

courage the trainee beyond his or her apparent abilities are usually the rotations most highly sought and most fondly remembered. In my view, both teachers and trainees would be better off if we focused on identifying, supporting and multiplying such teachers rather than concentrating on the specifics of what is taught where.

G. Kandel

Division of Gastroenterology
St. Michael's Hospital
Toronto, Ont.

Reference

1. Flegel KM, Palepu A. Training on the internal medicine teaching wards [editorial]. *CMAJ* 2003; 168(8):997-8.

To ensure that residents are given opportunities for patient encounters that will be more meaningful to their future practice, Kenneth Flegel and Anita Palepu¹ recommend that trainees spend more time in the outpatient or community setting. Clearly, that is vital, but how is it to be accomplished, given that universities do not seem willing to address this point in any meaningful way?

Traditionally, the training of medical students and specialists has depended on volunteer clinical faculty, who donate their time and often their offices to the cause. However, with increasing workloads and rising overhead costs, clinical faculty are becoming reluctant to reduce their incomes by seeing fewer patients, which is the inevitable result of mentoring residents.

Western society can no longer depend on this model and must accept the financial responsibility associated with medical training. The massive subsidy that clinical faculty have been providing, in the form of both time and facilities, can no longer be sustained, and, as is the case with all subsidies, its disappearance could end in the collapse of the system. The true costs of a medical education are as yet unknown, but eventually they must be recognized — by paying clinical teachers for their time and by providing the facilities needed for appropriate training.

Flegel and Palepu have identified

the problem. It is now up to the universities, which are responsible for medical education, to develop realistic solutions.

George Price

Physician
Vancouver, BC

Reference

1. Flegel KM, Palepu A. Training on the internal medicine teaching wards [editorial]. *CMAJ* 2003; 168(8):997-8.

I could not agree more with Ken Flegel and Anita Palepu¹ that the primarily in-hospital education that house staff receive leaves them less than fully prepared for their future careers. However, this is not something new. I vividly recall my first day in internal medicine practice almost 20 years ago. I felt like I was on top of my game and, with complete confidence, I attended my in-hospital patients, treating acute myocardial infarctions, strokes, pneumonia — the whole gamut of acute care medicine. That afternoon, I returned to my brand new office. My very first patient walked in, sat down in my consulting room and told me his chief complaint. To this day I hope that he did not see the blank look on my face as I listened to his story, knowing full well that I had not a clue how to even begin addressing his concern, never mind trying to formulate a differential diagnosis. Certainly my 4 years of residency hadn't trained me for the complexity of his problem.

This patient's presenting symptom? Fatigue.

Ian Blumer

Physician
Ajax, Ont.

Reference

1. Flegel KM, Palepu A. Training on the internal medicine teaching wards [editorial]. *CMAJ* 2003; 168(8):997-8.

An Oasys for occupational asthma

Susan Tarlo and Gary Liss, in their clear, concise review of the under-

recognized problem of occupational asthma,¹ suggest that peak expiratory flow rate (PEFR) be measured 4 times a day. We have found that obtaining 2-hourly measurements of PEFR and analyzing these data by means of a computer-assisted diagnostic aide (OASYS)² is the best way of using serial peak flow readings in the diagnosis of occupational asthma.^{3,4} This technique, developed primarily by Sherwood Burge in the United Kingdom, reportedly has a sensitivity of 75% and a specificity of 94% in the diagnosis of occupational asthma.² We find that the greater frequency of recording PEFR is helpful in identifying the relation of asthma to work, although it does entail considerable extra effort on the patient's part. However, if the purpose of the serial readings is explained, compliance is generally good.

Jeremy Beach

Associate Professor and Residency
Program Director
Occupational Health
Harold Hoffman
Occupational and Environmental
Medicine Specialist
University of Alberta
Edmonton, Alta.

References

1. Tarlo SM, Liss GM. Occupational asthma: an approach to diagnosis and management. *CMAJ* 2003;168(7):867-71.
2. Oasys Research Group. Oasys and occupational asthma [Internet]. UK: Midlands Thoracic Society; [no date]. Available: www.occupationalasthma.com (accessed 2003 June 26).
3. Burge PS, Pantin CF, Newton DT, Gannon PF, Bright P, Belcher J, et al. Development of an expert system for the interpretation of serial peak expiratory flow measurements in the diagnosis of occupational asthma. *Midlands Thoracic Society Research Group. Occup Environ Med* 1999;56: 758-64.
4. Baldwin DR, Gannon P, Bright P, Newton DT, Robertson A, Venables K, et al. Interpretation of occupational peak flow records: level of agreement between expert clinicians and Oasys-2. *Thorax* 2002;57:860-4.

Competing interests: None declared.

[The authors respond:]

We agree that the Oasys method of interpreting serial peak expiratory flow readings is an objective scoring system. This and other methods¹ are

alternatives to visual inspection of graphed results, especially if an "experienced reader" is not available to interpret the graphs. Among experienced readers, visual inspection has a reported sensitivity of 87% and specificity of 84% compared with specific challenge tests.² Even if a computerized or other objective method of interpretation is used, it may be helpful to inspect visual records and review records of symptoms (e.g., of upper respiratory infection), medications and other relevant factors, such as unusual workplace exposure, all of which may be relevant to the interpretation of changes in peak flow.

Compliance with serial recordings is often suboptimal.^{1,3} Although we agree that 2-hourly recordings of peak expiratory flow rate provide greater sensitivity than 4-hourly measurements (73% v. 61%),⁴ many workers may find it difficult to adhere to this schedule. Such difficulties with compliance may be particularly important when monitoring is required for prolonged periods both at work and away from work. Four-hourly recordings (before work, midshift, after shift and at bedtime) are less likely to interfere with the patient's work schedule and are usually more practical, especially for industrial workers.

Regardless of the method used, a significant minority of records are typically incomplete or inconclusive.⁵ Therefore, several investigations should be performed, if possible, to improve the accuracy of diagnosis of work-related asthma.

Susan M. Tarlo

Gary Liss

Gage Occupational and Environmental Health Unit

St. Michael's Hospital and University of Toronto

Toronto, Ont.

References

1. Liss GM, Tarlo SM. Peak expiratory flow rates in possible occupational asthma. *Chest* 1991; 100:63-9.
2. Perrin B, Lagier F, L'Archeveque J, Cartier A, Boulet LP, Cote J, et al. Occupational asthma: validity of monitoring of peak expiratory flow rates and non-allergic bronchial responsiveness as compared to specific inhalation challenge. *Eur Resp J* 1992;5:40-8.
3. Malo JL, Trudeau C, Ghezzi H, L'Archeveque J, Cartier A. Do subjects investigated for occupational asthma through serial peak expiratory flow measurements falsify their results? *J Allergy Clin Immunol* 1995;96:601-7.
4. Malo JL, Cote J, Cartier A, Boulet LP, L'Archeveque J, Chan-Yeung M. How many times per day should peak expiratory flow rates be assessed when investigating occupational asthma? *Thorax* 1993;48:1211-7.
5. Tarlo SM, Liss GM. Occupational asthma: an approach to diagnosis and management. *CMAJ* 2003;168(7):867-71.

Competing interests: None declared.

COX-2 inhibitors and type 4 error

Further to Walter Maksymowych's letter¹ about James Wright's article on cyclooxygenase-2 (COX-2) inhibitors,² we would like to add that disclosure of competing interests and presentation of contrary viewpoints tend to reduce the likelihood of bias contributing to the "tomato effect," also known as type 4 error. This type of error is an overestimation of risks, which leads to rejection of an efficacious therapy.³

Concerns about the possibility of type 4 error in this case are reinforced by a summary of the Wright article published recently in *BMJ*,⁴ which states that "This is an excellent (although non-systematic) review of the benefits and harms of COX-2 inhibitors." It has been overlooked that Wright, in disregarding systematic reviews and meta-analyses on COX-2 inhibitors, has missed a large body of relevant evidence, including differences between individual NSAIDs.⁵⁻⁸

Before the publication of Wright's article, several other authors presented critical views regarding the cardiovascular safety of COX-2 inhibitors under the guise of scientific objectivity.⁹⁻¹¹ Some argued that use of acetylsalicylic acid (ASA) might change the cost-effectiveness of COX-2 inhibition by reducing gastrointestinal benefit; hence, there would be no justification for prescribing a more expensive therapy.¹¹ However, these authors overlooked the benefits of the combination of ASA and COX-2 inhibition relative to less-

expensive options such as ASA combined with a non-ASA NSAID or a non-ASA NSAID alone. These benefits include better gastrointestinal tolerability, sustained inhibition of platelet aggregation and freedom in the dosing regimen.¹²

Michal R. Pijak

Consultant Rheumatologist

Frantisek Gazdik

Research Fellow

Department of Clinical Immunology

Institute of Preventive and Clinical Medicine

Bratislava, Slovakia

References

1. Maksymowych WP. Seeking disclosure [letter]. *CMAJ* 2003;168(8):960,962.
2. Wright JM. The double-edged sword of COX-2 selective NSAIDs. *CMAJ* 2002;167(10):1131-7.
3. Robin ED, Lewiston NJ. Type 3 and type 4 errors in the statistical evaluation of clinical trials. *Chest* 1990;98:463-5.
4. Harms outweigh benefits of COX 2 for many patients [filler]. *BMJ* 2003;326(7389):0. Available: www.bmj.com/cgi/content/full/326/7389/0/f (accessed 2003 May 15).
5. Reicin AS, Shapiro D, Sperling RS, Barr E, Yu Q. Comparison of cardiovascular thrombotic events in patients with osteoarthritis treated with rofecoxib versus nonselective nonsteroidal anti-inflammatory drugs (ibuprofen, diclofenac, and nabumetone). *Am J Cardiol* 2002;89:204-9.
6. White WB, Faich G, Whelton A, Maurath C, Ridge NJ, Verbug KM, et al. Comparison of thromboembolic events in patients treated with celecoxib, a cyclooxygenase-2 specific inhibitor, versus ibuprofen or diclofenac. *Am J Cardiol* 2002;89:425-30.
7. Zhao SZ, Reynolds MW, Lejkowich J, Whelton A, Arellano FM. A comparison of renal-related adverse drug reactions between rofecoxib and celecoxib, based on the World Health Organization/Uppsala Monitoring Centre safety database. *Clin Ther* 2001;23:1478-91.
8. Whelton A, Fort JG, Puma JA, Normandin D, Bello AE, Verburg KM. Cyclooxygenase-2-specific inhibitors and cardiorenal function: a randomized controlled trial of celecoxib and rofecoxib in older hypertensive osteoarthritis patients. *Am J Ther* 2001;8:85-95.
9. Mukherjee D, Nissen SE, Topol EJ. Risk of cardiovascular events associated with selective COX-2 inhibitors. *JAMA* 2001;286:954-9.
10. Woollerton E. What's all the fuss? Safety concerns about COX-2 inhibitors rofecoxib (Vioxx) and celecoxib (Celebrex). *CMAJ* 2002;166(13):1692-3.
11. Pickard AS, Schumock GT. Aspirin use may change cost-effectiveness of COX-2 inhibitors. *Arch Intern Med* 2002;162:2637-8.
12. Pijak MR, Gazdik F. The overlooked benefits of aspirin-COX-2 inhibitor combination for patients with cardiovascular risk [electronic letter]. Available: www.bmj.com/cgi/eletters/326/7384/334#30000 (posted 27 Feb 2003; accessed 2003 May 15).

Competing interests: Dr. Pijak has received speaker fees from local branches of Pharmacia and Fournier.