Rocky Mountain Organizing Committee

- **Dr. Robert Herman**, University of Calgary (CHAIR)
- **Dr. Norm Campbell**, University of Calgary
- **Dr. Sharon Card**, University of Saskatchewan, Canadian Society of Internal Medicine
- **Dr. Narmin Kassam**, University of Alberta
- **Dr. Barry Kassen**, University of British Columbia
- **Dr. Michael Kenyon**, Nanoose Bay, BC
- **Dr. Nadia Khan**, University of British Columbia
- **Dr. Brendan MacDougall**, University of Manitoba
- **Dr. Scott McKee**, Salmon Arm, BC
- **Dr. Chris Mody**, University of Calgary, American College of Physicians
- **Dr. John (Jake) Onrot**, University of British Columbia
- **Dr. Heather Ward**, University of Saskatchewan
- **Dr. Brian Wirzba**, Alberta Medical Association

Rocky Mountain Reviewer Committee

- **Dr. Robert Herman**, Professor of Medicine, MD, FRCPC, University of Calgary
- **Dr. Norman R. Campbell**, Professor of Medicine, B Med Sc, MD, ABIM, FACP, FRCPC, University of Calgary
- **Dr. P. Timothy Pollak**, Professor of Medicine, MD, PhD, FRCPC, University of Calgary
- **Dr. Kelly B. Zarnke**, Associate Professor of Medicine, MD, MSc, FRCPC, University of Calgary

Introduction to the 2008 Rocky Mountain General Internal Medicine Conference

Building on its success from previous years, the 13th Annual Rocky Mountain/ ACP General Internal Medicine Conference was attended by more than 220 delegates. With registrations up by nearly 70 over last year, it is clear that the Conference's topical content appeals to a mix of community and academic internists alike.

There is a critical shortage of general internists and family physicians across the country and the problem will only grow in magnitude in the coming years as the population ages. It has been estimated that in order to maintain the status quo of current healthcare, 100 new internists need to be trained in Canada every year. We are far from reaching this level. More importantly in 2008, there is a maldistribution of manpower and infrastructural resources between urban and rural communities, which threatens to further push patients from smaller regional centers where there are hospitals but few doctors to larger centers where there are doctors but few available hospital beds. During a roundtable meeting, some of the initiatives proposed to support community GIM were debated in a rousing discussion. There is still much work to be done. A key point from a GIM point of view is the need for us to advocate for solutions to these issues and lead the changes so that an appropriate balance of generalism and subspecialization is regained.

What needs to happen immediately is that resources and, more importantly, training positions, must be allocated specifically to the recruitment and training of community internists. GIM is well positioned to take on this responsibility, but will be looking to the subspecialists to provide additional training in special competencies such as endoscopy and echocardiography, which are needed and offer monetary incentives to internists locating to regional community centres. Likewise, the subspecialties need to do a better job in preparing their subspecialty trainees for work opportunities in smaller communities. For this, they must look to GIM to provide training and experience in generalism, so that these people are better able to respond to the diverse expectations of rural practice. To date, our universities and post-secondary training programs have been remiss in the provision of these positions and in promoting a true spirit of cooperativity between generalism and the subspecialities. Governments and provincial licensing bodies must address the distribution of resources and unfair remuneration schedules that continue to foster subspecialism. And finally, the RCPSC must recognize General Internal Medicine as a discrete specialty possessing a unique and valuable skill set that is in critical demand and remove the certification in generalism from those physicians no longer capable or willing to fulfill that role. This latter could be easily accomplished through recertification and/ or a maintenance of certification program, not too dissimilar from that which already exists.

It is our hope that the Rocky Mountain/ ACP General Internal Medicine Conference will serve as a forum for continued discussions and collaborations supporting the achievement of these objectives, in addition to our more obvious goal of continuing education. This Conference Report, initiated in 2007, is intended to serve as a tool to reinforce the learning that occurred at the Conference. This peer-reviewed Report aims to highlight key messages and provide important insights into some of the issues that were discussed. Visit the Rocky Mountain Conference website at **http://www.ucalgary.ca/gim/rmc.html** to view and download the speaker presentations.

Top 5 General Internal Medicine Papers 2007/2008

Presented by Dr. Raj Padwal, University of Alberta

Several major trials published in the last year are poised to challenge current paradigms of clinical practice. Dr. Raj Padwal, from the University of Alberta, summarized the outcomes and impact of five of the most influential papers published in 2007/2008 that general internists should read:

1. The ACCORD and ADVANCE trials do not support intensive glucose control in type 2 diabetes to improve macrovascular outcomes. In fact, this strategy may cause harm to some patients, possibly related to the increased incidence of hypoglycemia.
2. A meta-analysis by Weiner *et al.* does not support intensive glucose control in critically ill patients to reduce mortality and this strategy may, likewise, be harmful to patients.
3. The CORTICUS study does not support significant benefits of the use of glucocorticosteroids for septic shock in patients with relative adrenal insufficiency.
4. The ONTARGET study does not support the combination of ACEIs and ARBs in high-risk patients. The combination does not provide incremental cardioprotective benefits despite a further 2.4 mmHg reduction in blood pressure. The study does provide support that telmisartan offers similar cardioprotective benefits to ramipril in high-risk patients.
5. The JUPITER study provides evidence that rosuvastatin significantly reduces the risk of cardiovascular events in patients with low to moderate cardiovascular risk defined by normal LDL levels (<3.4 mmol/L) and CRP ≥2.

REFERENCES

The Action to Control Cardiovascular Risk in Diabetes Study Group. Effects of Intensive Glucose Lowering in Type 2 Diabetes. *N Engl J Med* 2008;358:2545-59.

The ADVANCE Collaborative Group. Intensive Blood Glucose Control and Vascular Outcomes in Patients with Type 2 Diabetes. *N Engl J Med* 2008;358:2560-72.

Wiener RS, Wiener DC, Larson RJ. Benefits and risks of tight glucose control in critically ill adults: a meta-analysis. *JAMA* 2008;300:933-44.

Sprung CL, Annane D, Keh D, *et al.*; CORTICUS Study Group. Hydrocortisone therapy for patients with septic shock. *N Engl J Med* 2008;358:111-24.

ONTARGET Investigators, Yusuf S, Teo KK, Pogue J, *et al.* Telmisartan, ramipril, or both in patients at high risk for vascular events. *N Engl J Med* 2008;358:1547-59.

Ridker PM, Danielson E, Fonseca FA, *et al.* Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. *N Engl J Med* 2008;359:2195-207.

Reviewers' Comments:

General internists should familiarize themselves with these key papers. Dr. Padwal's presentation can be accessed on the Rocky Mountain Conference website at **http://www.ucalgary.ca/gim/rmc.html.** While both the ACCORD and ADVANCE trials were slated to address the issues of tight versus usual glycemic control, unfortunately, the number of outcome events and duration of follow up resulted in insufficient power to answer this important question. What they did show, and this was aptly pointed out in Dr. Padwal's presentation, was a proportionally equal propensity for harm, indeed death, in those with pre-existing cardiovascular disease. It is well known that hypoglycaemia of any degree of severity is a high-risk event in a cardiac patient and should be avoided at all cost, including the costs of impaired glycemic control. Nonetheless, it should be mentioned that the ACCORD trial was showing a trend towards benefit for tight glycemic control in all patients and a certain benefit in those without established CV disease before it was prematurely concluded. The ADVANCE trial, likewise, did show a benefit in combined macrovascular and microvascular outcomes, including a 21% relative reduction in nephropathy. What remains to be determined is whether the harm associated with tight glycemic control is fully accounted for by hypoglycaemia, and whether more modern treatment strategies with a lesser propensity for inducing hypoglycaemia can realize that benefit.

The results of the JUPITER trial are important and will hinge on further discussions of the role of hsCRP in the risk assessment and the cost/risk/benefit of testing and treating an "apparent" lower risk patient. What is important to realize is that the JUPITER cohort were not low risk patients. A mean hsCRP of 4.2 was in the upper quintile of the Women's Health Initiative and affords a 2.5 - fold greater risk of CV disease than those in the lowest quintile. Further, the event rate in the placebo treated arm of JUPITER compares to a 13.6/100 patients per 10 yrs, which is clearly in the intermediate risk range. Thus the JUPITER results suggest rosuvastatin may benefit intermediate risk patients if they can be reliably identified to be at higher risk. This strongly supports the use of good risk prediction algorithms in all CV risk determinations.

Vitamin D: New ASA or Next HRT?

Presented by Dr. Kelly Zarnke, University of Calgary

Vitamin D is recognized for its role in calcium metabolism and the maintenance of skeletal health. However, in recent years the potential benefits of this vitamin beyond these effects have become a topic of much discussion. In northern climates such as Canada, the majority of the population does not obtain current recommended levels of vitamin D intake, and it has been suggested that there may be an "unrecognized epidemic of vitamin D deficiency" contributing to many chronic and debilitating diseases.

The potentially protective role of vitamin D against some cancers, multiple sclerosis, rheumatic diseases, cardiovascular disease, and diabetes has been widely reported in the literature and the popular media. The biological rationale for the effects of vitamin D beyond the skeletal system is attractive, and extra-renal expression of the enzyme that converts inactive vitamin D to its biologically active form has been found in tissues throughout the body. However, the relationship between vitamin D supplementation and non-skeletal benefits at this time is based on observational data and some positive results from small, randomized controlled trials, which have not been replicated in larger trials. Although a meta-analysis of 18 trials reported an 8% reduction in mortality in non-skeletal indications, the result was barely significant and no unifying cause of death could be identified, raising the question of the play of chance. The meta-analysis appeared to exclude short-term harm of supplementation in the range of 300 to 2000 IU per day.

Other supplements have gone through a cycle of enthusiasm followed by neutral or negative randomized trials, including beta-carotene, vitamin A and vitamin E. At this time, in the absence of strong or compelling evidence to support routine vitamin D supplementation in the general population, physicians should continue to recommend up to 800 IU per day with calcium for those at risk of osteopenia, osteoporosis or fragility fractures.

Reviewers' Comments:

Vitamin D supplementation is a very topical – albeit controversial issue in health science today. There is considerable evidence that people in northern and southern climates are deficient in this vitamin, particularly the elderly, people who are institutionalized, those who do not regularly consume fortified dairy products, and people with dark skin. There are robust data from clinical trials to support the protective effects of vitamin D supplementation against fragility fractures and to a lesser extent the maintenance of muscle strength. Although short-term evidence suggests doses of 800 to 2000 IU/day vitamin D are safe, robust data to support non-skeletal benefits are currently lacking. Further, a definition of an appropriate upper dosage limit and the safety of higher doses over the longer term, particularly with respect to soft tissue calcification and nephrolithiasis remain uncertain. Health Canada is in the process of re-evaluating recommendations for daily vitamin D intake, which are currently set at 400 IU/day.

Management of Medication in the Perioperative Period

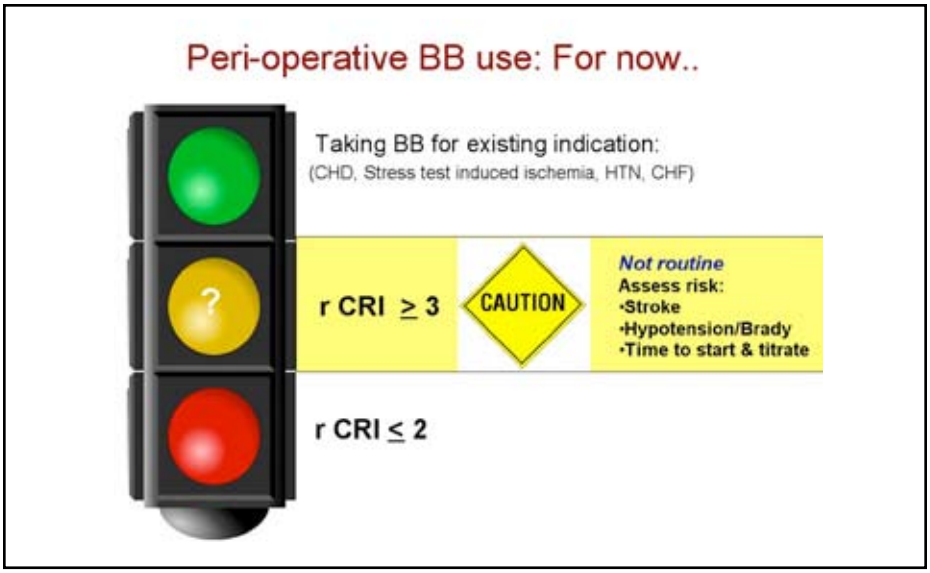
Presented by Dr. Bruce Fisher, University of Alberta

Patients undergoing elective non-cardiac surgery incur significant risk for cardiovascular morbidity and mortality, and have been increasingly offered cardiovascular prophylaxis with beta-blockers in the perioperative period. This practice, endorsed by American Heart Association and American College of Cardiology (AHA/ACC) guidelines, is based on smaller clinical trials that suggested mixed results for beta-blocker prophylaxis.

The recent POISE (PeriOperative Ischemia Evaluation) trial was a large (n =8351) multinational trial in the non-cardiac surgery perioperative setting, designed to provide more conclusive evidence on the role of perioperative beta-blockade. Patients were randomized to extended-release metoprolol or placebo control. The metoprolol group received 100 mg 2 to 4 hours preoperatively, another 100 mg orally within 6 hours post-operatively, and then 200 mg of oral sustained release metoprolol daily thereafter for a total of 30 days.

The primary composite outcome of cardiovascular death and nonfatal cardiac events within 30 days was lower for the metoprolol group compared to placebo (ARR 1.1%). This was largely driven by nonfatal myocardial infarction, which was asymptomatic in half of patients. This benefit came at the expense of a higher incidence of death (ARI 0.8%), stroke (ARI 0.5%), hypotension (5.3%) and bradycardia (ARI 4.2%). Of those who survived their strokes, 70% had serious loss of function with requirements for help or incapacity.

Although the POISE trial suggests that the harms of beta-blocker prophylaxis outweigh the benefits, this conclusion is limited by several factors. The acute introduction of metoprolol may have forfeited potential plaque stabilization effects that require more prolonged use of the drug. Additionally, the metoprolol doses may have been too high in patients who were naïve to beta-blockers. Further, heart rate control may have been suboptimal given the limited dosage titration protocols that were used,



rCRI is defined as revised Cardiac Risk Index according to the Lee and Goldman criteria.

and the protocol for stopping rather than downwardly titrating the drug when hypotension or bradycardia were encountered may have exposed some patients to beta blocker withdrawal. Finally, the study inclusion criteria allowed for the entry of patients with rCRI scores of 2 or less, which may have diminished the potential benefit of the intervention.

The aggregate data on the use of perioperative beta-blockade suggest that patients must be carefully selected if beta-blocker prophylaxis is being considered based on their cardiovascular risk profile (Figure). As per the AHA/ACC guidelines, beta-blockers should be continued uninterrupted in the perioperative period in those who are already taking these drugs for existing indications such as coronary heart disease, hypertension, congestive heart failure, or stress test induced ischemia. In patients with rCRI scores of 2 or less, the harms of perioperative prophylactic beta-blocker use appear to outweigh any benefits, and prophylaxis should not be offered. For patients in the highest risk category (rCRI of 3 or more), it is not clear whether the benefits of beta-blocker prophylaxis outweigh the risks. If beta-blocker prophylaxis is used, it is prudent to do so only in individuals who are not deemed to be at increased risk for stroke, hypotension, or bradycardia, and by following a protocol that allows sufficient days pre-operatively to start and titrate the drug.

REFERENCES

POISE Study Group, Devereaux PJ, Yang H, Yusuf S, *et al.* Effects of extended-release metoprolol succinate in patients undergoing non-cardiac surgery (POISE trial): a randomized controlled trial. *Lancet* 2008;371:1839-47.

Reviewers' Comments:

In patients undergoing elective non-cardiac surgery, it is imperative to assess stroke history and risk carefully to determine whether the benefit of cardioprotection is greater than the risk of stroke. The basis for recommendations on beta-blockade in non-cardiac surgery in the perioperative setting was relatively weak and does not reflect the level of evidence we demand from studies today. The POISE study suggests that there are risks associated with "jolting" the sympathetic nervous system by suddenly introducing and removing large doses of beta-blockers. Potentially the greatest weakness in the POISE trial design was the abrupt nature of metoprolol dosing. In a beta-blocker naïve population, these drugs should probably be introduced and withdrawn more gradually.

Court is in Session – Scrutinizing the Atherosclerosis Evidence in 2008

Presented by Drs. Patrick Ma and Norman Wong, Calgary, Alberta

The JUPITER trial (Justification for the Use of statins in Primary prevention: an Intervention Trial Evaluating Rosuvastatin) "is the first large scale prospective trial to examine the role of statin therapy in individuals with low to normal LDL-C levels, but with increased cardiovascular risk as identified by elevated CRP", stated Dr. Patrick Ma, Director of the Lipid Clinic in Calgary, Alberta. The rationale for the trial arose from the following observations. First, nearly half of all cardiovascular events occur in people who are apparently healthy and who have low or normal LDL-C. Second, high-sensitivity CRP (hs-CRP) appears to predict cardiovascular events independent of LDL-C levels. Thus, the JUPITER protocol was undertaken. Subjects were randomized to either 20 mg of rosuvastatin or placebo with the intention of following for 3 to 4 years to assess the effects on cardiovascular death and nonfatal CV events.

Major inclusion criteria included: men aged ≥ 50 years; women aged ≥ 60 years; fasting LDL-C levels < 3.36 mmol/L;

CRP levels ≥ 2.0 mg/L, and triglyceride levels < 5.65 mmol/L on initial screening. A total of 89,890 subjects were screened to enroll 17,802 subjects. Of note, 41-42% had metabolic syndrome as defined by AHA/NHLBI criteria.

The JUPITER trial was stopped after two years due to an excess of events in the placebo group. Table 1 depicts the outcomes of the composite endpoint and its individual elements. All were statistically significant. Death from any cause was reduced by 20%. No significant differences in safety and tolerability were observed between the two treatment arms.

Dr. Ma concluded his presentation by stating that "JUPITER is a significant primary prevention trial" and that, "it will take time to step back and digest the results and incorporate any practice changes into guidelines."

Dr. Norman Wong, of the Libin Gene Institute in Calgary, Alberta then presented information on the role of hs-CRP. According to Dr. Wong, hs-CRP meets all of the ideal criteria of a biomarker but is not itself a "contributer" to atherosclerosis. Dr. Wong concluded that "use of CRP in JUPITER has helped to identify patients at risk for CVD for whom treatment with rosuvastatin lowers event rates."

JUPITER - Primary Endpoint Components

	Placebo [n=8901] n (rate**)	Rosuvastatin [n=8901] n (rate**)	HR	95% CI	p-value
Primary Endpoint (Time to first occurrence of *CV death, MI, stroke, unstable angina, arterial revascularisation*)	**251** (1.36)	**142** (0.77)	**0.56**	0.46-0.69	**<0.001***
Non-fatal MI	**62** (0.33)	**22** (0.12)	**0.35**	0.22-0.58	**<0.001***
Fatal or non-fatal MI	**68** (0.37)	**31** (0.17)	**0.46**	0.30-0.70	**0.0002**
Non-fatal stroke	**58** (0.31)	**30** (0.16)	**0.52**	0.33-0.80	**0.003**
Fatal or non-fatal stroke	**64** (0.34)	**33** (0.18)	**0.52**	0.34-0.79	**0.002**
Arterial Revascularization	**131** (0.71)	**71** (0.38)	**0.54**	0.41-0.72	**<0.0001**
Unstable angina†	**27** (0.14)	**16** (0.09)	**0.59**	0.32-1.10	**0.09**
CV death, stroke, MI	**157** (0.85)	**83** (0.45)	**0.53**	0.40-0.69	**<0.001***
Revascularization or unstable angina	**143** (0.77)	**76** (0.41)	**0.53**	0.40-0.70	**<0.001***

** Rates are per 100 person years; † Hospitalisation due to unstable angina; *Actual p-value was < 0.00001

HR = Hazard Ratio; CI = Confidence Limit

Ridker P et al. *N Eng J Med* 2008;**359**: 2195-2207

REFERENCES

Ridker PM, Danielson E, Fonseca FA, *et al.* Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. *N Engl J Med* 2008;359:2195-207.

Reviewers' Comments:

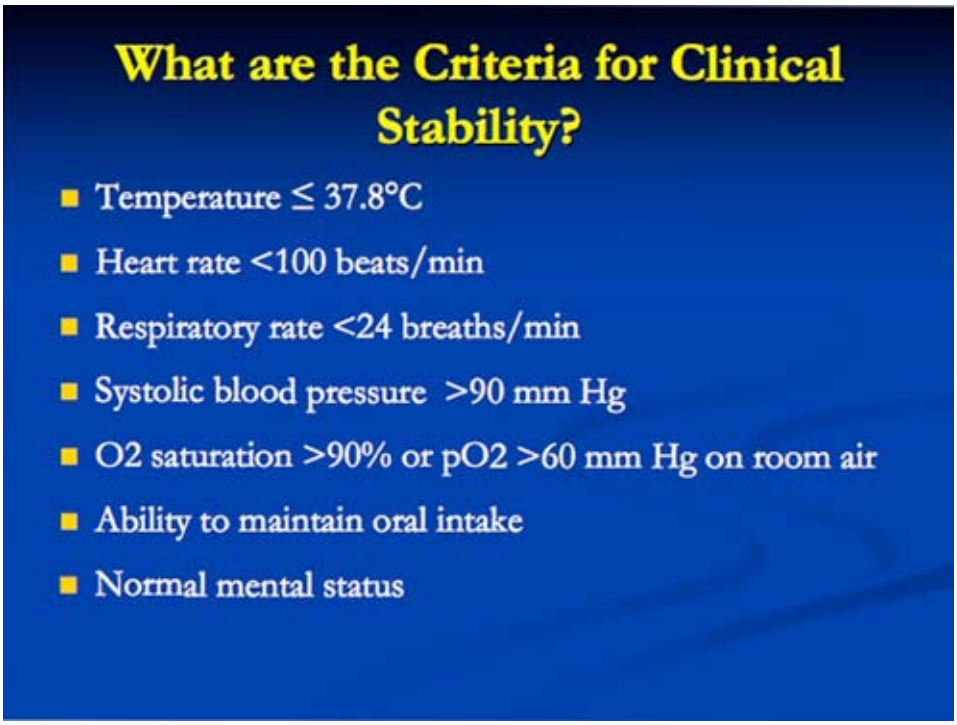
There is controversy regarding the measurement and use of new risk markers like hsCRP. Generally speaking, no risk factor, including hsCRP, or model employing various combinations of risk factors has been shown to outperform the Framingham Risk Score in classifying and predicting outcomes in patients with high (> 20% predicted 10-year risk of having a cardiovascular event) or low (< 10% 10-year risk) CV risk. Recently, a Reynolds Risk Score has been derived, which includes all of the traditional Framingham risk variables plus hsCRP, family history of a myocardial infarction before age 60 yrs, and in women with diabetes, a HbA1c, and has been tested in large cohort studies against the Framingham Risk Score. These studies show that of those patients in the Framingham Intermediate Risk category (i.e., 10-20% 10-year risk), 21% of women and 8% of men would more correctly be classified by the Reynolds Risk Score as having high CV risk. It is these patients, those with high risk according to age and an elevated hsCRP, but having low LDL, and so not recognized as high risk according to the Framingham Risk algorithm, that the JUPITER trial focuses our attention towards.

As discussed by Drs. Ma and Wong, JUPITER shows that treating patients with a high hsCRP but low LDL with statin therapy achieves a 50% reduction in most important CV outcomes, including death, with a number needed to treat (NNT) to avoid a single occurrence of the primary outcome event over 2 years of 95. Working backwards, then, how many patients presumably in the Framingham Intermediate Risk category would need to be tested, and of those who test positive, treated, in order to achieve this benefit, and what would be the combined cost of this testing and treatment? Also, what would be the comparative cost of using a cost-neutral approach, whereby patients with diabetes (or additionally a positive family history for premature CAD) are promoted up one risk category (i.e., a pseudo ATP III approach)? Thorough discussion of these considerations, and others, will need to be undertaken to determine how the Jupiter trial findings should impact clinical practice.

Update on Pneumonia – Short Therapy, Early Discharge

Presented by Dr. Stuart Skinner,
University of Saskatchewan

There is growing recognition that some patients with pneumonia can be safely treated with shorter courses of antibiotic therapy and can be safely considered for early discharge. Recent studies support the efficacy and safety of an early switch from intravenous to oral antibiotics once patients are clinically stable. This usually occurs within 3 days in uncomplicated cases of community-acquired pneumonia (CAP). The established criteria for clinical stability are very practical (Figure). There is a range of short-course antibiotic regimens that can be used in such stable and uncomplicated CAP patients meeting these criteria, such as five days of treatment with an oral macrolide or high-dose respiratory fluoroquinolone.



How does one select the most appropriate antibiotic regimen? Dr. Skinner advocated for the routine use of gram stain and adequate sputum cultures, if they can be obtained, in patients being hospitalized for pneumonia. By elucidating the infectious organism, cultures can help direct initial therapy as well as step-down therapy following the use of a broad-spectrum agent. Patient presentation can also help guide appropriate treatment selection. In particular, patients with hospital-acquired pneumonia (HAP) have higher rates of colonization with resistant organisms. There is also growing recognition of "healthcare-associated pneumonia" (HCAP) in residents of nursing homes or long-term care facilities who present an intermediate risk for resistant pathogens.

While the vast majority of patients with CAP can be treated empirically with a common regimen, it is important to consider antibiotic resistant organisms when patients don't respond as expected or have specific risk factors. A growing incidence of expanded spectrum beta-lactamase (ESBL) producing gram negative pathogens in clinical practice has paralleled the widespread use of third-generation cephalosporins. Because these organisms can also carry resistance genes to fluoroquinolones and aminoglycosides, they should be avoided as initial therapy for patients colonized with ESBL-producing gram negatives. Carbapenems remain the most reliable agents in selected patients; high doses of piperacillin/tazobactam can be used as an alternative.

Infection with methicillin-resistant *Staphylococcus aureus* (MRSA), including community acquired MRSA, should be considered in cases of CAP in patients with specific risk factors or presentations, particularly those who have multi-lobar involvement or necrotizing pneumonia. Recent infection with Influenza virus is an important risk factor for MRSA pneumonia. Athletes (contact sports), military personnel, and those who use intravenous drugs are also at increased risk for colonization and infection with MRSA. Current treatment options for MRSA pneumonia include vancomycin and linezolid. Vancomycin may not be as effective as linezolid in MRSA pneumonia due to poor lung penetration. In contrast, linezolid has excellent lung penetration, but remains an expensive option at up to $200/day.

Reviewers' Comments:

Dr. Skinner's workshop reminds us of how a simple lab test can provide helpful information to guide the choice of antibiotic therapy. Gram stains of adequate sputum cultures can direct the management of patients who stabilize in the hospital and who can be quickly stepped down and discharged with a low risk of recurrence. Patients who meet the low-risk criteria are appropriate candidates for short-course antibiotic therapy and early discharge. Patients at risk of harbouring ESBL or MRSA pathogens do not meet these criteria and require a longer course of appropriate antibiotic therapy.

New CHEST Guidelines for DVT Prophylaxis

Presented by Dr. Elizabeth MacKay, University of Calgary

An update of the CHEST guidelines for the management of deep venous thrombosis (DVT) was published in 2008. The following list highlights the key changes to the CHEST guidelines that internists should be familiar with:

- Hospitals need to develop formal strategies for DVT prophylaxis and increase adherence to established protocols and order sets.
- Higher dose DVT prophylaxis should be considered for bariatric surgery patients.
- DVT prophylaxis should be extended beyond hospitalization to 14-35 days for patients with abdominal cancers, those undergoing hip or knee arthroplasty, and sub-populations of medical patients (e.g., stroke).
- New oral anticoagulants for DVT prophylaxis are available in Canada and have been evaluated in phase 3 clinical trials, however their role in DVT treatment remains uncertain at this time.
- Patients should be risk-stratified to identify those who might be the best candidates for long or short course DVT therapy based on their risk of clotting and bleeding and ability to adhere to treatment and monitoring of anticoagulants.
- The use of low molecular weight heparin (LMWH) should be increased for VTE treatment in cancer patients.
- Implementation of low dose vitamin K protocols should be considered, particularly in patients with labile INRs.
- Considering atrial fibrillation and arterial embolic prophylaxis in the perioperative period, jurisdictions should consider standardized protocols for bridging anticoagulation therapy using such criteria as CHADS 2 scoring.

REFERENCES

Geerts WH, Bergqvist D, Pineo GF, *et al*. Prevention of Venous Thromboembolism. American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). *Chest*. 2008; 133(6 Suppl):381S-453S.

Reviewers' Comments:

DVT prophylaxis continues to be a deceivingly mundane (and thus often overlooked) but highly important topic for GIM, and evidence-based management strategies continue to evolve. Dr. MacKay was charged with the formidable task of providing a review of the updated 8th ACCP DVT prophylaxis guidelines; a complex but thorough document. This very recent update includes a number of key changes that are pertinent for today's internist. Her complete presentation is available on the Rocky Mountain Conference website at **http://www.ucalgary.ca/gim/rmc.html**.

Pacemakers – Terminology, Indications, and Perioperative Management

Presented by Dr. Derek Exner, University of Calgary

It is imperative for internists to be familiar with the many different types of pacemaker devices available today and to be confident in using the correct nomenclature. Basic pacing nomenclature provides important clues on device mechanisms and patient indications (Figure). During a case-based workshop, Dr. Derek Exner reviewed the indications for pacemaker devices and led challenging discussions on the perioperative management of patients with pacemakers.

Basic Pacing Nomenclature

chamber paced	chamber sensed	response to sensed event
A - atrium	**A** - atrium	**I** - inhibited
V - ventricle	**V** - ventricle	**T** - triggered
D - dual	**D** - dual	**D** - dual
O - none	**O** - none	**O** - none

The updated 2008 AHA/ACC/HRS guidelines for device-based therapy of cardiac rhythm abnormalities provide recommendations for permanent pacing in patients with symptomatic sinus node dysfunction, symptomatic third degree or advanced second degree AV block, bifascicular block with advanced second degree or intermittent third degree AV block or alternating bundle branch block, and selected patients with persistent AV block after acute phase myocardial infarction. Readers are directed to the Rocky Mountain Internal Medicine Meeting website to access this engaging presentation.

REFERENCES

Epstein AE, DiMarco JP, Ellenbogen KA, *et al.* ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia Devices): Developed in Collaboration With the American Association for Thoracic Surgery and Society of Thoracic Surgeons. *Circulation* 2008;117:e350-408.

Reviewers' Comments:

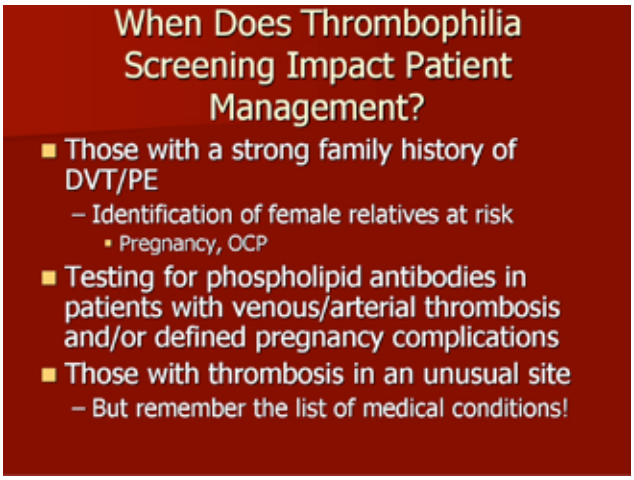
This workshop offered internists a concise and practical review of pacemaker device terminology as it relates to indications. Internists should be cognizant of the limited shelf life of devices, which can vary considerably. When dealing with a pacemaker clinic, it is important to know that they are not retiring their proprietary controller/interrogating devices before the patients in their practice are no longer using the devices they pertain to. The cases provided important reminders about perioperative management strategies for patients with pacemaker devices, including strategies to avoid electromagnetic interference when using defibrillators in the event of cardiac arrest. Visit the Rocky Mountain Conference website at **http://www.ucalgary.ca/gim/rmc.html** in the coming months for a case-based CME program on pacemakers with Dr. Derek Exner.

Thrombophilia Screening – Is it worth it?

Presented by Dr. Cathy Moltzan, University of Manitoba

Many patients with DVT or pulmonary embolism (PE) are routinely screened using a standard thombophilia panel. But according to Dr. Cathy Moltzan, "The more we learn about DVT and PE, the less we know."

Venous thromboembolism is a multifactorial disorder. Transient risk factors and systemic medical conditions can contribute to risk, however not all patients will actually develop thrombosis. There is mounting evidence that thrombophilia screening often does not change clinical management, therefore the utility of screening all patients is being questioned. Also, the timing of screening impacts the quality of the results, and although the majority of patients are screened during an acute episode, limited testing at the end of treatment (i.e., d-dimer to assess subsequent risk of VTE, or APA, AT-III, Protein S or C in selected patients off warfarin, as outlined below) may be a better strategy.



There are some indications where screening can provide important information to guide clinical decision-making (Figure). Patients who develop VTE or PE in the absence of risk factors for thrombosis should be screened, particularly young patients presenting with a first idiopathic event. In other patients, the full thrombophilia panel might not be necessary and select lab tests could be ordered.

Reviewers' Comments:

In today's healthcare environment, resources are scarce and the cost of unnecessary lab testing can have a huge impact on hospital budgets. Thrombophilia screening is a good example of ordering tests for the sake of "needing to know," despite evidence that argues that this alone is not enough to warrant blanket screening of all patients with DVT or PE. Patients with established risk factors for re-clotting should be treated with appropriate antithrombotic therapies; screening such patients will not change the management plan. Efforts should be focused on those patients where screening will guide clinical management.