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*Can eye surface temperature be used to indicate a stress response in harbour seals (*Phoca vitulina*)?*

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Abstract

*Infra-red thermography (IRT) is increasingly being used to estimate physiological stress responses in animals via changes in eye surface temperature. The aim of this study was to determine whether eye temperature of harbour seals (*Phoca vitulina*) changes in response to routine handling and the potentially painful procedure of flipper-tagging, and if responses to tagging can be mitigated by subcutaneous injection of lidocaine. Orphaned pups (n = 52) at a rehabilitation facility were assigned to one of four treatments: Lidocaine (handled twice, once for injection and once for tagging); Saline (also handled twice); Tag Only (handled once); Sham Tag (handled once). Eye temperature increased more when pups were first handled compared to pups that were not handled and increased further in pups that underwent a second handling. Eye temperature of pups that were tagged without any previous treatment (Tag Only) increased compared to pups that were sham-tagged. Eye temperature also tended to increase after pups were injected with lidocaine but not saline. These results suggest that: (i) handling causes a physiological stress response; (ii) increased eye temperature arising from the second handling suggests the first handling was likely aversive, resulting in sensitisation to further handling; (iii) the rise in eye temperature after tagging, but not sham-tagging, may reflect pain from tagging; and (iv) lidocaine, at the dosage tested, did not appear to reduce the physiological response to tagging. These results show promise for the use of eye temperature to monitor stress responses and for evaluating the potential aversiveness of routine procedures in seals.*

Keywords: *animal welfare, eye temperature, handling, harbour seal, pain, stress response*