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# THE IMPLEMENTATION OF A NEW OPERATING ROOM EMERGENCY MANUAL AT UNM

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## INTRODUCTION

The occurrence of life threatening emergency situations in the operating room is an ever present danger to patients. Quick identification and response to such situations is vital to prevent severe consequences to patient morbidity and mortality (1,2). Here we present the implementation of a new University of New Mexico Hospital (UNMH) Operating Room Emergency Manual (EM) as an improvement process conducted by the Department of Anesthesia in partnership with the operating room and surgical services. Cognitive aids such as an emergency manual have been demonstrated to facilitate the ease and speed of life saving actions during emergency situations (see table 1), (3,4). To improve and standardize our handling of emergency situations we undertook this project to upgrade our operating room emergency manual.

## METHODS AND MATERIALS

Our new manual was created using an established template pioneered by the Stanford University Cognitive Aids Group. The template manual contained standardized actions for response to a list of emergency situations (see figures 1 and 2). Where necessary, we modified these actions to reflect local practice at UNMH. We introduced our new EM to the anesthesia department with education on its use during emergency situations. The EM was also introduced to surgical services and the operating room staff. An emergency manual is now located in all anesthetizing locations across the UNM system such as the Main Operating Rooms and Labor and Delivery. Checking for the presence of a manual is now integrated as a standard part of the anesthesia time out. We collect data on the use of the emergency manual via the electronic anesthesia record (AR). The AR contains a mandatory field regarding the emergency manual that must be completed in order for the record to be considered billable (see figure 3). In this way we are guaranteed to collect data on the EM for every anesthetic administered. We collect details regarding the presence of an emergency manual, whether it was used during an emergency and the circumstances in which it was used. Additionally, we use online surveys to elicit the opinion of anesthesia providers and collect data regarding improvements and additions to incorporate into the next iteration of the emergency manual.

**EMERGENCY NUMBERS: 333** Adopted by:

<b>ACLS (for perioperative setting)</b>	Fire – Patient	13
Asystole	Hemorrhage – MTG	14
Bradycardia – Unstable	Hypotension	15
PEA	Hypoxemia	16
SVT – Stable Tachycardia	Local Anesthetic Toxicity	17
SVT – Unstable Tachycardia	Malignant Hyperthermia	18
VF/VT	Medication List	30
	Myocardial Ischemia	19
<b>BROAD DIFFERENTIAL DIAGNOSES</b>	Oxygen Failure	20
Hypotension	Obstetric Hemorrhage	26
Hypoxemia	PEA	3
	Pneumothorax	21
<b>SPECIFIC CRITICAL EVENTS</b>	Power Failure	22
Anesthetic Fluid Embolism	SVT – Stable Tachycardia	4
Anaphylaxis	SVT – Unstable Tachycardia	5
Asystole	Total Spinal Anesthesia	23
Bradycardia – Unstable	Transfer Plan- OGIS and SRMC	27
Bronchospasm	Transfusion Reaction	24
Delayed Emergence	Venous Air Embolus	25
Difficult Airway – Unanticipated	VF/VT	6
Fire – Airway	Phone List	31

**EMERGENCY MANUAL**  
COGNITIVE AIDS FOR PERIOPERATIVE CRITICAL EVENTS 2016, v3.1  
STANFORD ANESTHESIA COGNITIVE AID GROUP

Figure 1: Front cover of the UNMH Emergency Manual with table of contents for critical events

Category	Number of Incidents
Anaphylaxis	6
Bradycardia/Tachycardia requiring treatment	13
Bronchospasm	34
Cardiac arrest/CPR	23
Hypotension (severe)	59
Hypoxia (<90%, >5min)	29
Laryngospasm	5
Pneumothorax	2

Table 1: The frequency of emergency situations across all UNM anesthetizing locations for Fiscal Year 2017. Data extracted from quality control documentation in anesthesia record for more than 10,000 anesthetic administrations.

### References:

- (1) Arriaga et al. *New England Journal Of Medicine* 2013;368:246-53
- (2) Augoustides et al. *Anesth Analg* 2013 November.
- (3) Gaba DM. *Anesth Analg* 2013 November.
- (4) Harrison et al. *Anesth Analg* 2006;103:551-6

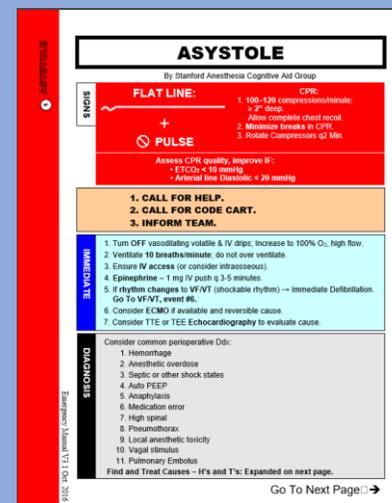


Figure 2: An example of a critical event covered by the EM. Each event presents cardinal signs for recognition, immediate actions to be taken and differential diagnosis if applicable.

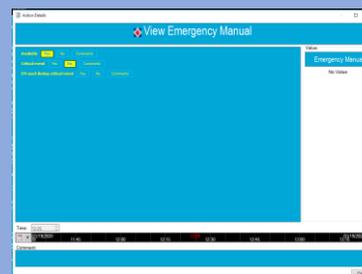
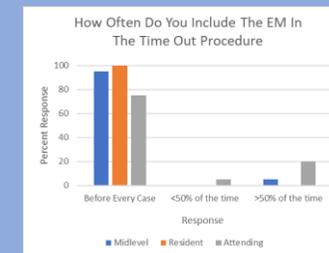
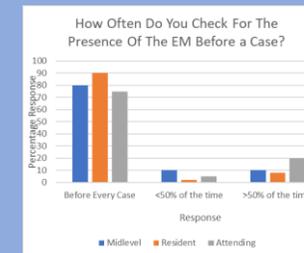


Figure 3: An example of EM documentation in the anesthesia record; in this way we can more accurately track the use of the EM

## RESULTS AND DISCUSSION



Charts 1 and 2: Survey data demonstrates that most anesthesia providers are checking for the presence of the EM (left) and are routinely incorporating the EM (right) into the surgical time out; uptake is highest amongst anesthesia residents.

The emergency manual is now present at all anesthetizing locations within the UNM system. It has now been standardized as part of the time out procedure and most anesthesia providers ensure its presence before the start of a case (see charts 1 and 2). The data collected from our anesthesia records demonstrate its use in notable emergency situations such as intraoperative cardiac arrest, anaphylaxis and massive obstetric hemorrhage. The most often used portion of the EM is the drug dosing chart. Drug dosing errors are a common medical error and our data suggests that expanding upon our drug dosing chart can improve OR safety.

## CONCLUSION

The UNM Operating Room Emergency Manual is now a well-integrated part of anesthetic practice at our institution. Anesthetic providers have appreciated its usefulness as a cognitive adjunct during operating room emergencies as well as for routine review. We continue to assess for weaknesses in the manual and are implementing an iterative process of manual improvement. Based on the success of the current emergency manual, a pediatric specific emergency manual has been introduced to the UNM pediatric operating rooms. Our next goals are to introduce an obstetric specific manual to labor and delivery and to update the current manual based on current feedback.