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In Reply:—"Add-on" surgical cases are usually scheduled individually. A problem that operating room (OR) managers face in running an OR suite on the day of surgery is to identify "holes" in the OR schedule in which to assign add-on cases.[1] The "upper prediction bound" is the predicted case duration for which there is a specified probability that the duration of the surgeon's next case will be less than or equal to the predicted duration.[2] For example, the functional definition of the case's "90% upper prediction bound" is that it is a value that will, with 90% degree of confidence, be equal to or greater than the duration of the next case.[3] In our recent article, we showed that the chance that the duration of the next case would be ≤ its 80% or 90% upper prediction bound is within 1% of the expected (nominal) rate of 20% or 10%, respectively, when prediction bounds are calculated using equations appropriate for a log-normal distribution.[4]

Drs. Overdyk and Rust explain that our results are "not sufficient to ensure the [clinical] usefulness of [our] statistical procedure." We agree wholeheartedly with this statement. In our article,[4] we evaluated scientifically the validity of the approach, in that we perceived its clinical utility to be self-evident. For purposes of discussion, we consider the two surgeons with results that are the most striking: surgeon #2 (n = 12; SD, 0.2 h; median case duration, 1.6 h; and 90% prediction bound, 2.2 h) and surgeon #6 (n = 2; SD, 0.5 h; median case duration, 2.3 h; and 90% prediction bound, 13.8 h). We apply these two surgeons to an application of upper prediction bounds that we described in the Discussion section of our article.[4]

Example Application

It is 2:00 P.M., a case in an OR is running late, and the OR manager wants to move the next case in that OR (a knee arthroscopy) to a different OR. The anesthesiologist who would care for the patient must leave by 5:00 P.M. How does the OR manager determine whether there is a high (*e.g.*, 90%) chance that the case will be completed by 5:00 P.M.? One option is that the OR manager use the surgeon's average case duration. Surgeons #2 and #6 have median case durations less than 3 h. This information is insufficient for the OR manager to make a decision because it only shows what will happen on average. The second option is that the OR manager use the 90% prediction bound. Surgeon #1 has a 90% prediction bound less than 3 h. Therefore, if surgeon #1 wants to perform the arthroscopy, surgeon #1 should be given the time. Surgeon #6 has an 90% prediction bound of 13.8 h. Surgeon #6 should not be given the time. The seemingly absurd (although correct!) value of 13.8 h provides the OR manager with exactly the sort of information that the OR manager needs to make the managerial decision. Because surgeon #6 has only performed the case twice at the OR suite, and because for those two cases the durations varied by several hours, the OR manager does not have a reliable idea as to how long the case will take. The third option is that the OR manager rely on the surgeon's assurance that the case will be finished on time. The 90% upper prediction bound of 13.8 h shows that surgeon #6 most likely also would have no idea how long the case is going to take him.

Overdyk and Rust's table 1 clearly shows the usefulness of prediction bounds for the scheduling of add-on cases. When scheduling an elective case, if the OR manager wants to minimize staffing costs, he/she should use the mean of the durations of cases that were the same scheduled procedure performed by the same surgeon.[5] When scheduling an add-on case, if the OR manager wants to ensure that a case will probably be finished within a certain period of time, he/she should use the appropriate upper prediction bound.

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