Should We Screen Patients With Viral Symptoms for HIV Disease?

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In this issue, Coco addresses a vitally important question: Is it cost-effective to test for acute HIV infection among outpatients complaining of viral symptoms and at least 1 risk factor for HIV infection? If so, what is the appropriate method for such testing?[1] In a companion article Coco and Kleinhans address a key factor in answering these questions: What is the prevalence of acute HIV infection in 13- to 54-year-old ambulatory patients who have any of 17 viral symptoms?[2]

The author offers a convincing justification for this analysis: primary HIV infection is a major factor in the HIV epidemic, and most patients become symptomatic and seek care but are seldom tested or have HIV diagnosed. Thus, we miss an opportunity to intervene early. He determines the cost-effectiveness of expanding testing for primary HIV infection to a large cohort of outpatients.

How can we best use this impressive work? Although Coco's conclusions are based on a model, we cannot wait for a randomized controlled trial to confirm his findings, because there will likely never be such a trial addressing this question. Are the results valid? How should this research affect the care we provide our patients, ie, how should we apply the results tomorrow? These complex questions cut to the core of cost-effectiveness analysis. Cost-effectiveness analysis is a tool, and like other tools we use in medicine, we need to know its strengths and limitations—how we can best use it to for the betterment of our patients.

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Cost-effectiveness analysis is designed to assist decision makers, specifically health policy makers. There are both ethical and pragmatic reasons why we should be cautious in applying cost-effectiveness analyses, such as Coco's study, directly to our clinical practice.[3]

First, in all but the simplest of decisions, a decision model cannot include all the elements we would consider important. Not only are some the variables unknown, but many values are not in the model. For example, how much do patients fear the needle for the blood draw? How do patients value or fear the concept of HIV infection? Without answers to these and other questions, the model is incomplete. Results of the model are therefore similar to other elements of a decision process, such as considerations of politics, ethics, and justice for policy decisions; and history, physical, and laboratory information for clinical decisions. They inform but do not dictate the decision.

Second, what assumptions does the analyst make regarding the variables? Coco assumes, for example, that the life expectancy of the patient is 39.5 years, a good average for his model, as well as a good assumption for the policy maker trying to decide a health benefits package. His results, however, will not apply to either a 20-year old college student or a 70-year old retired librarian. Coco explicitly acknowledges this limitation, stating the impact of the report, not in clinical terms, but in policy terms: "Expanded testing for primary HIV infection … may be a sound expenditure of health care resources." In other words, the primary decision makers who will use his findings are not patients or clinicians at the point of care but policy makers who set the framework from which we provide care.

A third key issue relates to the uncertainty inherent in any complex decision. Cost-effectiveness analysis not only makes explicit the assumptions related to these uncertainties, but uses sensitivity analysis to addresses the question, How sensitive are the results of the analysis to uncertainty in the variables? There are several types of uncertainty in this cost-effectiveness analysis. For some variables, eg, the cost of a return

office visit, the value for a given person is known, but there is a range of values in the population. For other variables, the individual patient has a single value, but it is not knowable. For example, it is not possible to know whether any given patient will be lost to follow-up, but a population average can be determined. Finally, there are times when we have no data on the variable, eg, the sensitivity and specificity of the p24 antigen EIA. Coco's Table 1 lists all the key variables, the baseline estimate, and the range used in the sensitivity analysis, along with references to support the assumptions, thus allowing readers to make their own judgments.

To their credit, Coco and Kleinhans went the extra yard to estimate a key variable for this analysis: the national prevalence of primary HIV infection in patients visiting ambulatory settings with fever, rash, or sore throat, and a diagnosis consistent with an acute viral illness. The additional study, which is published in a sister article,[2] is a beautiful example of how one can inform cost-effectiveness analysis with data from large data sets, specifically the National Ambulatory Medical Care Survey, the National Hospital Ambulatory Medical Survey, and data from the Centers for Disease Control and Prevention. The prevalence of HIV infection in patients with viral symptoms seeking care in an ambulatory practice is the key variable in the cost-effectiveness analysis and, therefore, in the decision to test for HIV infection. The limited data on the variability of the prevalence of acute HIV infection among ambulatory patients with many constellations of viral symptoms is a major factor that policy makers and clinicians should consider before applying Coco's cost-effectiveness analysis to specific settings and to specific types of patients and clinical presentations.

Given the necessary limitations these assumptions place on the generalizability to our patients, does this analysis deserve space in the *Annals of Family Medicine*? The answer is a resounding yes. Coco's paired articles deserve close evaluation by clinicians, researchers, and policy makers. Clinicians will see that screening for HIV infection in those with viral symptoms will often be cost-effective, though it maybe premature to implement such screening into practice. Researchers now have new areas of investigation to provide better data for this cost-effectiveness model. Policy makers now have an excellent study to help inform their decisions related to screening patients with viral symptoms for acute HIV disease. Given the current state of our knowledge and based on Coco's analysis, screening for HIV infection with p25 antigen EIA in those with acute viral symptoms should be viewed as a valid use of resources, and consideration should be given to developing policies supporting this practice.

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