

Is there scope to refine emesis induction protocols to improve animal welfare in companion animal practice?

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1.1 Background

Awareness of the potential iatrogenic harms of veterinary care have increased, with concerns that routine veterinary care may cause, exacerbate or perpetuate fear, anxiety and stress¹. Researchers working with laboratory animals are obligated to refine their practices². While there is no explicit mandate for veterinarians in private practice to do the same, there are expectations of veterinary clients and veterinary team members – including other veterinary team members – that veterinarians seek to minimise negative affective states, while promoting positive affective states among companion animal patients³. As such, there is scope to refine common practices in primary care.

Veterinarians are frequently required to induce emesis in dogs and cats as a first-line of treatment for the ingestion of selected potential toxicants or foreign bodies⁴. This may prevent further absorption or distribution of a potentially harmful substance, or eliminate a foreign body before it causes gastrointestinal obstruction or trauma⁵.

However, the process of inducing emesis may lead to negative affective states. For example, nausea is an unpleasant subjective experience in human patients and reflects a negative affective state in animals^{6,7}. It is associated with the urge to vomit, even where vomiting does not occur. Human patients report nausea as a worse subjective experience than vomiting itself⁶. An unintended but expected consequence of induction of emesis in cats and dogs, nausea could lead to aversion to veterinary settings. Refinement of emesis induction involves eliminating or more realistically mitigating negative affective states. But to refine a procedure or protocol, baseline data about how that procedure is carried out is required to identify areas for improvement.

1.2 How is induction of emesis carried out by Australian veterinarians?

We administered an anonymous, online survey of Australian veterinarians relating to practices associated with induction of emesis in dogs and cats. The methodology and complete results of this study were published earlier this year⁸, thus only key results will be summarised here. Briefly, the most common protocols utilised to induce emesis were subcutaneous injection of apomorphine (n = 310/316, 98.1%) in dogs and intramuscular injection of dexmedetomidine or medetomidine (n = 79/128, 61.7%) in cats. Respondents had less success (n = 74/128, 57.8%) inducing emesis in cats compared with dogs (n = 312/316, 98.7%) ($P \leq 0.001$). Sedation was the most reported adverse effect for both species.

The subconjunctival route of apomorphine was found to significantly increase the risk of adverse effects in dogs (notably ocular adverse effects including corneal ulcers), compared

with the subcutaneous route ($P = 0.03$). Antiemetics were more frequently administered to dogs than cats. Veterinarians with under 5 years' experience were significantly more likely to use an antiemetic drug when inducing vomiting in dogs ($P = 0.05$) compared with veterinarians with 31 or more years of experience.

In free-text responses, 4.2% ($n = 6/142$) mentioned ocular adverse effects following subconjunctival administration of apomorphine in dogs. Several ($n = 18/142$, 12.7%) reported challenges or frustrations associated with induction of emesis in cats. Almost one in ten ($n=13/142$, 9.2%) respondents reported that they resorted to "spinning cats" on chairs following emetic administration to exacerbate/stimulate nausea and subsequent vomiting.

1.3 Potential refinement of emesis induction protocols based on our findings

- i. Carefully consider whether induction of emesis is indicated. The decision to induce emesis should be based on a risk assessment following a history and clinical examination (including current body weight of the patient). The risk assessment should consider the substance or item ingested, the potential dose in the case of toxicant(s), the time of ingestion and whether or not gastrointestinal decontamination is appropriate⁹. For potential foreign body ingestion, imaging may be useful to screen the patient (depending on the item ingested) prior to induction of emesis.
- ii. Avoid subconjunctival administration of apomorphine where possible. There are alternative routes of administration of apomorphine, including intravenous, subcutaneous or – recently described – intranasal¹⁰, that do not run the risk of potential ocular irritation or corneal ulceration and therefore these routes should be used preferentially, unless a safer and equally efficacious means of ocular administration is developed. While ocular ropinirole has been found to be an effective emetic in dogs, apomorphine was found to be clinically superior, with a higher first-dose emetic success rate, shorter median time to first emetic event, decreased minor adverse events, and a lower frequency of protracted vomiting¹¹.
- iii. Consider alternative protocols for inducing emesis in cats. The use of spinning as an adjunct to administration of emetic agents is likely to lead to fear, anxiety and stress in cats, and runs the risk of physical injury if cats fall off the chair. Furthermore, spinning cats in carriers may lead to aversion of the carrier, which could negatively impact future veterinary visits. Dexmedetomidine has been reported to be more effective at inducing emesis than xylazine^{12,13}. Hydromorphone was effective at inducing emesis in 75% of cats compared with 58% for dexmedetomidine, though the difference was not statistically significant and the study – though robustly designed - involved only 12 cats¹⁴.
- iv. Administer an antiemetic once the objective of emesis induction has been achieved. This can reduced unnecessary vomiting and the duration of nausea, which can be aversive. Furthermore, where appropriate, offering treats or other reward may help promote positive affective states in patients that accept these.

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