanaimo, Port Alberni, Prince George, Nanaimo, Vernon and Victoria. Feedback from the program has been very positive. Our video library of speakers continues to grow and is available on our website below. The UBC department website is now linked to the Canadian Anesthesiology Society Continuing Professional Development website so that interested anesthesiologists can access our departmental website and visiting professor videos.
Our videos can be found at:

http://www.apt.ubc.ca/anesthesiology/Video_Lectures.htm

This year, we again thank Abbott Laboratories and Anne Stoll for their continued support of the visiting professor program through an unrestricted educational grant. We also thank Winnie Yung for her ongoing work and assistance in organizing the program.

**Whistler Anesthesiology Summit (WAS)**

The 2nd annual 2012 Whistler Anesthesiology Summit was held Feb 23 to 26. The conference has a variety of local and international speakers as well as a regional anesthesia workshop. Our out of town guest speakers for 2012 included: Dr(s) Vincent Chan (University of Toronto), Mike Murphy (University of Alberta) and Peter Slinger (University of Toronto). The next annual conference in Whistler will be held February 21-24, 2013.

The conference has very good pre-registration numbers and we are hoping for some good weather on the mountain so attendees will have a great time on the slopes and also in the classroom. We are continuing to offer UBC anesthesiology residents special pricing for both conference registration and the ultrasound guided regional anesthesiology workshop.

The CPD Advisory Committee meets 2-3 times/year. Dr. Bourgeois-Law oversees CPD, Faculty Development and Faculty Career Development. Dr. Ran Goldman is the current chair of the Advisory Committee.

You can view the CPD website [www.cpd.med.ubc.ca](http://www.cpd.med.ubc.ca) for information about upcoming UBC sponsored conferences and CME events.
RESIDENCY TRAINING PROGRAM

Matthew Klas MD FRCPC
Program Director

2012 saw the end of a successful 10 year term for Dr. Brian Warriner. We would all like to thank Dr. Warriner for his extreme dedication to our specialty and department and his presence will be missed. Dr. Roanne Preston started her term as head in late 2012 and she has already been an excellent leader and advocate for the residency program.

Training

As of July 1, 2012, a total of 58 residents were registered in the 5-year Royal College Physicians & Surgeons program. All of these 58 were funded by the B.C. Ministry of Health, including our one IMG-BC resident. Ten of these residents are scheduled to complete their residency during the 2013 calendar year and all will be taking their RCPSC examinations in anesthesia in the spring of 2013. The number of CaRMS positions has remained stable at ten for the last few years after the initial increase from seven several years ago. In 2011 one IMG position was selected into the program as a one-time occurrence and there are no plans to continue this annually due to program capacity and the difficulty of this selection process.

All 15 PGY5 residents were successful in the 2012 RCPSC specialty examinations in Anesthesiology. This is due to their hard work and the dedication of our teaching faculty.

The Family Practice Anesthesia program has a new program director Dr. James Kim who took over from Dr. Ron Ree in December of 2011. There are currently 3 Family Practice Anesthesia residents in this program and plans are to continue to select up to 3 FPA residents per year into this program.

Admissions

A sub-committee of the Residency Training Committee (RTC) reviewed all applicants. The Selection Committee was chaired by Trina Montemurro, with committee members, Drs. Bob Purdy, Penny Osborne, Naomi Kronitz, Farah Valimohamed, Gord Finlayson, Aeron Doyle, Ron Ree, Laura Duggan, Brian Saunders, Hazhir Ahmadi, Mike Atherstone, Jon McEwen, Peiter Swart, Lisa Li, Chris Durkin, Sarah Waters, Sean MacLean, Brad Merriman, and Patrick Hecht. (the latter 5 as resident representatives).

Under the Association of Canadian Medical Colleges (ACMC) agreement, all entry positions were filled through the Committee in Canadian Resident Matching Service, CaRMS. Our CaRMS match was again successful, of the 106 applicants 26 were from UBC, similar to 2011. This high level of interest in anesthesia as a residency from UBC medical students is most likely attributed to the high quality educational experience they receive as organized by Dr. Oliver Applegarth. For the 2012 CaRMS match, the ten CaRMS PGY1 positions were filled with excellent candidates, 7 of the successful candidates matched from UBC, 1 from Dalhousie University, 1 from the University of Ottawa, and 1 from McGill University. These residents began their residency on July 1, 2012 at one of the three PGY 1 sites: Victoria
General Hospital/Royal Jubilee Hospital, St. Paul’s Hospital, or the Royal Columbian Hospital.

There was one re-entry residency positions in 2012 that was filled by Dr. Julie Paget, a practicing Family Practice Anesthetist. For the 2013 CaRMS match we will select the 11 residents through the CaRMS selection process.

**Academic Program**

The academic program involving active participation from each of the teaching hospitals was very successful. A full day Curriculum Retreat took place in May of 2012 which revamped the format and content of the academic curriculum. The feedback form residents and faculty has been very positive and the day is felt to be more interesting and interactive. It is more in line with the newly developed National Curriculum of the Royal College Specialty Committee in Anesthesiology.

The Residency Training Committee continues to support the autonomy of each participating UBC teaching hospital in delivering their contribution to the residents’ educational program. Program content was tailored to match the area of clinical expertise of each site. The participating sites are Vancouver General, St. Paul’s, Royal Columbian, British Columbia Children’s and British Columbia Women’s Hospitals. Lions Gate Hospital has also come on board to host an Academic Day. The Case-Based Learning portion of the academic day continues to be very successful in providing excellent educational experience. Resident coordinators and faculty members at each site demonstrated creativity and commitment in delivering the educational program. In particular, Drs. Jacqui Trudeau, Travis Schisler, Brad Merriman, and Sean McLean, the co-chief residents for the academic year 2012, took a leadership role in making the academic days a success.

The formal academic year begins in September and will finish at the end of May 2013. The academic days use videoconferencing from all sites for out of town residents.

The RTC decided that either the Advanced Trauma Life Support course or something equivalent would continue to be provided to the anesthesiology residents. The Fundamentals of Critical Care Support course continues to be provided to all the PGY 1 Anesthesia residents and is a very useful course in teaching the fundamentals of critical care. All PGY 5 residents completed the Advanced Cardiac Life Support refresher course specifically designed for anesthesia. All courses (Neonatal Resuscitation Providers course (NRP), ATLS, ACLS update, and PALS) will now be provided to residents by PGY level instead on a 3 yearly cycle in order to provide more predictable numbers for planning, from educational and financial perspectives. PGY 2 residents also took part in a full day of the surgical CRASH course in November of 2012 along with all junior Surgical and Emergency Residents. Feedback been excellent on this collaborative day and there was excellent input from many Anesthesiology faculty members.

The Summer Lecture Series (Basics of Anesthesia) continues to evolve and during 2012 sessions on POEM (Perioperative emergency Management) were added with great input from faculty and residents. Resident led CBL’s along with lectures on basic science topics were also incorporated. One of our pharmacology colleagues, Dr. David Godin provided two of the lectures on a review of pharmacologic principles as part of the summer lecture series.
and this was very favorably received by the residents. In addition, Dr. Kate Chipperfield (VGH hematopathologist) provided a lecture on transfusion medicine which was also very well received.

In March 2012, the Airway academic day, coordinated by Dr. Theo Weideman with participation from faculty from various sites, and this year in collaboration with the Department of Otolaryngology (both faculty and residents), provided both didactic sessions and small group hands-on sessions. In addition, there was a Regional Anesthesia Academic day, coordinated by Dr. Ray Tang also with the participation of faculty from various sites, and with support from the UBC Department of Anatomy for providing anatomical specimens to demonstrate the relevant anatomy. Both days were very successful and as always are very popular with the residents.

In June 2012, the annual residents’ retreat was held at Pemberton/Whistler. This included lectures on various topics relevant to CanMEDS roles.

Dr. Jamie Renwick was instrumental in leading a group of interested and committed faculty in the very successful weekly R5 Seminar Series designed to allow residents to review topics to help them approach clinical problems at the consultant level, and to ensure they had consultant-level knowledge in the various areas.

This year, all of the PGY 2-5 residents went to the high fidelity UBC Anesthesia Simulator housed in the CESEI (Center of Excellence for Surgical Education and Innovation) at VGH. Dr. Lalitha Rupesinghe, as the coordinator of the anesthesia simulator, with her co-assistant, Dr. Laine Bosma, and their group of dedicated faculty (“Sim Docs”), ran the highly successful simulations for the UBC anesthesia residents. Each UBC anesthesia resident from PGY 2 to 5, including the FPA residents, was exposed to the UBC Anesthesia Simulator twice during the academic year. Some improvement in the capital equipment has occurred. There are ongoing challenges with resources and faculty involvement in the area of Simulation. Dr. Roanne Preston is actively involved in helping to improve this area of residency training.

Journal Club
Journal Club remains an integral part of the academic program and a change in format was implemented due to the increase in membership. Meetings occur monthly at faculty members’ homes or other venues. Dr. Alana Flexman took over the coordinator role for the JC for 2012. Three separate residents act as moderators for each article presented. They continue to provide the residents with an excellent educational opportunity to learn about critical appraisal skills. I would like to thank Dr. Choi for being the Journal Club leaders during the last few years.

Clinical Program
The clinical program continues to be a strong element of the UBC Anesthesiology training program. The regional anesthesia rotation provides very good educational experience under the direction of Dr. Steve Head, SPH and Ray Tang, VGH, as does the airway rotation under the direction of Dr. Theo Weideman, VGH. The cardiac surgery ICU elective at both SPH and VGH remain popular electives. The mandatory community anesthesia rotations in Nanaimo and Prince George have received positive reviews by residents. The four week
anesthesia rotation at Victoria General Hospital/RJH under the direction of Dr. Trevor Herrmann has now evolved into a mandatory Victoria anesthesia rotation at the PGY 4 level, with residents able to choose either pediatric anesthesia, adult general anesthesia, or subspecialty cardiac, neuro, thoracic or vascular anesthesia. BCCH has moved to 4 consecutive mandatory pediatric rotations with 24 hour call to give better exposure to after-hours cases as well as out of OR care such as the Pain Service and Trauma calls. Many of the larger teaching hospitals are having residents experience out of OR/Perioperative Medicine days which have been favorably viewed by residents and faculty.

A number of new electives have proved to be popular, for example, palliative care medicine, Air Transport/Evac medicine, Surrey Memorial Hospital general pool anesthesia, Burnaby General Anesthesia, Richmond Hospital, Comox Hospital on Vancouver Island, RCH ICU, RCH echocardiography, and Kelowna for Chronic Pain and Thoracic Anesthesia. Residents also continue to go to Uganda for research projects or electives and enjoy the experience.

**In-House Examinations**
The written examination for PGY 2 residents included the Anesthesia Knowledge Test, AKT 1, held in July and August 2012. In December 2012 the PGY 2 residents sat the AKT 6 exam. The AKT 24 exam, testing subspecialty anesthesia knowledge, is taken by PGY 5’s. The national organization, ACUDA, agreed to collaborate and arrange for PGY 5 residents to sit the AKT 24 exam during their first month. This will allow comparison of performance across Canadian training programs. UBC residents continue to perform very well and compare very favorably with our national colleagues.

PGY 3-4 residents wrote the American Board of Anesthesiologist in-training examination in March 2012. The ABA Exam allows for more individual feedback and ranks the candidates with all trainees at their level.

The May and December in-house oral examinations continued with the Royal College format. All residents were examined in one day by faculty volunteer examiners. Each resident received two half-hour exams. Residents generally found the experience stressful but educational.

The PGY 5’s continue to have the Seminar Series to help in preparation for Royal College exams. These sessions are very well received thanks to the dedication of all faculty members involved. This series is a big reason for the UBC residency’s high success rate at the Royal College exams.

**5th Annual UBC Anesthesiology, Pharmacology and Therapeutics Research Day and Awards Night**
Anesthesia residents, anesthesia clinical fellows, pharmacology graduate students, and pharmacology post-doctoral fellows presented their research papers in the competition held on June 27, 2012. Dr. Bev Orser was the invited guest judge for anesthesia. Awards for research, academic excellence and clinical proficiency were presented. (Award winners are listed separately in the report). The evening was a success as evidenced by the attendance and the quality of research presentations.
Residency Training Committee (RTC)
This committee met every 2 months during 2012 and as always was very effective in guiding the activities of the residency training program. Committee members include hospital program coordinators from each site: Drs. Ron Ree SPH, Giselle Villar BCWH, Gord Finlayson VGH, Mike Traynor BCCH, Laura Duggan RCH, Marshall Richardson Prince George, Alan Berkman Nanaimo, our Royal College Examiners, Dr. George Isac and Roanne Preston, Dr. Brian Warriner, Professor and Head, Dr. Peter Choi Research Coordinator, and Dr. Matthew Klas, Chair and Program Director.

Resident members on the RTC include the PGY 5 representatives Drs. Chris Durkin, Lisa Li, Paul Mercereau and Angineh Gharapetian, co-chief PGY 4 residents Sean McLean, Travis Schisler, Jacqui Trudeau, Brad Merriman as well as the PGY 3 rep Mario Francispragasam, PGY 2 rep Steven Green and PGY1 site reps, Peter Rose (RCH), Alison Read (Victoria) and Reza Faraji(SPH).

Royal College Accreditation
The program started the preparation for the upcoming Royal College accreditation that will take place in 2013 for all UBC Postgraduate programs. Many aspects of the program are being reviewed and fine-tuned for the Royal College visit in November of 2013.

Website
The new departmental website is a reality and continues to grow. The plan is for this to be a key resource for the program. Residents and Faculty alike will be able to source all information relevant to the program, from academic articles and rotation schedules to vacation forms and program policies.

Administration
Ms. Jill Delane continued in her role as the Program Coordinator. Ms. Susan Van Bruggen continues to be an excellent Program Secretary. Both have been invaluable in the administration of the program. A modest reduction in funding for residency training has been handled well with support of administration, residents, and the RTC.

Summary
Overall, this has been a successful year for the UBC Anesthesiology Residency Training Program. This is due to the many hours of hard work on the part of our clinical faculty working with our residents, taking part in the academic program, as well as helping senior residents prepare for the oral exam and to become skilled anesthesiology consultants. The goodwill and high level of commitment to residency training is a credit to this department.
### UBC Anaesthesia Residents 2011-2012

**PGY 1**

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Year</th>
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<tbody>
<tr>
<td>Sadiq Abdulla</td>
<td>(RCH)</td>
<td></td>
</tr>
<tr>
<td>Su-Yin MacDonell</td>
<td>(Victoria)</td>
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</tr>
<tr>
<td>Graham Noble</td>
<td>(RCH)</td>
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<tr>
<td>Timothy Oliveira</td>
<td>(Victoria)</td>
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<tr>
<td>Jei Eung Park</td>
<td>(RCH)</td>
<td></td>
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<tr>
<td>Parisa Soltani</td>
<td>(SPH)</td>
<td></td>
</tr>
<tr>
<td>Sarah Thompson</td>
<td>(RCH)</td>
<td></td>
</tr>
<tr>
<td>Alexander Wong</td>
<td>(RCH)</td>
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**PGY 2**

<table>
<thead>
<tr>
<th>Name</th>
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<th>Year</th>
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<tbody>
<tr>
<td>Claire Fast</td>
<td></td>
<td></td>
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<tr>
<td>Mario Francispragasam</td>
<td></td>
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<tr>
<td>Patrick Hecht</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alexandra (Sandy) Kislievsky</td>
<td>(starting Feb. 13, 2012)</td>
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<tr>
<td>Cristin McRae</td>
<td></td>
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<tr>
<td>Perseus Missiris</td>
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<tr>
<td>Habib Moshref Razavi</td>
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<tr>
<td>Devin Nielsen (FPA)</td>
<td></td>
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<tr>
<td>Cheryl Peters</td>
<td>(starting Sept. 21, 2011)</td>
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<tr>
<td>Nadia Salvaterra</td>
<td>(FPA)</td>
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<tr>
<td>Lindi Thibodeau</td>
<td>(FPA) (until Oct 8/11)</td>
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<tr>
<td>Jean van Eeden</td>
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<td>Jason Wilson</td>
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<td>Paul Zakus</td>
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### UBC ANESTHESIA RESIDENTS 2011-2012
#### PGY 3

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<tr>
<th>Alex Blais</th>
<th>Pooya Kazemi</th>
<th>John Kim</th>
<th>Sean McLean</th>
<th>Brad Merriman</th>
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<tr>
<td>Travis Schisler</td>
<td>Eric Shin</td>
<td>Sara Waters</td>
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### UBC ANESTHESIA RESIDENTS 2011-2012
#### PGY 4

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<tr>
<th>Anton Chau</th>
<th>Christopher Durkin</th>
<th>Angineh Gharapetian</th>
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<td>Steven Lee</td>
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<td>Paul Mercereau</td>
<td>Roop Randhawa</td>
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<td><img src="image16" alt="Paul Mercereau" /></td>
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<tr>
<td>Colleen Shamji</td>
<td>Jacqueline Trudeau</td>
<td>Ciara Wong</td>
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<td><img src="image19" alt="Jacqueline Trudeau" /></td>
<td><img src="image20" alt="Ciara Wong" /></td>
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### UBC ANESTHESIA RESIDENTS 2011-2012
#### PGY 5

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<tr>
<th>Sana Ahmed</th>
<th>Mike Atherstone</th>
<th>Simon Bruce</th>
<th>Richard Gardiner</th>
<th>Jennifer Demarty</th>
<th>Julia Haber</th>
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<td>(until Sept. 25, 2011)</td>
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<th>Jacqueline Hudson</th>
<th>Mark Masterson</th>
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<th>Kaiina Popova</th>
<th>Chris Prabhakar</th>
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<th>Teresa Ripley</th>
<th>Kevin Rondi</th>
<th>Aaron Rostas</th>
<th>Jacques Smit</th>
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The year was started with the successful graduation of 2 FP anesthesia residents. Dr. Devin Nielsen returned to Canmore, Alberta and Dr. Nadia Salvaterra started her practice in Inuvik. The residents attended an innovative conference/simulation training in Ontario at the Northern Ontario Medical School Department of Anesthesia. This FPA ‘bootcamp’ was a week in duration and comprised many hours of simulation sessions and lectures. The new residents for 2013-2014 will also participate in this program.

Much time and energy was spent on the pre-survey questionnaire for the upcoming accreditation process in 2013. A separate FPA-RTC committee was formed as well as a separate FPA-selection committee.

The membership of the 2012 FPA-RTC included:

- Dr. James Kim, MD, FRCPC, FPA Program Director, Chair
- Dr. Mathew Klas, MD, FRCPC, Royal College Anesthesia Program Director
- Dr. John Veall, MD, FRCPC, Lion’s Gate Hospital Site Coordinator
- Dr. Ron Ree, MD, FRCPC, St. Paul’s Hospital Site Coordinator
- Dr. Pieter Swart, MD, FRCPC, Vancouver General Hospital Site Coordinator
- Dr. Mitch Giffin, MD, FRCPC, Vancouver General Hospital Site Coordinator
- Dr. Michael Traynor, MD, FRCPC, BC Children’s Hospital Site Coordinator
- Dr. Giselle Villar, MD, FRCPC, BC Women’s Hospital Site Coordinator
- Dr. Nadia Salvaterra, MD, CCFP, FPA resident member

Corresponding Members:
- Dr. Diana Chang, MD, CCFP, FP Enhanced Skills Program Director
- Dr. Carl Whiteside, MD, CCFP, REAP Liaison

The membership of the 2012 FPA-Resident Selection Committee included:
- Dr. James Kim
- Dr. Mathew Klas
- Dr. Ron Ree
- Dr. Pieter Start
- Dr. Nadia Salvaterra

Three new residents were selected for the 2012-2013 program.

The program is looking forward to and preparing for the upcoming accreditation which will be in late 2013. As well the UBC FP Anesthesia conference will be held in November of 2013.
Objective: To review research currently conducted by graduate and post-graduate trainees and fellows in the Department of Anesthesiology, Pharmacology & Therapeutics at the University of British Columbia.

This event is an accredited group learning activity as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada (6.5 h under CPD Section 01).

The Department of Anesthesiology, Pharmacology & Therapeutics, University of British Columbia, would like to acknowledge:
The Judges of the 6th Annual Research Day:

Guest Judge
Dr. Beverly Orser

Anesthesiology

Dr. Clinton Wong
Dr. Roanne Preston
Dr. Richard Merchant
Dr. Joanne Douglas
Dr. Donald Griesdale
Dr. Stephan Schwarz
Dr. Peter Choi

Pharmacology

Dr. David Fedida
Dr. Bernie MacLeod
Dr. Stephanie Borgland
Dr. Darryl Knight
Dr. Harley Kurata
Dr. Andrew Horne
Dr. Pascal Bernatchez

The Research Day Organizing Committee:

Dr. Peter Choi Research Day Coordinator (ANAE Section)
Dr. Pascal Bernatchez Research Day Coordinator (PCTH Section)
Ms. Aileen To Administrative Manager
Ms. Jill Delane ANAE Administrative Assistant
Ms. Katharine Garcia ANAE Administrative Assistant
Ms. Jessica Yu PCTH Administrative Assistant
Ms. Susan van Bruggen ANAE Residency Program Secretary
Program

Oral Presentations

Abstract 01 - Goodchild SJ et al., Use of genetically encoded photoactivable cross-linking molecules to probe NaV channel fast inactivation

Abstract 02 - Schisler et al., Fluid management and acute kidney injury in the post-cardiac surgery intensive care unit.

Abstract 03 - Trane A et al., Therapeutic potential of small peptides for increasing nitric oxide release

Abstract 04 - Brown Z et al., Cardiac index changes in children placed prone for surgery

Abstract 05 - Li et al., Essential aspartate anchor for ATP-sensitive K+ Channel gating.

Abstract 06 - Brinkmann et al, Single-operator real-time ultrasound-guided neuraxial injection using SonixGPS™: A feasibility study in cadavers

Abstract 07 - Pless S et al., How swapping of single atoms can inform on physiological processes

Abstract 08 - Kaur et al., Real time paravertebral blockade using a GPS guided ultrasound system

Abstract 09 - Lee et al., Local anesthetic inhibition of a bacterial sodium channel

Abstract 10 - Sanders et al., Serum levels of oral morphine and pharmacogenomics of CYP2D6 and UGT2B7 in a pediatric population

Abstract 11 - Rivera-Acevedo et al., Extracellular quaternary ammonium blockade of transient receptor potential vanilloid subtype 1 channels expressed in Xenopus laevis.
6th ANNUAL RESEARCH DAY and AWARDS NIGHT

WINNERS OF RESEARCH COMPETITION

Residents
1st place oral – Travis SCHISLER
Poster – Michael AHERSTONE

Fellows
1st place oral – Zoe BROWN
2nd place oral – Silke BRINKMANN
Poster – James BROWN

MSc candidates
1st place oral – Andy TRANE
2nd place oral – Jenny BOWEN LI
Poster – Heidi BOYDA

PhD candidates
1st place oral – S. PLESS
2nd place oral – SJ GOODCHILD

AWARDS

Dr. Dimitri Giannoulis Memorial Award in Regional Anesthesia – Dr. Jacqueline Trudeau
Dr. John A. McConnell Award for Academic Excellence – Dr. Julia Haber
Dr. Derek Daniel Wolney Prize for Clinical Proficiency – Dr. Jacques Smit
Dr. Jone Chang Memorial Award in Anesthesiology Excellence – Dr. Simon Bruce
Dr. Jone Chang Memorial Prize in Chronic Pain – Dr. Jacqueline Hudson

Master Teacher Awards:
VGH – Dr. Henrik Huttunen
SPH – Dr. Bobby Lee
RCH – Dr. Laura Duggan
BCCH – Dr. Stephan Malherbe
BCWH – Dr. Paul Kliffer
Rural/Community – Dr. Brent Caton (Victoria)
Medicine – Dr. Gord Finlayson (ICU)

Family Practice Anesthesia Awards:
FPA Master Teacher Award – Dr. Mark Vu (VGH)
FPA Teaching Site Award – Dr. Paul Kliffer (BCWH)

Dr. Dimitri Giannoulis Resident Appreciation Award – Dr. Donald Griesdale

Dr. James Kimme Golden Epidural Award – Dr. Lindi Thibodeau (Jr. Resident)
Dr. Simon Bruce (Sr. Resident)
Dr. Michael Smith Award for Pediatric Anesthesia – Dr. Dagmar Moulton

RCH Resident Award for Clinical Excellence - Dr. Patrick Hecht (Jr. Resident)
- Dr. Kalina Popova (Sr. Resident)

Ken C.K. Wong Award for Clinical Teaching – Dr. Sean McLean
PUBLICATIONS January 1, 2012 – December 31, 2012

Peer-reviewed publications

Journal articles


* Faculty members holding a primary or an affiliated appointment in the UBC Department of Anesthesiology, Pharmacology & Therapeutics (as of December 31, 2012) are in bold.


92. Patyal R, Woo EY, Borgland SL. Local hypocretin-1 modulates terminal dopamine concentration in the nucleus accumbens shell. *Front Behav Neurosci* 2012;6:82.


**Non-refereed publications**

**Books**

1.

**Book chapters**


Invited journal articles and editorials


6. Tossonian H, Conway B. Recent HIV-1 infection: to treat or not to treat, that is the question. J Infect Dis 2012;205:10-2.

Commentaries and letters


13. Tejani AM, **Musini V**, Basset K, Perry T, **Dormuth C, Wright JM**. The importance of total serious adverse events as an outcome in randomized controlled trials [e-letter]. *CMAJ* 2012 Jan 16. Available at: [http://www.cmaj.ca/content/183/16/E1189/reply#cmaj_el_680382](http://www.cmaj.ca/content/183/16/E1189/reply#cmaj_el_680382)


**Other publications**


**Abstracts, posters, and conference proceedings (national & international meetings)**


46. Petersen CL, Ansermino JM, Dumont GA. Audio pulse oximeter. Society for Technology in Anesthesia 2012 Annual Meeting, 18-21 January, Palm Beach, FL, USA.

47. Petersen CL, Ansermino JM, Dumont GA. High-speed algorithm for plethysmograph peak detection in real-time applications. Society for Technology in Anesthesia 2012 Annual Meeting, 18-21 January, Palm Beach, FL, USA.


49. Pitman KA, Borgland SL, Macleod BA, Puil E. The proposed GABA\(_B\) agonist isovaline does not activate GABA\(_B\) receptors in isolated cells. Neuroscience 2012 (Society for Neuroscience 42nd Annual Meeting), 13-17 October 2012, New Orleans, LA, USA.


55. Soltesz K, Dumont GA, van Heusden K, Hagglund T, Ansermino JM. Simulated mid-ranging control of propofol and remifentanil using EEG-measured hypnotic depth of anesthesia. 51st IEEE Conference on Decision Control, 10-13 December 2013, Maui, HI, USA.


58. Thompson JL, Borgland SL. Leptin depresses excitatory synaptic transmission onto dopamine neurons of the ventral tegmental area. Neuroscience 2012 (Society for Neuroscience 42nd Annual Meeting), 13-17 October 2012, New Orleans, LA, USA.

59. Trane A, Bernatchez PN. Developing caveolin-1 derived peptides as a novel therapeutic avenue for modulating eNOS in endothelial dysfunction. Gordon Research Conference, [date], Ventura, CA, USA.


