Adherence to The Joint Commission Standards by Anesthesiology Providers after the Implementation of an Educational Intervention

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Abstract

A medical error is defined as a preventable adverse effect of medical care. In anesthesiology practice, this is especially important as there is a specific risk related to it. Medical errors are the third most common cause of annual deaths in the US. The Joint Commission (TJC) develops standards of routine for the practice of anesthesiology with the aim of reducing the incidence of medical errors. The aim of this study is to determine adherence to TJC before and after the administration of educational material. The adherence to TJC standards was evaluated in two phases (A pre-interventional phase followed by an educational intervention; thereafter, a post-interventional phase) by random checks during cases in the operating room. For the data analysis, measures of central tendency and ratios were used. This quality assurance project was waived by the Institutional Review Board. During the pre-intervention phase a total of 525 cases were checked during a period of 3 months; 217 (41%) cases report non-compliance events. During the Pre-intervention phase, the average number of non-compliance events per provider was 24.11 and the Total events/Total cases ratio was 2:5. After the educational period (Post-intervention phase) a total of 1701 cases were randomly checked; 192 (11.3%) cases report non-compliance events. In a 9-month period, the average number of events per provider was 5.68 and the Total events/Total cases ratio was 1:9. The implementation of an educational intervention plus a systematic evaluation increases the adherence of the anesthesia providers to The Joint Commission standards.

Introduction

A medical error is defined as a preventable adverse effect of medical care, whether it is evident or harmful to the patient ( ). Some authors estimate that medical errors are the third most important cause of annual deaths in the United States ( ); this is especially important in anesthesiology practice where there are specific risks related with it (similarities between ampules, the simultaneous use of various medications and the need to administer them quickly) ( ).

Despite multiple attempts to change this, the rate of error still is a cause of serious harm to the patients ( ). Chopra et al. in 1990 report 113,700 anesthesia incidents during a 10-year period ( ). More recently, a study published in 2006 by Hicks et al, reports 3260 errors in the operating room between the periods of 1998 and 2006, of those, 5.6% resulted in harm ( ). Another study published in 2001 by

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Beverley A, consists in a self-reported survey from 687 anesthesiologists; the authors report that 85% of participants had experienced at least one drug error, of those, 4 cases end in the death of a patient. The same study reports that the most common error was the administration of muscle relaxant instead of a reversal agent, where intendedness (70.4%) and misidentification of the label (46.8%) were the most important contributing factor . Failure to check the anesthesia equipment, lack of attention and vigilance by the provider are the most common reported causes of medical errors. To decrease the incidence of errors, The Joint Commission (TJC) develops standards of routine for the practice of anesthesiology; the compliance of this recommendations assures a reduction of medical errors in the anesthesiology practice. There is no evidence in our institution of how the implementation of an educational intervention plus a systematic evaluation can increase the adherence to The Joint Commission standards. The aim of this study is to determine if the adherence to TJC before and after the administration of educational material and intervention.

Methods

This quality assurance project was waived from the Institutional Review Board; informed consent was not required. The first phase consisted of an evaluation of TJC standards before the administration of educational material and intervention. Subsequently, an educational intervention was implemented to the anesthesia providers. We created an institutional policy regarding The Joint Commission (TJC) compliance standards. We presented a lecture to all anesthesia providers dedicated to the education of TJC standards. We reviewed each of the different sections of the policy in detail. A copy of this policy was also emailed to each provider and placed in the operating rooms. All providers also signed an acknowledgement stating that they have read, understood, and will adhere to the TJC policies. Thereafter, during the period from May 2018 to February 2019, the adherence to The Joint Commission standards by the Anesthesiology providers was measured. The evaluation consisted of random checks during cases in the operating room. The providers were separated into two different groups: Residents (CA-1s, CA-2s, CA-3s) and Certified Register Nurse Anesthetists (CRNAs). The compliance according to the JCAHO standards was verified using a Quality Assurance Form that included information regarding the appropriate labeling of IV tubing, IV bags, vials, and syringes, as well as proper storage of handles, blades, laryngoscopes, and suction tubes. Total compliance was considered when: 1) The IV fluid bags were labeled with the provider's initials, start and expiration date(24 hrs.), 2) IV tubing was labeled with the provider's initials, start date and expiration date(72 hrs., arterial line is 96hrs) , 3) Multi-dose vials were labeled with the name of the drug, time and date of preparation, and expiration date(28 days), 4) Prepared medication in syringes were labeled with name of the medication, dosage strength, amount of medication per unit of measurement and expiration date(24 hrs., propofol is 12 hrs.), 5) Laryngoscope handle and blade was in sterile packaging or kidney basin, 6) Yankaeur suction was covered at all times when not in use, 7) Provider had designated separate clean and contaminated areas of practice, 8) Any bag that was not dedicated to the operating room was covered, 9) The anesthesia cart was locked with no residual medication left between cases. If anyone of these were not done at the time of the random check, they were marked noncompliant for that specific issue. After each random check, a non-individualized report was generated and sent to providers daily. The relation of compliance/noncompliance was obtained for each provider; the report was sent to each provider on a weekly basis. The chairman of the department met with each anesthesia provider personally to discuss their performance, provide feedback, and to re-educate and review the policy, if necessary, to ensure compliance in every case. In addition, all the information was added into a Microsoft Excel spreadsheet. For the data analysis, measures of central tendency and ratios were used.

Results

Thirty-eight providers were evaluated by random checks in the OR. Twenty-seven (71%) providers were resident-physicians and eleven (29%) CRNAs. During the pre-intervention phase a total of 525 cases were checked during a period of 3 months; 217 (41%) cases report non-compliance events. During the Pre-intervention phase, the average number of non-compliance events per provider was 24.11 and the Total events/Total cases ratio was 2:5. After the educational period (Post-intervention phase) a total of 1701 cases were randomly checked over a period of 9 months; 192 (11.3%) cases report non-compliance events. In a 9-month period the average number of events per provider was 5.68 and the Total events/Total cases ratio was 1:9. Two residents present total compliance (absence of non-compliance events) during this time. (Table 1).

During the Pre-Intervention phase the total number of Non-compliance events were 217; of those, 44 (20.28%) correspond to inappropriate labeling of fluid bags, 34 (15.67%) to unproper tubing labeling, 7 (3.23%) to inappropriate labeling of multi dose medication, 76 (35.02%) to inappropriate labeling of syringes and bags of medications, 3 (1.38%) to inappropriate packing of laryngoscopes, 19 (8.76%) to uncovered suction tube, 6 (2.76%) to provider without designated clean area, 6 (2.76%) to uncovered outside bag, and 22 (10.14%) to unlocked cart or residual medication in between cases. During the Post-Intervention phase the total number of Non-compliance events were 192; of those, 14 (7.29%) correspond to inappropriate labeling of fluid bags, 20 (10.42%) to unproper tubing labeling, 94 (48.96%) to inappropriate labeling of syringes and bags of medications, 2 (1.04%) to inappropriate packing of laryngoscopes, 11 (5.73%) to uncovered suction tube, 9 (4.69%) to uncovered outside bag, and 42 (21.88%) to unlocked cart or residual medication in between cases. In the Post-intervention phase, there are no cases of inappropriate labeling of multi dose medication or provider without designated clean area. (Table 2).

Discussion

This is the first study in our institution that attempts to determine if the implementation of an educational intervention plus a systematic evaluation can increase the adherence to The Joint Commission standards.

The number of non-compliance events after the educational intervention decreased from 217 in the pre-intervention phase to 192 in the post-intervention phase. Most important, the ratios of events

and the total number of cases, decreased from 2 non-compliance events per every 5 cases to only 1 event per every 9 cases in the pre-interventional and post-interventional phase respectively. This is probably due to the increased awareness of anesthesia providers about the importance of TJC standards for the reduction of adverse effects. Adhering to the recommendations suggested by TJC can greatly help reduce the number of medical errors, which is a major public health problem; Abeysekera A et al in 2004, review 896 reports of an incident monitoring database, they found that 105 (11.7%) of these events correspond to minor morbidity, 42 (4.7) to major morbidity, and 3 (0.3%) to death . This is fundamental to reduce the morbidity among our patients. We expect that the practice in our institution will be safer with the increased adherence to TJC standards.

Even with an important reduction, the non-compliance event most reported, for both (pre-intervention and post-intervention) phases was the absence of appropriate syringe labeling, corresponding to 35.02% and 48.96% of the total number of non-compliance events for each phase respectively. Other important non-compliance events were the inappropriate labeling of the fluid bags and the IV lines, corresponding to 15.67% and 20.28% of the total of non-compliance events during the pre-interventional phase, and 10.47% and 7.29% during the post-interventional phase. This is especially important as appropriate labeling is a fundamental element of medication safety. The difficulties in compliance in this variable can be explained by the nature of anesthesiology where there is a lack of safeguards and double checks provided by nurses and pharmacists, also most of the times . Regarding the labeling, one of the things we discovered is that the label we use for the syringes and bags of medications is not as detailed as it should be and is in fact lacking: The label simply said 'date", not expiration date. Thus, providers were documenting the date that they prepared the syringe or bag, rather than writing the expiration date as recommended by the TJC. This led to the provider being marked noncompliant. We are in the process of obtaining new labels with a space for the date when the medication is prepared, as well as a space for the expiration date to be compliant with TJC. This is part of our current and on-going quality assurance and will be reevaluated in the future. As far as the carts being left unlocked or residual medications left in between cases, we are not certain what caused this to increase post intervention, but it is something that is being evaluated currently to see if there is a single cause or if there are multiple variables leading to the increase, one aspect that's becoming apparent is that there is an increase demand on providers to turn over their rooms to increase the case volume in our institution.

Drug errors are still an important cause of iatrogenic injury to patients in the anesthesiology practice. The Joint Commission Standards was created with the aim to reduce these errors, decreasing the morbidity and mortality of the patients. The implementation of an educational intervention plus a systematic evaluation increases the adherence of the anesthesia providers to The Joint Commission standards.

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	Number of cases and noncompliance events					
	Pre-intervention			Post intervention		
	Residents	CRNAs	All providers	Residents	CRNAs	All providers
NUMBER OF CASES	**330**	**195**	**525**	**1025**	**676**	**1701**
Noncompliance issues						
Bags are properly labeled (expiration time and date 24 hrs., type of fluid, initials.	34	10	44	10	4	14
Tubing is unproperly labeled (expiration time and date: 72 hrs. IV and 96 hrs. A-line)	30	4	34	14	6	20
Multi dose medication (time and date prepared, expiration date-28 days, initials)	2	5	7	0	0	0
Syringes and bags of medication a) not used within 24 hrs. b) expiration in <24 hrs.	56	20	76	44	50	94
Laryngoscope blades are in sterile packing	3	0	3	1	1	2
Suction yankauer is covered	14	5	19	5	6	11
Provider has designated separate clean and contaminated areas of practice	4	2	6	0	0	0
Outside bag is covered	3	3	6	6	3	9
Cart is locked, no residual medication in between of cases.	15	7	22	33	9	42
TOTAL ISSUES	**161**	**56**	**217**	**113**	**79**	**192**
Mean number of Non-Compliance Events per provider	17.89	6.22	24.11	4.19	7.18	5.68
Mean number of cases per provider	11.79	21.67	16.73	37.96	61.45	49.71
RATIO TOTAL EVENTS:TOTAL CASES	**1/2**	**2/7**	**2/5**	**1/9**	**1/9**	**1/9**

Table 1. Number of cases and Non-compliance events, and mean of NCE and cases per provider

	Pre-Intervention		Post-intervention	
Noncompliance issues	No. of Events	Percentage	No. of Events	Percentage
Bags are properly labeled (expiration time and date 24 hrs., type of fluid, initials.	44	20.28%	14	7.29%
Tubing is unproperly labeled (expiration time and date: 72 hrs. IV and 96 hrs. A-line)	34	15.67%	20	10.42%
Multi dose medication (time and date prepared, expiration date-28 days, initials)	7	3.23%	0	0.00%
Syringes and bags of medication a) not used within 24 hrs. b) expiration in <24 hrs.	76	**35.02%**	94	**48.96%**
Laryngoscope blades are in sterile packing	3	1.38%	2	1.04%
Suction yankauer is covered	19	8.76%	11	5.73%
Provider has designated separate clean and contaminated areas of practice	6	2.76%	0	0.00%
Outside bag is covered	6	2.76%	9	4.69%
Cart is locked, no residual medication in between of cases.	22	10.14%	42	21.88%
	217	100.00%	192	100.00%

Table 2. Number of noncompliance issues during the pre-intervention and post-intervention phases.