coronary artery bypass graft surgery (CABG) by Takagi and colleagues.¹ The inclusion criteria comprised prospective randomized studies with the incidence of postoperative neurocognitive decline as the primary end point. However, there was significant clinical heterogeneity in the studies that were included in the meta-analysis. In particular, the definitions used to define neurocognitive decline between the trials varied markedly.^{2,3} As a result, we question whether the incidences of neurocognitive decline can be reliably compared. Furthermore, studies that derive an incidence value for neurocognitive impairment after CABG are prone to the statistical phenomenon of regression to the mean (RTM).⁴ RTM explains much of the neurocognitive deficits that have been reported with the use of incidence analysis.

At present, there is no agreement as to what degree of change constitutes neuropsychological dysfunction. In one study of patients undergoing CABG, the incidence of postoperative neurocognitive dysfunction varied considerably according to the definition of neurocognitive decline.⁵ Incidence figures superficially provide a convenient summation of the extent of impairment, but they are calculated by imposing an arbitrary statistical constraint on individual test measures. As such, overall incidence data will vary according to which statistical criteria are used, the sensitivity and number of tests used, and the type of cognitive domains they assess.⁵ Any approach that essentially dichotomizes patients as “impaired” or “unimpaired” is a costly way of data handling that reduces statistical power.

Whereas a specific definition of neurocognitive impairment is required when the study objective is to determine the incidence of postoperative neurocognitive dysfunction, it is not necessary when one wants to test a specific hypothesis such as the effects of an intervention, for example, off-pump surgery. It is far better to use continuous measures inasmuch as they provide greater statistical power and allow more sophisticated analyses. Recently, we⁶ reported neurocognitive outcomes in 212 patients prospectively randomized to on-pump or off-pump CABG. We derived composite scores from all the individual test scores and avoided categorizing patients as “cognitively impaired or not,” thus treating the test scores as a continuous variable. Therefore, any subtle changes in test scores will

have contributed to the overall effect size. In addition, we compared the postoperative scores having adjusted for preoperative scores by using analysis of covariance. This takes RTM into account and is a powerful method of analysing test–retest data.

In summary, asking how often neurocognitive dysfunction occurs after CABG, and expecting a simple one-sided answer to suffice, is simplistic, however desirable. When neuropsychologic tests are used to test a certain hypothesis, as in this investigation, one does not need to set an arbitrary definition of neurocognitive decline to categorize individuals into those with or without a neurocognitive deficit. Instead, one can look at change and its relative difference between groups, which greatly enhances the power of the analysis.

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Reply to the Editor:

We appreciate Drs Motallebzadeh and Jahangiri's letter to the editor regarding our meta-analysis¹ of randomized controlled trials of neurocognitive decline after off-pump versus on-pump coronary artery bypass graft surgery. Although the definitions of neurocognitive decline varied among the trials, as mentioned in their letter, we could not but include only studies reporting neurocognitive dysfunction dichotomously because there is no standard definition for neurocognitive dysfunction. We excluded a randomized controlled trial by Dr Motallebzadeh and associates² in our meta-analysis¹ because it did not report neurocognitive dysfunction dichotomously, and all except for the trial did not report composite neurocognitive scores. Dr Motallebzadeh and colleagues derived composite neurocognitive scores from all of the individual test scores and avoided categorizing patients dichotomously, thus treating the test scores as a continuous variable. If a number of randomized controlled trials reporting composite neurocognitive scores are published, we would like to perform another meta-analysis.

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Surgical techniques for posterior aortic root enlargement

To the Editor:

We have read with extreme interest the paper by Dhareshwar and colleagues,¹ published in a recent issue, describing their results with patients undergoing posterior aortic root enlargement.