BCMJ
BC Medical Journal

November 2016; 58: 9
Pages 489–540

Fake joints, real results

Part 1: Hip and knee replacement

bcmj.org

QHR Technologies

TECHNOLOGY WILL CHANGE THE WAY WE *ALL* INTERACT WITH HEALTHCARE

ACCURO® Electronic Medical Records

Take the first step on your journey to improved efficiencies, streamlined workflows and greater peace of mind with the **#1 EMR in Canada**.

MEDEO™ Virtual Care

Using secure messaging and video conferencing, Healthcare Providers now have better access to patients with the Medeo Virtual Care Platform.

SPECIAL OFFER:

British Columbia's Physicians can enjoy special savings for a limited time.
Call Today ***1.866.454.4681***

OFFER CODE: BCDR9

November 2016
Volume 58 • Number 9
Pages 489–540

doctors of bc

contents

BCMJ
BC Medical Journal
Established 1959

ON THE COVER: In this first of a two-part theme issue on joint replacement, we consider the most common joint replacement surgeries: hip and knee replacement. Dr Masri's guest editorial begins these articles on page 504.

ARTICLES

THEME ISSUE: FAKE JOINTS, REAL RESULTS, PART 1

OPINIONS

DEPARTMENTS

contents

#115–1665 West Broadway, Vancouver, BC, Canada V6J 5A4
Tel: 604 638-2815 or 604 638-2858 Fax: 604 638-2917
E-mail: journal@doctorsofbc.ca Web: www.bcmj.org

BCMJ
BC Medical Journal

EDITOR
David R. Richardson, MD

EDITORIAL BOARD
Jeevyn Chahal, MD
David B. Chapman, MBChB
Anne I. Clarke, MD
Brian Day, MB
Timothy C. Rowe, MB
Cynthia Verchere, MD
Willem R. Vroom, MD

MANAGING EDITOR
Jay Draper

SENIOR EDITORIAL AND PRODUCTION COORDINATOR
Kashmira Suraliwalla

ASSOCIATE EDITOR
Joanne Jablkowski

COPY EDITOR
Barbara Tomlin

PROOFREADER
Ruth Wilson

DESIGN AND PRODUCTION
Scout Creative

COVER CONCEPT & ART DIRECTION
Jerry Wong
Peaceful Warrior Arts

PRINTING
Mitchell Press

ADVERTISING
Kashmira Suraliwalla
604 638-2815
journal@doctorsofbc.ca

ISSN: 0007-0556

PRINTED IN BC

DEPARTMENTS (Continued)

Advertisements and enclosures carry no endorsement of Doctors of BC or *BCMJ*.

The *BCMJ* is published 10 times per year by Doctors of BC as a vehicle for continuing medical education and a forum for association news and members' opinions. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August.

Prospective authors should consult the "Guidelines for Authors," which appears regularly in the *Journal,* is available at our website at www.bcmj.org, or can be obtained from the *BCMJ* office.

Statements and opinions expressed in the *BCMJ* reflect the opinions of the authors and not necessarily those of Doctors of BC or the institutions they may be assoicated with. Doctors of BC does not assume responsibility or liability for damages arising from errors or omissions, or from the use of information or advice contained in the *BCMJ*.

The *BCMJ* reserves the right to refuse advertising.

Subscriptions

Single issue	$8.00
Canada per year	$60.00
Foreign (surface mail)	$75.00

Postage paid at Vancouver, BC. Canadian Publications Mail, Product Sales Agreement #40841036. Return undeliverable copies to *BC Medical Journal*, 115-1665 West Broadway, Vancouver, BC V6J 5A4; tel: 604 638-2815; e-mail: journal@doctorsofbc.ca

AAA OFFICE OWNERSHIP

A LIMITED OPPORTUNITY

With 394 homes sold in just weeks, ONE BURRARD PLACE stands as one of the most successful luxury residential real estate launches in Vancouver history.

ONE
burrard
PLACE

Now, *Reliance Properties* and *Jim Pattison Developments* are offering an unprecedented strata office ownership opportunity in this landmark downtown tower.

- Flexible office sizes from 500 – 15,000 sq. ft.
- Prime Downtown Vancouver location on Burrard Street offers exceptional visibility, easy transit, and vehicle access.
- Adjacent to Yaletown, the West End, the Beach District and the Financial District.
- Access to luxury amenities including meeting rooms, entertainment rooms, gym, swimming pool and amenity concierge services.

RELIANCE PROPERTIES | THE JIM PATTISON GROUP | magnum projects ltd.

REGISTER NOW | T 604.893.9833

burrardplace.ca

This is not an offering for sale. Any such offering can only be made with disclosure statement. E&O.E.

Apply healing paint daily

"Take the coast road. It's in way better condition and much nicer to drive."

This was the e-mail advice I received from the nice woman at the hotel in Amalfi, Italy, in response to my query as to the best method of arrival by car. After spending a week in Tuscany and then another 10 days on a bike tour across Italy, the Amalfi coast seemed like a perfect ending to a fairytale trip. So on a beautiful Monday morning we headed out on our 5-hour drive from southern Tuscany. Apart from the numerous tolls and high-performance vehicles traveling around 200 km/hr on the autostrade, the trip was uneventful until I piloted my little Fiat 500 onto road SS163. Two Fiat 500s might be able to pass one another on this ever-twisting, walled avenue of death but not the collection of buses, trucks, vans, people, and bikes we encountered. However, none of the local drivers seemed to be aware of the physical principles of space and time, and drove as if God himself had blessed them with a protective bubble. The icing on the cake was when I looked to my left to see an even smaller Fiat honking and weaving as it passed each vehicle in a long line behind some poor scared tourist a few cars ahead. There was even a grandma in the passenger seat gesturing as only an Italian can. I'm pretty sure she wasn't mouthing "Welcome to the coast."

Like the Amalfi car, I now have numerous scars.

As you can deduce from the fact that I penned this editorial after my encounters, Grandma didn't cause my death, and I sincerely hope her heavenly bubble wasn't burst by a large, cornering, two-wheeling tour bus (prior to my trip I wasn't aware such a thing was even possible). I did notice that the walls that lined "S-cared S-… less 163" have numerous gouges. I also noticed that the typical Amalfi vehicle has dents on all four sides.

This got me thinking about how we all develop scratches along the way. In my 50s I have to admit that, like the Amalfi car, I now have numerous scars, most of them from crashing my bicycle. I remember one patient stating the obvious: "Dr Richardson, have you ever considered that maybe you aren't very good at this bike riding thing?" This is probably why I've never had the urge to get a tattoo—I've been doing a pretty good job of that on my own. And physical scars are one thing, but emotional scars run deeper. As physicians, we often deal with our patients' mental dents. A privilege of general practice is that as the physician-patient relationship grows through the years patients let down their guard and share their stories. We are trusted with tales of childhood trauma, relationship failure, addiction, loss, and more. It is in these moments that heartfelt words of support can mean so much to those we care for. Therefore, I have made a commitment to acknowledge at least one patient's emotional dent each day and, if possible, to apply a little healing paint.

I wonder how much Limoncello and gelato I would have had to consume to calm my nerves had I driven the much more dangerous mountain road.

—DRR

Quest for Superdoc

Cock-a-doodle-doo! Sun rays hit the room. Max the cat is in my face whining to be let out. Baby's foot is in my ear. Hubby is snoring. It's 5:30 a.m. Good morning!

Here I go—hit the bamboo floors running. First sip of tea does it. Ahhh! Good morning world!

I owe, I owe, it's off to work I go.

Love going to work. Love my assistant, Connie, who seems to know what I'm thinking at all times and is always one step ahead of me. Love the patients who ask how my day is going and how my daughter is doing (every one of them asks) and who share special tidbits of their lives.

Love going to my family home with my husband and my daughter after work a few days each week to enjoy the most amazing Indian food ever made. And to enjoy seeing the whole family, but especially the two people who got me to this point in life and who continue to be my heroes—my parents.

Then I get to go home and spend time with my beautiful fur babies and play in my garden and run around on the farm after the chickens. Occasionally I get to go for a 10 km run and throw around some weights. Hercules!

So could it get any better? Could I be doing more as a family doc? Have I failed because I'm not a full-service GP? I don't do obstetrics and I have only associate privileges at the hospital. My dreams of being Superdoc … gone?

Back in the day docs did 24-hour call and in some places they still do. Times have changed. Expectations to have a fulfilling family life have taken precedence. But there are docs out there who still do it all. And kudos to them.

I had to come to terms with the fact that I can't do it all. I'd love to, but there are not enough hours in the day to be Superdoc, Superwife, Supermom, Supersis, Superauntie, and Superfriend.

There is a fleeting moment of guilt when I discover that one of my patients has been admitted to the hospital—the burden on the ER and on the hospitalists, my patient seeing different docs during their hospital stay when it's already so stressful for them. I rationalize by thinking how great our hospitalists are and how my patient is receiving the best care. But in my heart I know there is nothing like seeing your family doc while you're in the hospital.

So I am going to start visiting my inpatients once a week. I hope to provide some emotional support to my patients and any additional information I can to the doc looking after them.

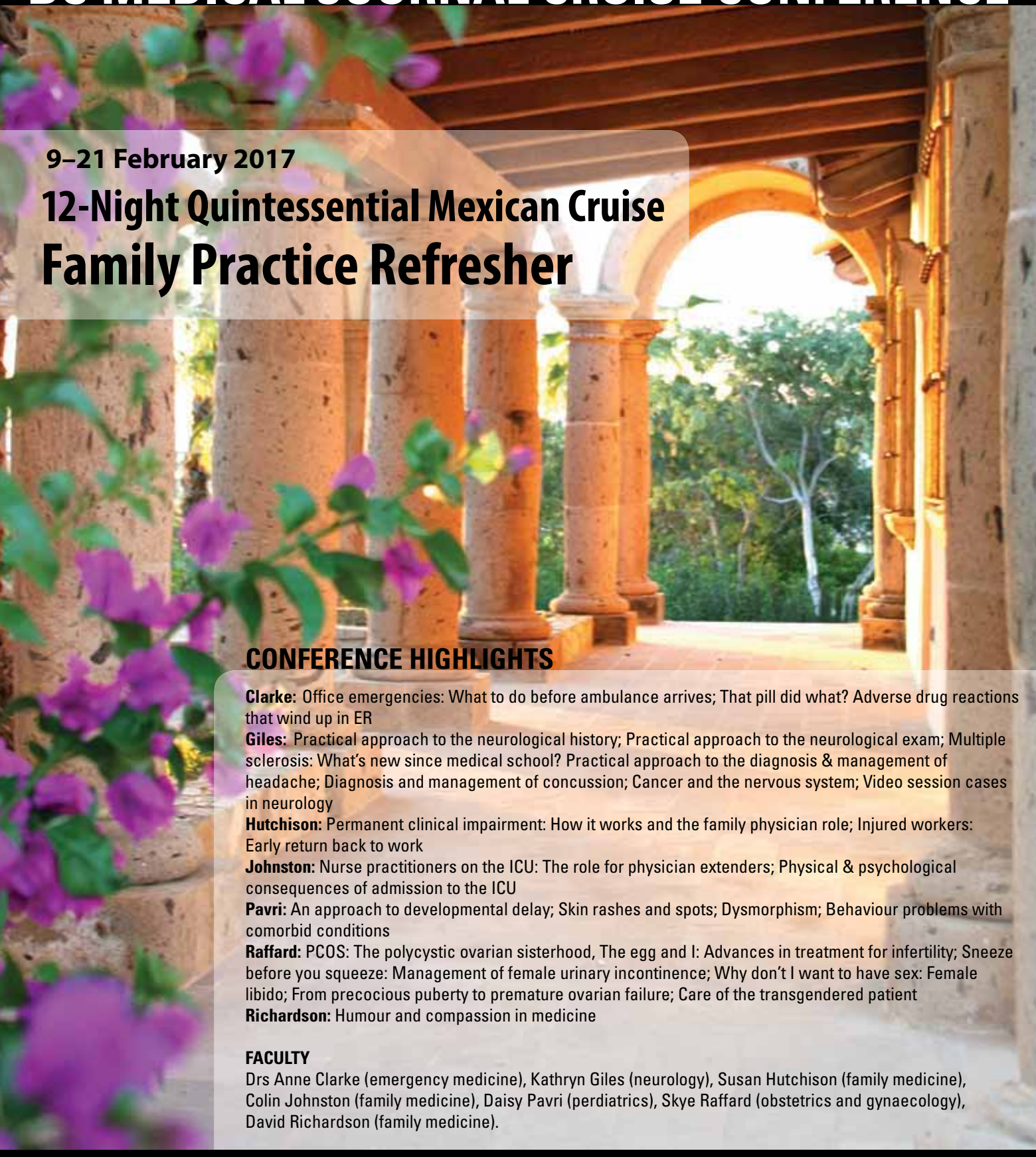
But should I feel guilty? I've only taken 2 weeks off this year. I have a solo family practice with no locums available. I drag around my faithful computer, with my EMR, everywhere I go, tasking every free moment I get. I do my own call and have my cellphone on me 24/7. I visit patients in their own homes. I've adopted the open-access model for patient care at my clinic.

One day, when my daughter is in school, I may return to hospital work. I aspire to one day joining Doctors Without Borders.

I've spent my whole life trying to be Super Jeeves. But now I realize my happiness and self-contentment translates into healthy relationships with my family, friends, and patients. Life is like riding a bicycle. You can coast, brake, or go full speed ahead. But you always need balance.

—JKC

BC MEDICAL JOURNAL CRUISE CONFERENCE



9–21 February 2017

12-Night Quintessential Mexican Cruise

Family Practice Refresher

CONFERENCE HIGHLIGHTS

Clarke: Office emergencies: What to do before ambulance arrives; That pill did what? Adverse drug reactions that wind up in ER

Giles: Practical approach to the neurological history; Practical approach to the neurological exam; Multiple sclerosis: What's new since medical school? Practical approach to the diagnosis & management of headache; Diagnosis and management of concussion; Cancer and the nervous system; Video session cases in neurology

Hutchison: Permanent clinical impairment: How it works and the family physician role; Injured workers: Early return back to work

Johnston: Nurse practitioners on the ICU: The role for physician extenders; Physical & psychological consequences of admission to the ICU

Pavri: An approach to developmental delay; Skin rashes and spots; Dysmorphism; Behaviour problems with comorbid conditions

Raffard: PCOS: The polycystic ovarian sisterhood, The egg and I: Advances in treatment for infertility; Sneeze before you squeeze: Management of female urinary incontinence; Why don't I want to have sex: Female libido; From precocious puberty to premature ovarian failure; Care of the transgendered patient

Richardson: Humour and compassion in medicine

FACULTY

Drs Anne Clarke (emergency medicine), Kathryn Giles (neurology), Susan Hutchison (family medicine), Colin Johnston (family medicine), Daisy Pavri (perdiatrics), Skye Raffard (obstetrics and gynaecology), David Richardson (family medicine).

BCMJ BC Medical Journal

seacourses INC Custom Cruises & Tours for Professionals

Book now for best stateroom selection and pricing
cruises@seacourses.com • 604 684 7327
1 888 647 7327 • seacourses.com

The value of social media to you and the profession

How up to speed are you on Twitter, Facebook, Instagram, LinkedIn, or Snapchat? Would you know how to reach @doctorsofbc or @awruddiman, or what to do with #ilovesocialmedia or #physicianleadership? If you're like many people and professionals, these social media terms may be familiar yet applying them can be a little mind boggling. We've all heard the term *social media* and generally speaking we know what it is, yet understanding how to embrace and use it may be a little daunting for some. I am active on Twitter, but only picked it up as a communication and information forum 2 years ago.

Research shows that more and more people, including professionals, are relying on social media as their primary source of communication because it's instant and in real time. You can reach a broad audience in one click, and you can just as efficiently receive comprehensive responses on a host of topics.

But what does social media have to do with health care? Today, professional influence is increasingly derived through social media, providing a huge opportunity for physicians and health care organizations to use this communication channel to inform, to connect, and to influence.

My current social media tool of choice is Twitter. I see it as an increasingly effective way to express my thoughts, ideas, and opinions on what is occurring locally and globally and on what those interested in my thoughts (referred to as my followers) might be interested in knowing. For instance, on Twitter I have 1774 followers who range from physicians, stakeholders, government, media, friends, family, and, more broadly, the public. I have acquired followers because, I imagine, they believe the information I push out—brewing health system issues, good news or provocative media stories, or just about anything else that relates to my role as Doctors of BC president, my rural professional life, or my life as a member of a vibrant rural BC community—is of value or interest to them.

Increasingly more members of the medical profession are embracing social media as a way to connect, engage, and influence. Whether it's to share helpful medical information, stay connected on a collegial level with family and friends, or network with colleagues and peers, it helps build and foster two-way relationships.

And it's not just individuals who use social media. As an organization, Doctors of BC is very active on social media platforms such as Twitter and, more recently, Facebook, often using them to communicate key positions on important issues to the public, stakeholders, media, and our members quickly, early, and often.

At this year's CMA General Council Meeting, the hashtag #cmagc was tweeted on average 106 times per hour, and received over 68 million impressions—or, in simpler terms, it was seen and viewed over 68 million times. This allowed members who couldn't attend, key stakeholders, the public, and the media—everyone who followed that hashtag—to stay connected and to keep abreast of each turn of events at the CMA GC in real time.

One of the greatest opportunities social media provides physicians is the ability to leverage information—to highlight individual professional activities and interests, to advocate for the profession, or to influence behavior to the benefit of the health care system. It allows us to expand our breadth of connectivity, engagement, and knowledge beyond the borders of our offices, our specialties, our hospitals, even our communities. And, in so doing, it enables doctors to position ourselves as a trusted and knowledgeable source, to fill in gaps in information, to change how the public and stakeholders view certain issues, and to strengthen our professional voice.

I recognize the hesitation some may have about being proactive on social media. Concerns over privacy and confidentiality, or inadvertently saying something that is incorrect or offensive, are important considerations. However, there is no risk to simply following someone on social media. In fact, there's a great deal of value in seeing what's being said by those you admire or respect. And as long as you're circumspect about the content of what you post and you stick to the general rule of thinking twice before you post, you will be fine.

Social media broadly reaches and connects not only the profession, but key partners and stakeholders, those interested in our activities, and the public. As physicians we have the opportunity to harness this tool and the online world to inform, to connect, and to influence. So have some fun and join the world of social media! And when you do, don't forget to "like" Doctors of BC's new Facebook page, and I would appreciate the follow on Twitter at @awruddiman. I'd be delighted to follow you back and together we can broaden our professional networks and reach.

—Alan Ruddiman, MBBCh, Dip PEMP, FRRMS
Doctors of BC President

BCMJ
BC Medical Journal

Letters of less than 300 words are welcomed provided they do not contain material that has been submitted or published elsewhere; they may be edited for clarity and length. Letters may be e-mailed to journal@doctorsofbc.ca, submitted online at bcmj.org/content/contribute, or sent through the post and must include your mailing address, telephone number, and e-mail address.

Expectation of fairness

For most families in BC the dinner hour of 6 p.m. and onward is a time for coming together to eat and enjoy some relaxation after the work of the day. For a family or individual to be deprived of this expectation requires some compensation. MSP is morally wrong in not compensating surgeons and their assistants for the loss of this sweet time, disruption of meals, and reduced family togetherness if an operation starts before 6 p.m. and continues to 11 p.m. Cynically, MSP pays at night rates for the few procedures that start before 8 a.m. and continue into business hours. Such extra payment is not indicated and makes further mockery of what is then incorrectly called out-of-office hours premiums.

—Michael A. Ross, FRCSC
Victoria

Pharmacy prescribing and renewal system

It's been 19 years since I last wrote a letter to the *BCMJ*, at which time I put forth the Peter Finch quote from the movie *Network*, "I'm mad as hell and I'm not going to take it anymore!"

Recently I got to thinking about how the current pharmacy prescribing and renewal system is antiquated, fraught with errors, and a huge time waster for all involved. I got to thinking once again about the frustrations of dealing with trashed-out looking faxes (really a dinosaur of technology compared to the electronic portals that are now available) that come to us in all shapes and sizes. I wonder how much pharmacies are billing us to inundate us with a continuous barrage of faxes relating to our prescribing practices.

There would be no or many fewer errors fulfilling scripts, especially for patients discharged from hospitals.

How much negotiating has Doctors of BC done on our behalf, pushing to establish Real Time Online Prescription Fulfillment (RTOPF) from doctors anywhere—at specialists' offices, walk-in clinics, ERs, and regular offices?

Ideally in the RTOPF scenario, at the time of completion of the prescription order, the dose, quantity, prescriber's name and contact information, and location filled are all transmitted to the EMR of the doctors who need to know—mainly the patient's regular physician but also anyone who has an active EMR with the patient's records. I liken it to withdrawing funds with one's debit card. Even if one were in Timbuktu, all who need to know would have the transaction details of how much one withdrew and what the balance was. This would mean no time wasted on faxes for explanations of what was meant for an Rx, when there might be several versions of a given drug.

There would be no or many fewer errors fulfilling scripts, especially for patients discharged from hospitals. I have often found discrepancies in the medications prescribed to a patient on discharge by both hospitalist and specialist. I've had the same medication given but with different doses prescribed by each doctor. A recent ruling by the College of Pharmacists of BC requires that every patient's meds be cancelled upon discharge and must be represcribed. Thus, to keep one's EMR happy, this might require many scripts, especially for elderly patients with polypharmacy issues, to be manually represcribed and re-entered each time they visit the hospital. This is clerical work, not medicine, and a very large time waster.

There would also be many fewer interruptions to our day by pharmacies' faxes querying details of a prescription being renewed by the patient's regular doctor with adjustments made outside the office other than by the renewing doctor. And of course we must not forget the numerous times that a specialist changes meds, and we might be remiss and forget to enter this manually into our EMR.

Remedies as described above for this pharmacy issue would save us docs much time and the system millions of dollars!

—Jack Boxer, MD
Vancouver

Is lesion location random, and does it really matter?

We physicians are so busy labeling and treating that we don't have the time to question why lesions occur where they do.

Margo S. Clarke, MD

A very peculiar feature of HLA-B27 uveitis is the tendency for one eye to become involved during an attack. This can be so profound that that cells precipitate in the anterior chamber forming a snowbank appearance. Curiously the other eye is completely unaffected, with not a single visible cell floating in the anterior chamber. Clearly the immune system has the ability to discriminate between the two eyes, yet why this occurs is a complete mystery. What is fascinating is that some individuals will repeatedly have an attack in one eye while others will flip-flop between eyes in a seemingly unpredictable fashion. These oddities happen consistently, but in a busy practice these observations simply help to confirm the diagnosis of HLA-B27 iritis. We think it is strange that iritis occurs this way but perhaps these oddities are clues to finding the cause of immune misdirection. More importantly, finding answers may lead to truly definitive treatment rather than symptom control.

Dr Clarke is a clinical assistant professor in the Department of Ophthalmology and Visual Sciences at the University of British Columbia. She is now retired. Dr Clarke's additional areas of special interest include immunology, developmental biology, and genetics.

This article has been peer reviewed.

What I have described for iritis is not unique. Many inflammatory conditions occur asymmetrically and at very select locations. These specific features of preferred sites of pathology are used in determining a differential diagnosis. Why each disease has susceptible anatomic sites is often unknown. Although rheumatoid arthritis involves the metacarpophalangeal joint and not the distal interphalangeal joint, and this pattern of involvement assists diagnostically, we don't question why the distal interphalangeal joint is spared in rheumatoid arthritis yet involved with psoriatic arthritis. Similarly psoriasis tends to involve extensor skin surfaces and each dermatological condition has specified regions of involvement, but there is currently very little data to explain these patterns.

Degenerative diseases also occur in specified sites, and as imaging technology advances it has been noted that there is often directional evolution. Asymmetrical presentation occurs frequently, Parkinson disease being a classic example of unilateral onset. If we perceive asymmetry and lesion site to be random, then we limit the observations that will be made. If we are willing to imagine that tissue that appears to be the same microscopically is in fact molecularly different and that these variances may determine why lesions occur where they do, then asymmetry and directional evolution become powerful clues that can assist our understanding of disease mechanism, which could lead to more specific therapy.

Amazing developmental biology has made great strides in determining the molecular organization that guides assembly of all body sites, and significant portions of this molecular map persist in adult tissue. Remarkably, the blueprint for the body as a whole and for each organ follows a repetitive plan drawn on coordinates (head-tail, back-front, and left-right). Hence each position in the body has molecular coordinates where tissue varies along these axes and the variances can create differential resistance or susceptibility to disease and may explain why all tissue does not succumb simultaneously.

Another fascinating finding in developmental biology is that the mesoderm (fibroblasts and their close relatives in other tissue) carries most of the position code. This was illustrated in chicks that had epithelium from the wing switched to the location where a leg was to develop: scales appeared instead of feathers, hence determining that the mesoderm directed the options inherent in the epithelium. Of relevance to the role of mesoderm in human adult tissue, fibroblasts were cultured from 43 body sites and a position code, analogous to a postal code, was identified unique to each body site, yet following developmental coordinates. Since

Continued on page 500

Continued from page 499

then fibroblasts from many organs have been examined with similar findings. The concept advanced is that positional variances present in fibroblasts then direct changes in skin and hair, explaining the different patterns present over the surface of the body. Understanding the combinatorial regulatory modules that define dermatological patterns remains one of the goals of future research. Perhaps one day the molecular meaning of the lupus butterfly rash will be known.

Spectacular progress has occurred in the field of genetics in the last few decades and it is clear that the further one goes into genetic analysis the more complex it becomes. Each disease is recognized to exhibit heterogeneity. With each person averaging a base-pair substitution every 2000 base pairs, the implication is that with 3 billion base pairs in our genome we each harbor over a million base-pair variances. Although the vast majority of these changes have little impact on the quality or quantity of the proteins we produce, it is easy to understand why there is inter-individual variation in all diseases. Hence any feature of a disease where there is a constant provides an important clue to unraveling disease mechanism. To ignore the cause of asymmetry in HLA-B27 iritis, and not determine the cause for distal interphalangeal involvement in psoriatic arthritis or the reason for distal to proximal spread in dermatomyositis, may mean that valuable clues are being missed. Mechanisms to use these clues include comparative omics by site and phenotyping in genome-wide association studies according to lesion site and directional evolution. In select diseases these approaches are being pursued in part.

Unfortunately as clinicians we are so busy diagnosing and treating diseases that getting the job done and staying on top of recent advances consumes our time and energy. We have been saturated with data to memorize, and asking why has often been shelved. Recently it has been reported that the top-earning treatments for the pharmacological industry are biologicals. And the focus of research is increasingly directed at new biologicals rather than traditional small-molecule drugs. The expense of this approach is concerning. Clearly one can understand that financial incentives direct pharmaceutical research, but as patient advocates we need to foster alternative treatment directions.

This article is written with hope that physicians in clinical practice—especially those new to practice—will become curious, if they are not already, and that through their patient encounters they will continue to question current concepts and form alliances with researchers to pursue questions that address basic concepts.

Lesion location is not random. It is generated by a combination of phenotype variances superimposed on a core developmental map altered by circumstances such as aging, infection, and trauma, and further modified by the visiting immune system that can react appropriately, overreact, or underreact according to clues from the tissue or its innate predecessors. It is all logical but it depends on complex overlapping databases that are inherently faulty if the developmental map is absent. The constant features of location, direction, and asymmetry are potent allies in the quest to ultimately find new specific, definitive treatments. BCMJ

Competing interests

None declared.

BC physicians reduce unnecessary antibiotic use—and costs

It is rare to find a health intervention that both improves a standard of practice and reduces costs, but this seems to be the case for the Do Bugs Need Drugs? program in BC.

The World Health Organization and the Public Health Agency of Canada recognize the rapid emergence of antibiotic-resistant organisms as being among the most significant threats to health and health care–system sustainability. Wise use and stewardship of antibiotics are essential in mitigating the threat by reducing the pressure for natural selection of resistant organisms and preserving the value of antibiotics for future generations.

Between 80% and 90% of antibiotics used in human populations are prescribed in the community. In 2005 the BC Ministry of Health funded Do Bugs Need Drugs?, a program of professional and public education aimed at reducing the risk of antibiotic resistance and improving prescribing practices at the population level. The BCCDC routinely assesses changes in patterns of antibiotic prescribing in the community by analyzing non-identifying data made available for this purpose from PharmaNet.

Between 2005 and 2014 the rate of antibiotic prescribing fell 15% from 1.79 to 1.53 antibiotic prescriptions per thousand person days (**Figure**). This drop can be explained by steep declines in prescribing for children and for respiratory infections, which were the original targets of the program. The declines have occurred over a period where many trends in resistance stabilized, though we remain under constant threat of emergence of more resistant strains.

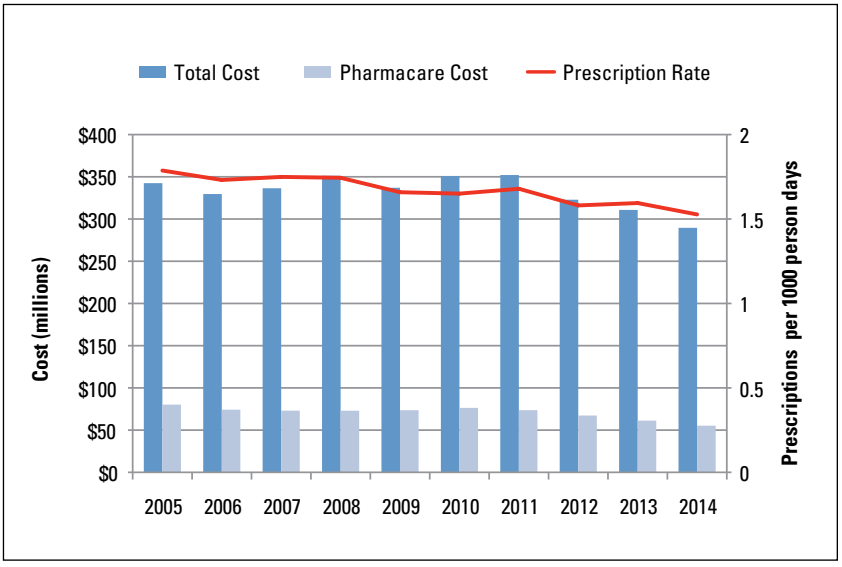


Figure. Prescription rate, total cost, and cost to BC Pharmacare for antibiotics, 2005–2014.

Source: BC Ministry of Health. PharmaNet. Victoria, BC, 2013.

Reduced prescribing is associated with a reduction in costs for BC. Over the first 10 years of the program, the annual cost of community antibiotic prescribing fell by 15.5%, from $342 million to $289 million, a difference of $53 million in 2014 alone. As well, over the same time period, there has been a 31% decrease in annual costs to Pharmacare for antibiotic claims, saving the Ministry of Health $25 million in 2014 compared with 2005. Other changes have played into costs over time; however, declines in the average cost of a prescription (–10.4%) were of the same order of magnitude as increases in population (+10.4%) over the decade, so these effects tend to cancel each other out. (The cost of a prescription has decreased due to lower costs for generic antibiotic drugs and because of some drug-switching by BC physicians back to first-line, narrower-spectrum agents.) The BC Ministry of Health's academic detailing program has also put effort into educating health care professionals on appropriate antibiotic use, and other educational programs have been at play.

But cost reductions are only incidental. The goal of stewardship is to avoid unnecessary antibiotic use in order to slow emergence of resistance and to reduce complications from unnecessary treatments. The country furthest along on this continuum is the Netherlands, which experiences lower rates of antibiotic use with no evident increase in complications from bacterial infections. BC would approach the same success if there were a further 20% to 25% reduction in prescribing.

Can we get there safely? The answer is, almost certainly, yes. We are beginning to see reductions in prescribing for residents of long-term care facilities, where a tendency to overtreat asymptomatic bacteriuria is being slowly reversed. We are also collaborating with our dental

Continued on page 503

This article is the opinion of the BC Centre for Disease Control and has not been peer reviewed by the BCMJ *Editorial Board.*

The scoop on supplements for disease prevention

Approximately 40% of Canadians regularly consume vitamin and mineral supplements, hoping to prevent disease, promote longevity, or compensate for the inadequacies of the typical Canadian diet. Epidemiologic studies suggest that diets high in nutrient-rich foods like fruits, vegetables, and fish are effective in preventing disease.[1] The traditional assumption is that simply replacing these nutrients with supplements will provide the same benefit. Unfortunately, although supplementation may change serum levels, total intake, or other surrogate markers, well-designed controlled studies on artificial supplementation have failed to show consistent reduction in fractures, heart disease, cancer, or dementia.[2-6] The synergy of nutrients and related substances (e.g., phytochemicals, antioxidants, fibre) available in foods has yet to be replicated by a pill.

There are certain situations where supplementation should be considered:

- Folic acid to prevent congenital neural tube defects (strong evidence).[1]
- Vitamin D in breastfed infants (strong evidence), frail elderly women (moderate evidence), and dark-skinned or homebound patients (low evidence).[7]
- Iron for those with low intake (vegetarians), regular blood loss (e.g., menorrhagia), or at risk for poor absorption (elderly on medications such as metformin, proton pump inhibitors).[1]
- Vitamin B12 for vegans and those at risk for poor absorption.[1]

For other supplements, including calcium, antioxidants, B vitamins, vitamin C, omega-3s, co-enzyme Q10, and zinc, there is no evidence of benefit for disease prevention[2-6] and no indication for routine screening for deficiencies.

Unfortunately, although supplementation may change serum levels, total intake, or other surrogate markers, well-designed controlled studies on artificial supplementation have failed to show consistent reduction in fractures, heart disease, cancer, or dementia.

Although taking a daily multivitamin is considered safe, it is unnecessary for most Canadians. Some experts suggest that food-insecure Canadians or those with a very poor diet may benefit; however, this has not been proven. Many foods in Canada are already enriched to prevent widespread deficiencies.[2,3]

Contrary to the widely held belief that vitamins and minerals are natural and therefore safe, supplements can be harmful, particularly if exceeding tolerable upper levels, but also in recommended doses. Recent studies have shown increased risk of myocardial infarction with beta-carotene, calcium, and vitamin E; increased all-cause mortality from vitamin E and beta-carotene; teratogenesis from vitamin A at high doses; and nephrolithiasis from zinc, vitamin C, and calcium.[1]

Minerals like calcium or iron can impair absorption of levothyroxine, bisphosphonates, and fluoroquinolones, and vitamin B6 reduces absorption of medications like levodopa and antiepileptics. Vitamin A and beta-carotene can increase hepatotoxicity of medications including acetaminophen, carbamazepine, methotrexate, warfarin, and retinoids. Vitamin E can potentiate the bleeding risk of warfarin, ASA, and NSAIDs.[1] The cost of supplements can be significant.

Studies have repeatedly found examples of supplements containing contaminants, dangerous additives, and misleading or inaccurate labeling or dosage information.[8] Unfortunately, the supplement industry has resisted stricter regulation to ensure consumer safety.[8]

Despite the consistent lack of evidence of benefit, many patients continue to take supplements. The following recommendations can help patients minimize potential harms:

- Do not exceed recommended doses.
- Discuss supplements with health care providers.
- Purchase well-known brands labeled with Health Canada natural product numbers.

As trusted sources of up-to-date, evidence-based information, physicians need to help patients interpret the overwhelming volume of often poor quality information available by providing clear guidance. Required nutrients are best obtained through a healthy diet rich in whole foods. We can't replace a poor diet with a pill. "Let food be your medicine, and medicine be your food." —Hippocrates

—Ilona Hale, MD
—Kathleen Cadenhead, MD
—Mary Hinchliffe, MD

This article is the opinion of the Council on Health Promotion and has not been peer reviewed by the BCMJ *Editorial Board.*

References

1. McCord P, Opsteen J. Vitamin and mineral supplementation: Primary disease prevention. Foundation for Medical Practice Education 2016;24(6).
2. Singal M, Banh HL, Allan GM. Daily multivitamins to reduce mortality, cardiovascular disease, and cancer. Can Fam Physician 2013;59:847.
3. Macpherson H, Pipingas A, Pase MP. Multivitamin-multimineral supplementation and mortality: A meta-analysis of randomized controlled trials. Am J Clin Nutr 2013;97:437-444.
4. Fortmann SP, Burda BU, Senger CA, et al. Vitamin and mineral supplements in the primary prevention of cardiovascular disease and cancer: An updated systematic evidence review for the US Preventive Services Task Force. Ann Intern Med 2013;159:824-834.
5. Schwingshackl L, Hoffmann G, Buijsse B, et al. Dietary supplements and risk of cause-specific death, cardiovascular disease, and cancer: A protocol for a systematic review and network meta-analysis of primary prevention trials. Syst Rev 2015;4:34.
6. Theodoratou E, Tzoulaki I, Zgaga L, Ioannidis JP. Vitamin D and multiple health outcomes: Umbrella review of systematic reviews and meta-analyses of observational studies and randomised trials. BMJ 2014;348:g2035.
7. Bjelakovic G, Gluud LL, Nikolova D, et al. Vitamin D supplementation for prevention of mortality in adults. Cochrane Database Syst Rev 2014;(1):CD007470.
8. Newmaster SG, Grguric M, Shanmughanandhan D, et al. DNA barcoding detects contamination and substitution in North American herbal products. BMC Med 2013;11:222.

Continued from page 501

colleagues, who now account for over 11% of prescriptions in BC. Dental practitioners are identifying the opportunity to reduce unnecessary perioperative prophylaxis as well as prescribing for periapical abscess and other indications. We also laud work being done at the BC Divisions of Family Practice to pilot personalized feedback on antibiotic prescribing for family physicians through an electronic health record platform.

Thanks to many BC practitioners, our province is now moving in the right direction with community antibiotic use.

—David M. Patrick, MD, FRCPC, MHSc
—Laura Dale
—Mark McCabe, MPH
—Bin Zhao, MSc
—Mei Chong, MSc
—Edith Blondel-Hill, MD, FRCPC
—Fawziah Marra, PharmD

Fake joints, real results, Part 1: Hip and knee replacement

Dr Bas Masri

Arthritic conditions have plagued humanity since the beginning of time. It was not long ago that becoming unable to walk or needing to rely on walking aids was considered a normal part of aging. Efforts to replace arthritic joints began in 1890, when Professor Gluck tried to replace an arthritic femoral head with an ivory one. After this unsuccessful first effort at hip replacement, numerous attempts were made with variable and generally poor or unpredictable results. In the early 1960s, Sir John Charnley developed low-friction arthroplasty of the hip, which is basically the modern hip replacement. Without a doubt, this was one of the most significant advances in orthopaedics in particular and medicine in general. Further advances have since led to a rapid expansion in the application of hip replacement beyond arthritic conditions to traumatic and neoplastic affliction. Over the years, joint replacement technology has also moved beyond hips. In fact, knee replacements have surpassed hip replacement in terms of numbers done in British Columbia. Other joints are now successfully treated with arthroplasty as well, including shoulders, elbows, wrists, knuckles, and ankles.

In this first of a two-part theme issue, we consider the most common joint replacement surgeries. Drs Bradley Ashman, David Cruikshank, and Michael Moran outline the history of hip replacement and the many designs and materials used for components in 2016, while Drs Paul Dooley and Charles Secretan examine the indications for and expectations of knee replacement. In the second part of the theme issue to be published next month, we will consider joint replacements that are becoming increasingly common. Dr Kelly Apostle will discuss advances in ankle replacement, while Dr Derek Plausinis will review current options for shoulder replacement.

What is most remarkable about this group of authors is that so many of them are faculty members in the Department of Orthopaedics at the University of British Columbia, and most of them practise outside Vancouver. This is very different from the situation in the department, the university, and the province when I first enrolled at UBC in 1981, and reflects the benefits that have come from expanding the Faculty of Medicine across BC.

I am very grateful for the contributions made by the theme issue authors and hope that you will enjoy these articles and find them of use in your practice.

—Bas Masri, MD, FRCSC
Professor and Head of Orthopaedics, University of British Columbia and Vancouver Acute (VGH and UBCH)
Surgeon-in-Chief, Vancouver Acute (VGH and UBCH)

This article has been peer reviewed.

Bradley Ashman, MD, David Cruikshank, MD, Michael Moran, MBBCh, FRCSC

Total hip replacement: Relieving pain and restoring function

Since the first successful modern hip arthroplasty was performed by Sir John Charnley in the 1960s, procedures and components have evolved and made joint replacement available to patients younger than 65.

ABSTRACT: Total hip replacement is one of the most common orthopaedic reconstructive procedures performed today, with more than 40 000 replacements completed annually in Canada. New surgical techniques and materials have led to procedures that produce profound changes in the lives of patients and allow them to resume virtually all of their previous activities. Sir John Charnley developed low-friction arthroplasty in the 1960s. Since then, procedures have evolved to address the issues of wear and bone loss and permit joint replacement in patients younger than 65. Pain is the primary indication for a hip replacement, with osteoarthritis being the most common cause. State-of-the-art implants in 2016 include cemented, uncemented, or hybrid components; metal or ceramic femoral heads; and polyethylene or ceramic acetabular liners. In British Columbia, the standard of care is a metal acetabular shell with a polyethylene liner and a cemented or uncemented femoral stem with a metal femoral head. Hip resurfacing is an option for young active patients, although its use worldwide has declined dramatically. Early mobilization after total hip replacement is recommended. While complication rates are low, possible postoperative problems include venous thromboembolism and nerve injury in the short-term, and periprosthetic fracture and osteolysis in the long-term. If there is a failure of the hip replacement for some reason, the likelihood of a revision procedure succeeding is good.

Total hip replacement is a remarkable procedure that can relieve pain and restore function. According to the Canadian Institute for Health Information, more than 40 000 hip replacements are completed annually in Canada (https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC2945&lang=en). For most patients with a destructive process occurring in the hip joint, total hip arthroplasty (THA) is a viable option. Since the first successful THA was performed in the 1960s, procedures and the components used have evolved and we now have a better understanding of post-op considerations and possible complications.

History

Beginning in the 1800s, a number of attempts were made at hip replacement for infection and fracture using implants of ivory, glass, ceramic, and metal. These trials continued through to the 1960s, when Sir John Charnley

Drs Ashman and Cruikshank are residents in the Department of Orthopaedics at the University of British Columbia. Dr Moran is an orthopaedic surgeon at the University Hospital of Northern BC and a clinical professor in the Department of Orthopaedics at the University of British Columbia.

This article has been peer reviewed.

developed the modern total hip replacement, which he called low-friction arthroplasty.[1] Charnley's procedure used a single-component (monoblock) metal femoral stem and head combined with a cemented polyethylene acetabular shell. The arthroplasty of Charnley's era survived for many years but had problems. The 22.25-mm femoral head was prone to dislocation and the polyethylene shell to eccentric wear. Larger femoral heads were developed that reduced the rate of dislocation, but at the cost of increased wear. Whatever the size of the head, the cement mantle tended to loosen and then fail. The problem of loosening was essentially solved with the introduction of uncemented components. However, failures continued to occur with the breakdown of the polyethylene and subsequent bone loss.

Since the late 1990s, highly crosslinked polyethylene with much improved wear characteristics has been used with excellent results. Today wear and bone loss as a result of hip replacement are exceedingly rare, regardless of patient age or activity level. In addition, so-called hard-on-hard articulations are being used more often. These include metal-on-metal and ceramic-on-ceramic bearing surfaces. While the risk of wear is minimal with these articulations, metal-on-metal total hip arthroplasty has been abandoned because of the many failures related to adverse local tissue reactions to metal debris and the formation of pseudotumors. Currently, the only hard-on-hard bearing surface available for a total hip arthroplasty is ceramic-on-ceramic, and according to joint registry data there is no evidence of superiority when ceramic and highly crosslinked polyethylene are compared at 10 years follow-up.

Today's state-of-the art implants include:

- Femoral heads of metal or ceramic.
- Acetabular liners of polyethylene or ceramic.
- Components that are cemented, uncemented, or hybrid (uncemented acetabulum and cemented femur).

With the improving outcomes of hip replacement it is no longer necessary to wait until patients are completely disabled before considering surgery.

Indications

The primary indication for total hip replacement is pain. Patients who are unable to sleep because of pain will generally have a remarkable outcome from THA and will likely awake from surgery to realize that their pain has been resolved. Patients unable to perform activities of daily living or with deformities such as a leg-length discrepancy or flexion deformity are prime candidates for this operation. Such patients tend to have significant pain. With the improving outcomes of hip replacement it is no longer necessary to wait until patients are completely disabled before considering surgery. Earlier intervention yields better outcomes provided that nonoperative treatments are no longer effective and the patient has pain that is related to the hip joint and not referred from the lumbar spine or related to extra-articular structures.

Pain from the hip joint is typically located in the groin or buttock, with referral to the thigh and often to the knee. Hip arthritis can present solely with knee pain, a finding especially common in elderly patients. All patients presenting with knee pain should undergo a physical examination of the hip and appropriate radiographs should be obtained if abnormalities are found during the hip examination.

Diagnoses

Obviously, patients being considered for THA need to have an underlying condition that can be addressed using joint replacement. In broad terms, any patient with a pathology that leads to degeneration of the articular cartilage of the joint might benefit from replacement of that joint. Osteoarthritis, whether idiopathic, developmental, or posttraumatic, is by far the most common diagnosis leading to hip replacement surgery. This includes osteoarthritis in the medial wall of the acetabulum, which is often missed because the radiological findings can be subtle and the presenting symptoms can be somewhat unusual. For example, a patient may have pain at night and with certain activi-

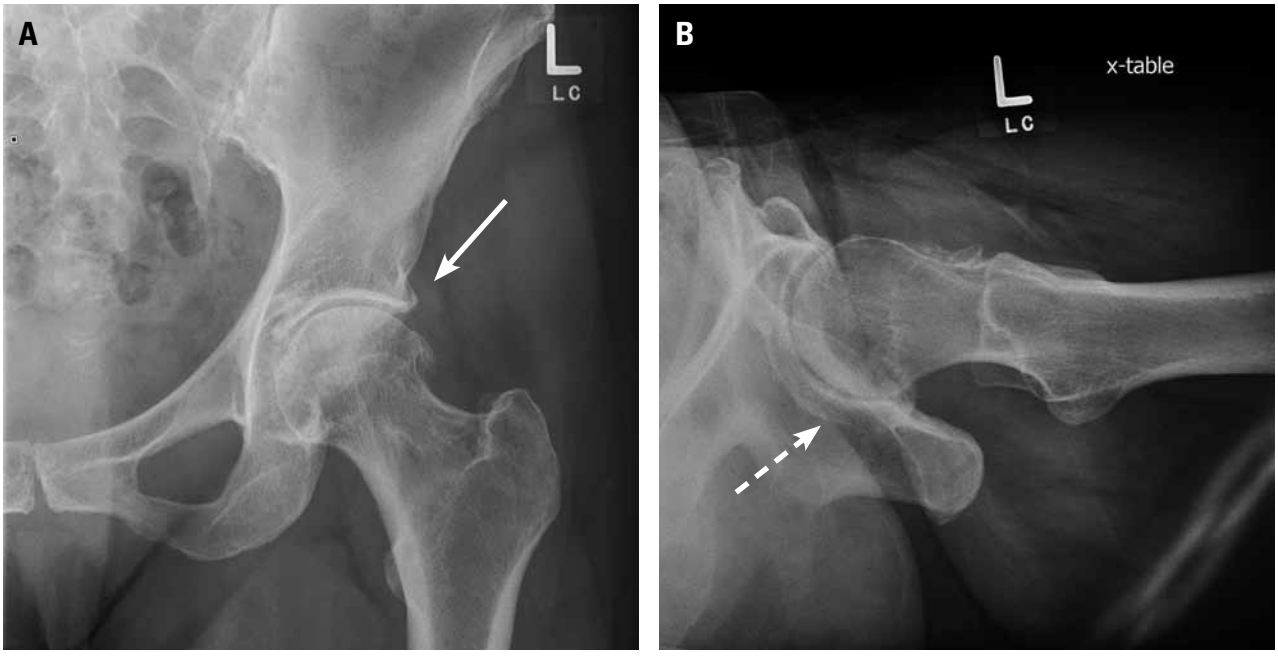


Figure 1. Anteroposterior view of left hip (A) shows minor changes at the dome of the acetabulum and difficult-to-assess osteoarthritis (solid arrow) in the acetabular medial wall. Lateral view of the left hip (B) reveals osteoarthritis (dashed arrow) in the acetabular medial wall.

ties because the medial wall of the acetabulum is affected, but can still have good walking tolerance because the dome of the acetabulum (the weight-bearing surface) is relatively unaffected. In these cases, the lateral radiograph can be helpful in assessing medial wall osteoarthritis (**Figure 1**).

Over the past decade femoroacetabular impingement (FAI) has been recognized as a precursor of and possibly one of the ultimate causes of idiopathic osteoarthritis of the hip. The condition commonly occurs as either cam FAI (deformity of the femoral neck) or pincer FAI (deformity of the acetabulum). The impingement caused by deformed hip bones eventually leads to acetabular labral tears and concomitant articular cartilage degeneration. Because the labral tears are part of the degenerative process, the repair of these in patients older than 40 without a bona fide injury and FAI is almost never indicated. An MRI or MRI/arthrogram of the hip will rarely change the management and should not be ordered if there is any evidence of degenerative arthritis. Hip-preserving surgery (hip arthroscopy or open dislocation and debridement) in the presence of degeneration will not lead to a good outcome and may lead to more rapid progression of the arthritis and an earlier need for a hip replacement.

Acetabular dysplasia involves a shallow or underdeveloped acetabulum that leads to early hip osteoarthritis. As in cases of femoroacetabular impingement, patients older than 40 with acetabular dysplasia will not benefit from osteotomies and labral repairs. The only effective surgical option is a total hip replacement. As such, there is no role for MRI in diagnosing acetabular dysplasia and degenerative change.

Avascular necrosis occurs when the blood supply to the femoral head is disrupted. In such cases the avascular portion of the femoral head can collapse and cause degeneration of the hip joint. However, the radiological findings are often not as pronounced as the patient symptoms. MRI will reveal the extent of the disease but is not usually a necessary investigation unless the plain X-ray images do not reveal any abnormalities early in the course of the disease.

Inflammatory arthropathies such as rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis all present with degenerative changes similar to those seen in osteoarthritis and should be treated in the same manner.

Age

In the past, being younger than 65 was considered a barrier to joint replacement. This is no longer the case. Although patients with hip-related pain should be counseled to persist with nonoperative treatment until such time as their symptoms are severe enough to warrant THA, it is

important to recognize that patients age 40 to 50 may be better served by replacement than by hip arthroscopy or further waiting. These patients are not too young for hip replacement, and the thinking that only patients older than 65 should be offered THA is no longer correct.

As the bearing surfaces used for hip replacement have improved, the lifespan of implants has increased, and the age of the patient is not as critical a consideration as it once was. Implants are now good enough to outlast the patient in most cases. Therefore, the status of the joint and the symptoms of the patient, not the age of the patient, should determine whether a THA is appropriate.

Implants are now good enough to outlast the patient in most cases.

Implants

Many implant designs have been used during the development of total hip arthroplasty. Research into various implant materials and different shapes and sizes of both the femoral and acetabular components has made this field a diverse and exciting one.

During a total hip arthroplasty procedure, the degenerated femoral head and acetabulum are replaced with a metal femoral stem and head (cemented or uncemented), a metal acetabular shell (cemented or uncemented), and an acetabular liner that locks into the acetabular shell. The bearing surface that takes the force of contact during the joint articulation consists of the femoral head and the acetabular liner. The search for the best materials to use in this bearing surface have led to industry innovation and much debate.

Options today include a femoral head made of metal (cobalt and chromium) or ceramic and an acetabular liner made of metal, ceramic, or polyethylene. In British Columbia, the Medical Services Plan covers the cost of a cemented or uncemented femoral stem with a metal femoral head and a metal acetabular shell with a polyethylene liner (either ultra high molecular weight or highly crosslinked polyethylene). If a patient asks for a different component because of a perceived benefit, there is an additional charge since no benefit has been found with other articulating surfaces.

Metal-on-polyethylene bearing surface

In the 1960s, Charnley pioneered the use of a metal femoral head and an acetabular component of ultra high molecular weight polyethylene. This metal-on-polyethylene bearing surface was adapted from the impact bearings used for looms in the textile industry.[1]

Since Charnley's time, only a few improvements have been made, and the metal-on-polyethylene bearing now has an excellent track record. The main difference between modern implants and the original 1960s implants is the move away from the monoblock head-and-stem construct. The implant used by Charnley was a femoral stem and head that had been machined as a single unit, whereas current implants consist of a femoral stem with a trunnion that permits attachment of a head and thus allows for more sizing options. In recent years, however, trunnion corrosion has led to pseudotumor formation similar to that experienced by patients with metal-on-metal total hip replacement.[2] Although rare, these inflammatory masses have been reported with metal-on-polyethylene hip replacements and are thought to be related to metallic corrosion where the head of cobalt and chromium joins with the femoral stem, which in most cases is made of titanium.

In North America currently, the metal-on-polyethylene bearing surface is used most commonly.[3] It has good wear characteristics, a high survivorship, and remains the workhorse of arthroplasty surgeons now that the early problem of liner wear has been addressed. Originally, the pressure of the metal femoral head on the softer polyethylene liner produced an eccentric wear pattern that eventually led to joint failure and the need for revision.[4] Over the last 15 years or so the use of crosslinked polyethylene has significantly reduced the rate of wear, and revisions for polyethylene wear are now uncommon.

Ceramic-on-ceramic and ceramic-on-polyethylene bearing surface

An alternative to metal-on-polyethylene is a bearing surface of medical grade ceramic. The ceramic-on-ceramic bearing surface is more expensive but has better wear characteristics, reduced particulate debris

generation, and greater biocompatibility.[5]

The use of ceramic bearings is increasing in North America and is used in the majority of cases in Europe. Earlier generations of ceramic were relatively brittle, which lead to a high risk of component fracturing.[6] Improvements in ceramic technology and manufacturing techniques have dramatically reduced the incidence of implant fracturing[5] along with the risk of squeaking from the hip with walking and bending motions.[7] Despite the potential advantages of a ceramic-on-ceramic bearing surface, the rate of revision at 10 years is identical to that of metal-on-polyethylene and the cost is greater. While the ceramic-on-ceramic bearing surface is considered an option for young, active patients who require a total hip arthroplasty,[7] the routine use of ceramic-on-ceramic instead of metal-on-polyethylene is not considered cost-effective.

An alternative to the standard ceramic-on-ceramic bearing is a ceramic femoral head with a polyethylene liner. This ceramic-on-polyethylene bearing surface does not pose a squeaking risk and is cheaper than a ceramic-on-ceramic bearing. While the wear rates of ceramic-on-polyethylene and metal-on-polyethylene are not appreciably different, the risk of pseudotumor formation from metallic debris is eliminated with the use of ceramic-on-polyethylene. Despite this advantage, the routine use of ceramic-on-polyethylene is not considered to be cost-effective because of the rarity of pseudotumors in the large number of hip replacements done annually and the higher cost of ceramic implants.

Metal-on-metal bearing surface

From the late 1990s to the early 2000s there was a resurgence in the use of a metal-on-metal bearing surface in total hip arthroplasty. The advantages included low volumetric wear, high resistance to implant fracture, and lower rates of dislocation with the increased femoral head sizes permitted by large-head metal-on-metal THA.[8]

This enthusiasm was short lived, however. It has now been well documented that patients with a metal-on-metal THA have elevated serum levels of cobalt and chromium, of which the clinical effects are unknown. Further, it has been discovered that in some patients the metallic ion wear debris leads to formation of benign solid or cystic masses. Investigations have found that the prevalence of these pseudotumors in asymptomatic patients with metal-on-metal implants is unacceptably high.[9] Given the complications and the high revision rates for large-head metal-on-metal implants, this bearing surface is no longer an option for total hip arthroplasty.

Cemented versus uncemented implants

A major consideration in THA is whether to use a cemented or an uncemented implant. Early procedures relied on polymethylmethacrylate cement from the dental industry,[10] a bonding agent that failed to adequately secure arthroplasty implants to bone. Charnley recognized that rather than using the cement for bonding, he should use it as a grout to create an interface between the porous metaphyseal and cortical bone and the metal implant in order to greatly increase the surface contact area and achieve long-term stability. While cemented implants (**Figure 2**) are still favored in some parts of the world, including Sweden and Norway,[10] the most common type of prosthesis in North America is an uncemented implant (**Figure 3**).

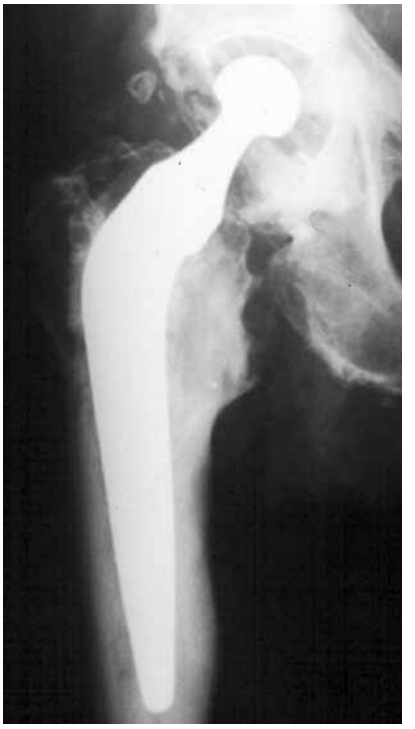


Figure 2. Total hip replacement with cemented components.

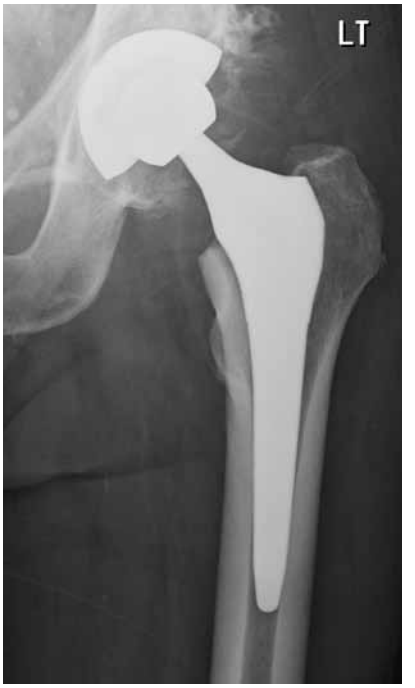


Figure 3. Total hip replacement with uncemented components.

In uncemented techniques, both the femoral and acetabular components are coated with a porous material that encourages the bone to grow into the surface of the implant. Initial stability depends on having the implant firmly pressed into the bone, and long-term stability is gained by the bone bonding to the implant. In some cases, such as when the femoral bone is of poor quality and cannot support a firmly press-fit femoral component, cement can be used. This is known as a hybrid THA, in which the acetabular component is uncemented, but the femoral component is cemented. There is no substantial difference in outcome between uncemented and hybrid fixation techniques, and the choice of fixation depends on surgeon experience and patient characteristics.

Hip resurfacing

Hip resurfacing is an alternative to the traditional total hip arthroplasty, which requires the removal of the femoral head and neck. In a resurfacing procedure, the femoral head is machined to accept a metal cap and the acetabulum is replaced in a manner similar to that used for THA. In this way the large-diameter head and acetabular component make a metal-on-metal bearing surface.

The advantages of a hip resurfacing procedure include the maintenance of bone stock, which can eventually be converted to a THA should the resurfaced joint wear out or fail. The disadvantages include a risk of femoral neck fracture and the risks that go along with a metal-on-metal bearing surface, such as elevated serum levels of metal ions and adverse tissue reactions. However, it has been shown that the serum metal ion concentrations generated by hip resurfacing are much less than those generated by a large-head metal-on-metal THA.[11]

The use of hip resurfacing has declined dramatically worldwide over the past few years, but remains a viable option for young, active patients with disabling osteoarthritis. While hip resurfacing must be used with caution, it can lead to good and long-lasting outcomes when performed by an experienced surgeon and in a well-selected patient. Currently the procedure is not recommended for women, men of small stature, or patients older than 65.

Post-op considerations

After patients have undergone total hip arthroplasty, they should be encouraged to mobilize early and to observe hip precautions. Patients should also be monitored for possible complications. Complications that may occur in the short-term are:

- Venous thromboembolism (VTE)
- Prosthetic joint infection
- Nerve injury
- Vascular injury
- Bleeding
- Leg-length discrepancy
- Dislocation/instability
- Fracture

Complications that may occur in the long-term are:

- Prosthetic joint infection
- Periprosthetic fracture
- Dislocation/instability
- Polyethylene wear
- Osteolysis

Mobilization and hip precautions

Postoperative patient mobilization should begin within 24 hours of hip replacement surgery.[12] Benefits of early mobilization include decreased risk of venous thromboembolism, shorter inpatient stay, and lower total cost of care.[12]

Hip precautions following THA have become routine in postoperative care. Recent research suggests precaution-free post-op protocols have not resulted in higher dislocation rates when patients undergo an anterior or anterolateral approach THA. Similarly, there is no strong evidence for higher dislocation rates with precaution-free post-op protocols when patients undergo a posterior approach replacement.[13] While patients are encouraged to observe hip precautions, a commonsense approach should be followed and patients should not be too worried about dislocation, which remains a relatively rare complication provided the implants are positioned correctly.

Venous thromboembolism

Venous thromboembolism is a well-documented complication of total hip arthroplasty. THA patients are at particular risk because of both intraoperative endothelial trauma and venous stasis from relative immobilization in the perioperative period. A recent systematic review found approximately 1 in 200 patients (0.53%) developed symptomatic VTE prior to hospital discharge following hip arthroplasty despite receiving VTE prophylaxis.[14] This same study found rates of symptomatic VTE events occurred in approximately 2% to 5% of hip arthroplasty patients within 3 months of surgery.[14] The rate of clinically asymptomatic VTE events is higher still but clinical relevance of asymptomatic VTE is not known.[14]

The American Academy of Orthopaedic Surgeons (AAOS) and the American College of Chest Physicians (ACCP) have published guidelines regarding VTE prophylaxis in joint arthroplasty patients.[15,16] The AAOS guidelines state that moderate evidence supports the use of pharmacological and/or mechanical VTE prophylaxis for routine hip replacement, but do not recommend one particular prophylactic regimen over another because of inconclusive evidence.[16]

The ACCP guidelines state that grade 1B evidence supports the use of either low molecular weight heparin, fondaparinux, apixaban, dabigatran, rivaroxaban, low-dose unfractionated heparin, warfarin, or aspirin for VTE prophylaxis in THA patients. Furthermore, the ACCP cites grade 1C evidence for intermittent pneumatic compression devices as mechanical VTE prophylaxis.[15]

Following surgery, patients who develop VTE can remain asymptomatic, experience leg swelling suggestive of deep vein thrombosis (DVT), or exhibit one or more of the following symptoms suggestive of pulmonary embolism (PE): tachycardia, shortness of breath, chest pain, hemoptysis, hypotension, anxiety.[17] Knowing the likelihood of VTE developing and promptly recognizing the signs and symptoms can permit early workup and treatment to limit morbidity, reduce cost of care, and prevent mortality. It should be emphasized that a D-dimer assay has no role in the postop workup given the expected elevation of D-dimer levels due to recent surgery.[18] Duplex Doppler ultrasound can help in the diagnosis of DVT, but should not be used to scan the calf because a diagnosis of calf DVT based on duplex Doppler ultrasound is unreliable and the risk of embolism from calf DVT is very low in the postoperative setting and does not warrant the risk of anticoagulation. CT pulmonary angiography (or ventilation-perfusion scan in patients unable to undergo CT angiography) is the test of choice to assess for pulmonary embolism.[18] When the radiologist reports a filling defect on a CT pulmonary angiogram, it needs to be noted whether this is a segmental or subsegmental filling defect. Subsegmental filling defects do not require anticoagulation. Segmental filling defects are consistent with a diagnosis of pulmonary embolism and require anticoagulation. Because DVT/PE after hip replacement is a provoked event, anticoagulation is not required long-term and may be stopped after 3 months unless the condition is a recurrent one, in which case the patient should be referred to a thrombosis clinic or to a hematologist to see if long-term anticoagulation is indicated.

A methodical approach to the evaluation and management of surgical wounds following THA is critical.

Prosthetic joint infection

Prosthetic joint infection is a serious complication that occurs in 1% to 2% of patients and has negative effects on patient morbidity and satisfaction and on the overall cost of care. A methodical approach to the evaluation and management of surgical wounds following THA is critical. Postoperative wound infection can result from surgical contamination, contiguous spread, or hematogenous spread.[18] Acute THA wound infections manifest within days or weeks of surgery and present with localized hip pain, swelling, erythema, and warmth. Wound drainage or a draining sinus tract may be evident and the presentation can include fever, malaise, and frank sepsis.[18] Chronic wound infections present more subtly but are commonly associated with pain. Standard workup for wound infection includes obtaining blood for culturing and WBC and C-reactive protein testing (with or without erythrocyte sedimentation rate), and obtaining sterile joint aspirate for culturing and sensitivity testing and cell count with differential. Obtaining aspirate prior to initiating systemic antibiotic therapy prevents compromising the diagnostic value of the aspiration and allows selection of an appropriate antibiotic. A prospective multicentre study of arthroplasty patients compared results from superficial cultures of wound exudate with deep cultures of intra-articular tissue or aspirate and found poor concordance, with many superficial cultures yielding bacterial growth while deep cultures and further workup suggested the absence of infection. Based on these findings, the authors of the study recommend against the use of superficial cultures to prevent misdiagnosis and medical or surgical mismanagement.[19] Ideally, when patients present with concerning surgical wounds, workup for infection and prompt follow-up with their surgeon or an on-call orthopaedic surgeon should occur before antibiotics are initiated.

Until recently, patients with orthopaedic implants, including hip replacements, were routinely given antibiotic prophylaxis when undergoing low- or high-risk dental procedures to prevent prosthetic joint infections.

Clinical practice guidelines released in 2012 by the AAOS in conjunction with the American Dental Association now recommend against antibiotic prophylaxis for dental procedures because of a lack of evidence that dental-procedure-induced bacteremia leads to prosthetic joint infections. The grade of recommendation for this is designated as Limited.[20,21]

The incidence of nerve injury following THA is approximately 1 to 2 cases per thousand.

Other complications

The incidence of nerve injury following THA is approximately 1 to 2 cases per thousand, with the peroneal branch of the sciatic nerve and the femoral nerve most commonly affected.[17] Multiple causes must be considered, including traction injury, compression, and direct trauma, although in many cases the cause will remain unknown. Prognosis tends to be favorable for partial, if not full, return of function, but depends on the cause of the injury. Supportive treatment, including a foot drop orthosis for sciatic nerve palsies, is recommended.[17,18]

While vascular injury is exceedingly rare during THA surgery,[18] bleeding in the perioperative period remains a well-established risk even when surgical technique is meticulous. Preoperative cessation of anticoagulants should be undertaken, and the use of tranexamic acid for bleeding prophylaxis should be considered.[18] Patients should also be counseled preoperatively regarding the possible need for perioperative blood transfusion, although this is becoming rare in patients with a preoperative hemoglobin level over 125 g/dL.

Leg-length discrepancy may occur following THA. Patients tend to tolerate up to 2 cm of LLD without need for treatment, but a greater discrepancy can become clinically important, potentially manifesting as knee, hip, or lumbar pain or as gait disturbance.[18] Most symptomatic LLD can be treated with a shoe lift. In patients requiring bilateral THA, subsequent arthroplasty on the contralateral hip may actually balance out the inequality. It is not unusual for patients with no measurable LLD to complain that the surgical limb seems longer. This is known as a functional leg-length discrepancy and is related to mobilization of a previously stiff hip in which the hip is held in an abducted position to avoid dislocation and also due to weak hip abductor muscles. In most patients, this resolves within 3 months and does not require any specific treatment. Intraoperative fracture can happen on the acetabular or, more commonly, the femoral side during bony preparation or implant insertion. If identified intraoperatively, additional fixation is often necessary to ensure prosthesis stability. Postoperative recognition of fracture, especially involving the acetabulum, could alter clinical course and may require revision surgery to ensure implant stability.[18]

Hip instability or dislocation occurs in approximately 1% to 3% of THA patients and is the second most common indication for revision surgery after infection. Dislocation most commonly happens within 1 month of surgery.[17] Numerous factors can lead to instability, including infection, trauma, patient noncompliance, implant wear or loosening, pseudotumor formation, and component malposition. Treatment of a dislocated prosthesis is closed reduction under procedural sedation with orthopaedic referral.[18] Recurrent dislocations generally require revision surgery.

Periprosthetic fractures secondary to trauma can occur at any point postoperatively. Immediate orthopaedic referral is required to determine the need for operative fixation or revision arthroplasty.

Components wear over time with repetitive loading and friction within the artificial joint; this natural wear process can be exacerbated by component malpositioning.[18] Research into implant biomechanics is continuing in an attempt to maximize component lifespan by minimizing wear. Wear debris, particularly from the breakdown of polyethylene, triggers an immune response and can lead to prosthesis instability and osteolysis. This bone resorption, in turn, can cause component loosening and pain.[18] Osteolysis is a complication

of older implants from the 1990s and earlier, and is seen rarely now. Implant loosening can still be seen, however, and is related to either the failure of the cement or the failure of bone ingrowth in uncemented components. Patients with persistent hip pain following THA, especially of new onset, should be re-referred to their orthopaedic surgeon for workup.

If there is a failure of a hip replacement due to infection, osteolysis, periprosthetic fracture, or some other cause, the likelihood of a revision procedure succeeding is good. Revision THA produces results that approach those of the initial surgery.

Summary

Total hip arthroplasty can relieve pain, restore function, allow patients to return to normal activities, and is a viable option for most patients with a degenerative process occurring in their hip joint. In BC the standard of care for hip implants is a metal acetabular shell with a polyethylene liner and a cemented or uncemented femoral stem with a metal femoral head. Early mobilization after total hip replacement is recommended. While complication rates are low, possible postoperative problems can include venous thromboembolism, prosthetic joint infection, and periprosthetic fracture. When a hip replacement fails for some reason, there is a good likelihood that a revision procedure will succeed.

Competing interests

None declared.

References

1. Gomez PF, Morcuende JA. A historical and economic perspective on Sir John Charnley, Chas F. Thackray Limited, and the early arthroplasty industry. Iowa Orthop J 2005;25:30-37.
2. Whitehouse MR, Endo M, Zachara S, et al. Adverse local tissue reactions on metal-on-polyethylene total hip arthroplasty due to trunnion corrosion. Bone Joint J 2015;97B:1024-1030.
3. Lehil MS, Bozic KJ. Trends in total hip arthroplasty implant utilization in the United States. J Arthroplasty 2014;29:1915-1918.
4. Abu-Amer Y, Darwech I, Clohisy JC. Aseptic loosening of total joint replacements: Mechanisms underlying osteolysis and potential therapies. Arthritis Res Ther 2007;9(suppl 1):S6.
5. Masson B. Emergence of the alumina matrix composite in total hip arthroplasty. Int Orthop 2009;33:359-363.
6. Boutin P. Total hip arthroplasty using a ceramic prosthesis. Pierre Boutin (1924-1989). Clin Orthop Relat Res 2000;(379):3-11.
7. Aoude AA, Antoniou J, Epure LM, et al. Midterm outcomes of the recently FDA approved ceramic on ceramic bearing in total hip arthroplasty patients under 65 years of age. J Arthroplasty 2015;30:1388-1392.
8. Jacobs JJ, Urban RM, Hallab NJ, et al. Metal-on-metal bearing surfaces. J Am Acad Orthop Surg 2009;17:69-76.
9. Williams DH, Greidanus NV, Masri BA, et al. Prevalence of pseudotumor in asymptomatic patients after metal-on-metal hip arthroplasty. J Bone Joint Surg Am 2011;93:2164-2171.
10. Troelsen A, Malchau E, Sillesen N, Malchau H. A review of current fixation use and registry outcomes in total hip arthroplasty: The uncemented paradox. Clin Orthop Relat Res 2013;471:2052-2059.
11. Garbuz DS, Tanzer M, Greidanus NV, et al. The John Charnley Award: Metal-on-metal hip resurfacing versus large-diameter head metal-on-metal total hip arthroplasty: A randomized clinical trial. Clin Orthop Relat Res 2010;468:318-325.
12. Stowers MD, Lemanu DP, Coleman B, et al. Review article: Perioperative care in enhanced recovery for total hip and knee arthroplasty. J Orthop Surg (Hong Kong) 2014;22:383-392.
13. Husted H, Gromov K, Malchau H, et al. Traditions and myths in hip and knee arthroplasty. Acta Orthop 2014;85:548-555.
14. Januel JM, Chen G, Ruffieux C, et al. Symptomatic in-hospital deep vein thrombosis and pulmonary embolism following hip and knee arthroplasty among patients receiving recommended prophylaxis: A systematic review. JAMA 2012;307:294-303.
15. Falck-Ytter Y, Francis CW, Johanson NA, et al. Prevention of VTE in orthopedic surgery patients: Antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012;141(suppl 2):e278S-e325S.
16. Jacobs JJ, Mont MA, Bozic KJ, et al. American Academy of Orthopaedic Surgeons Clinical Practice Guideline on: Preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty. J Bone Joint Surg Am 2012;94:746-747.
17. Lieberman JR (ed). AAOS comprehensive orthopaedic review. Rosemont, IL: American Academy of Orthopaedic Surgeons; 2009.
18. Nutt JL, Papanikolaou K, Kellett CF. Complications of total hip arthroplasty. Orthop Trauma 2013;27:272-276.
19. Tetreault MW, Wetters NG, Aggarwal VK, et al. Should draining wounds and sinuses associated with hip and knee arthroplasties be cultured? J Arthroplasty 2013;28:133-136.
20. Watters W, Rethman MP, Hanson NB, et al. Prevention of orthopaedic implant infection in patients undergoing dental procedures. J Am Acad Orthop Surg 2013;21:180-189.
21. Jevsevar DS, Abt E. The new AAOS-ADA clinical practice guideline on prevention of orthopaedic implant infection in patients undergoing dental procedures. J Am Acad Orthop Surg 2013;21:195-197. BCMJ

Paul Dooley, MD, MSc, FRCSC, Charles Secretan, MD, PhD, FRCSC

Total knee replacement: Understanding patient-related factors

Obesity, comorbidities, and unrealistic expectations can all contribute to poor outcome after knee arthroplasty and should be discussed by surgeons and patients during the preoperative informed consent process.

ABSTRACT: Total arthroplasty of the knee to address symptomatic osteoarthritis has become increasingly common as the population ages. Many nonoperative treatment approaches exist and should be attempted before surgical intervention is considered. Surgical alternatives to total knee arthroplasty also exist and may be appropriate. These include osteotomy, unicompartmental arthroplasty, and patellofemoral joint arthroplasty. Though suitable for some patients, these less invasive procedures have reduced survivorship at 10 years when compared with total knee arthroplasty. The primary indication for knee replacement is pain that significantly reduces walking tolerance, impairs ability to perform activities of daily living, and interferes with sleep. Patient-related factors that can affect the success of knee replacement include obesity, comorbidities, and unrealistic expectations for total pain relief and joint function. Absolute contraindications to knee arthroplasty include active knee sepsis and severe untreated or untreatable peripheral arterial disease. Total knee replacement may be considered for patients of any age once a diagnosis of osteoarthritis is confirmed clinically and radiographically, the patient continues to experience moderate to severe pain and poor quality of life despite an extended course of nonoperative treatment, and no contraindications exist. Referral before the patient's disease reaches an extremely advanced stage leads to better outcomes. While usually beneficial, knee arthroplasty is a major surgical procedure with possible complications and risk of failure to provide the desired result. An understanding of the many patient-related factors that can greatly affect outcome and patient satisfaction is essential.

This article has been peer reviewed.

Total arthroplasty of the knee continues to be among the most common and successful major elective surgical procedures. The aging of the population has resulted in a significant increase in the demand for this procedure. This is due, in part, to an increase in patient expectation for high functional capacity into the later decades of life despite the presence of a painful degenerative joint condition. Additionally, the success of knee arthroplasty in alleviating arthritis-related joint pain in most patients, both young and old, has increased patient demand.

History

Knee replacement has evolved considerably over the past 100 years. In

Dr Dooley is an orthopaedic surgeon at Vernon Jubilee Hospital and a clinical instructor at the University of British Columbia. Dr Secretan is an orthopaedic surgeon at Vernon Jubilee Hospital and a clinical instructor at the University of British Columbia.

its earliest form, interposition arthroplasty was attempted to manage the most severe pathology of the knee using materials such as bursa, fascia lata, skin, and pig bladder, usually with very poor results. Until the 20th century, arthrodesis remained the treatment of choice for severe degenerative knee conditions.

Metallic interposition arthroplasty of the tibiofemoral joint has been evolving since the 1930s with the use of many different designs and materials. Modern total knee arthroplasty (TKA) was born when the importance of the patellofemoral articulation was recognized and the patellar component was introduced in the 1970s.

Surgical alternatives to total knee replacement

Concurrent with the evolution of the modern TKA, other surgical options for management of knee arthritis were developing. These options are still viable today in appropriate patients and include osteotomy, unicompartmental arthroplasty, and patellofemoral joint arthroplasty.

Osteotomy

Osteotomy refers to cutting of bone for the purpose of altering alignment. In the management of knee arthrosis, this most often involves osteotomy of the proximal tibia in a varus knee with medial compartment arthritis. Proximal tibia osteotomy has several other indications that are beyond the scope of this article.

Osteotomy may be considered as an alternative to total knee arthroplasty, but an understanding of the indications, contraindications, and limitations is essential. Typically, patients are younger than 65, have good range of motion (more than 120 degrees and less than 5 degrees flexion contracture), have arthrosis isolated to one compartment only, have no ligamentous instability, and lack inflammatory condition of the joint. The success of the procedure is highly dependent on accurate correction of alignment and requires adherence to postoperative protocols, which may involve restricted weight bearing for up to 12 weeks. Osteotomy may be considered in the individual who meets the above criteria and wants to continue engaging in high-impact activity or be able to kneel on the affected knee—an action poorly tolerated by many total knee arthroplasty designs. It is generally accepted that pain relief after osteotomy is not as predictable as after knee arthroplasty. Persistence or development of degenerative pain after osteotomy may require further surgical intervention in the form of arthroplasty. While arthroplasty following osteotomy is certainly possible, the procedure can be more complicated and it is unclear at this time whether outcomes following this procedure are equivalent to primary knee arthroplasty.[1-3]

Unicompartmental arthroplasty

Unicompartmental arthroplasty may be an option for individuals with symptoms of isolated compartment arthrosis. For isolated medial or lateral compartment arthrosis, the surgical indications and contraindications are similar to those for osteotomy. Recovery is typically quicker after unicompartmental arthroplasty than after osteotomy, but at this time it is unclear which of the two is better in terms of function and survivorship.[4] It is well understood, however, that total knee arthroplasty provides superior survivorship when compared with both osteotomy and unicompartmental arthroplasty.

Patellofemoral joint arthroplasty

Although not a common occurrence, symptomatic degenerative change can be isolated to the patellofemoral articulation. When nonoperative treatments fail to control symptoms related to degeneration, isolated arthroplasty of the patellofemoral articulation may be considered. This procedure involves resurfacing of the patella as well as the femoral trochlea while leaving the tibiofemoral compartments alone.

Though less invasive than total knee arthroplasty, patellofemoral joint arthroplasty clearly demonstrates reduced survivorship at 10 years, with a cumulative revision rate of 27.0% compared with 5.5% for TKA.

Indications

The primary indication for total knee replacement has been and continues to be arthritis-related pain that significantly reduces walking tolerance, impairs ability to perform activities of daily living, and interferes with sleep. Furthermore, such symptoms must be resistant to readily available, less invasive, and more cost-effective management approaches. Once it has been determined that surgical intervention is warranted, consideration must be given to options other than total knee arthroplasty, including osteotomy and isolated compartment replacement, where appropriate.

It is critical that both surgeons and patients understand that knee arthroplasty is not without risk and are fully in agreement regarding reasonable expectations following knee arthroplasty. To this end, patient expectations need to be discussed and tempered by reality prior to embarking on a knee replacement. Surgeons must explain that patient-related factors such as obesity and comorbidity can significantly affect outcome following this increasingly common procedure.

Patient-related factors affecting outcome

After undergoing knee arthroplasty, the majority of patients demonstrate significant improvement over their preoperative state. An appreciable minority of patients (10% to 20%) demonstrate some degree of functional impairment or dissatisfaction despite an absence of identifiable technical deficiency or complication.[5]

A number of patient-related factors have been found to contribute to poor outcome following knee arthroplasty. These include, but are not limited to, obesity, comorbidities, unrealistic expectations, and tolerance to narcotics. It is important that clinicians identify patients at risk of poor outcome in order to counsel them appropriately during the process of deciding whether TKA is appropriate.

Obesity

The Canadian Institute for Health Information estimates that 1 in 4 Canadians are obese and that the rates are continuing to increase. Along with contributing to the development of comorbidities such as diabetes, hypertension, and coronary artery disease, obesity can contribute to the development and severity of symptomatic knee arthritis.[6]

Conflicting evidence exists regarding the impact of obesity on outcomes following arthroplasty of the knee and those studies that exist tend to be low-level case series. A recent systematic review identified 41 studies looking at this issue and found that the majority, including three systematic reviews, concluded that obesity adversely affected outcome, rate of complications, implant survival, and cost of TKA.[7]

Obesity can increase the risk of superficial and deep infection of surgical wounds, one of the most significant complications that can arise and affect the success of the procedure,[8-12] and can also contribute to increased length of stay and direct medical costs following knee arthroplasty.[11,13] This is an area of increasing interest and study in our current environment of fiscal restraint in health care.

Despite concerns about the impact of obesity on knee arthroplasty, most obese patients will benefit from the procedure. In some patients with morbid obesity, however, knee replacement should probably not be offered. While each surgeon's practice varies, and understanding that body mass index (BMI) is not necessarily a perfect measure of obesity, many surgeons would agree that a BMI of 45 to 50 or greater should be considered a contraindication to joint replacement, and patients should be counseled about the importance of weight loss as treatment of their life-threatening condition. Increasingly, bariatric surgery is being used to assist in the management of morbid obesity and its long-term health consequences. A recent systematic review indicates that bariatric surgery in the setting of prearthritic knee pain resulted in significantly decreased knee pain and stiffness as well as improved function.[14] It has not yet been determined how this approach to weight reduction might affect outcome following knee arthroplasty in previously morbidly obese patients.

Comorbidities

As the population ages, the number of elderly patients proceeding to knee arthroplasty is growing. With increasing age comes increasing comorbidity. It is well established that such comorbidity can negatively affect outcome following knee arthroplasty. In a prospective study, Wasielewski and colleagues determined that increased comorbidity was associated with increased length of stay and hospital cost, as well as poorer patient-reported outcome.[15] Other studies have found a similar relationship between comorbidity and decreased patient satisfaction following knee arthroplasty.[16,17] While good outcomes have been reported in octogenarians and nonagenarians, postoperative delirium is a major risk in this age group. Interviewing family members to make sure that early cognitive impairment is not present can lessen the chance of postoperative delirium occurring. Patients need to be counseled about this real risk prior to agreeing to joint replacement surgery. Similarly, mental health issues such as anxiety, depression, and pain catastrophizing must be considered in the preoperative consultation process, as these factors have been shown to contribute to dissatisfaction and poor outcome following arthroplasty.[16,18]

Expectations

Patient satisfaction is becoming an increasingly important metric in health care delivery, particularly in publicly funded and third-party payer systems. Patient expectations can contribute significantly to satisfaction following knee arthroplasty, and should be addressed as part of the informed consent process. It is now well established that unrealistic or unmet expectations can lead to patient dissatisfaction independent of objective measures of knee function.[19,20] To ensure patient expectations are realistic, the limitations of knee replacement surgery must be discussed. Patients who expect to be 100% pain-free after surgery, to return to a high level of athletic performance, or to be able to squat and kneel unimpeded will inevitably be disappointed with the outcome of the operation.

Tolerance to narcotics

The increasing use of narcotic medi-

cations in the medical management of arthritis means that patients may be on high-dose narcotics prior to surgery. This can put them at substantial risk of a poor outcome because their tolerance to narcotics makes safely achieving adequate pain control after surgery almost impossible.[21] Escalating doses of narcotics can be needed postoperatively, and pain can worsen as narcotics are withdrawn. To end the vicious circle of escalating and reducing doses, narcotics need to be withdrawn gradually or reduced to below 100 mg of morphine equivalent per day prior to joint replacement surgery. Long-acting narcotics need to be replaced with immediate-release narcotics and the doses tapered off prior to surgery.

When to refer

Referral for total knee arthroplasty is appropriate when pain arising from joint failure due to osteoarthritis, osteonecrosis, rheumatoid arthritis, and other inflammatory arthropathies is refractory to nonoperative management. The first step in determining the need for knee replacement is to confirm the diagnosis that surgery is expected to address. Causes of knee pain other than arthritis must be ruled out, including pain referred from the hip and lumbar radicular pain. Appropriate weight-bearing radiographs of the knee (**Figure**) and skyline views of the patella must be obtained. If there is a question regarding the true source of the pain, diagnostic injections with anesthetic agents can be helpful. Appropriate placement of the anesthetic is essential and referral for image-guided injection can be utilized. Once the diagnosis is confirmed on radiographs, there is no need for magnetic resonance imaging. MRI scans yield no useful information and should not be ordered. The first-line investigation in the assessment of knee pain in any patient older than 40 should be standing radiographs and not an MRI scan.

Once the patient's symptoms, signs, and radiographic features are clinically clear, nonoperative management should be initiated. First-line treatments include activity modification, weight loss, and the use of walking aids such as a cane. Although patients may resist such options, a treatment plan should be discussed and agreed upon. Acetaminophen and

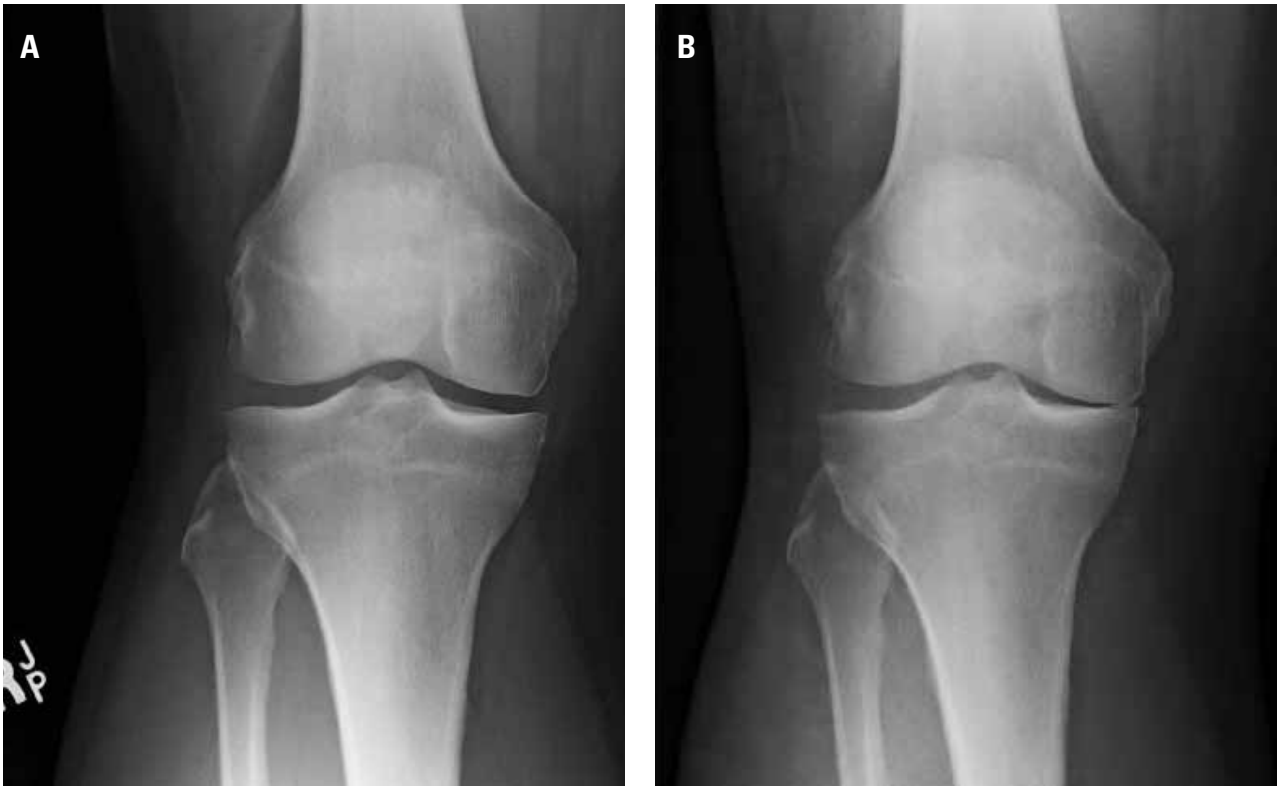


Figure. Two anteroposterior radiographs of the same knee. The non-weight-bearing radiograph (A) shows minimal medial joint space loss, while the weight-bearing radiograph (B) reveals significant loss.

NSAIDs may be added to the treatment plan if appropriate, although long-term NSAID use should be avoided. If NSAIDs are used, patients must be monitored for renal and cardiac toxicity. Narcotics should never be used for the treatment of pain related to osteoarthritis. Patients should be referred for surgical consideration well before narcotics are even considered as dependence on opioids can lead to complications and delays in recovery during the postoperative period.[21] Other treatment options, including viscosupplementation, prolotherapy, and injections of steroids, platelet rich plasma stem cells, or glucose, lack definitive clinical evidence.[22-24] Physiotherapy, chiropractic treatment, and acupuncture also lack evidence of significant benefit.[25,26] Joint mobility and patient activity should be encouraged with an emphasis on those activities that limit joint load and focus on cardiovascular health.

Absolute contraindications to knee arthroplasty include active knee sepsis, previously untreated or chronic osteomyelitis, ongoing remote source of infection, absent extensor mechanism, and severe untreated or untreatable peripheral arterial disease. Relative contraindications include surgical site skin conditions such as psoriasis and excessive scarring, physical and mental conditions that prohibit appropriate rehabilitation, morbid obesity, and a neuropathic joint. Age is not a contraindication to surgery. There is no age cut-off for surgery, and patients of all ages may be suitable candidates for a knee replacement.

Once a diagnosis of osteoarthritis has been confirmed clinically and radiographically, nonoperative management has been optimized and used for an extended period, and any contraindications have been ruled out, surgical intervention can be considered for any patient with ongoing moderate to severe pain that is significantly affecting quality of life. It is important to refer the patient early once it is clear that nonoperative treatment is failing because surgical outcomes are better when patients are operated on before the disease is at an extremely advanced stage.

How to optimize outcomes

When TKA has been deemed appropriate and the patient is awaiting surgery, any modifiable risk factors should be addressed. Medical treatment of diabetes and cardiopulmonary illness should be optimized. While there is no evidence that tight glycemic control prevents complications after knee replacement, better glycemic control is good for patients in general, and patients contemplating referral for knee replacement surgery should have an HbA1c of 7% or less. Smoking cessation protocols should be initiated if necessary. Although complete cessation can be an unrealistic goal for some smokers, patients should be informed that even a reduction in smoking can lead to a lower risk of perioperative complication. Patients who are immunocompromised because of medication load or illness should be assessed and appropriate treatment changes should be initiated. Immunocompromise is a common concern for those suffering from rheumatoid arthritis. Many of the disease-modifying antirheumatic drugs (DMARDs) such as methotrexate and gold can be continued through the perioperative period; however, the biologic agents associated with the treatment of rheumatoid arthritis may need to be stopped temporarily.[27] Steroid use should be reduced or stopped where possible. Decisions regarding DMARDs should be made with input from the family practitioner, orthopaedic surgeon, and internal medicine specialist/rheumatologist. Malnutrition is also a common occurrence in the aging population and can adversely affect surgical outcomes. Appropriate screening tools should be used and referral made to a dietitian or nutrition support team when problems are identified.[28]

Although there is interest in developing a clinical tool that can be applied preoperatively to predict the likelihood of positive or negative outcome,[29] no such tool is readily available yet. Certainly an outcome prediction tool of some kind could improve the informed consent process as well as the delivery of health care services, including knee arthroplasty.

Summary

Total arthroplasty of the knee continues to be one of the most common surgical procedures as the population ages and patients with painful degenerative joint conditions seek high functional capacity in their later decades. Overall, the majority of patients who undergo knee arthroplasty have a significant reduction in pain and improvement in function. However, outcomes following knee arthroplasty vary and clearly involve a complex interplay of technical and patient-related factors. Until we have a tool that can reliably predict patient outcome based on these factors, we must focus on appropriate diagnosis and patient selection, establish appropriate expectations, optimize patient health, and avoid preventable complications. In this way we will be able to improve outcomes and maximize patient satisfaction.

Competing interests

None declared.

References

1. Amendola A, Bonasia DE. Results of high

tibial osteotomy: Review of the literature. Int Orthop 2010;34:155-160.
2. van Raaij TM, Reijman M, Verhaar JA. Total knee arthroplasty after high tibial osteotomy: A systematic review. BMC Musculoskelet Disord 2009;10:88.
3. Erak S, Naudie D, MacDonald SJ, et al. Total knee arthroplasty following medial opening wedge tibial osteotomy: Technical issues early clinical radiological results. Knee 2011;18:499-504.
4. Dettoni F, Bonasia DE, Castoli F, et al. High tibial osteotomy versus unicompartmental knee arthroplasty for medial compartment arthrosis of the knee: A review of the literature. Iowa Orthop J 2010;30:131-140.
5. Robertsson O, Dunbar M, Pehrsson T, et al. Patient satisfaction after knee arthroplasty: A report on 27 372 knees operated on between 1981 and 1995 in Sweden. Acta Orthop Scand 2000;71-3:262-267.
6. Blagojevic M, Jinks C, Jeffery A, Jordan KP. Risk factors for onset of osteoarthritis of the knee in older adults: A systematic review and meta-analysis. Osteoarthritis Cartilage 2010;18:24-33.
7. Rodriguez-Merchan EC. Review article: Outcome of total knee arthroplasty in obese patients. J Orthop Surg (Hong Kong) 2015;23:107-110.
8. Namba RS, Paxton L, Fithian DC, Stone ML. Obesity and perioperative morbidity in total hip and total knee arthroplasty patients. J Arthroplasty 2005;20(7suppl 3):46-50.
9. Dowsey MM, Choong PF. Obese diabetic patients are at substantial risk for deep infection after TKA. Clin Orthop Relat Res 2009;467:1577-1581.
10. Samson AJ, Mercer GE, Campbell DG. Total knee replacement in the morbidly obese: A literature review. ANZ J Surg 2010;80:595-599.
11. D'Apuzzo MR, Novicoff WM, Browne JA. Morbid obesity independently impacts complications, mortality, and resource use after TKA. Clin Orthop Relat Res 2015;473:57-63.
12. Kerkhoffs GM, Servien E, Dunn W, et al. The influence of obesity on the complication rate and outcome of total knee arthroplasty: A meta-analysis and systematic literature review. J Bone Joint Surg Am 2012;94:1839-1844.
13. Kremers HM, Visscher SL, Kremers WK, et al. The effect of obesity on direct medical costs in total knee arthroplasty. J Bone Joint Surg Am 2014;96:718-724.
14. Groen VA, van de Graaf VA, Scholtes VA, et al. Effects of bariatric surgery for knee complaints in (morbidly) obese adult patients: A systematic review. Obes Rev 2015;16:161-170.
15. Wasielewski RC, Weed H, Prezioso C, et al. Patient comorbidity: Relationship to outcomes of total knee arthroplasty. Clin Orthop Relat Res 1998;356:85-92.
16. Clement ND. Patient factors that influence the outcome of total knee replacement: A critical review of the literature. OA Orthopaedics 2013;1:11.
17. Scott CE, Bugler KE, Clement ND, et al. Patient expectations of arthroplasty of the hip and knee. J Bone Joint Surg Br 2012; 94:974-981.
18. Scott CE, Howie CR, MacDonald D, Biant LC. Predicting dissatisfaction following total knee replacement: A prospective study of 1217 patients. J Bone Joint Surg Br 2010;92:1253-1258.
19. Noble PC, Conditt MA, Cook KF, Mathis KB. Patient expectations affect satisfaction with total knee arthroplasty. Clin Orthop Relat Res 2006;452:35-43.
20. Dunbar MJ, Richardson G, Robertsson O. I can't get no satisfaction after my total knee replacement: Rhymes and reasons. Bone Joint J 2013;95-B(11suppl A): 148-152.
21. Zywiel MG, Stroh DA, Lee SY, et al. Chronic opioid use prior to total knee arthroplasty. J Bone Joint Surg Am 2011;93: 1988-1993.
22. Filardo G, Kon E, Di Martino A, et al. Platelet-rich plasma vs hyaluronic acid to treat knee degenerative pathology: Study design and preliminary results of a randomized controlled trial. BMC Musculoskelet Disord 2012;13:22.
23. Rutjes AW, Juni P, da Costa BR, et al. Viscosupplementation for osteoarthritis of the knee: A systematic review and meta-analysis. Ann Intern Med 2012;157:180-191.
24. Rabago D, Best TM, Beamsley M, Patterson J. A systematic review of prolotherapy for chronic musculoskeletal pain. Clin J Sport Med 2005;15:376-380.
25. French HP, Brennan A, White B, Cusack T. Manual therapy for osteoarthritis of the hip and knee—A systematic review. Man Ther 2011;2:109-117.
26. Quilty B, Tucker M, Campbell R, Dieppe P. Physiotherapy, including quadriceps exercises and patellar taping, for knee osteoarthritis with predominant patello-femoral joint involvement: Randomized controlled trial. J Rheumatol 2003;30:1311-1317.
27. Howe CR, Gardner GC, Kadel NJ. Perioperative medication management for the patient with rheumatoid arthritis. J Am Acad Orthop Surg 2006;14:544-551.
28. Gherini S, Vaughn BK, Lombardi AV, Mallory TH. Delayed wound healing and nutritional deficiencies after total hip arthroplasty. Clin Orthop Relat Res 1993;293: 188-195.
29. Barlow T, Dunbar M, Sprowson A, et al. Development of an outcome prediction tool for patients considering a total knee replacement—The knee outcome prediction study (KOPS). BMC Musculoskelet Disord 2014;15:451. BCMJ

Achilles tendon ruptures—a review for primary care

The Achilles tendon is the most commonly ruptured tendon and the incidence is increasing.[1-3] Unfortunately, 20% to 25% of acute Achilles tendon ruptures are misdiagnosed initially.[1,4] Diagnosis is based on history and physical examination. Use of MRI or ultrasound is not indicated unless there are equivocal physical exam findings.

Common mechanisms include pushing off with the weight-bearing foot while extending the knee; a sudden, unexpected dorsiflexion of the ankle; or violent ankle dorsiflexion of a plantar flexed foot.[1] Patients often describe feeling as if they were kicked in the back of the ankle. Some will have minimal discomfort and may be weight-bearing. They may describe a "pop" at the time of injury. Fluoroquinolone or steroid use, diabetes, or chronic renal failure can increase the risk of rupture but make small contributions to overall incidence.[5,6]

The Thompson test is considered to be the most accurate—it is positive in 96% to 100% of acute ruptures.[7-9] Other physical findings include a palpable tendon gap, tenderness, and possibly swelling/bruising depending on injury acuity. In the prone position with the patient's feet off the examining table, the injured foot will hang in more dorsiflexion than the contralateral foot. The patient may be able to plantarflex and the Thompson test may result in some movement, but in both cases the injured side will be weaker and decreased compared with the uninjured side. This is due to other musculotendinous structures that pass the ankle posteriorly.

This article is the opinion of WorkSafeBC and has not been peer reviewed by the BCMJ *Editorial Board.*

Treatment

Treatment of Achilles tendon ruptures is currently undergoing transition. Traditional treatment involves 12 weeks of immobilization. If treated surgically, the tendon is repaired and the foot immobilized in equinus. Immobilization could be splinting followed by casting at 2 weeks, or, more recently, a cast boot with heel wedges. If treated conservatively, the foot is immobilized in equinus. Both approaches are non-weight-bearing and the foot is incrementally brought up to a neutral position over approximately 6 weeks by recasting or removing the heel. The second 6 weeks have the foot immobilized at 90 degrees. Some surgeons may opt to allow protected weight-bearing at this point. If the injury is identified and treatment started within 14 days, the primary difference between the options is higher re-rupture rates with conservative management (meta-analyses found this to be approximately 3% vs 13%)[10,11] vs the risks of surgery. Some surgeons believe surgical repair has better functional outcomes, but this has not been conclusively demonstrated.

A multicentre study in 2010 using an accelerated functional rehabilitation protocol changed the landscape.[3] It found no clinically significant differences in outcome or re-rupture rates. This protocol involved limited immobilization with early motion. The original protocol (see **Table**)[3] has since been slightly modified by various surgeons. This approach is currently used by a significant number of orthopaedic surgeons in BC. Other studies have validated the results of this approach.[12-15] There may be an advantage of earlier return to work with surgical intervention.[12] Surgical treatment remains the primary option for patients in whom treatment is begun more than 14 days after injury.

Acute Achilles ruptures are most common in male weekend warriors. Diagnosis is made with history and physical examination. Treatment can be conservative or surgical, with accelerated function rehabilitation offering conservative management the advantages of surgery without the risks. The conservative approach can be used only if treatment is initiated within 14 days of injury. A patient diagnosed with acute Achilles rupture should be immediately made non-weight-bearing, immobilized in equinus, and referred to the local orthopaedic surgeon on call. This will allow all treatment options to be available to the patient and treating surgeon.

—Derek Smith, MD, FRCSC
WorkSafeBC Orthopaedic Specialist Advisor

References

1. Uquillas CA, Guss MS, Ryan DJ, et al. Everything Achilles: Knowledge update and current concepts in management. J Bone Joint Surg Am 2015;97:1187-1195.
2. Guss D, Smith JT, Chiodo CP. Acute Achilles tendon rupture: A critical analysis review. JBJS Rev 2015;3:e2.
3. Willits K, Amendola A, Bryant D, et al. Operative versus nonoperative treatment of acute Achilles tendon ruptures: A multicenter randomized trial using accelerated functional rehabilitation. J Bone Joint Surg Am 2010;92:2767-2775.
4. Cooper MT. Acute Achilles tendon ruptures: Does surgery offer superior results (and other confusing issues)? Clin Sports Med 2015;34:595-606.
5. Raikin SM, Garras DN, Krapchev PV. Achilles tendon injuries in a United States population. Foot Ankle Int 2013;34:475-480.
6. Sode J, Obel N, Hallas J, Lassen A. Use of fluroquinolone and risk of Achilles ten-

don rupture: A population-based cohort study. Eur J Clin Pharmacol 2007;63: 499-503.
7. Thompson TC, Doherty JH. Spontaneous rupture of tendon of Achilles: A new clinical diagnostic test. J Trauma 1962;2: 126-129.
8. O'Brien T. The needle test for complete rupture of the Achilles tendon. J Bone Joint Surg Am 1984;66:1099-1101.
9. Inglis AE, Sculco TP. Surgical repair of ruptures of the tendo Achillis. Clin Orthop Relat Res 1981;(156):160-169.
10. Bhandari M, Guyatt GH, Siddiqui F, et al. Treatment of acute Achilles tendon ruptures: A systematic overview and meta-analysis. Clin Orthop Relat Res 2002; (400):190-200.
11. Khan RJ, Fick D, Keogh A, et al. Treatment of acute Achilles tendon ruptures. A meta-analysis of randomized, controlled trials. J Bone Joint Surg Am 2005;87:2202-2210.
12. Soroceanu A, Sidhwa F, Aarabi S, et al. Surgical versus nonsurgical treatment of acute Achilles tendon rupture: A meta-analysis of randomized trials. J Bone Joint Surg Am 2012;94:2136-2143.
13. Jones MP, Khan RJ, Carey Smith RL. Surgical interventions for treating acute Achilles tendon rupture: Key findings from a recent Cochrane review. J Bone Joint Surg Am 2012;94:e88.
14. Olsson N, Silbernagel KG, Eriksson BI, et al. Stable surgical repair with accelerated rehabilitation versus nonsurgical treatment for acute Achilles tendon ruptures: A randomized controlled study. Am J Sports Med 2013;41:2867-2876.
15. Keating JF, Will EM. Operative versus non-operative treatment of acute rupture of tendo Achillis: A prospective randomised evaluation of functional outcome. J Bone Joint Surg Br 2011;93:1071-1078.

Table. Achilles tendon rupture rehabilitation protocol.

Time frame	Activity
0–2 weeks	Posterior slab/splint; non-weight-bearing with crutches: immediate post-op in surgical group, after injury in non-op group
2–4 weeks	Aircast walking boot with 2-cm heel lift*† Protected weight-bearing with crutches Active plantar flexion and dorsiflexion to neutral, inversion/eversion below neutral Modalities to control swelling Incision mobilization modalities‡ Knee/hip exercises with no ankle involvement (e.g., leg lifts from sitting, prone, or side-lying position) Non-weight-bearing fitness/cardiovascular exercises (e.g., bicycling with one leg, deep-water running) Hydrotherapy (within motion and weight-bearing limitations)
4–6 weeks	Weight-bearing as tolerated*† Continue 2–4 week protocol
6–8 weeks	Remove heel lift Weight-bearing as tolerated*† Dorsiflexion stretching, slowly Graduated resistance exercises (open and closed kinetic chain as well as functional activities) Proprioceptive and gait retraining Modalities including ice, heat, and ultrasound, as indicated Incision mobilization‡ Fitness/cardiovascular exercises to include weight-bearing as tolerated (e.g., bicycling, elliptical machine, walking or running on treadmill, stair climber) Hydrotherapy
8–12 weeks	Wean off boot Return to crutches or cane as necessary and gradually wean off Continue to progress range of motion, strength, proprioception
>12 weeks	Continue to progress range of motion, strength, proprioception Retrain strength, power, endurance Increase dynamic weight-bearing exercise, include plyometric training Sport-specific retraining

* Patients were required to wear the boot while sleeping.

† Patients could remove the boot for bathing and dressing but were required to adhere to the weight-bearing restrictions according to the rehabilitation protocol.

‡ If, in the opinion of the physical therapist, scar mobilization was indicated (i.e., the scar was tight or not moving well), the physical therapist would attempt to mobilize using friction, ultrasound, or stretching (if appropriate). In many cases, heat was applied before beginning mobilization techniques.

New procedure for CL19 medical reports

ICBC has adopted new policy and procedures for completing the CL19 Medical Report. The new approach is as follows:

- ICBC agrees that a physician need only complete and return a CL19 based on a review of the patient's file.
- A special or separate office visit is not required for the purpose of completing the CL19.
- ICBC currently pays a fee of $193.54 (inclusive of bonus) for the CL19, when completed.
- If a physician informs ICBC that they intend to bill the CL19 at a rate higher than ICBC pays, ICBC has indicated they will confirm the withdrawal of their request.
- The choice of whether to charge a higher rate is up to the individual physician.

Remember that when a request for records other than a CL19 occurs, as per the standards of the College of Physicians and Surgeons of BC, you should obtain clear authorization from the patient or patient's legal representative to release that information.

For questions or concerns around procedures, contact Ms Juanita Grant, Physician and External Affairs Department at jgrant@doctorsofbc.ca or 604 638-2829.

Congratulations from the *BCMJ*

At this year's UBC Medical Student Orientation Day, first-year students had an opportunity to enter to win an iPad by signing up to receive each issue's table of contents by e-mail. Congratulations to Vionarica Gusti, winner of the draw, and thank you to everyone who entered.

To start receiving the *BCMJ* table of contents by e-mail, visit bcmj.org and click on the Sign-up for e-alerts button.

Planning your family: The insurance essentials

As physicians plan to start their families in the province of BC, there are important considerations to think about.

Life insurance

The first and foremost is to increase life insurance. Life insurance coverage is calculated to cover immediate needs such as a mortgage or other loans to allow the surviving spouse to live debt-free in the event of a death. If there is a new dependent child, it is important that life insurance covers costs of raising the child, including education costs and a monthly income for the child until he or she reaches adulthood. Coverage increases depend on the child's age. For example, if the child is 5 years old, you may need to account for 13 to 15 years of monthly income before the child becomes financially independent. The policyholder determines the number of years of income the child receives and the amount of income received per month, and the insurance coverage is increased accordingly.

Parental leave program

Insurance advisors also strongly recommend that physicians look into the parental leave program. Physicians paid by the Medical Services Plan on a fee-for-service or sessional basis, or paid under a nonsalaried service contract in the calendar year prior to the commencement of a leave, are eligible for benefits. The program provides up to $1000 per week for 17 weeks over a 52-week period to BC physicians who take a leave from practice as a result of the birth or adoption of a child. In addition, physicians can have their Doctors of BC membership dues reduced while on parental leave.

Updated wills

Another priority is having an updated will. If a child under 18 is designated as a beneficiary, a trustee should be designated to receive funds on the child's behalf. Instructions that stipulate at what age, percentage, and circumstance the funds are to be transferred to the child should be included. If no trustee is elected, the funds will be paid to the courts.

Health and dental coverage

If a physician has health and dental coverage through the Doctors of BC Health Benefits Trust Fund, it is important to add the child to the plan within 90 days of birth/adoption. During this period proof of health for the child is not needed. After 90 days has passed, proof of health is required and the child could be accepted or declined for coverage.

Disability insurance

Many physicians are not aware that disability insurance covers disability resulting from complications of pregnancy. This includes complications from a cesarean section, whether the procedure was elective or otherwise.

Critical illness insurance

Physicians who have critical illness insurance can consider adding a child critical illness option to their coverage. The plan includes an optional child rider offering up to $20 000 if the child becomes ill or develops one of six specific childhood conditions covered by the plan. If added, the chosen coverage amount will apply to each child, and no matter how many children are in the family, there is only one low premium.

Accidental death and dismemberment insurance

Adding a family option for the dependent child to accidental death and dis-

memberment insurance means that, in the unfortunate event of the death of the child, 10% to 15% of the policy holder's coverage will be given to the living parents.

For more information regarding any of these recommendations, contact a Doctors of BC advisor at 604 735-5551, or learn more at www.doctorsofbc.ca.

—Ada Lo
UBC Medical Student, Year 2
Doctors of BC Student Liaison

Practice Support: 1300 docs

Nearly 1300 doctors participated in 80+ Practice Support Program learning modules within the last year, with many commenting in part that the modules improved their care for people with mental health issues and allowed them to provide more than just meds. To learn more visit www.pspbc.ca.

Physicians honored with Above & Beyond Awards

Several Fraser Health physicians have been honored with a Fraser Health Above & Beyond Award. Each year, Fraser Health recognizes the employees, physicians, and volunteers who go above and beyond to improve patient care and services in local communities. This year, Fraser Health celebrated 19 individuals and teams making a difference every day in health care.

Among the winners were four individual physicians working at sites across Fraser Health:

- Dr Shikha Minhas, a palliative care physician at Surrey Memorial Hospital, was honored for helping patients pass peacefully.
- Dr Joelle Bradley, a hospitalist at Royal Columbian Hospital, was awarded for enabling important discussions about advance care planning.
- Dr Nick Petropolis, a family physician with the Fraser Northwest Division, was recognized for launching a new program to secure frail and elderly seniors better access to family doctors.
- Dr Christopher Wong, an infectious disease specialist at Royal Columbian Hospital, was celebrated for spending a lifetime innovating to fight infectious disease.

Two of the teams recognized with awards also included physician members:

- Dr Julian Pleydell-Pearce and the Pediatric Observation Unit team at Chilliwack General Hospital, who realized their dream of a dedicated space for their smallest patients.
- Dr Shelley Tweedle and the Pre-Admission Clinic team at Royal Columbian Hospital, who adapted clinic procedures to end long waits and put patients first.

Resource for treating obese or overweight child patients

MEND (Mind, Exercise, Nutrition… Do it!) is a free, 10-week program that family physicians can recommend to families with children age 7 to 13 who are moving away from a healthy weight trajectory and whose BMI is at or above the 85th percentile for age. Through group sessions that focus on healthy eating and meal planning, physical activity, and goal setting, the early intervention program aims to reduce the risk of children developing weight-related physical and mental health problems later in life. Families can contact the MEND coordinator in their community and find more information at www.bchealthykids.ca or contact Leah Robertson, MEND provincial manager, at leah.robertson@cw.bc.ca.

Study: COPD epidemic looms

Despite a decline in smoking rates, an epidemic of chronic obstructive pulmonary disease (COPD) is expected over the next 2 decades, according to a new study from the University of British Columbia.

To predict future rates of COPD disease, researchers at UBC conducted forecasting analyses, combining population statistics and health data for BC, and concluded that between 2010 and 2030 the number of COPD cases in the province will increase by more than 150%—despite decreased rates of smoking. Among seniors over 75 years of age, the number of cases will increase by 220%. Researchers expect the BC-based predictions to be applicable to Canada and other industrialized countries.

Senior author Dr Mohsen Sadatsafavi, assistant professor in the Faculties of Pharmaceutical Sciences and Medicine, identified that people think COPD will soon be a problem of the past because smoking is declining in the industrialized world. But aging is playing a much

Continued on page 524

Continued from page 523

bigger role and that factor is often ignored. Lead author Amir Khakban, health economist in the Faculty of Pharmaceutical Sciences at UBC and the Centre for Health Evaluation and Outcome Sciences, notes that age-adjusted COPD rates have remained constant as smoking rates have declined.

Researchers suggest that COPD will overtake all other diseases of aging over the coming decades, and the associated health care costs of caring for these patients will be significant. The study predicts that annual inpatient days related to COPD will grow by 185%.

The UBC team is focusing on driving research and innovation to change this trajectory with therapeutic and biomarker solutions that prevent and treat COPD.

The study, "The projected epidemic of COPD hospitalizations over the next 15 years: A population based perspective," is published in the *American Journal of Respiratory and Critical Care Medicine.*

New weapon for hard-to-treat bacterial infections

Researchers at the University of British Columbia have successfully prevented drug-resistant bacteria from forming abscesses using a peptide, which worked by disrupting the bacteria's stress response. Abscesses are responsible for 3.2 million emergency room visits every year in the United States, and standard treatment for abscesses involves cutting out the infected tissue or draining it.

Senior author Bob Hancock, a professor in UBC's Department of Microbiology, clarified that the peptide offers a new strategy because its mechanism is completely different from every known antibiotic. Professor Hancock and his colleagues discovered that bacteria in abscesses are in a stress-triggered growth state. Using a synthetic peptide known as DJK-5, they were able to interfere with the bacteria's stress response and heal abscesses in mice. The peptide was effective against two classes of bacteria, known as gram-positive and gram-negative bacteria, whose different cell wall structures make them susceptible to different antibiotics. Professor Hancock hopes to begin clinical trials on human infections within a year.

The study, "Bacterial abscess formation is controlled by the stringent stress response and can be targeted therapeutically," appears online in *EBioMedicine.*

Uncovering cancer's invisibility cloak

UBC researchers have discovered how cancer cells become invisible to the body's immune system, a crucial step that allows tumors to metastasize and spread. As cancer cells evolve

Continued on page 525

Telephone fees: SSC fee items 10001, 10002, 10003, and 10004

It has come to the attention of the Patterns of Practice Committee that specialists may be billing fee items 10001, 10002, 10003, or 10004 and not documenting correctly, or misinterpreting how to apply a particular fee item.

Lack of documentation

If you are a specialist billing the Specialist Services Committee (SSC) telephone fees (10001, 10002, 10003, or 10004), you are required to create an adequate medical record for each patient encounter as defined in the Preamble to the *Doctors of BC Guide to Fees*. This involves documenting all of the requirements in the respective fee notes, including the time of the initiating request and the time of response, as well as the advice given and to whom it was given.

Section A. 2. Introduction to the General Preamble vii) requires "Making and maintaining an adequate medical record of the encounter that appropriately supports the service being claimed. A service for which an adequate medical record has not been recorded and retained is considered not to be complete and is not a benefit under the Plan."

Misinterpretation of fee item 10003

The purpose of fee item 10003 (specialist patient management) is for the specialist to provide real-time advice when the intent of communication is to replace the need for the specialist to see the patient in person. The consulting specialist is responsible for ensuring that an appropriate communication modality is used to meet the medical needs of the patient.

This fee applies to telephone and video technology communication (including other forms of electronic verbal communication) between the specialist physician and patient, or a patient's representative. It is not payable for written communication (i.e., fax, letter, or e-mail).

If you receive a normal test result and would not normally book an appointment with the patient to inform them of the result, then the fee should not be billed for relaying the result over the phone.

For fee items G10001, G10002, G10003, and G10004, please refer to section D. 1. (Telehealth Services) of the General Preamble.

—Keith J. White, MD
Chair, Patterns of Practice Committee

This article is the opinion of the Patterns of Practice Committee and has not been peer reviewed by the BCMJ *Editorial Board. For further information contact Juanita Grant, audit and billing advisor, Physician and External Affairs, at 604 638-2829 or jgrant@doctorsofbc.ca.*

pulsimeter

Continued from page 524

over time they may lose the ability to create a protein known as interleukein-33 (IL-33). When IL-33 disappears in the tumor, the body's immune system has no way of recognizing the cancer cells and they can begin to metastasize.

Researchers found that the loss of IL-33 occurs in epithelial carcinomas, including prostate, kidney, breast, lung, uterine, cervical, pancreatic, skin, and many others.

Professor Wilfred Jefferies is a senior author of the study, working in the Michael Smith Laboratories and as a professor in the Departments of Medical Genetics and Microbiology and Immunology at UBC. Working with researchers at the Vancouver Prostate Centre to study several hundred patients, study authors found that patients with prostate or renal cancers whose tumors have lost IL-33 had more rapid recurrence of their cancer over a 5-year period. They will now begin studying whether testing for IL-33 is an effective way to monitor the progression of certain cancers.

The study, "Discovery of a metastatic immune escape mechanism initiated by the loss of expression of the tumour biomarker interleukin-33," was published in the journal *Scientific Reports*.

in memoriam

Dr Eugene Giuseppe Caira, 1918–2016

Dr Caira passed away with his family by his side on 5 September 2016 at Shuswap Lake General Hospital in Salmon Arm in his 98th year. Dr Caira was the cherished father of Loren, Janine, Nadia (Dave), Daren (Jeff), Martene (Mark), Rachel (Tim), and Leean; and dearly loved Nonno (Granddad) of Anders, Kristian, Stefan, Katja, Drew, Caira, and Briar.

Dr Caira studied medicine at the University of St. Andrews for Medicine in Glasgow, Scotland, from 1943 to 1948, and in 1949 he was admitted to the Royal College of Physicians of Edinburgh. In 1956, after completing his master's of science in experimental surgery at the University of McGill, Montreal, he was accepted into the Royal Faculty of Physicians and Surgeons of Glasgow. In 1959 Dr Caira obtained his certification as a general surgeon, and in 1972 he became a Fellow of the Royal College of Surgeons of Canada. Dr Caira dedicated his life to his profession as a respected general surgeon who was qualified in the United Kingdom, British Guiana (Guyana), and Canada. He was also instrumental in bringing the first nuclear medicine scintillation camera to Canada in 1970.

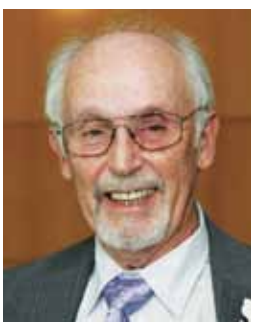
Eugene will be remembered for his lively personality, sense of humor, and his love for all things alive. He was known as a mean painter and an able golfer by his friends. He was described by a very dear friend as "an astute diagnostician and a skilled general surgeon whose humanity, good nature, and humor has put the practice of art into the practice of surgery to the benefit of his patients."

Eugene's family would like to extend their heartfelt gratitude to his dear friends and staff at Lakeside Manor, where he spent the last 3 years with the help of We Care Home Health, and for the wonderful care Eugene received from Dr Herman Venter and the exceptional staff at Shuswap Lake General Hospital, Salmon Arm, during his final weeks.

Cremation has taken place, and a celebration of Dr Caira's life was held at the Prestige Harbourfront Resort in Salmon Arm on 23 September. Charitable donations may be made in lieu of flowers to Shuswap Lake General Hospital. Online condolences may be sent through Dr Caira's obituary at https://memoryleaf.net/dr--eugene-caira.

—Nadia Caira
100 Mile House

Dr Sheldon C. (Shelly) Naiman, 1937–2016



Dr Sheldon C. Naiman passed away in July 2016 following a short illness. Dr Naiman was a beloved family man and a mentor to many individuals in the medical community in BC.

Born in Toronto, Dr Naiman graduated from the University of Toronto in 1962. After medical school he moved to California and while at the Los Angeles County Hospital he became interested in bleeding and clotting problems and decided to pursue a career in hematology. (Dr Naiman later became well known in Vancouver as Dr DIC.) After returning to Toronto for further training he was subsequently recruited by Drs Mac Whitelaw and Wally Thomas to join UBC and the staff at VGH. With Dr George Gray he directed the hematology lab at VGH for many years.

Dr Naiman became the province's first full-time clinical hematologist and subsequently the first head of the UBC Division of Clinical Hematology. During this time he also joined the first examining board of the new Royal College of Physicians and Surgeons of Canada subspecialty of clinical hematology.

During the 1970s and 1980s Dr Naiman traveled with his popular hematology road shows around the province where he educated and befriended many practitioners. After 15 years of frustration with the outcomes of acute leukemia treatment in adults, Dr Naiman helped organize the Bone Marrow Transplant Program at VGH in 1979. Overall, he practised hematology for over 40 years at both VGH and St. Paul's Hospital in Vancouver.

Dr Naiman was a shining example—and one of the last—of a hybrid clinical and laboratory hematologist and was widely regarded as an outstanding educator. His lengthy consultation letters and impromptu lectures on virtually any area of the specialty were a testament to his vast knowledge and experience. He received several master teacher awards, and many students considered him to be the best teacher they had ever had. Even as his sight was failing he was still considered the go-to person for difficult blood film and bone marrow interpretation. In 2009 he received the prestigious Dr Cam Coady Foundation Medal of Excellence.

Shelly was a true *mensch*, always finding time for family and friends as well as for his patients. He and his wife, Dr Linda Vickars, were a true

force, working together for over 20 years at St. Paul's Hospital. They were also passionate about traveling and visited all seven continents before Linda's untimely death in 2014. While traveling they consulted for their friend, Dr George Deng, in Chengdu, China, and contributed to the annual postgrad hematology course in India.

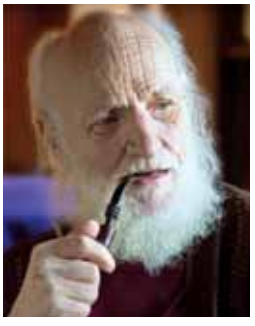
Shelly and Linda created an endowment at the UBC Centre for Blood Research, and the multipurpose lab in the Life Sciences Centre has been named after them.

Shelly was particularly grateful for the care given him by his lifetime personal physician and good friend, Dr Lyle Levy, and was overwhelmed by the compassionate attention shown to him by the ICU staff at VGH during his last hospitalization.

Dr Naiman is survived by his five children and their mother, Marcia Schultz; his brother, Neil; and eight grandchildren.

—Gershon Growe, MD
Vancouver
—The Naiman family
Vancouver

Dr Charles Edward (Ted) Reeve, 1936–2016



Directing British Columbia's kidney transplant program for 19 years might seem an unexpected destiny for a skinny kid from small town Alberta, but Dr Ted Reeve's trajectory had a logical—albeit idiosyncratic—path that made such an outcome all but inevitable.

Born in Stettler, Alberta, to an Anglican priest and his schoolteacher wife, Ted grew up in Calgary before attending Bishop's University, as his parents had before him. While there, Ted found his interests in theatre, music, philosophy, and Christianity repeatedly drawing him into the circle of Phyllis Parham, the young woman who became his wife. Married in 1958, Ted and Phyllis continued to debate these themes, then with their five children and, still later, seven grandchildren. Characterizing their relationship, Phyllis said they'd been discussing Sartre for 60 years.

But Bishop's University held further attractions for Ted. It was there that he began in earnest the scientific career that would bring him to organ transplantation's leading edge. Following his bachelor's degree in mathematics and physics, Ted studied medicine at McGill University before he and his young family moved west for a residency at St. Paul's Hospital in Vancouver and a postdoctoral fellowship at UCLA.

The science thrilled him, but so did the opportunity and responsibility of treating acutely ill patients, regardless of their background. It was a matter of pride for Ted that when he and his colleagues brought transplantation to British Columbia they didn't just help pioneer this therapy, they did so in an environment where it was available to unemployed cafeteria cooks and self-made millionaires equally. This emphasis on quality of life led him to branch out from nephrology and transplantation to related research in immunology, hematology, and genetics, and to frequent involvement in the organizations and committees that governed and lobbied for medical practitioners, like Doctors of BC.

After several decades as a physician, Ted sought a new career, feeling that administrative and philosophical changes had moved medicine and academia away from his ideals. He and Phyllis acquired Page's Resort & Marina on Gabriola Island where he became as dedicated to the island community as he had been to his medical practice. Together, Ted and Phyllis nurtured their business and supported the arts, opening their home for concerts, book launches, and art exhibitions.

In his 60s, Ted was diagnosed with hepatitis C, likely picked up during his medical career. As his battle with the disease stiffened he was fortunate to have had the sympathetic care of Dr Francois Bosman. Ted's suffering, however, did not diminish his compassion; rather than lamenting that new treatments arrived too late for him, he worried that their exorbitant pricing limited their accessibility.

Ted is survived by Phyllis and their children: Dorothy (Jacques), Charles (Amy), Gloria (Ken), Elizabeth, and Henry (Tiffani). His beloved family also includes grandchildren Christopher, Amandine, Nicolas, Stephanie, Michelle, Lioba, and Charlie. His sister Helen, brother Norman, and parents Charles and Dorothy predeceased him. He was blessed with numerous cherished friends who, along with his wife and family, miss him dearly.

—Charles Reeve, Jr., PhD
Toronto

Recently deceased physicians

If a BC physician you knew well is recently deceased, consider submitting a piece for our "In Memoriam" section in the *BCMJ*. Include the deceased's dates of birth and death, full name and the name the deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high-resolution photo. Please limit your submission to a maximum of 500 words. Send the content and photo by e-mail to journal@doctorsofbc.ca.

BCMJ
BC Medical Journal

Division-created patient resources: Empowering patients to make healthy choices

Educating patients about their health and the health care system can help to ensure that they make healthy, informed choices and feel engaged in their own care. A growing number of divisions of family practice have developed patient education and awareness campaigns, giving GPs the opportunity to contribute their knowledge to the creation of community-specific resources that can help improve the health and experiences of their patients.

Division-organized patient education and awareness campaigns cover topics such as how to prepare for doctors' appointments, how and where to access appropriate care, and how to make healthy lifestyle choices. Many of these resources were developed through divisions' work on the A GP for Me initiative, and in some cases the learning materials created have been repurposed by other divisions in communities around the province.

This article is the opinion of the GPSC and has not been peer reviewed by the BCMJ *Editorial Board.*

Primary care options

Ensuring patients know where to go to receive appropriate care can strengthen GP-patient attachment and reduce low-acuity visits to the ER. These were the goals of White Rock–South Surrey Division's Right Care, Right Place campaign, produced in collaboration with Fraser Health and Peace Arch Hospital. The campaign informs patients of various primary health care options available in the region that may be appropriate for their health care needs. The campaign features a rack card, video, and poster encouraging patients to "call your doctor first" and suggesting when they might call 811 (HealthLink BC), speak with a pharmacist, access a walk-in clinic, or visit the ER (or call 911).

Table. Division-created patient education resources.

Division	Resource	Online access
Burnaby	Empowering Patients	www.divisionsbc.ca/burnaby/empoweringpatients
Central Okanagan	Healthy Initiatives Get Regular with Your GP	http://healthyinitiatives.ca www.divisionsbc.ca/cod/posters
Chilliwack	Appropriate Access to Care Mini Medical School Healthy Kids Initiative: Live 5-2-1-0	www.divisionsbc.ca/chilliwack/agpformevideos www.divisionsbc.ca/chilliwack/minimed www.divisionsbc.ca/chilliwack/hkilogin
Kootenay Boundary	Right Care, Right Place	www.divisionsbc.ca/kb/careoptions
Richmond	Think Where for Care	www.divisionsbc.ca/richmond/whereforcare
Sunshine Coast	Empowering Patients	www.divisionsbc.ca/sunshine-coast/empoweringpatients
Vancouver	Talk to Your GP	www.divisionsbc.ca/vancouver/talktoyourgp
White Rock–South Surrey	Right Care. Right Place	www.divisionsbc.ca/white-rock-south-surrey/rcrp

Recognizing the value of this information to patients, the Chilliwack Division adapted these materials for use in their own Appropriate Access to Care campaign. Chilliwack's program also features a series of nine videos that define primary care for patients, advise them on preparing for a medical appointment, and provide information on how to keep track of medications. The Kootenay Boundary Division also adapted White Rock–South Surrey's materials to create their own Right Care, Right Place materials specific to their region.

The Richmond Division designed their own unique materials for their Think Where for Care campaign, which they developed in partnership with VCH, the City of Richmond, HealthLink BC, and SUCCESS. Campaign materials include pamphlets, posters, and rack cards titled "Why Have a Family Doctor?" and "A Visit to Your GP," and a health literacy puppet show video. All materials, including the informational video, are available in four languages—English, Cantonese, Punjabi, and Mandarin—to address the needs of the community's ethnic and immigrant populations.

Importance of the physician-patient relationship

While some of the patient/public campaigns outlined above incorporate information that helps patients make the most of their time with their doctor, two divisions have created campaigns specifically promoting the physician-patient relationship. Central Okanagan Division's Get Regular with Your GP posters build awareness about the ways in which a good relationship with a GP can result in better health outcomes. The posters, which

remind patients to inform their doctor of all health concerns, be proactive in their health, and prepare for their appointments, can be downloaded from the division's website.

The Vancouver Division has created the Talk to Your GP campaign, a series of FAQ videos that feature division members providing a physician's perspective on topics such as why it's important to have a good relationship with a GP, how GPs can help their patients when they're admitted to hospital, what kind of information is important for patients to tell GPs, and what patients can do to enhance the care they receive from their GP.

Healthy eating, lifestyle, and general health information

Many divisions have created patient education resources that encourage healthy choices and lifestyles. Central Okanagan Division's Healthy Initiatives website serves as an online resource for residents to find local fitness facilities and parks, fresh food choices, and doctors' offices and clinics.

Chilliwack Division's Healthy Kids Initiative provides a number of printable resources to educate kids and families about the Live 5-2-1-0 health message. Materials include a coloring sheet, rack card, support booklet, goal trackers, a poster, and a Healthy Balance for Life Medicine Wheel produced in partnership with the Stó:lō Service Agency.

The Chilliwack Division also provides local residents with a Mini Medical School information series, through which they can get information on various health topics from doctors, residents, and other health professionals. The information series, put on by medical residents through the local UBC Medical Residency program, has created a repository of presentations and resources on topics relating to mental health, end-of-life care, healthy kids, brain injury, public health strategies, and more.

The Burnaby Division has created a public education program called Empowering Patients, comprising a wide array of presentations and information sheets for a patient audience. Topics include heart disease, blood pressure, diabetes, healthy eating, emotional wellness, healthy physical activity, and information about hospital stays. These materials are available for use by all other divisions, and the Sunshine Coast Division has repurposed them for their own local audience.

Please see the **Table** for a list of division-created patient education resources, and contact divisions@doctorsofbc.ca to learn more about adapting these materials for use in your own community.

—Afsaneh Moradi
Initiatives Lead, Divisions of Family Practice

calendar

BCMJ's CME listings

Rates: $75 for up to 150 words (maximum), plus GST per month; there is no partial rate. If the course or event is over before an issue of the *BCMJ* comes out, there is no discount. VISA and MasterCard accepted.

Deadlines:

Online: Every Thursday (listings are posted every Friday).

Print: The first of the month 1 month prior to the issue in which you want your notice to appear, e.g., 1 February for the March issue. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August.

We prefer that you send material by e-mail to journal@doctorsofbc.ca, but we also accept paper listings at *BC Medical Journal*, 115-1665 West Broadway, Vancouver, BC V6J 5A4, Canada. Tel: 604 638-2815; fax: 604 638-2917. Please provide the billing address and your complete contact information.

MEDICAL CBT
Various locations and dates
When you learn medical cognitive behavior therapy's ultra-brief techniques, you'll feel much more comfortable handling the many "supratentorial issues" in your practice. Choose from the following workshops, each "3.1" accredited for at least 36.0 Mainpro+ credits by the CFPC: Scottsdale—Fairmont Scottsdale Princess (24–26 Nov); Caribbean cruise—*Disney Fantasy* (10–17 Dec); Disney World—Grand Floridian Resort (19–21 Dec); Mexico—Iberostar Mayan Riviera (18–20 Jan), Bahamas—Atlantis Resort (9–11 Feb 2017); Las Vegas—Aria Resort (15–17 Feb); Whistler—Delta Whistler Village Suites (20–22 Mar); Maui—Sheraton Ka'anapali (27–29 Mar); Kauai—Grand Hyatt (10–12 Apr 2017); South Pacific cruise—*Paul Gauguin* (15–29 Apr 2017); Mediterranean cruise—*Celebrity Reflection* (9–20 Oct 2017). CBT Canada, now 20 years old, is a national winner of the CFPC's CME Program Award and was the first organization authorized to provide 3-credit-per-hour CME. Lead faculty Greg Dubord, MD, has given over 300 CBT workshops and is a recent University of Toronto CME Teacher of the Year. For details and to register visit www.cbt.ca or call 1 877 466-8228. Look for early-bird deadlines.

UGEMP COURSE
Vancouver, 28 Oct (Fri), 18 Nov (Fri)
The use of bedside ultrasound by clinicians to guide invasive emergency and critical care procedures improves success and reduces complications, and is rapidly becoming established as the standard of care. The Ultrasound Guided Emergency Medicine Procedures course will be held at the Centre of Excellence for Surgical Education for Innovation, Vancouver General Hospital, 3602–910 W.10 Ave. Pre-course work includes web-based learning modules to complete the self-directed learning. Human models will allow for demonstration of human surface landmarks, and ultrasoundable task-trainers that simulate the tactile feel of human tissue will allow for the repeated practice of invasive procedures without harming the human models. Formative evaluation in the form of immediate feedback provided by the instructor will help the students to monitor their progress and guide their learning. Maximum course capacity: 24 participants. Target audience: Emergency, rural, intensive care, and family physicians, pediatricians, anesthetists, trauma physicians, residents, IMGs. Accreditation: up to 15 Mainpro-M1/MOC Section-3 credits. Register for 28 Oct at http://ubccpd.ca/course/UGEMP-Oct28-2016 and for 18 Nov at http://ubccpd.ca/course/UGEMP-Nov18-2016. Tel 604 875-5101, e-mail cpd.info@ubc.ca.

CME ON THE RUN
VGH & various videoconference locations and dates (Fri)
CME on the Run sessions are held at the Paetzold Lecture Hall, Vancouver General Hospital, and there are opportunities to participate via videoconference from various hospital sites. Each program runs on Friday afternoons from 1 p.m. to 5 p.m. and includes great speakers and learning materials. Topics and dates: 25 Nov (therapeutics). Therapeutics topics include The Role of DMARDS in Rheumatologic Disease; Advances in Managing Neuropathic Pain; Medical Marijuana—Evidence-based Therapeutic Uses; Probiotics in the Management of GI Symptoms: What works?; Anticoagulation Post-CVA/TIA: What Therapeutic Options and for How Long?; IUD—Contraception and Beyond; Medical Abortion Update; Androgen Therapy—What's the Evidence? The next sessions are 3 Feb (internal medicine); 31 Mar (gynecology and urology); 28 Apr (palliative care and geriatrics); 9 Jun (diagnostics and radiology). To register, and for more information, visit www.ubccpd.ca, call 604 875-5101, or e-mail cpd.info@ubc.ca.

FALL/WINTER CME CRUISES FROM SEA COURSES
November 2016–March 2017
Travel with the CME cruise experts. Discover new destinations. Return to favorite ports. Costa Rica (Nov), Tahiti & Marquesas (Nov), Caribbean (Dec, Mar & Apr), South America (Jan), Australia/New Zealand (Feb), Mexico (Feb), Bali–Singapore (Feb). Trips planned by physicians for physicians. Sea Courses has provided almost 300 unique CME conferences onboard cruise ships over the past 20 years. Programs are accredited for specialists and family physicians, have no pharma-sponsorship and include a complimentary enrichment program for travelling companions. All Sea Courses trips offer group pricing, special airfares, and free cruising for companions. Contact Sea Courses Cruises for more information and details of current promotions. Phone 604 684-7327 or toll free 1-800-647-7327; e-mail cruises@seacourses.com. Visit www.seacourses.com for a complete list of CME cruises and tours.

BLEEDING AND THROMBOSIS
Vancouver, 17 Nov (Thu)
The Centre for Blood Research at the University of British Columbia is hosting the 10th annual Earl W. Davie Symposium at the Segal Building, 500 Granville St. This 1-day event in honor of the discoverer of the coagulation cascade features presentations by experts in vascular biology, hemostasis-thrombosis, inflammation, and cardiovascular and neurovascular disease, and facilitates knowledge exchange between researchers and physicians. This symposium will focus on cutting-edge advances in the understanding and treatment of hemophilia, thrombosis, and bleeding disorders. Highlights of the symposium include keynote presentations by Drs Nigel S. Key and John W. Wiesel, a lineup of leading local and international speakers, talks by patients, and selected oral and poster presentations by students at all levels of training. Accreditation: RCPSC MOC Section 1 credits (pending). Fees: $99 (professionals); $49 (students). Registration: http://cbr.ubc.ca/events/earl-w-davie-symposium/.

ESSENTIAL MEDICAL-LEGAL TOOLKIT
Vancouver, Various dates
This program is suitable for family physicians and specialists and will be held at UBC Robson Square. Medical Legal Reports: The Essentials, will be held 9 a.m. to 4 p.m., 26 Nov (Sat), and 25 Feb (Sat). If writing medical legal reports causes you stress, if you are not sure what to write when asked about prognosis, unsure of what to do about patients' subjective complaints, or how much you should be billing for your reports, then this is the course you want to attend. Medical Legal Reports Advanced and Testifying in Court: Becoming a Great Expert**,** will be held 9 a.m. to 4 p.m. on 4 Mar (Sat) and will provide advanced training on writing more complex medical legal reports and provide tips on how to reduce stress while testifying in court. These courses will be taught by medical legal professionals with extensive experience—faculty who have busy personal injury practices and know exactly what they want from medical legal reports and expert testimony in court. Fees: $480/course. For **r**egistration and further information call 604 525-8604, e-mail manager@coremedicalcentre.com, or visit www.medlegaltoolkit.com.

MINDFULNESS IN MEDICINE—FOUNDATIONS OF THEORY AND PRACTICE
Brentwood Bay Resort, 2–4 Dec (Fri–Sun)
As chronic stress and its associated mental and physical health challenges continue to rise in epidemic proportions, the application of mindfulness in clinical practice settings has gained prominence both in terms of evidence-based research and in the popularity of its use. Join us for this 3-day experiential workshop on mindfulness and meditation as they relate to the unique challenges and blessings of our work as physicians. Learn about the latest clinical evidence and neuroscience on mindfulness in medicine, find out about programs offered throughout BC and Canada, and explore practical meditation tools for yourself and for your patients. Accrediation: 32 cert + group learning credits. Visit drmarksherman.ca for more info or contact info@drmarksherman.ca to register.

***BCMJ* CME CRUISE**
Mexico, 9–21 Feb (Thu–Fri)
12-night Quintessential Mexican—Family Practice Refresher onboard the Azamara Quest. San Diego round trip sailing the Baja California and the Sea of Cortez. Ports of call include Cabo San Lucas (water sports, nightlife, and nature), La Paz (see jumping Mobula Rays and swim with whale sharks), Loreto (Loreto Bay Marina National Park with dolphin and whale watching), Guaymas (close proximity to San Carlos), Topolobampo (gateway to the Copper Canyon), and Mazatlan (access Pueblo Magico of Rural Sinaloa to travel to Durango). Overnight stay in Loreto, and 2 late-night stays each in Topolobampo and Cabo San Lucas. Enjoy the Dance of the Dead at Wild Canyon—one of the free AzAmazing evenings. Excellent faculty and topics providing 23 hours of CME while not in port. Cruise price includes all gratuities, bottled water, soft drinks, specialty coffees and teas, standard spirits, international beers and wines, shuttle service to and from ports where available, and English butler service for suite guests. Escape the winter and book now for this exciting voyage. For registration and information contact Sea Courses at cruises@seacourses.com. Tel: 1 888 647-7327.

Continued on page 532

Continued from page 531

GP IN ONCOLOGY TRAINING
Vancouver, 20 Feb–3 Mar (Mon–Fri), and 11 Sep–22 Sep 2017 (Mon–Fri)
The BC Cancer Agency's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology training program beginning with a 2-week introductory session every spring and fall at the Vancouver Centre. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they may provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 6 weeks of customized clinic experience at the cancer centre where their patients are referred. These can be scheduled flexibly over 6 months. Participants who complete the program are eligible for credits from the College of Family Physicians of Canada. Those who are REAP-eligible receive a stipend and expense coverage through UBC's Enhanced Skills Program. For more information or to apply, visit www.fpon.ca, or contact Jennifer Wolfe at 604 219-9579.

HAWAIIAN CME: MAUI/KAUAI
Maui, 27–29 Mar 2017 (Mon–Wed), and Kauai, 10–12 Apr 2017 (Mon–Wed)
Aloha! Please join us in the happiest American state next spring for award-winning CME in medical cognitive behavior therapy—Medical CBT: Ultra-brief techniques for real doctors. The Maui workshop (CBT for Depression/Happiness) will be held at the idyllic Sheraton Maui on Ka'anapali Beach. With 23 acres of lush Hawaiian grounds, you'll never feel crowded! Maui has been voted best island by the readers of *Condé Nast Traveler* for more than a dozen years. Attractions include 10 000 foot Hale'akala (Hawaiian for house of the sun), 14 golf courses (including some of the world's top-rated), the scenic road to Hana, the Seven Sacred Pools of Oheo, and over 500 restaurants. The Kauai workshop—CBT Tools, will be held at the spectacular Grand Hyatt on sunny Poipu Beach. The Grand Hyatt Kauai is ranked among the world's top resorts by both the *Condé Nast Traveler* and *Travel+Leisure*. Kauai is the most tranquil and pristine of the main Hawaiian Islands, with beaches fringing nearly 50% of its tropical coastline. Attractions include the world-famous Kalaulua Trail on the Napali Coast, red-rocked Waimea Canyon, 17-mile Polihale Beach (Hawaii's longest), crescent-shaped Hanalei Bay, and Hawaii's only navigable river, the Wailua. See www.cbt.ca for details about both the Maui and Kauai workshops. Warning: Our significantly discounted guestrooms for these two workshops will sell out far in advance.

SOUTH PACIFIC CRUISE
15–29 Apr 2017 (Sat–Sat)
The world's most romantic destinations, from French Polynesia to Fiji. Join us for a 13-night cruise exploring exotic Tahiti (where Captain Bligh's men mutinied to stay put), Mo'orea (Arthur Frommer's vote for "the most beautiful island on earth"), Taha'a (French Polynesia's vanilla-scented isle), Bora Bora (celebrities' exclusive hideaway), the Cook Islands (New Zealand's private paradise), the Kingdom of Tonga (proudly never colonized), and three idyllic islands of Fiji (Viti Levu, Vanua Levu, and postcard-perfect Beqa). You'll be enchanted by the South Pacific's craggy volcanic peaks, sugary beaches, warm lagoons teaming with fish, glistening black pearls, and Tamure dancing suggestive enough to make you blush. The CME provides a rock-solid foundation in medical CBT for depression, reviewing a plethora of ultra-brief office techniques to defeat depression and be happy. CBT Canada, now 20 years old, is a national winner of the CFPC's CME Program Award, and was the first organization authorized to provide 3-credit-per-hour CME. Lead instructor Greg Dubord, MD, is a University of Toronto CME Teacher of the Year. Assistant faculty includes Lori Montgomery, MD, from the University of Calgary, who will be presenting on CBT for chronic pain. Super early bird rates for ocean-view staterooms aboard the spectacular m/s *Paul Gauguin* start at $12 850 (includes all beverages, all taxes, all gratuities, return airfares, and companion cruises free). Book with Canada's largest cruise agency, CruiseShipCenters. See CBT Canada at www.cbt.ca or call 1 888 739-3117.

BCMJ
BC Medical Journal

CLASSIFIED ADVERTISING (limited to 700 characters)

Rates:
Doctors of BC members $50 + GST per month for each insertion of up to 350 characters. $75 + GST for insertions of 351 to 700 characters. We will invoice on publication.
Non-members $60 + GST per month for each insertion of up to 350 characters. $90 + GST for insertions of 351 to 700 characters. We will invoice on publication.

Deadlines: Ads must be submitted or cancelled by the first of the month preceding the month of publication, e.g., by 1 November for December publication. Please call if you have questions. Tel: 604 638-2858.
Submit requests at www.bcmj.org/classified-advertising-submission-form.
Provincial legislation prohibits ads that discriminate on the basis of sex. The BCMJ *may change wording of ads to comply.*

practices available

KELOWNA—FP PRACTICE WITH OBSTETRICS
Awesome practice available in collegial FP group that does obstetrics. Doc is retiring. Great shared call schedule. Supportive group. Vibrant community. Great place to raise a family and be outdoors. Available now. Locums also welcome. Contact Dr Rishi at jrishi@telus.net or 250 718-4101.

LAKE COUNTRY, BC—FOUR PHYSICIANS NEEDED
Lake Country Family Practice is expanding! Lake Country is a fast-growing community of 19 000, 15 km north of Kelowna. We are looking for four physicians to join our established group of four practices to allow very flexible working hours and a minimum of 8 weeks of vacation per year, yet maintain low overhead and full coverage without the need for locums. For more information visit our website lakecountryfamilypractice.com, or e-mail Bonnie at lcfp@shaw.ca.

VANCOUVER—PEDIATRICS
Busy pediatric practice available. Solid referral base. Recently renovated 1000 sq. ft. office, including four exam rooms and two MD rooms. EMR in place. Conveniently located near BC Children's Hospital. Options to buy or rent commercial unit. E-mail vanpeds@outlook.com or call 778 233-6543 for more information.

employment

ABBOTSFORD—LOCUMS
Full-service East Abbotsford walk-in clinic requires locum physicians for a variety of shifts including weekends and evenings. Generous split: pleasant office staff and patient population. Please contact Cindy at 604 504-7145 if you are interested in obtaining more info.

LILLOOET—FP
Five-physician, unopposed fee-for-service practice seeks sixth family physician with ER skills. Clinic group focus is on balancing work and lifestyle. Easy access to Lower Mainland, Whistler, and Interior of the province. Call is currently 1 in 5. Regular schedule includes 1 week off every fifth week. Full rural physician recruitment and retention benefit eligibility, including 38 days of rural locum coverage for holidays. World-class wilderness at your doorstep for skiing, hiking, fishing, white-water kayaking, and mountain biking. Full-service rural hospital with GP surgeon and anesthetist on staff. For more information e-mail physicianrecruitment@interiorhealth.ca or visit www.betterhere.ca.

MERRITT—FP
Rolling hills, sparkling lakes, and over 2030 hours of sunshine every year make Merritt a haven for four-season outdoor recreation. We have a need for family physicians in their choice of clinic. Nicola Valley Hospital and Health Centre is a 24-hour level-1 community hospital with a 24-hour emergency room. Royal Inland Hospital in Kamloops is a tertiary-level hospital located only 86 km away. Remuneration is fee-for-service ($250 000 to $450 000-plus per year), rural retention incentives and on-call availability payment. For more information
Continued on page 534

Continued from page 533

e-mail physicianrecruitment@interiorhealth.ca or view online at www.betterhere.ca.

N VANCOUVER—FAMILY PHYSICIANS WELCOME

Family practice/walk-in seeking F/T or P/T physicians. Spacious, Oscar EMR, Wi-Fi. Located near SeaBus. Convenient to downtown Vancouver. Offering highest splits on North Shore (up to 72.5%). No OB or ED mandatory. Flexible hours. Great staff. Contact Francis: e-mail fhvala@gmail.com.

N VANCOUVER—FP LOCUM

Physician required for the busiest clinic/family practice on the North Shore! Our MOAs are known to be the best, helping your day run smoothly. Lucrative 6-hour shifts and no headaches! For more information, or to book shifts online, please contact Kim Graffi at kimgraffi@hotmail.com or by phone at 604 987-0918.

NANAIMO—GP

General practitioner required for locum or permanent positions. The Caledonian Clinic is located in Nanaimo on beautiful Vancouver Island. Well-established, very busy clinic with 26 general practitioners and 2 specialists. Two locations in Nanaimo; after-hours walk-in clinic in the evening and on weekends. Computerized medical records, lab, and pharmacy on site. Contact Ammy Pitt at 250 390-5228 or e-mail ammy.pitt@caledonianclinic.ca. Visit our website at www.caledonianclinic.ca.

NEW WEST—FAMILY PHYSICIAN

New Westminster: Columbia Square Medical Clinic is looking for a family physician for a full- or part-time position. Partnership and options to buy are available. Flexible hours, competitive split. The clinic is newly renovated with bright rooms, Oscar EMR, excellent friendly and efficient staff, 20 minutes from downtown Vancouver. We have 800 families waiting for a family doctor who wants to establish a permanent practice or work part-time. Considering a change of location or practice style? Call Irina at 778 886-6511 or e-mail irinapaynemd@gmail.com.

NORTH DELTA—GENERAL PRACTITIONER

Very busy, established family practice located on Scott Road. The practice consists mainly of Punjabi-speaking patients. Two spacious exam rooms plus a private office available for the physician. Underground parking. No set-up fees or equipment required. Everything is included in the billing split (80/20). Potential to earn 400K per year. Physician may decide their own schedule. Each exam room is fully equipped with everything required. EMR: Med Access. Very friendly medical office assistant and office manager. For more information contact Dr Jagtar Rai at raimedicalclinic@gmail.com.

POWELL RIVER—PERMANENT FPs & LOCUMS

Powell River is a rural community of 20 000 people on the Sunshine Coast of British Columbia, a 25-minute flight from Vancouver. It's known for its waterfront location, outdoor beauty, urban culture, and international music festivals. Supported by a 33-bed general hospital, the close-knit medical community consists of 26 general practitioners, 4 ER and anesthesia physicians, 2 NPs, and 7 specialists. We are looking for permanent general practitioners and locums. Please visit divisionsbc.ca/powellriver/opportunities for details.

RICHMOND—FP & LOCUMS

Opportunities for physicians looking to do walk-in shifts, build a practice, or relocate in our busy modern clinic. EMR OSCAR. Great location next to a 24-hr Shoppers Drug Mart. No hospital work, no call, 70/30 split—walk-in shifts at $100 per hour minimum—and bonus available. Contact us at healthvuemedical@gmail.com, 604 270-9833/604 285-9888.

SURREY (WHALLEY)—METHADONE-LICENSED GP

Methadone-licensed GP needed to joint an addiction clinic. No overhead if available weekdays other than Tuesday and Thursday. Patient loads guaranteed. Staffed with MOA and counselor. MSP billing available. Please apply by e-mail to healthmedicalservices@gmail.com or contact 604 715-6011 for more info.

SURREY/DELTA/ABBOTSFORD—GPS/SPECIALISTS

Considering a change of practice style or location? Or selling your practice? Group of seven locations has opportunities for family, walk-in, or specialists. Full-time, part-time, or locum doctors guaranteed to be busy. We provide administrative support. Paul Foster, 604 572-4558 or pfoster@denninghealth.ca.

VANCOUVER/RICHMOND—FP/SPECIALIST

We welcome all physicians, from new graduates to semiretired, either part-time or full-time. Walk-in or full-service family medicine and all specialties. Excellent split at the busy South Vancouver and Richmond Superstore medical clinics. Efficient and customizable Oscar EMR. Well-organized clinics. Please contact Lisa at medicalclinicbc@gmail.com.

VANCOUVER—FAMILY DOCTOR

Family doctor wanted for semiprivate Copeman-style clinic on Vancouver's west side. Excellent pay and working conditions. Please e-mail drhnj@telus.net.

VANCOUVER—FP OR SPECIALIST 80/20

Modern practice in King Edward Village, 10 minutes from downtown core. Tailor schedule to your lifestyle. Friendly staff, brand-new equipment. Full-time/part-time. You will have

access to two rooms and the split is 80/20 for 6 months. CDM 100%. Annual CDM 50K. Contact julie@lotusmedical.info.

VANCOUVER—FP/BREASTFEEDING MEDICINE
Vancouver Breastfeeding Centre is looking for a permanent, part-time family physician with a special interest in breastfeeding medicine to join our group. Maternal and child health experience and IBCLC qualification preferred. Supervised clinical training is available. Visit www.breastfeedingclinic.com and contact veritylivingstone@gmail.com for more info.

VANCOUVER—LOCUM
Busy walk-in shifts in Kitsilano at Khatsahlano Medical Clinic, three-time winner of Georgia Straight reader's poll for Best Independent Medical Clinic in Vancouver. Split is 65%; 70% on evenings/weekends. Contact Dr Chris Watt at drchriswatt@gmail.com.

VERNON—AESTHETICS/VEIN/LASER
Outstanding opportunity to join a well-established and thriving GP derm/aesthetics/vein/laser practice in one of the best places to live in Canada. We are looking for an associate/equity partners. The office has all the latest technology and an excellent, congenial staff. Training provided but a special interest in dermatology a definite asset. The Okanagan has some of the best weather, lakes, wineries, golf courses, ski hills, and overall lifestyle anywhere in Canada, if not the world. Contact Dr William Sanders: 250 558-9606, w.sanders@shaw.ca.

VICTORIA (OAK BAY)—MD PARTNER
Derma Spa is a well-established medical/cosmetic practice located in the charming seaside neighborhood of Oak Bay, Victoria. Our business is growing and we have an experienced medical, financial, and marketing team in place to support you. Please contact Alex at 250 580-9428 or concierge@dermaspa.ca.

VICTORIA—GP/WALK-IN
Shifts available at three beautiful, busy clinics: Burnside (www.burnsideclinic.ca), Tillicum (www.tillicummedicalclinic.ca), and Uptown (www.uptownmedicalclinic.ca). Regular and occasional walk-in shifts available. FT/PT GP post also available. Contact drianbridger@gmail.com.

VICTORIA—SHARED PRACTICE
Ideal opportunity for Mandarin/Cantonese–speaking physician to join a turnkey, EMR practice with a view to building the practice. Escape the high-cost accommodation in Vancouver and relocate to Victoria, known for its breathtaking natural beauty and enviable quality of life. Combine a rewarding career with a satisfying lifestyle. E-mail chewmoa@shaw.ca.

VICTORIA—WALK-IN
Walk-in clinic shifts available in the heart of lovely Cook St. Village in Victoria, steps from the ocean, Beacon Hill Park, and Starbucks. For more information contact Dr Chris Watt at watt1@telus.net.

WILLIAMS LAKE—FP EMERGENCY
Seeking CCFP-EM or CCFP with ER experience. Cariboo Memorial Hospital services a population of approximately 26 000 with 20 000 visits to the ER annually. ER is staffed by six full-time ER physicians and a variety of part-time ER physicians (staffed 24/7). We have a 28-bed hospital with 3-bed ICU. Excellent collegial specialist support including general surgery, OB/GYN, pediatrics, internal med, radiology, anesthesia, and psychiatry. Further specialist support available at our referral centre in Kamloops. Williams Lake is known for its outdoor opportunities and full range of amenities (including local college and airport). Contact 1 877 522-9722 or physician recruitment@interiorhealth.ca.

medical office space

LANGLEY—OFFICE SPACE AVALABLE
Medical office for rent. Close to Langley Hospital, one consulting room, two exam rooms, one parking spot, available 1 November 2016.

Continued on page 536

Continued from page 535

For more information please call 604 534-7515.

NEW WEST—MED OFFICE FOR RENT
One medical office available in Brewery District next to Royal Columbia Hospital for lease. Three exam rooms with sinks; separate MOA area; large, carefree common waiting area; private washroom. Current occupants on same floor: urologist, surgeon, neurologist, GP, etc. Available January 2017. E-mail londoneconomics@gmail.com for details.

PORT COQUITLAM—MED OFFICE SPACE
Two medical office spaces are available to join a practice in Port Coquitlam. Both are available immediately and are run by one doctor looking for another to join. Fully furnished, easy access, and ample parking. One is in a medical building and the other in a plaza. Perfect for family practice. For more details please call Emad 604 941-5575.

RICHMOND—MED OFFICE SPACE
New modern EMR clinic in Steveston Village looking for physicians to join our team. Opportunities to start a practice or relocate existing practice without worrying about administrative headaches. We offer base 70/30 split and higher for complex care and forms. Visit www.HealthVue.ca or contact healthvuemedical@gmail.com, 604 285-9888.

VANCOUVER (VGH AREA)—MED OFFICE SUBLEASE
Office space for psychiatrists, psychologists, or any other specialist MD. No secretary or other additional overhead expenses. Top floor. Great view. Two offices for sublease. One office is bigger and has a sink and space for an examination table. E-mail alevin@drlevin.ca.

VAN (DWTN)—MED OFFICE SPACE
Two established psychiatrists seeking a third psychiatrist to share office space in the Robson Professional Building located on Robson Street. The space features two bright offices; reception/waiting room area; kitchen with sink, fridge, and microwave. Includes full secretarial services (reception, typing, and billing). Opportunity for mentoring in assessment and treatment of ADHD and comorbidities available. Very reasonable rent. Available: January 2017. Call 604 687-0654 or e-mail inquiries to dr.melck@telus.net.

VANCOUVER (KERRISDALE)—OFFICE
Airy, spacious, and quiet office available for a psychiatrist or psychologist on Fridays. Located in the Kerrisdale Prof. Bldg., an exceptionally convenient location for access by public transit or car, with a large amount of free residential parking available. Close to numerous pharmacies, labs, a walk-in clinic, coffee shops, and restaurants—all within walking dis-

Continued on page 537

advertiser index

Thanks to the following advertisers for their support of this issue of the *BC Medical Journal*.

Continued from page 536

tance. The office is accessible by elevator or by stairs. Consists of a waiting area that seats two people; a large reception desk; file storage room; and large, bright, and comfortable interview room/office. If interested please contact Dr Lewis Pullmer at dr.pullmer@gmail.com, or call the office directly at 604 872-3422.

VANCOUVER—WEST BROADWAY
Fully furnished space for one or multiple doctors. Space can be used part-time or full-time with short- or long-term arrangement possible. Use some or all of the large space. MOA provided if needed. Extraordinary views. Concrete professional building with elevators, underground parking, and three restaurants. Available immediately. Please call Neil at 604 644-5775.

VANCOUVER—WEST SIDE
Vancouver medical office space to rent. Very nice office, ideal for GP or pediatrician. Child-friendly neighborhood, great staff. Negotiable hours and low rate. Call Howie James at 604 263-7338.

miscellaneous

CANADA-WIDE—MEDICAL TRANSCRIPTION
Medical transcription specialists since 2002, Canada wide. Excellent quality and turnaround. All specialties, family practice, and IME reports. Telephone or digital recorder. Fully confidential, PIPEDA compliant. Dictation tips at www.2ascribe.com/tips. Contact us at www.2ascribe.com, info@2ascribe.com, or toll free at 866 503-4003.

FREE MEDICAL RECORD STORAGE
Retiring, moving, or closing your family practice? RSRS is Canada's #1 and only physician-managed paper and EMR medical records storage company. Since 1997. No hidden costs. Call for your free practice closure package: everything you need to plan your practice closure. Phone 1 866 348-8308 (ext. 2), e-mail info@rsrs.com, or visit www.RSRS.com.

PATIENT RECORD STORAGE—FREE
Retiring, moving, or closing your family or general practice physician's estate? DOCUdavit Medical Solutions provides free storage for your active paper or electronic patient records with no hidden costs, including a patient mailing and doctor's web page. Contact Sid Soil at DOCUdavit Solutions today at 1 888 781-9083, ext. 105, or e-mail ssoil@docudavit.com. We also provide great rates for closing specialists.

VANCOUVER—TAX & ACCOUNTING SERVICES
Rod McNeil, CPA, CGA: Tax, accounting, and business solutions for medical and health professionals (corporate and personal). Specializing in health professionals for the past 11 years, and the tax and financial issues facing them at various career and professional stages. The tax area is complex and practitioners are often not aware of solutions available to them and which avenues to take. My goal is to help you navigate and keep more of what you earn by minimizing overall tax burdens where possible, while at the same time providing you with personalized service. Website: www.rwmcga.com, e-mail: rodney@rwmcga.com, phone: 778 552-0229.

WHITE ROCK—BILLING SERVICE AVAILABLE
I provide billing service from my home. Patient information is received by e-fax or pickup from hospitals. I use Mediclaim, but can also bill using Accuro, Plexia, or Osler. My work includes rebilling unpaid claims, correcting and resubmitting pre-edit refusals, and submitting overage claims. Experience dealing with MSP and fee updates. Currently billing for internal medicine, cardiology, endocrinology, gastroenterology, psychiatry, and GP, as well as locums working at hospital locations only. Reference available. I can be contacted at 778 886-4993.

CURRENT ADS ONLINE
Ads are available online in an easily searchable format at bcmj.org/classifieds.

Proust questionnaire: Vishal Varshney, MD

What profession might you have pursued, if not medicine?
Something in marketing or political science. I am fascinated by both.

Which talent would you most like to have?
I wish I had artistic talents, like drawing or painting. I am in awe of those who so easily create beautiful imagery.

What do you consider your greatest achievement?
I'm hoping that my greatest achievement is yet to come. For now, I feel incredibly fortunate to be able to pursue a career in medicine, which started when I was accepted into medical school at the University of Calgary.

Who are your heroes?
Without a doubt my heroes are my parents, Pratap and Kamlesh Varshney. They are compassionate, courageous, and immensely hardworking. Each day I strive to reflect their values and teachings in my life.

What is your idea of perfect happiness?
Perfect happiness for me starts with waking up to sunshine and the smell of waffles, being surrounded by family and friends, drinking tea and eating excellent Indian food, with some amazing music playing in the background.

What is the trait you most deplore in yourself?
Deplore might be a strong word, but I am always seeking to improve my time management skills.

Which living physician do you most admire?
My sister, Dr Nishi Varshney, and brother-in-law, Dr Vineet Bhan, are both practising physicians in BC (geriatrician and cardiologist, respectively). I admire them most for their ability to excel in their profession while maintaining such strong family values, as cherished by both me and their sons (a.k.a. my nephews!).

What is your favorite activity?
Anything social where I get an opportunity to learn from or spend time with other interesting people.

Which words or phrases do you most overuse?
I've recently started to realize that I say "and whatnot" far more than I should, and whatnot.

What characteristic do your favorite patients share?
An optimistic outlook on life—they refuse to be defined by illness, and persevere to enjoy what is important to them.

Where would you most like to practise?
I am blessed to be able to live and work in Canada. Anywhere in this amazing country would be a true privilege.

What is your most marked characteristic?
I only engage in activities that I have true passion, energy, and enthusiasm for. Without that, it simply becomes tedious.

What do you most value in your colleagues?
Honesty and passion.

What is your greatest fear?
Losing those who are closest to me.

Who are your favorite writers?
There is something about William Shakespeare for me that is always memorable and everlasting.

What is your motto?
"You CAN do this." Reaching outside of my comfort zone has led to some of my most cherished moments in life.

Dr Varshney is a fourth-year anesthesiology resident at UBC, the immediate past president of Resident Doctors of BC, and board chair of Resident Doctors of Canada. Born and raised in Calgary, he completed medical school at the University of Calgary. While his professional interests include pain management and medical administration, his personal interests include music and learning to play the ukulele.

CLUB MD
Member Discounts

doctors of bc

Hotels Car Rentals Sporting Events Entertainment @doctorsofbc

Rx Security

Protect your practice from fraud with a price leader in tamper proof prescription pads, secure printer paper and discharge forms. Save 15% before shipping.

doctorsofbc.ca/rx-security

Flight Centre

Travel with the security of 24 hour emergency support, competitive pricing and multiple options. Reduced fee of only $20 per booking.

doctorsofbc.ca/flight-centre

Coast Hotels

Every hotel shares in common exceptional value, full-service experience and a refreshingly local approach.

Enjoy negotiated flat rates at Canadian properties.

doctorsofbc.ca/coast-hotels

CLUB MD PARTNERS

Car Purchase & Lease
Dilawri Group of Companies
Mercedes-Benz Canada

Car Rentals
Hertz Rental Car
National & Enterprise
Club MD Booking Service

Electronics
Dell Canada
NCIX.com

Financial Services
BMO MasterCard
Mardon Group Insurance
MD Financial Services
Mortgage Group
Scotiabank

Fitness & Wellness
YYoga

Food & Beverage
Laughing Stock Vineyards
SPUD.ca

Hotels
Choice Hotels
Delta Hotels
Metropolitan Hotel Vancouver
OPUS Vancouver
Pan Pacific Hotels & Resorts
Rosewood Hotel Georgia
The Loden Hotel Vancouver
Club MD Booking Service

Office Management
AMJ Campbell Moving
Chairlines
Mills Printing & Stationary
Rx Security Pads

Ski Tickets
Silver Star
Sun Peaks
Whistler Blackcomb

Sporting & Entertainment
BC Lions
Broadway Across Canada
Cineplex
Vancouver Canucks
Vancouver Giants
Vancouver Whitecaps
PNE/Playland
Plum Benefits

Travel
Flight Centre
Harbour Air Seaplanes
MEDOC Travel Insurance
Park'N Fly

604 638 7921
1 800 665 2262 ext 7921
clubmd@doctorsofbc.ca

doctorsofbc.ca/clubmd

Essential Medical Legal Toolkit

For FAMILY PHYSICIANS and SPECIALISTS

Medical Legal Reports: *The Essentials*

Saturday, November 26, 2016 or Saturday, February 25, 2017 (9 am–4 pm)

Does writing medical legal reports cause you stress? Not sure what to write when asked about prognosis? Need help figuring out how much you should be billing for your reports? What to do when patients have subjective complaints?

This course will outline:

- The essential components of a medical legal report
- How to clearly narrate the patient's history, physical examination findings, diagnosis and prognosis
- The steps to complete a medical legal report efficiently
- How to streamline the payment/invoicing for medical legal reports
- How lawyers, juries and judges identify the good, bad and ugly medical legal report
- Common challenges with medical legal reports and how to easily resolve them

Medical Legal Reports Advanced and Testifying in Court: *Becoming a Great Expert*

Saturday, March 4, 2017 (9 am–4 pm)

Physicians and all health care professionals generally prefer not to testify in court. This course will provide advanced training on writing more complex medical legal reports as well as how to reduce the stress of testifying in court.

This course will outline:

- Advanced skills for successful medical legal report writing
- How to address issues of patient compliance/adherence and possible secondary gain in a medical legal report
- How to answer complex questions related to Cost of Future Care and Future Treatment
- The role of the medical/health professional expert witness in court
- How to prepare for court testimony
- How to succeed in the various parts of expert testimony: Qualifying the expert, direct testimony, cross examination, re-direct
- Common pitfalls and traps in court—and how to avoid them

Dr Gurdeep Parhar

Teaching Faculty:
These courses will be taught by medical and legal professionals who have extensive medical legal experience and have taught numerous courses for health care professionals and lawyers. The legal teaching faculty have busy personal injury practices and know exactly what they want from medical legal reports and expert testimony in court.

Register at www.medlegaltoolkit.com

Cost: $490/course

More information: 604-525-8604 or email manager@coremedicalcentre.ca

Presented by CORE Occupational Health Care Centre

UBC Robson Square
800 Robson Street
Vancouver, BC V6Z 3B7