patients deserve care that is founded on the best evidence available. Cost-to-benefit ratio discussions were deliberately avoided in the 2003 guidelines, as Canadian data are absent, and most literature in this area is based on economic models from other countries that are not relevant to the Canadian health care system. The evidence clearly demonstrates that early identification of risk and aggressive therapeutic interventions reduce morbidity and mortality. Yet, as Dr Jayabarathan points out, comprehensive diabetes care is expensive. It is important to note, however, that the 2003 guideline recommendations are based on evidence, not on the prevailing political approach to disease management. In 2004, it appears that policies on drug and other treatment coverage are out of step with the evidence.

Finally, Dr Jayabarathan questions whether the more than 900 references in the guidelines constitute sufficient evidence on which to base our recommendations, then suggests we should ignore the available evidence and rely on "best practice" and "fiscal realities" to guide how we manage our patients. The CDA guidelines will not satisfy her wish for a best practice guide based on cost-to-benefit ratios, but the guidelines do offer those physicians who are committed to practising evidence-based medicine a wealth of information on how to prevent, detect, and manage this complex, prevalent, and serious disease.

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References

1. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2003 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes* 2003;27(Suppl 2):S1-S152.
2. Jaakkimainen L, Shah BR, Kopp A. Sources of physician care for people with diabetes. In: Hux JE, Booth G, Laupacis A, editors. *Diabetes in Ontario: an ICES practice atlas*. Toronto, Ont: Institute for Clinical Evaluative Sciences; 2002. p 9, 181-91.
3. Klein R, Klein BE, Moss SE, Davis MD, DeMets DL. The Wisconsin epidemiologic study of diabetic retinopathy. III. Prevalence and risk of diabetic retinopathy when age at diagnosis is 30 or more years. *Arch Ophthalmol* 1984;102:527-32.
4. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet* 1998;352:837-53.
5. Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 1993;329:977-86.
6. Ohkubo Y, Kishikawa H, Araki E, Miyata T, Isami S, Motoyoshi S, et al. Intensive insulin therapy prevents the progression of diabetic microvascular complications in Japanese patients with non–insulin-dependent diabetes mellitus: a randomized prospective 6-year study. *Diabetes Res Clin Pract* 1995;28:103-17.
7. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *BMJ* 1998;317:703-13.
8. Hansson L, Zanchetti A, Carruthers SG, Dahlof B, Elmfeldt D, Julius S, et al. Effects of intensive blood pressure lowering and low-dose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment (HOT) randomized trial. HOT Study Group. *Lancet* 1998;351:1755-62.
9. Pyörälä K, Pedersen TR, Kjekshus J, Faergeman O, Olsson AG, Thorgeirsson G. Cholesterol-lowering with simvastatin improves prognosis of diabetic patients with coronary heart disease. A subgroup analysis of the Scandinavian Simvastatin Survival Study (4S). *Diabetes Care* 1997;20:614-20. Erratum in: *Diabetes Care* 1997;20:1048.
10. Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomized placebo-controlled trial. *Lancet* 2003;361:2005-16.
11. Manuel DG, Schultz SE. Diabetes health status and risk factors. In: Hux JE, Booth G, Laupacis A, editors. *Diabetes in Ontario: an ICES practice atlas*. Toronto, Ont: Institute for Clinical Evaluative Sciences; 2002. p 4, 77-94.
12. Barrett-Connor E, Pyörälä K. Long-term complications: diabetes, coronary heart disease, stroke, and lower extremity arterial disease. In: Ékoé JM, Zimmett P, Williams R, editors. *The epidemiology of diabetes mellitus: an international perspective*. Chichester, UK: John Wiley & Sons, Ltd; 2001. p. 301-19.
13. Booth GL, Rothwell D, Kinwah F, Jack VT. Diabetes and cardiac disease. In: Hux JE, Booth G, Laupacis A, editors. *Diabetes in Ontario: an ICES practice atlas*. Toronto, Ont: Institute for Clinical Evaluative Sciences; 2002. p 5, 95-125.
14. Coutinho M, Gerstein HC, Wang Y, Yusuf S. The relationship between glucose and incident cardiovascular events. A meta-regression analysis of published data from 20 studies of 95,783 individuals followed for 12.4 years. *Diabetes Care* 1999;22:233-40.
15. Tuomilehto J, Lindström J, Eriksson JG, Valle TT, Hamalanian H, Ilanne-Parikka P, et al. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* 2001;344:1343-50.
16. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002;346:393-403.
17. Chiasson J-L, Josse RG, Gomis R, Hanefeld M, Karasik A, Laakso M, et al. Acarbose for prevention of type 2 diabetes mellitus: the STOP-NIDDM randomised trial. *Lancet* 2002;359:2072-7.

Unnecessary use of ceftriaxone?

We were disappointed with the short report[1] published in the April issue of *Canadian Family Physician* advocating the broad use of parenteral ceftriaxone in cellulitis resulting from mammal bites. The authors use overly broad inclusion criteria and have no appropriate control group. They demonstrate that ceftriaxone is effective for treating cellulitis but fail to show that it has any benefit over other options, including cheaper and easier-to-use oral agents. Unnecessary use of parenteral antibiotics has been identified as a source of increased expense and emergency department visits, as well as avoidable inconvenience and discomfort for patients.[2,3]

The criteria for including patients in this series was "moderate-to-severe acute infections inflicted by dogs or cats…." The authors define moderate-to-severe as "impaired function in the limb and swelling, erythema, or purulent discharge in the bite or scratch area."[1] These criteria would include many patients with uncomplicated mild cellulitis, in addition to the moderate-to-severe infections the study claims to be targeting. The authors do not present any information (such as systemic symptoms, lymphangitis, or size of affected area) to support their claim that the patients they were treating had moderate-to-severe infections. Guidelines for grading the severity of cellulitis do exist and could be used for this purpose.[4-6]

The authors state that the results were excellent, with no hospitalizations and no complications in the patients treated with ceftriaxone. We have no idea how important this finding is. The authors present data from previous studies to suggest this represents an improvement. The historical ranges they present for both hospitalizations (0 to 35%) and complications (0 to 48%), however, are exceedingly wide and include zero. We have no way of knowing whether the populations in these previous studies are anything like the patients they treated with ceftriaxone. Given the poorly defined patient population and the lack of reasonable comparators, it is inappropriate for the authors to suggest this treatment protocol will save money through a "reduced rate of hospitalizations." No data here can reasonably support that conclusion.

Infections following animal bites do indeed harbour different pathogens than those seen in cellulitis due to other causes and do require different antimicrobials. However, following appropriate adjustment of antibiotics, the clinical course of these infections is similar.

Without evidence to suggest otherwise, we suspect many of these patients had mild-to-moderate cellulitis and would have responded well to oral antibiotics. Review of the literature suggests that 90% of patients with cellulitis will respond to appropriate initial therapy. Close follow up is indicated to ensure that the 10% that fail to respond are identified, and a decision is made regarding the initiation of parenteral therapy or referral for further assessment.

Using the "study design" and logic employed in this article, one could show that many different parenteral antibiotics treat cellulitis effectively while costing less than a day in hospital. Although ceftriaxone is the appropriate agent in cases where parenteral therapy is indicated, intravenous or intramuscular therapy is not always warranted. Parenteral antibiotics all cost much more than a course of oral therapy and are unnecessary for most patients.

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PS: We also note the absence of any reference to whether research ethics approval was obtained before initiation of this treatment protocol.

References

1. Pennie RA, Szakacs TA, Smaill FM, Smeija M, Yamamura D, McTaggart B, et al. Short report: ceftriaxone for cat and dog bites. *Can Fam Physician* 2004;50:577-9.
2. MacGregor RR, Graziani AL. Oral administration of antibiotics: a rational alternative to the parenteral route. *Clin Infect Dis* 1997;24:457-67.
3. Waldrop RD, Prejean C, Singleton R. Overuse of parenteral antibiotics for wound care in an urban emergency department. *Am J Emerg Med* 1998;16:343-5.
4. Eron LJ, Lipsky BA, Low DE, Nathawani D, Tice AD, Volturo GE. Managing skin and soft tissue infections: expert panel recommendations on key decision points. *J Antimicrobial Chemother* 2003;52(Suppl 1):i3-i17.
5. Campbell SG, Pierce S, Burton-MacLeod R. The management of cellulitis in adults. *Drugs Ther Maritime Pract* 2001;24(5):31-6.
6. Campbell SG, Burton-McLeod R, Pierce S, Ackroyd S, Gerami D. The Nova Scotia cellulitis guidelines—a pilot study. *Can J Emerg Med* 2001;3:142.

Response

I thank Drs Campbell and Pauls for directing us to four papers (all of which were reviews, opinions, and commentaries rather than studies) supporting our determination that parenteral, not oral, antibiotics were warranted for the initial therapy of our patients with infected dog and cat bites. All of our patients had cellulitis for more than 18 hours, severe pain, more than 5 cm breadth of erythema, a rapidly advancing edge of cellulitis, and involvement of the distal aspects of the limbs. According to the authors of the papers cited by Campbell and Pauls (their references 2 to 5), these characteristics define all of our reported patients as Grade (or Class) II to IV and as candidates for parenteral antibiotic therapy.

I agree that antibiotics must be prescribed with care to maximize benefit and minimize risk of side effects and bacterial resistance. Being careful involves choosing antibiotics that have a reasonable chance of success because they target the offending organisms and their dose and route of administration achieve effective concentrations at the site of infection. For infected animal bites, ceftriaxone satisfies both concerns.

Our paper demonstrated ceftriaxone's effectiveness as initial therapy of moderately to severely infected bites, none of which was mild or trivial when classified according to established criteria (their references 2 to 5). It might be that the newer oral fluoroquinolones are as effective as ceftriaxone, less expensive, and more convenient. But it will be important to test that hypothesis by controlled observation in case these new oral agents are less effective or less well tolerated.

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