

Clinical Sedation of Alaskan Phocid Seals

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Historically, veterinary handling of phocid seals has been challenging due to their tendency to become apneic under chemical restraint, poor mobilization of chemical compounds in metabolically inactive tissue, resistance to voluntary induction with isoflurane gas, and anatomical considerations when intubating. This long-standing problem in marine mammal medicine has limited routine health assessments and treatment for seals living under human care, or else resulted in increased mortality from necessary clinical procedures, wildlife response activities, and research handling of wild seals. However, the advent of new drugs over the past 20 years with consistently reliable absorption and significantly reduced respiratory depression has allowed for improved safety during sedation of seals, with the added benefit of direct antagonists as reversal agents. Here, we describe sedation protocols for Alaskan seals, spotted (*Phoca largha*), ringed (*Pusa hispida*), and bearded (*Erignathus barbatus*) seals treated in a clinical setting at the Alaska SeaLife Center, Seward, AK. A total of 83 successful sedation procedures were conducted with sick seals handling during rehabilitation, and healthy seals handled for sampling and diagnostic procedures. Sedation protocols were optimized for individual animals, procedures, circumstances, and species and refined over five years. In most cases, a combination of Midazolam (range 0.15-0.55 mg/kg) and Butorphanol (range 0.15-0.7mg/kg) delivered via intramuscular injection was used to induce sedation for up to 2.5 h. Typically, sedation was discontinued with an intramuscular injection of Naltrexone. This reversal agent, which acts as both a direct antagonist for Butorphanol and a competitive antagonist for Midazolam, allowed for a smooth, calm recovery and immediate improvement in respiratory rate and oxygenation. The development of chemical sedation protocols in well controlled, clinical settings has enabled safe and predictable examination, sampling, and diagnostics of phocid seals, including Arctic species for which few veterinary data are available.