ference does not seem clinically important when one could take pseudoephedrine and ibuprofen for similar relief at a fraction of the cost. The one exception would be patients with allergic rhinitis. I would not hesitate to prescribe nasal steroids for these patients when they have acute sinusitis.

Five years ago in an editorial in the *Annals*,[4] I noted that, because of the minimal effectiveness of antibiotics for acute sinusitis, I would focus on symptom relief. Nasal steroids are not the answer for most patients.

Mr Jones? He was not satisfied with symptom relief but accepted the $15 prescription for amoxicillin. Five out of 6 is a good day!

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Key words: sinusitis; drug therapy; antibacterial agents

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EDITORIALS

What Does It Cost to Change Behavior?

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Dr Wu, in her essay on rewarding healthy behaviors by paying patients for their performance,[1] deserves considerable credit for exploring novel strategies to enhance patients' health. Her strategy of reinforcing patients' health-promoting behaviors is sensible in that it focuses on *behaviors*, and by now it is clear that patient behavior (eating, exercising, smoking) is a major determinate of health. Despite the strengths of this proposal, however, I do have some concerns.

Although contingency management (providing incentives that are dependent upon desired behavior change) can certainly influence behavior, the durability, feasibility, and cost-effectiveness of its effects are unclear. One concern that has implications for both feasibility and cost-effectiveness is the size of incentive needed for meaningful behavior change. There is a strong relation between the size of the incentive and degree of behavior change.[2] For example, Seaverson et al[3] studied program characteristics that predicted employee participation in a health risk assessment (HRA): a single, simple, discrete behavior that did not need to be sustained long-term. She examined the HRA participation rates across 36 employers covering almost 560,000 employees. Among the multiple predictors studied—incentive amount, incentive design (nonfinancial, cash, benefits-integrated), communication strategy (weak vs strong), and work culture (weak vs strong) —by far the best predictor of participation rate (which was 49% across the 36 employers) was incentive amount. Each $20 of incentive produced a 1.58% increase in participation. Importantly, the average incentive offered to employees to complete this discrete, one-time behavior was just over $100. The magnitude of this incentive is consistent with a 2009 survey of 2,900 companies by Mercer, a global human resources organization, which found that for those companies which offered an incentive, the average

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value of the incentive to complete an assessment was $150.[4] In its 2011 annual National Survey of Employer-Sponsored Health Plans of 2,844 employers, Mercer noted that the median value of incentives via a lower premium contribution had risen to $240.[5]

Research on smoking cessation yields very similar conclusions regarding the costs or "going rate" for behavior change. A recent Cochrane review examined 19 studies that tested contingency management in more than 4,500 smokers. Only 1 study reported significantly higher rates for the incentive group than for the control group beyond the 6-month assessment.[6] This exception is instructive in the context of Dr Wu's proposal. Volpp et al randomly assigned 878 employees (with relatively high levels of education) to receive information about smoking cessation programs or to receive information about the programs plus financial incentives.[7] The incentive group had significantly higher rates of smoking cessation than did the information-only group at 9 or 12 months after enrollment (14.7% vs 5.0%). Importantly, the available financial payout in the incentive condition was $750 for compliance to treatment and prolonged abstinence. Against this backdrop of findings, Dr Wu provides the example of spreading the $270,000 potential bonus made available to a group of physicians by a health plan across their panel of 10,000 patients. This makes $27 available per patient per year. Even if additional money materializes from contributions by employers, pharmaceutical companies, and the government, as Dr Wu hopes, it seems unlikely that sufficient resources will be available to change the major, refractory behaviors that undermine health.

As Dr Wu points out, behavior change initiated through contingency management tends not to persist once the financial contingencies are no longer in effect.[8-11] For example, this finding is consistent with the Cochrane review of smoking interventions, which found, with the exception noted above, that initial abstinence established though contingency management did not persist over time.[6] There may be ways to increase the durability of contingency management interventions, but at present, the durability of their effects is suspect. It is possible that such strategies as the one Dr Wu describes (long-term contingency management) could support more persistent effects, but this supposition is huge and has, at present, little supporting evidence. Further, the prospect of applying financial contingencies for the long term in the amounts suggested by the literature calls into further question the feasibility of this proposal.

There is little doubt that contingency management can work under some circumstances, but we shouldn't hold inappropriately sanguine expectations about its effects. I wish it were the case that great numbers of smokers would quit or that patients would make other difficult behavior changes for just $27—or for anything close to that amount. Perhaps someday the contingency management approach can deliver persistent and clinically meaningful behavior change at such a low cost, but a great deal of research is needed to show how it could occur.

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