

## Can the parasympathetic tone activity (PTA) monitor be used in ferrets?

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Monitoring the Parasympathetic Tone Activity (PTA) index (0 – 100) is a non-invasive, real-time analysis of nociception in animals undergoing general anaesthesia based on heart rate variability; PTA indices > 50 suggest the absence of nociception.

Three ferrets presented for dental surgery (n = 2) and laparotomy (n = 1) were monitored using the PTA index additionally to multi parameter monitoring. Premedication was based on an  $\alpha$ 2-agonist, plus opioid SC (n = 2) and IV (n = 1) protocol. One ferret received additional ketamine SC. Induction was performed either with propofol (n = 2) or alfaxalone (n = 1) IV. Maintenance consisted of isoflurane inhalant and dexmedetomidine continuous rate infusion (n = 2) or a total intravenous anaesthesia protocol with propofol, lidocaine and fentanyl (n = 1). Dental cases received an infraorbital and inferior alveolar block while in the laparotomy a splash block was performed.

Events with a decrease in PTA index < 50 together with a hemodynamic reaction (n = 1) as well as drops in PTA numbers without hemodynamic reaction (n = 7) were recorded (based on either the absence of local blocks on one side, inflammatory processes or breakthrough nociception). There were either an association with surgical stimulation (n = 4), technical issues (n = 1) or superficial plane of anaesthesia (n = 2). Last one included high jaw tone, tongue movement, HR > 180 beats minute<sup>-1</sup> and MAP > 91 mmHg, but no nociceptive manipulation. Increases in the PTA index > 55 were observed either following fentanyl boli administration or increasing depth of anaesthesia with isoflurane and dexmedetomidine infusion.

The PTA index as used in this case series could serve as a valuable additional tool for evaluating nociception or too light plane of anaesthesia, aimed at ensuring animal welfare in exotic species with limited available data.

### References

Ruíz-López P, Domínguez JM, Mar Granados M. (2020) Intraoperative nociception-antinociception monitors: A review from the veterinary perspective. *Vet Anaes and Anal.* 47, 162-159

Van Zeeland Y, Schoemaker NJ. (2023) Pain Recognition in Ferrets. *Vet Clin Exot Anim.* 26, 229-24

MDoloris Medical Systems. (2017). PTA monitor® [Medical device]. Lille, France. Retrieved from <https://www.mdoloris.com/products-mdoloris/pta-monitor/> [Accessed 28 Jan 2025].