

Table 1 Change in turnover time for each phase studied

Phase	Patient out/case cart in	Case cart in/circulator out	Circulator out/patient in	Aggregate time
Before intervention (min)	6.6 ± 3.4	7.3 ± 5.2	13.0 ± 9.0	26.7 ± 11.4
After intervention (min)	4.8 ± 2.2	5.2 ± 2.3	12.5 ± 4.2	22.5 ± 6.4
Percent improvement (%)	27	29	4	16

Identified opportunities for addressing turnover variation

A. Patient out/case cart in

Consolidated list of prioritized Perioperative Support Assistant (PSA) responsibilities

Guidelines for: number of people cleaning room; what cleaning can be done before patient leaves room; when PSAs should enter room and start cleaning

Encourage surgeons to book patients requiring preoperative, e.g., epidurals, lines; group similar cases to follow, e.g., laparoscopic procedures, to reduce need to move equipment

B. Case cart in/circulator out

Written guidelines for opening an operating room ("Standard operating procedure")

C. Circulator out/patient in

Anesthesia supplies and support ready for procedures on Preoperative area

Use pagers to notify Preoperative area of room turnover; modification of "all page" usage

Revised IV insertion policy to avoid delays

Improve communication with patient on day of surgery ("Where will you be that morning?")

most interested in predictable start and turnover times [1].” We briefly present the results of a process improvement project in our hospital’s main (inpatient) OR that was used as a Six Sigma (GE Health Care) training exercise.

Turnover times were a frequent complaint from surgeons, so we studied the factors that determine turnover time variation using the Six Sigma “Define, Measure, Analyze, Improve, Control (DMAIC)” approach. Six Sigma uses data collection and analysis to objectively identify sources of process variability. The project team consisted of nurses, nurse managers, anesthesiologists, and administrators. Because this project was a training exercise, variations in surgical practice were excluded from its scope, and no surgeons were on the project team.

We divided turnover time into 3 phases: patient out to case cart in, case cart in to circulator out (to get next patient), and circulator out to patient in. Time intervals for over 1400 turnovers were analyzed, and the factors affecting the 3 phases were identified.

Using these data to change the way in which we manage turnovers, we have been able to reduce our average turnover time from 27 ± 11 minutes (mean ± SD) to 22 ± 6 minutes (Table 1). Before the project, 22% of turnovers took longer than 35 minutes; we have reduced that figure to 5%. Surgeons have responded positively to the reduction in turnover time variability, and OR staff express greater satisfaction that they are working as a team.

To maintain control of our gains, we review the third week of the month for any case with a turnover time greater than 35 minutes, or any week with an average turnover time greater than 25 minutes.

All institutions have unique features that prevent “cookie cutter” solutions to improving turnover times. However, Six Sigma, with its emphasis on data collection and analysis, is a powerful tool in making effective changes in complex

processes such as OR turnovers. We recommend Six Sigma to other practitioners.

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doi:10.1016/j.jcline.2005.01.002

Use of double-sided tape to secure a tracheal tube

To the Editor:

Clinicians frequently have to secure tracheal tubes to patients with beards, those with dermatologic conditions, facial burns, or even to febrile patients who perspire excessively [1,2]. In these situations, it is helpful to use elastic straps, with Velcro fasteners, which wrap around the tracheal tube. However, these devices lack an adhesive backing.

By placing double-sided tape on the tracheal tube, these straps will adhere more securely to the external surface of the tube. The risk of dislodgement or unintentional extubation is thereby greatly reduced (Fig. 1).

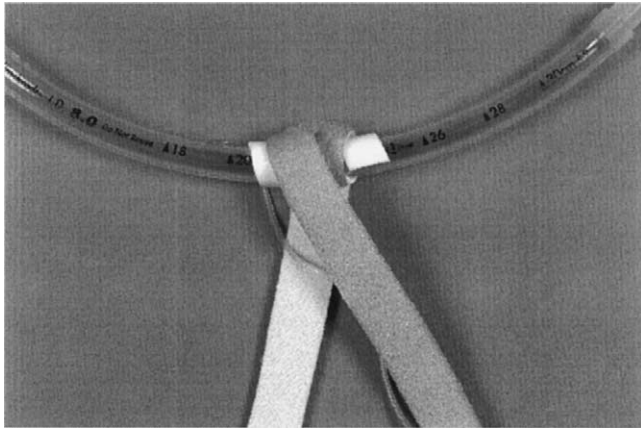


Fig. 1 Photograph depicting how double-sided tape (white) is placed around a tracheal tube. This arrangement allows for the elastic strap (shaded), with Velcro fastener, to better adhere to the external surface of the tracheal tube.

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doi:10.1016/j.jclinane.2004.10.002