

# Effects of Noise in the Operating Room

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## In the Literature

Dornbusch J, Boston S, Colee J. Noise levels in veterinary operating rooms and factors that contribute to their variations. *Vet Surg.* 2018;47(5):678-682.

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## FROM THE PAGE ...

The operating room (OR) can be loud, with noise arising from sources such as power tools, monitoring equipment, forced air blankets, music, human traffic, and conversation. Nonporous surfaces necessary for hygiene in OR environments can prolong noises generated from other sources because sound waves are reflected.

Increased noise in the OR has been associated with detrimental effects on communication, surgeon focus, veterinary staff stress, and incidence of complications and infections.<sup>1-3</sup> The World Health Organization has noted that consistent recognition of speech in relaxed conversation is possible at noise levels of 45 dBA and subsequently recommends that workplace noise levels do not exceed 55 dBA.<sup>3</sup> High background noise can be stressful and has been correlated with higher endogenous cortisol levels in surgeons.<sup>4</sup>

In this study, the mean, median, and maximum noise levels during 77 surgeries at an academic teaching hospital were recorded. Overall mean, median, and maximum decibel levels were 71.7 dBA, 69.4 dBA, and 90.3 dBA, respectively. Neurologic procedures had significantly higher mean and median decibel levels, presumably due to use of surgical power tools. Music significantly increased mean and median decibel levels (mean, 73.3 dBA with music vs 70.6 dBA without music; median, 71.3 dBA with music vs 68.2 dBA without music). Neither number of humans present nor number of staff members scrubbed in for a procedure significantly affected decibel levels.<sup>5</sup>

These results demonstrated decibel levels that substantially exceeded World Health Organization recommendations. To avoid risking miscommunication, verbal communication in this environment would need to exceed normal speaking volume. Although this study did not evaluate effects of high noise levels on outcomes such as complication rates or stress levels, the decibel levels measured were high enough to affect veterinary staff stress, based on results of a previous study.<sup>4</sup> In addition, music was associated with significantly higher noise levels, representing a controllable, if controversial, source of noise.

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## ... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** Taking inventory of sources of noise in the OR and subsequently considering ways to lower the noise volume (eg, setting monitors at a lower volume) is recommended.
- 2** Turning down the music volume and polling staff should be considered. Asking staff to note their perceived level of stress or calm before and after the volume is reduced, then evaluating the need for raised voices, the frequency of repeated requests, and whether staff relax after a source of noise is eliminated can be helpful in determining the effect of noise in an OR.
- 3** A quiet environment should be created throughout the practice. Concentration, communication, and calm are key elements of a successful veterinary practice. Where possible, discussing and reducing unnecessary noise in the practice environment may provide a subtle yet substantive benefit.

## References

1. Cheriyan S, Mowery H, Ruckle D, et al. The impact of operating room noise upon communication during percutaneous nephrostolithotomy. *J Endourol.* 2016;30(10):1062-1066.
2. Dholakia S, Jeans JP, Khalid U, Dholakia S, D'Souza C, Nemeth K. The association of noise and surgical-site infection in day-case hernia repairs. *Surgery.* 2015;157(6):1153-1156.
3. World Health Organization. Guideline values. In: Berglund B, Lindvall T, Schwela DH, eds. *Guidelines for Community Noise.* <http://www.who.int/docstore/peh/noise/Comnoise-4.pdf>. Published 1999. Accessed October 19, 2018.
4. Engelmann CR, Neis JP, Kirschbaum C, Grote G, Ure BM. A noise-reduction program in a pediatric operation theatre is associated with surgeon's benefits and a reduced rate of complications: a prospective controlled clinical trial. *Ann Surg.* 2014;259(5):1025-1033.
5. Dornbusch J, Boston S, Colee J. Noise levels in veterinary operating rooms and factors that contribute to their variations. *Vet Surg.* 2018;47(5):678-682.

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# Credelio™ (lotilaner)

## Chewable Tablets

### For oral use in dogs

#### Caution:

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Before using Credelio, please consult the product insert, a summary of which follows:

#### Indications:

CREDELIO kills adult fleas and is indicated for the treatment of flea infestations (*Ctenocephalides felis*) and the treatment and control of tick infestations (*Amblyomma americanum* [lone star tick], *Dermacentor variabilis* [American dog tick], *Ixodes scapularis* [black-legged tick] and *Rhipicephalus sanguineus* [brown dog tick]) for one month in dogs and puppies 8 weeks of age and older, and weighing 4.4 pounds or greater.

#### Dosage and Administration:

CREDELIO is given orally once a month, at the minimum dosage of 9 mg/lb (20 mg/kg). See product insert for complete dosing and administration information.

#### Contraindications:

There are no known contraindications for the use of CREDELIO.

#### Warnings:

Not for human use. Keep this and all drugs out of the reach of children.

#### Precautions:

The safe use of CREDELIO in breeding, pregnant or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures (see Adverse Reactions).

#### Adverse Reactions:

In a well-controlled U.S. field study, which included 284 dogs (198 dogs treated with CREDELIO and 86 dogs treated with an oral active control), there were no serious adverse reactions.

Over the 90-day study period, all observations of potential adverse reactions were recorded. Reactions that occurred at an incidence of 1% or greater are presented in the following table.

#### Dogs with Adverse Reactions in the Field Study

Adverse Reaction (AR)	CREDELIO Group: Number (and Percent) of Dogs with the AR (n=198)	Active Control Group: Number (and Percent) of Dogs with the AR (n=86)
Weight Loss	3 (1.5%)	2 (2.3%)
Elevated Blood Urea Nitrogen (BUN)	2 (1.0%)*	0 (0.0%)
Polyuria	2 (1.0%)*	0 (0.0%)
Diarrhea	2 (1.0%)	2 (2.3%)

\*Two geriatric dogs developed mildly elevated BUN (34 to 54 mg/dL; reference range: 6 to 31 mg/dL) during the study. One of these dogs also developed polyuria and a mildly elevated potassium (6.5 mEq/L; reference range: 3.6 to 5.5 mEq/L) and phosphorus (6.4 mg/dL; reference range: 2.5 to 6.0 mg/dL). The other dog also developed a mildly elevated creatinine (1.7 to 2.0 mg/dL; reference range: 0.5 to 1.6 mg/dL) and weight loss.

In addition, one dog experienced intermittent head tremors within 1.5 hours of administration of vaccines, an ear cleaning performed by the owner, and its first dose of CREDELIO. The head tremors resolved within 24 hours without treatment. The owner elected to withdraw the dog from the study.

In an Australian field study, one dog with a history of seizures experienced seizure activity (tremors and glazed eyes) six days after receiving CREDELIO. The dog recovered without treatment and completed the study. In the U.S. field study, two dogs with a history of seizures received CREDELIO and experienced no seizures throughout the study.

In three well-controlled European field studies and one U.S. laboratory study, seven dogs experienced episodes of vomiting and four dogs experienced episodes of diarrhea between 6 hours and 3 days after receiving CREDELIO.

To report suspected adverse events, for technical assistance or to obtain a copy of the Safety Data Sheet (SDS), contact Elanco US, Inc. at 1-888-545-5973. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

#### Effectiveness:

In well-controlled European laboratory studies, CREDELIO began to kill fleas four hours after administration or infestation, with greater than 99% of fleas killed within eight hours after administration or infestation for 35 days. In a well-controlled U.S. laboratory study, CREDELIO demonstrated 100% effectiveness against adult fleas 12 hours after administration or infestation for 35 days.

In a 90-day well-controlled U.S. field study conducted in households with existing flea infestations of varying severity, the effectiveness of CREDELIO against fleas on Days 30, 60 and 90 compared to baseline was 99.5%, 100% and 100%, respectively. Dogs with signs of flea allergy dermatitis showed improvement in erythema, papules, scaling, alopecia, dermatitis/pyodermitis and pruritus as a direct result of eliminating fleas.

In well-controlled laboratory studies, CREDELIO demonstrated > 97% effectiveness against *Amblyomma americanum*, *Dermacentor variabilis*, *Ixodes scapularis* and *Rhipicephalus sanguineus* ticks 48 hours after administration or infestation for 30 days. In a well-controlled European laboratory study, CREDELIO started killing *Ixodes ricinus* ticks within four hours after administration.

#### Storage Information:

Store at 15-25°C (59-77°F), excursions permitted between 5 to 40°C (41 to 104°F).

#### How Supplied:

CREDELIO is available in five chewable tablet sizes for use in dogs: 56.25, 112.5, 225, 450, and 900 mg lotilaner. Each chewable tablet size is available in color-coded packages of 1 or 6 chewable tablets.

NADA #141-494, Approved by the FDA

Manufactured for:

Elanco US Inc

Greenfield, IN 46140 USA

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