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Post-Anesthesia Care Unit Staffing and Patient Flow

Many PACU management problems can be solved by applying existing principles and statistical methods. Click here for references and a comprehensive bibliography of articles describing what is known about PACU management. Click here for a lecture on how we work with companies to forecast the impact of drugs and/or equipment on phase I PACU costs.

The assessment first considers the PACU length of stay, including a breakdown by type of anesthesia. The percentage impact of delays in discharge on total PACU length of stay of all patients is calculated, and accordingly the influence on total PACU nurse staffing.

Phase I PACU staffing is optimized to satisfy all ASPAN guidelines while reducing the percentage of days with at least one delay in admission from the OR into the PACU. For example, ideally each new PACU nurse would ideally work according to a schedule that would cause the largest reduction in the risk of delays in admission. However, there are so many schedule options that neither experience nor manual use of spreadsheets is practical to determine the best possible staff schedule. For example, consider a PACU with 14 nurses working daily in overlapping 8-hour, 10-hour, and 12-hour shifts. Between 8 AM and 11 PM, there are 18 potential shifts beginning at hourly intervals. Consequently, there are 18^{14} or more than 1000 trillion different possible scheduling solutions!

Every possible combination of specified shifts is considered as potential staffing solutions. The algorithm uses the number of available nursing hours to find the staffing solution with the fewest number of understaffed days. If a patient must wait in an OR for PACU admission at any time during a given day, then that day is considered understaffed. Because the software reproduces patient flow over a period of several months, the fraction of understaffed days is related statistically to the chance that any future day will be understaffed.

Calculations are based on historical data supplied by each hospital. Two types of data are needed: Dates and times of day that each patient waits in the OR for a bed in the PACU, and dates and times of day that each patient is admitted and discharged from the PACU. Such information is usually available from PACU billing data. In addition, the nurse: patient staffing ratio must be supplied for each patient if we cannot make the assumption that the majority of patients fit an acuity or staffing ratio of 1 nurse: 2 patients. These data are entered into labeled columns of worksheets that are supplied to the facility. Detailed instructions are supplied with all worksheets. If the acuity information is not available, a one-week survey is sufficient.

The mathematics identifies ways to change PACU nursing staffing so that as many patients can receive care with the same nursing hours, without increasing the risk of a day with a delay in PACU admission. There is a marked improvement in the achievable increase in productivity by increasing from 20 to 80 historical workdays of data, slight but statistically significant improvement between 80 and 100 days, but no significant improvement in further increasing the number of workdays of data. Therefore, 100 workdays of data are usually used (i.e., around 5 months).

An initial report is discussed during a web conference. The final PDF report is sent by email. The University charges $2500.

Click here for a sample report. The fee is based on the analyses being performed with either an OR or anesthesia group staffing and operational assessment (click here).

References for methods applied

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