Clarifying and Using OR Turnover Time for Purpose and Advantage

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There are several turnover times.

Different turnover times are correlated with different levels of risk, finance, and personnel satisfaction among the agents involved.

This concept graph shows relationships among the choice of scheduling policy techniques and the resulting tradeoffs on sTOT, aTOT, aTOT and productivity for the agents involved (surgeon, anesthesia, nursing staff/room).

Cumulative intervals for sTOT, aTOT, and rTOT are displayed in Summary Data at the bottom of the graph. Tradeoffs can be seen in the graph.

sTOT (indicated by each green bar parallel to 'surgeon' within each scenario) is the surgeon turnover time. It represents the interval from when the surgeon puts in the last suture or bandage on one case and starts scrubbing for the next. Most surgeons think of this when discussing turnover time.

aTOT (indicated by each green bar parallel to 'Anesthesia' within each scenario) is the anesthesia turnover time. It represents the interval between the time a particular anesthetist leaves one patient in PACU and starts the procedure for the next patient's induction.

rTOT (indicated by each green bar parallel to 'Rm 1' or 'Rm 2' within each scenario) is the room and nurse turnover time. It represents the interval of time following finishing and cleaning a room after one case and the beginning of the setup for the next case in the same room. rTOT is often incorrectly used and defined when surgeons and administration discuss turnover time.

Each horizontal red bar indicates whether the surgeon is using only one room, or flipping rooms with either one or two anesthetists available: (1,2,2) indicates 1 surgeon, 2 anesthetists, and 2 rooms (with nursing staff). In this scenario, sTOT is determined by how long it takes the surgeon to walk from one room to another.

(1,1,2) indicates 1 surgeon, 1 anesthetist, and 2 rooms. sTOT is longer.

(1,1,1) indicates 1 surgeon, 1 anesthetist, and 1 room. sTOT is longest.

Each case is represented by gold-blue-gold horizontal bars. Blue (light blue) is surgeon cutting; gold is setup and clean. Red 'S' is start of setup. Each red dot is when the surgeon first cuts ('cut-time'). Red 'N' indicates nurses prepping patient after patient asleep. For anesthesia: red 'A' is beginning induction, blue 'A' is for wake-up ok'd, green 'A' is when the anesthetist hands off the patient to PACU and leaves. Red 'P' indicates patient-in-room. Clear/white circle indicates patient-out-of-room.

For instructional purposes, I used realistic room setup times, surgeon times, and room cleanup times that would minimize rTOT when flipping rooms. In order to remove confounding parameters, each scenario uses only one surgeon, and every case part is identical in length (duration) except for anesthesia. The bold black text on the left below each red bar refines each scenario based on whether the anesthetist is fast or slow.

'Anesthesia Slow' takes 10 minutes longer for induction and 15 minutes longer awakening the patient than 'Anesthesia Fast', but the slow anesthetist adapts his wake-up technique by extubating in PACU so that cleaning the room after the case is not delayed. The slower anesthetist also adapts to a slower induction by having the 7am room setup begin earlier so that cut-time is always at 7am (seen in each scenario), and by decreasing his aTOT between cases by starting each induction 10 minutes earlier.

The Summary Data at the bottom right indicates 'Anesthesia Fast' by a red circle, and 'Anesthesia Slow' by a green circle (each colored circle and number together is unique). Vertical lines are drawn from the last patient-out-of-room toward the time line (number within each colored circle indicates how many cases were finished by that time).

Concept Graph

