Nonionic contrast media: a bargain for some, a burden for many

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Drs. Gafni and Zylak raise two important issues concerning our paper on the cost-utility ratio of nonionic radiologic contrast media:[1] the disutility of quality-adjusted life-years (QALYs) associated with very minor and minor side effects and the use of QALYs to measure the clinical effects. We believe that the former issue is now an important component of the policy debate going on in Canadian institutions and that the latter is an important issue for researchers in the field of decision analysis. We address the former in this reply.

At the time the decision was made in Ontario to convert from the old to the new contrast media we felt that most of the concern about contrast agents was focused on safety related to very major reactions and death. This was almost certainly a result of two deaths in Ontario that led to coroner's inquests. Because of the concern we structured our analysis to examine such outcomes. We believed that we were biasing the analysis very heavily in favour of the new media by assuming that they would reduce the risk of death 10-fold. As far as we are aware there is no published evidence to show that the new media reduce the risk of death by that amount. Moreover, the studies of Katayama and associates,[2] Palmer,[3] and Wolf, Arunson and Cross[4] showed a reduction of three to six times in the risk of reactions requiring physician intervention but no reduction in death rates. This is partly because the baseline risk of death from ionic contrast media has fortunately declined. It now appears that radiologists are more concerned with the very minor and minor side effects and the benefit the new agents offer in this respect. It is important, therefore, to consider this issue more fully, as Gafni and Zylak have done.

We still believe that the framework for the analysis should separate the low-risk and high-risk patients and procedures. There are data showing that the benefits of the new agents are greater (i.e., lower risk of reactions) among patients at high risk (e.g., because of a previous reaction) and among those who are at high risk for hemodynamic complications (e.g., those undergoing cardiac catheterization). The incremental cost-utility ratios cited by Gafni and Zylak concern the complete conversion from the old to the new agents for all patients in one step. The correct analytic strategy would be first to examine the incremental cost-utility ratio derived from the delivery of the new agents only to high-risk patients and the continuing use of the old agents for low-risk patients and then to calculate the incremental cost-utility ratio of moving from this "selective use" policy to one of universal availability. We recalculated the marginal cost-effectiveness ratios for using new contrast media only among patients at high risk (30% of general radiology patients) and among those at low risk (the remaining 70%) using the healthy years equivalent (HYE) with the same assumptions that Gafni and Zylak make.

The complete results are as follows: for administering nonionic contrast media only to patients at high risk the marginal cost per HYE gained is $8400; for treating the low-risk patients the marginal cost per HYE gained is $121 000. The marginal cost-effectiveness ratio for treating all patients is $25 000 per HYE gained, as reported by Gafni and Zylak.

The treatment of low-risk patients remains much less efficient than the treatment of only high-risk patients. The treatment of only high-risk patients is an even more efficient strategy in the new analysis. This is to be expected since the new assumptions favour nonionic contrast media.

The results from our recalculation and from our original paper should be interpreted very carefully. The probabilities used for occurrence of reactions and relative risks with the new contrast media were determined on the basis of data available at the time of the original analysis. New data are quite different with respect to mortality rates, reaction rates and risk levels across the different risk groups.

We agree with Gafni and Zylak that a study measuring actual patient preferences would be the

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ideal basis for an analysis such as this. A pilot study to measure preferences for the two forms of contrast media showed inconsistent results (V.G.: unpublished data). The main reason for this is the difficulty people have in properly integrating information about such small levels of risk and changes to these risks. The methods proposed by Gafni and Zylak would in all likelihood be even more difficult to implement. However, we hope that research into this important area will continue.

We compared our results with those of other economic evaluations using QALYs. However, since the HYE is a different unit of outcome we are uncertain that such comparisons can readily be made. We believe that Gafni and Zylak should estimate HYEs gained for other health programs and then recalculate the cost-effectiveness ratios for those programs before making comparisons.

In conclusion, although the assumptions proposed by Gafni and Zylak make this investment of resources appear more attractive than our previous analysis, the ratio associated with low-risk patients still suggests that the use of the new, more expensive agents requires more resources per unit of benefit than most of the other interventions that have been evaluated in a similar manner. In addition, since many health care interventions have not been subject to this kind of analysis we believe that relative to the use of all Canadian health care resources the use of nonionic agents may not be the least attractive use of resources. For institutions to use these criteria to help set priorities the cost-utility ratio of other interventions should also be measured. We have heard that with more competition on the market the price of the new agents may be substantially reduced. This would require another evaluation of the cost-utility ratio, which could further improve the image of the new contrast agents.

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