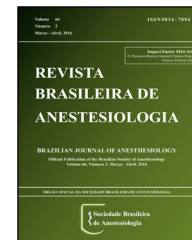




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## REVIEW ARTICLE

# Medication errors in anesthesia: unacceptable or unavoidable?

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### KEYWORDS

Medical errors;  
Patient safety;  
Drug errors;  
Quality improvement

**Abstract** Medication errors are the common causes of patient morbidity and mortality. It adds financial burden to the institution as well. Though the impact varies from no harm to serious adverse effects including death, it needs attention on priority basis since medication errors' are preventable. In today's world where people are aware and medical claims are on the hike, it is of utmost priority that we curb this issue. Individual effort to decrease medication error alone might not be successful until a change in the existing protocols and system is incorporated. Often drug errors that occur cannot be reversed. The best way to 'treat' drug errors is to prevent them. Wrong medication (due to syringe swap), overdose (due to misunderstanding or preconception of the dose, pump misuse and dilution error), incorrect administration route, under dosing and omission are common causes of medication error that occur perioperatively. Drug omission and calculation mistakes occur commonly in ICU. Medication errors can occur perioperatively either during preparation, administration or record keeping. Numerous human and system errors can be blamed for occurrence of medication errors. The need of the hour is to stop the blame – game, accept mistakes and develop a safe and 'just' culture in order to prevent medication errors. The newly devised systems like VEINROM, a fluid delivery system is a novel approach in preventing drug errors due to most commonly used medications in anesthesia. Similar developments along with vigilant doctors, safe workplace culture and organizational support all together can help prevent these errors.

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## PALAVRAS-CHAVE

Erros médicos;  
Segurança do  
paciente;  
Erros de  
medicamentos;  
Melhora da qualidade

## Erros de medicação em anestesia: inaceitável ou inevitável?

**Resumo** Os erros de medicação são as causas mais comuns de morbidade e mortalidade dos pacientes. Além disso, esses erros aumentam os encargos financeiros da instituição. Embora o impacto varie de nenhum dano a efeitos adversos graves, incluindo o óbito, é preciso estar atento à ordem de prioridades porque os erros de medicação são evitáveis. Na atualidade, com as pessoas cientes e os processos médicos em evidência, frear esse problema é de extrema prioridade. O esforço individual para diminuir os erros de medicação pode não obter sucesso até que uma mudança nos protocolos e sistemas existentes seja incorporada. Muitas vezes, os erros de medicação ocorridos não podem ser revertidos. A melhor maneira de “tratar” esses erros é impedi-los. Os erros de medicação (devido à troca de seringa), de overdose (devido a mal-entendido ou concepção da dose, mal uso de bomba e erro de diluição), de via de administração incorreta, de subdosagem e de omissão são causas comuns de erro de medicação que ocorrem no período perioperatório. A omissão e erros no cálculo de medicamentos ocorrem comumente em UTI. Os erros de medicação podem ocorrer no período perioperatório, tanto durante a preparação e administração quanto na manutenção de registros. Um grande número de erros humanos e do sistema pode ser responsabilizado pela ocorrência de erros de medicação. A necessidade do momento é parar o jogo da culpa, aceitar os erros e desenvolver uma cultura segura e “justa” para evitar os erros de medicação. Os sistemas recém-criados como o VEIN-ROM, um sistema de administração de líquidos, é uma nova abordagem na prevenção de erros de medicação devido aos medicamentos mais comumente usados em anestesia. Desenvolvimentos semelhantes, juntamente com médicos vigilantes, uma cultura de local de trabalho seguro e apoio organizacional, todos em conjunto podem ajudar a evitar esses erros.

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## Introduction

### “To err is human”

An anesthesiologist may inject up to half a million different drugs in his/her professional tenure. The chance of making an inadvertent error is easily fathomable. Anesthetized patients with unpredictable physiological reserves would not display or verbalize any symptoms that an awake patient would, such as hypotension, bronchospasm, arrhythmias or cardiac arrest. Any such error may cause irreversible damage/s. When patients consent for anesthesia, they trust that our training is adequate, judgment is uncompromised and competence validated. It is this responsibility for which we stand accountable.

Medication errors significantly augment the financial cost to human tragedy. Bates et al.<sup>1</sup> found that about two out of every 100 in-patients experience a preventable adverse drug event, resulting in an average increase of hospital costs by \$4700 per admission or about \$2.8 million annually for a 700 bed hospital. Therefore medical errors should be priority as an urgent, critical, and widespread public health problem. Systems need to be engineered to reduce the likelihood of medication misidentification through approaches such as revision of standards for labeling of drug ampoules and vials and the development of advanced electronic/digital mechanisms that allow “double-checking” or drug verification in the operating room.<sup>2</sup>

More people die from medical errors than motor vehicle accidents, breast cancer, or HIV, but unfortunately these

statistics never appropriately figure in public media or deliberations. A few horrific cases of erroneous drug administration do make the news headlines, either because they involve a celebrity or due to their egregious nature. Unfortunately, they constitute only the tip of the iceberg. The objective of this review is to discuss safety while administering drugs to patients under anesthesia.

### Incidence

With an aim to establish the frequency and nature of drug administration in anesthesia, Webster et al.<sup>3</sup> performed a study based on 7794 anesthesiologist responses from two hospitals. They documented that the frequency of drug administration error (of any type) per anesthetic case was 0.0075 (0.75% or 1 per 133 anesthetics) with the two largest categories of errors involving incorrect doses (20%) and substitutions (20%), hence concluding that ADE (adverse drug effects) during anesthesia is considerably more frequent than previously reported.

Sakaguchi et al.<sup>4</sup> studied the incidence of anesthesia related medication errors in a university hospital in Japan over 15 years and based on 64,285 anesthesia cases concluded that drug errors occurred in only 50 cases (0.078%), much lower from earlier reported incidence. The reported drugs were most commonly opioids, cardiac stimulants and vasopressors; syringe swap the leading cause of errors and interestingly, the responsible anesthesiologists most likely being doctors with little experience.

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