Should we sequence urgent cases by category?

The answer to this question depends, partly, on the meaning of a case being *urgent*. An *emergency* case can be considered one for which the patient is likely to sustain additional morbidity and or mortality unless surgical care is started in less time than needed for a team to be called in from home. By knowing the hours (days) between emergency cases, decisions can be made on the need for an in-house team. An *elective* case is one for which the patient can wait at least three days for surgery without sustaining additional morbidity (e.g., Friday to Monday). An *urgent* case is one with a priority between *emergency* and *urgent*.

Click here for derivations of urgent case sequencing, click here for further development **[PDF]**, and click here or **[PDF]** and click here or **[PDF]** for behavioral studies. Each is based on due dates for each procedure from the evidence-based literature. Click here for a lecture used in my course. Patient and surgeon waiting is minimized subject to the constraint that all medical deadlines are satisfied.

Appropriate decision making on the day of surgery depends strongly on appropriate staffing for urgent cases having been chosen months in advance by using the developed statistical methods (click here or **[PDF]**). For example, suppose that a hospital is suffering from frequent overtime. Surgeons have urgent cases that can wait safely many hours, and there is OR time available (e.g., at 1:00 PM), but many surgeons are unavailable in clinics. This is commonplace (click here). Strategically, the surgeons' focus on seeing new clinic patients is best economically (click here **[PDF]** and click here). Change the OR staffing.

The use of deadlines by procedure serves to reduce anesthesia groups' costs. Suppose that a hospital is considering instead the use of categories (e.g., "Urgent class 1" cases to be performed within 4 hr and "Urgent class 2" cases to be performed within 12 hr). To assure no harm to patients, deadlines for categories must be based on the briefest deadline among the procedures within the category, not the midpoint or longest due date. Thus, surgeons may negotiate for the simplicity of the use of categories, as their use will reduce surgeons' and patients' average waiting times. The fewer the numbers of categories, the briefer will be the average wait.

Monitor by control chart the numbers of cases waiting per day when the numbers of ongoing cases are fewer than that which maximizes

the efficiency of use of OR (or anesthesia) time, not the mean waiting times per case (click here or **[PDF]**). First, the waiting times per case should not be compared directly among facilities because optimal waiting times depend on the robustness and accuracy of the preceding staffing decision (click here or **[PDF]**). Second, the waiting times follow three-parameter log-normal distributions, with the estimated mean quite sensitive to the selection of the shift (location) parameter (click here or **[PDF]**). Monitoring waiting is especially important for non-operating room diagnostic radiology cases (click here or **[PDF]**).

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