The CRC incidence estimate of the SEER program is a weighted average of IR1 to IR3 of the general population (Fig. 1). That is, the expected incidence as based on the SEER program is problematic for both of the questions, (1) does polypectomy of adenoma reduce the risk of subsequent CRC? (best comparison: IR1 versus IR2), and (2) do patients with a history of adenoma and polypectomy have a higher risk of subsequent CRC than patients without adenoma? (best comparison: IR1 versus IR3).

Leung et al could clearly answer neither question (1) nor question (2), because the SEER program does not allow the estimation of the required CRC rates as mentioned above. Epidemiologic methods teach us that according to Leung et al’s approach, the effect of polypectomy of adenoma on subsequent CRC risk is underestimated (because the expected CRC incidence is underestimated) and the effect of a history of adenoma and polypectomy on the risk of CRC compared with people without this history is overestimated (because the expected CRC incidence is overestimated).

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Problems with combining esophagastroduodenoscopy and colonoscopy to analyze risks of transient hypoxia from procedures in patients with risk factors for obstructive sleep apnea: a call for stratifying risks according to individual procedures

To the Editor:

Obstructive sleep apnea is increasingly being diagnosed, and its cardiopulmonary risks are being increasingly elucidated, but the risks of GI endoscopy in patients with obstructive sleep apnea is previously unstudied. Thus the article by Khiani et al related to this subject is particularly welcomed and important. Khiani et al show no significant difference in the rates of transient hypoxia between relatively high-risk and relatively low-risk groups for obstructive sleep apnea. I have 2 comments about this article. First, the authors analyze patients at relatively high risk of obstructive sleep apnea but exclude patients with diagnosed obstructive sleep apnea and 2 other significant cardiopulmonary conditions, chronic obstructive pulmonary disease and congestive heart failure. Thus, their conclusion of an insignificantly increased risk of transient hypoxia during GI endoscopy pertains only to a population with some risk factors for obstructive sleep apnea, but not to the population with diagnosed obstructive sleep apnea, which is the population precisely at greatest theoretical risk of transient hypoxia from endoscopy. Their high-risk patients encompassed 39% of all outpatients undergoing endoscopy and thus likely comprised mostly patients without (undiagnosed) obstructive sleep apnea, as the prevalence of obstructive sleep apnea—whether diagnosed or undiagnosed—is estimated at 5% or less of the adult population. Second, the theoretical risks of transient hypoxia from GI endoscopy appear to be much greater for EGD than for colonoscopy because of potentially direct impingement of the airway, laryngeal irritation, or microaspiration during esophageal intubation during EGD. Only 25.8% of the total number of analyzed patients underwent only EGD. They combined EGD and colonoscopy in their statistical analysis of procedure risks. This combined analysis is not recommended in general because these procedures have different procedure indications, are often performed by endoscopists with different levels of training (ie, in many hospitals EGDS are performed exclusively by gastroenterologists, whereas colonoscopies are performed by gastroenterologists or surgeons), and have a different spectrum and distribution of complications. This combined analysis is particularly problematic when examining transient hypoxia because of the greater theoretical risk of this complication in EGD than in colonoscopy. I congratulate Khiani et al on their important study, but further studies are required, particu-
larly on pulmonary complications of EGD in patients with diagnosed obstructive sleep apnea.

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Response:

We greatly appreciate Dr Cappell’s insights and discussion of the strengths and weaknesses of our study. Obstructive sleep apnea is a condition that deserves attention in patients undergoing endoscopy. In particular, there are an increasing number of patients with undiagnosed obstructive sleep apnea who are undergoing endoscopy. While Dr Cappell is correct in stating that the overall prevalence of diagnosed obstructive sleep apnea may be around 3% to 7%, it has been estimated that the overall prevalence of obstructive sleep apnea in the U.S. population is approximately 20% with approximately 90% of all obstructive sleep apnea being undiagnosed. This is an under-recognized disease. Because there is a lack of literature on the percentage of patients at high risk for obstructive sleep apnea who present for endoscopy, a major aim of our study was to determine what proportion of patients presenting for endoscopy at our institution might have undiagnosed sleep apnea and whether the failure to recognize sleep apnea was leading to sedation-related complications. The Berlin Questionnaire is a validated questionnaire for assessing the risk of obstructive sleep apnea with a sensitivity range of 0.69 to 0.87 and a specificity range of 0.77 to 0.95. Therefore, about 80% of the patients in our high-risk group had undiagnosed obstructive sleep apnea. Patients with known pulmonary conditions such as congestive heart failure and chronic obstructive pulmonary disease were excluded to minimize confounding variables leading to cardiovascular complications in the study population. Patients with diagnosed sleep apnea were also deliberately excluded from our study because endoscopists often change sedation practices in patients with known sleep apnea. Our study did examine patients undergoing EGD, colonoscopy, or both. The majority of these patients did undergo colonoscopy. Overall, there was no significant difference in transient hypoxia between the high-risk and low-risk groups. We did not power our study for subset analysis and completely agree with Dr Cappell that it would be useful to perform further studies examining differences in subsets. Dr Cappell makes an excellent point about taking a closer look at the risk of transient hypoxia in patients with a known diagnosis of obstructive sleep apnea who are undergoing an EGD in particular.

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