

Proposal

i. Brief Introduction

Hospitalization in a veterinary intensive care unit (ICU) exposes dogs to a highly stimulating environment characterized by frequent handling, alarms, equipment noise, and continuous activity. These factors can contribute to fear, anxiety, and stress, which may negatively affect patient welfare, physiologic stability, and recovery. While pharmacologic interventions are commonly used to manage anxiety in hospitalized patients, they may be contraindicated or undesirable in critically ill dogs and do not address environmental contributors to stress.

ii. Problem Description and Significance

Noise reduction has been identified as an important but underexplored strategy for improving animal welfare in clinical settings. In human medicine, environmental modifications aimed at reducing auditory stimulation have been associated with improved patient comfort and outcomes, yet comparable data in veterinary critical care are limited. Wearable noise-dampening devices represent a simple, non-invasive approach that could be readily integrated into hospital workflows.

iii. Hypothesis and Objectives

This study aims to evaluate whether the use of noise-dampening headphones in a busy veterinary ICU reduces observable anxiety in hospitalized dogs compared with standard care. Additionally, the study will characterize ambient ICU noise levels to better understand their relationship with patient stress. Findings from this work may inform practical, low-risk strategies to improve canine welfare during hospitalization.

The use of noise-dampening headphones in hospitalized dogs will result in significantly lower behavioral indicators of fear, anxiety, and stress, compared with standard ICU care without headphones. Additionally, higher ambient ICU noise levels will be associated with increased anxiety scores, and the anxiolytic effect of the headphones will be greatest during periods of elevated environmental noise.

iv. Study Design and Methods

We will conduct a 6-week, prospective, pragmatic trial in a busy veterinary ICU using a within-dog, randomized, counterbalanced crossover design. Approximately 25–30 client-owned dogs hospitalized in the ICU for ≥ 24 hours will be enrolled. Dogs will be excluded if safe headphone placement is not possible (e.g., painful ear disease, head wounds, or severe agitation). Owner consent will be obtained prior to participation.

Each enrolled dog will complete two supervised 60-minute observation blocks per study day: Headphones ON (H-ON) and Headphones OFF (H-OFF). Block order will be randomized daily

(AB/BA). A washout period of ≥ 60 minutes, or longer until baseline is re-established, will separate blocks. Baseline will be considered re-established when the Fear, Anxiety, and Stress (FAS) score returns within ± 0.5 of the pre-Block 1 value (and heart rate/respiratory rate within $\pm 10\%$ when available).

At the start of each block (T0), FAS, heart rate, and respiratory rate will be recorded, followed by FAS and behavioral ethogram scoring every 10 minutes; heart and respiratory rates will be recorded at 30 and 60 minutes. Medication administration, procedures, and notable environmental events will be documented throughout.

Role of the Veterinary Student:

The veterinary student will play a central role in the execution and dissemination of this study. Under faculty supervision, the student will be responsible for day-to-day study conduct, including patient enrollment, application and monitoring of the headphones, behavioral scoring, and data collection. The student will oversee data organization and preliminary analysis. They will serve as the primary author of the resulting manuscript, leading data interpretation and manuscript preparation with mentorship from the investigative team.