Quality of warfarin management

I read with interest the excellent article on warfarin management in Canada in the June issue of *Canadian Family Physician*.[1] I was particularly pleased to see Liu and colleagues make the important point that "conservative" management of warfarin (underdosing in an effort to avoid hemorrhage) is a potentially dangerous practice and leads to a greater risk of stroke than hemorrhage,[1] which in general is more catastrophic (20% mortality, 59% disability).[2] This can be clearly seen in the classic graph by Hylek and Singer,[2] where the odds of ischemic stroke and intracranial hemorrhage are plotted against the patient's international normalized ratio (INR).

Although this situation is sometimes deliberate on the part of the physician (worried about a major bleed), it is often due to poor adherence on the part of the patient. Elderly minds become forgetful, as we all know. In this situation, more frequent testing might be helpful (eg, every 2 weeks) and the use of a reminder mechanism (eg, an INR log app or a telephone call from a family member or caregiver) might also be helpful. The good news with poor adherence and warfarin is that its long half-life (72 hours) gives the patient a "second chance." This is not the case with the direct oral anticoagulants, which have a shorter half-life (8 to 12 hours). For this reason, using a direct oral anticoagulant can put the forgetful patient at risk, as there is no routine blood test (like an INR or drug level) to tip us off.

Second, although Liu et al found that only 52.7% of INRs were within range in cases where atrial fibrillation, deep vein thrombosis, and pulmonary embolism were the indications for treatment, I am pleased that they recognized the potential for considerable improvement (eg, Sweden's registry with 80.3% of INRs within therapeutic range).[1] The disparity between Canada and Sweden demonstrates the great need for Canada to "pull up its socks." The same technologies (point-of-care testing, computer decision support software, trained operators, patient self-management programs) are available to us as well. And these types of services do make a difference (eg, time in therapeutic range of 74% with New Zealand's Community Pharmacy Anticoagulation Management Service program[3]; time in therapeutic range of >80% with Germany's self-management program[4]). And they do need wide adoption in our country. The cost of missing the opportunity to emulate Sweden's performance is huge in terms of all-cause mortality (60% reduction),[5] stroke and systemic embolism (49% reduction),[5] and major hemorrhage (59% reduction),[5] and commensurate cost reductions to our health care system.

Thank you, Liu and colleagues, for the excellent article, and let's work together in Canada to improve warfarin management and achieve some "Viking" results!

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Competing interests
Dr Trusler is President of INR Online Canada Limited, a warfarin management software company.

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Warfarin management in primary care

We read with interest the article entitled "Quality of warfarin management in primary care. Determining the stability of international normalized ratios using a nationally representative prospective cohort" by Liu et al.[1]

Ten years ago, our community-based family health team implemented a pharmacist-led, weekly point-of-care (POC) international normalized ratio (INR) clinic. All patients taking warfarin were booked into this clinic for a POC INR measurement and an immediate plan to manage results. In 2013, 2 of our (then) residents did a chart review of patients' INR results over a 6-month period with usual care of INRs versus the POC INR clinic.[2] We found a substantial (12%) increase in time in therapeutic range with the POC model. Other advantages of this model included eliminating the lag time between results and management, and providing an opportunity for patients to discuss any new medical issues that could affect INR (such as new medications or illness). While more and more of our patients are taking direct oral anticoagulants, we continue to run our weekly POC clinic. Our clinic is pharmacist led; however,

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