

Perianesthetic dose calculation errors by veterinary students during a live animal teaching laboratory

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Performing drug dose calculations is a fundamental skill in veterinary medicine. Calculation errors and errors in filling a syringe are the greatest contributors to medication errors in veterinary anesthesia (Pinho et al. 2024). This study aimed to evaluate the incidence and characteristics of drug dose calculation errors made by veterinary students during a live animal spay-neuter teaching laboratory session.

A prospective observational study during a spay-neuter teaching laboratory session with third-year veterinary students (n = 53) was performed. A deferred informed consent process was employed to minimize bias associated with prior knowledge of the study's objectives. Anesthesia protocols prepared for 83 dogs and cats were analyzed. For each protocol, students selected and calculated doses for drugs used in premedication, anesthetic induction and maintenance, analgesia, antimicrobial therapy, local anesthesia, and cardiovascular support. A supervising anesthetist reviewed the selected drugs, doses, and volumes, identifying and correcting any errors before drug preparation. Data were analysed descriptively to determine the incidence of drug dose calculation errors, the drugs involved, and the magnitude and direction of errors (overdose or underdose).

A total of 686 drug doses were calculated for 83 dogs and cats. Twelve dose calculation errors were identified across nine anesthesia protocols, resulting in a protocol error rate of 10.8% (9/83) and an overall drug dose calculation error rate of 1.8% (12/686). The drugs involved were ephedrine (33.3%; 4/12), glycopyrrolate (25%; 3/12), dexmedetomidine (16.7%; 2/12), acepromazine, lidocaine, and midazolam (8.3%; 1/12 each). Most errors (83.3%; 10/12) would have resulted in overdoses, while two errors (16.7%; 2/12) would have caused underdoses.

Drug dose calculation errors are common during the planning of anesthetic protocols by veterinary students and may pose significant risks to patient safety. These findings highlight the importance of implementing strategies to reduce error rates, such as independent double-check of calculations before drug preparation.

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Reference

Pinho RH, Tscheng D, Cheema JS, Pang DSJ (2024). Incidence and type of voluntary reported perianesthetic medication errors in community veterinary clinics in Calgary, Canada. *Am J Vet Res* 85, 1–8.