

Awareness During an Intensive Care Unit Procedure: A Root Cause Analysis and Creation of the D5 Handoff Tool

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INTRODUCTION

Awareness during anesthesia is a rare but feared complication. Intra-operative awareness is defined as the unexpected and explicit recall by patients of events that occurred during anesthesia.¹ Awareness often results from light anesthesia and patients undergoing certain high-risk procedures, such as cesarean section, cardiac surgery, or trauma surgery.² Several commercial devices exist for monitoring depth of anesthesia and some evidence suggests that bispectral index monitoring may help reduce awareness.¹ However, vigilance by the anesthesia provider remains the most valuable tool in detecting and preventing awareness.

The incidence of awareness is increased in cases where volatile anesthetics are not used.² Bedside procedures, such as transesophageal echocardiography or esophagogastroduodenoscopy (EGD), typically fall into this category. This can be attributed to the inability to measure anesthetic level since anesthesia machines are usually not present.

A root cause is a latent vulnerability in a system that allows an error to occur; changing or correcting the root cause could help prevent the error from happening again.³ A root cause analysis, then, is a systematic approach to understanding the causes of an adverse event and identifying system flaws that can be corrected to prevent the error from happening again. After several reported incidents of awareness following intubation for bedside procedures, we undertook this root cause analysis of a case of awareness in a 48 yo man admitted with bleeding esophageal varices who required intubation for a bedside EGD and later described recall of the endoscopy. He described being unable to verbalize his feelings at the time of procedure. We also created a handoff tool to assist all clinicians involved in these intubations and procedures in the future in order to try and prevent these events from occurring.

OBJECTIVES

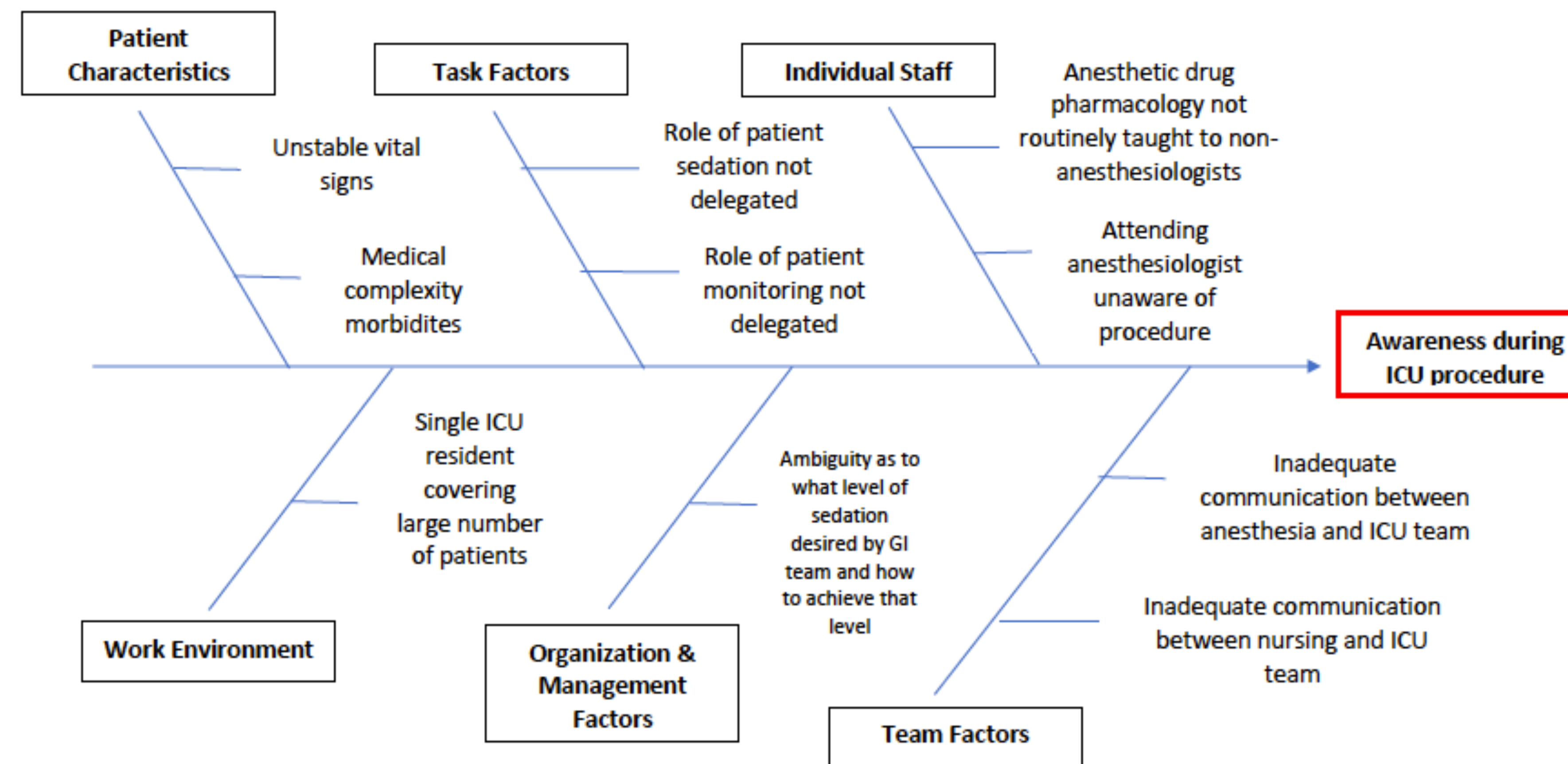
The objectives of this study are to: 1). perform root cause analysis of the systemic causes of an incident of awareness that occurred during bedside EGD and 2). create a handoff tool that is easily remembered that conveys the essential information about ICU intubations.

METHODS

The Epic record, including the intubation note, EGD note, all surrounding vital signs, nursing notes, and statements from the anesthesia, GI, and critical care physicians, as well as nurses, were reviewed. A fishbone diagram was generated using the information gathered.

RESULTS

Figure 1. Root causes of awareness during bedside EGD



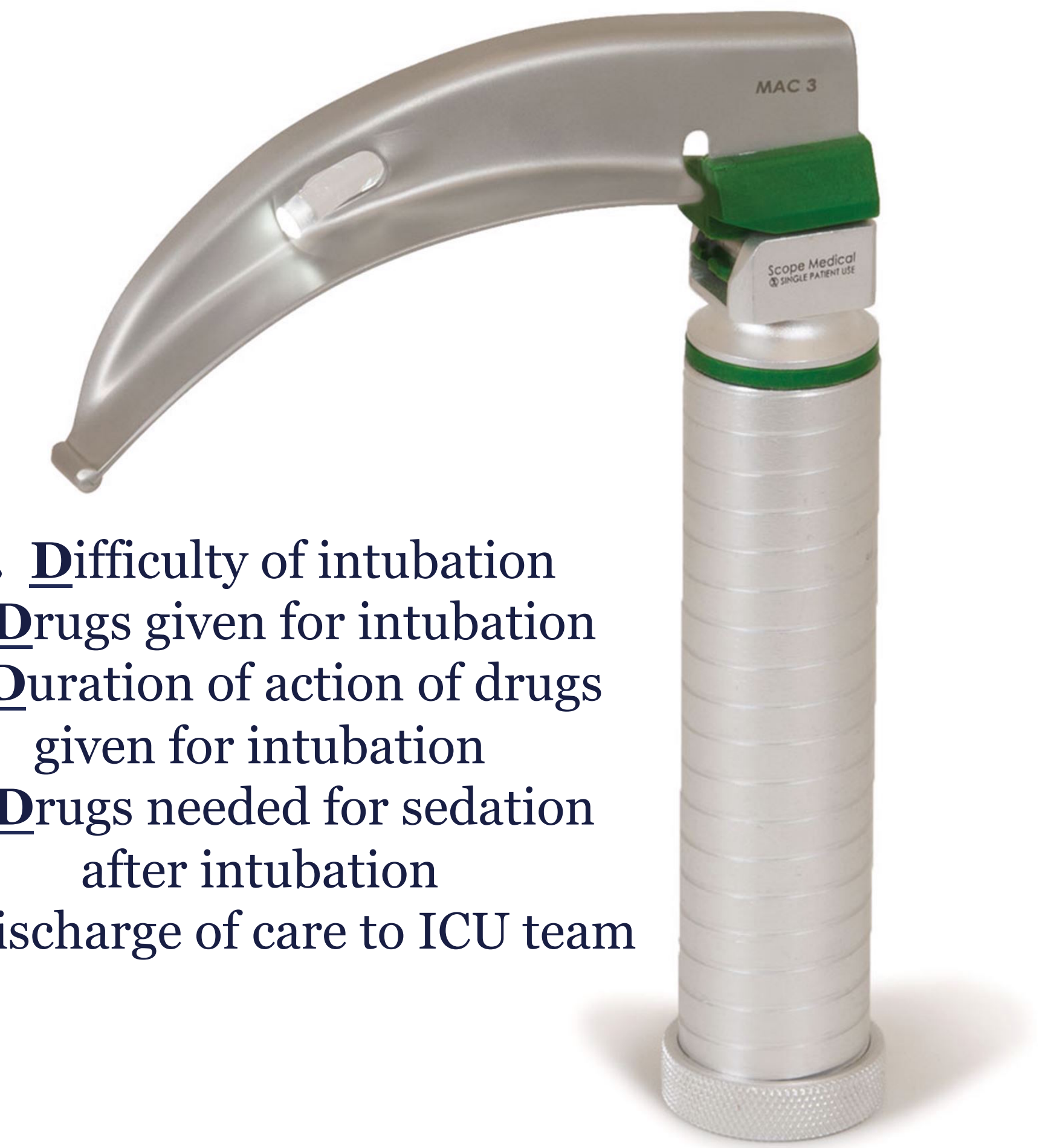
DISCUSSION

Our results demonstrated that ineffective communication as well as a lack of designation of tasks were the primary factors leading to awareness. Ineffective communication can contribute to preventable medical errors and communication during handoffs can be a particularly vulnerable time.⁴

These findings led to the development of a post-intubation handoff tool that will be implemented in the next three months (Figure 2). The use of this tool will be tracked through Epic and the departments of anesthesiology, internal medicine, and critical care physicians as well as critical care nurses will receive a description of the tool through email. Both the anesthesia provider who performed the intubation and the physician caring for the patient in the ICU will have to electronically acknowledge completion of the D5 handoff in Epic. Intubation notes in Epic not associated with a D5 handoff note will trigger an email to both the anesthesia provider and the primary resident or physician for that patient.

Figure 2. D5 ICU Post-Intubation Handoff Tool

D5 keeps patients asleep and alive



1. Difficulty of intubation
2. Drugs given for intubation
3. Duration of action of drugs given for intubation
4. Drugs needed for sedation after intubation
5. Discharge of care to ICU team

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