



## **A Reference Source for Analgesia & Analgesics in Animals**

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**AWIC Series, 2000-02  
December 2000**

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**Preface**

One of the major requirements of the Animal Welfare Act is to ensure that steps are taken to minimize pain and distress in animals insofar as allowed by the approved research protocol. Exceptions to this requirement must be scientifically justified by the investigator, in writing, and approved by the Institutional Animal Care and Use Committee (IACUC). (Section 13 (a)(3)). One of the methods used to accomplish this requirement is the provision of adequate veterinary care for the animals including the appropriate use of anesthetics, analgesics, tranquilizers or euthanasia.

The Animal Welfare Information Center (AWIC) was established by the 1985 amendments to the Act (Sect. 13(e)) and is required, by law, to provide specific information to the research community. As stated above, one of these requirements is minimizing pain or distress in the animals used in research when possible. This publication provides a list of published reference sources on analgesia and the use of analgesics in animals. While this publication is not meant to be a complete resource on the subject of analgesia and analgesics in animals it is hoped that it will be useful to those involved with animal research and will be of assistance to the investigators, veterinarians, and in the reduction of pain and distress to these animals.

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USDA, NAL, AWIC

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### General

NAL Call no: 472 N21

Descriptors: pain initiation, control.

BioSciences Information Service, (1992), **Analgesic Drugs: Pharmaceutical Studies**. Published Search. BioScience Information Service, Philadelphia, PA. Sponsored in part by National Technical Information Service, Springfield, VA. Jul. 1992, 250 citations.

Close, B.; Banister, K.; Baumans, V.; Bernoth, E.M.; Bromage, N.; Bunyan, J.; Erhardt, W.; Flecknell, P.; Gregory, N.; Hackbarth, H.; Morton, D.; Warwick, C., (1996), **Recommendations for euthanasia of experimental animals: Part 1**. DGXI of the European Commission. *Laboratory Animals*. London: Royal Society of Medicine Services. 1996, Oct. v. 30 (4), p. 293-316. ISSN: 0023-6772. NAL Call no: QL55.A1L3  
Descriptors: experimental animals, euthanasia.

Booth, N.H., (1988), **Neuroleptanalgesics, narcotic analgesics, and analgesic antagonists**. *Veterinary Pharmacology and Therapeutics*. Edited by Nicholas H. Booth, Leslie E. McDonald, 6<sup>th</sup> ed. Ames Iowa: Iowa State University Press, p. 290-328. ISBN: 0813817390. Ref. NAL Call no: SF915.J6 1988  
Descriptors: laboratory animals, wild animals, domestic animals, drugs, antagonists.

Close, B.; Banister, K.; Baumans, V.; Bernoth, E.M.; Bromage, N.; Bunyan, J.; Erhardt, W.; Flecknell, P.; Gregory, N.; Hackbarth, H.; Morton, D.; Warwick, C., (1997), **Recommendations for euthanasia of experimental animals: Part 2**. DGXT of the European Commission. *Laboratory Animals*. London: Royal Society of Medicine Services. 1997, Jan. v. 31 (1), p. 1-32. ISSN: 0023-6772. NAL Call no: QL55.A1L3  
Descriptors: experimental animals, euthanasia, laboratory animals.

Boothe, D.; Tranquilli, W.; Radasch, R., (1998), **Overview of pain management options**. *Proceedings North American Veterinary Conference*. (Gainesville, FL): Eastern States Veterinary Association. 1992-1998, v. 12, p. 571-573. Meeting held Jan. 10-14, 1998, Orlando, FL. Incl. Ref. NAL Call no: SF605.N672  
Descriptors: pain management, options, overview.

Cooper, J.E., (1994), **Anesthesia and Analgesia**. *Proceedings North American Veterinary Conference*. Gainesville, FL: Eastern States Veterinary Association. 1992, 1994. p. 895-896. Meeting held Jan. 15-20, 1994, Orlando, FL. Ref. NAL Call No: SF605.N672  
Descriptors: pain, control, relief.

Calignano, A.; La-Rana, G.; Giuffrida, A.; Piomelli, D., (1998), **Control of pain initiation by endogenous cannabinoids**. *Nature*. London: Macmillan Magazines Ltd. Jul. 16, 1998, v. 394 (6690), p. 277-280. ISSN: 0028-0836.

Cote, E., (1998), **Over-the-counter human medications in small animals. II. Analgesic, respiratory, and dermatologic drugs.** *Compendium on continuing education for the practicing veterinarian.* Trenton, NJ: Veterinary Learning Systems. Jul. 1998, v. 20 (7), p. 791-808, 829. ISSN: 0193-1903.  
NAL Call no: SF601.C66  
Descriptors: over-the-counter-drugs, analgesics, respiratory, dermatologic.

Davis, L.E., (1983), **Species differences in drug disposition as factors in alleviation of pain.** *Animal pain: Perception and alleviation.* Kitchell, R.L. and Erickson, H.H., eds. American Physiological Society, Bethesda, MD. 1983: i-x. p. 1-222, Chapter pagination: 161-178, ill.  
NAL Call no: QP451.4.A54  
Descriptors: alleviation of pain, species differences.

De-Leon-Casasola, Oscar A.; Lema, Mark J., (1996), **Postoperative epidural opioid analgesia: What are the choices?** Roswell Park Cancer Inst., Buffalo, N.Y., *Anesthesia and Analgesia.* 1996, v. 83 (4), p. 867-875. Literature review. ISSN: 0003-2999.  
Descriptors: postoperative analgesia, opioid.

Eldor, J., (1995), **Combined-spinal-epidural-general anesthesia.** *Medical-Hypotheses.* 1995, v. 45 (1), p. 86-90. ISSN: 0306-9877.  
Descriptors: anesthesia, spinal-epidural, combined.

Flecknell, P.A.; Molony, V., (1997), **Pain and injury.** *Animal welfare.* Wallingford, Oxon, UK: CAB International, c1997. p. 63-73. ISBN: 0851991807.  
NAL Call no: HV4711.A587 1997  
Descriptors: animals, pain, trauma.

Flecknell, P.A.; Liles, J.H.; Wolliamson, H.A., (1990), **The use of lignocaine-prilocaine local anaesthetic cream for pain-free venepuncture in laboratory animals.** *Laboratory Animals.* London: Royal Society of Medicine Services. Apr. 1990, v. 24 (2), p. 142-146. ISSN: 0023-6772. Ref.  
NAL Call no: QL55.A1L3  
Descriptors: laboratory animals, local anaesthetics, ointments, lidocaine.

Flecknell, P.A., (1987), **Anaesthetic breathing circuits for small laboratory animals.** *Animal Technology.* Journal of the Institute of Animal Technology. Apr. 1987, v. 38 (1), p. 1-8. Ill. Ref. ISSN: 0264-4754.  
NAL Call no: QL55.I5  
Descriptors: laboratory animals, anaesthetics, breathing, techniques.

Flecknell, P.A., (1985), **The management of post-operative pain and distress in experimental animals.** *Animal Technology.* Journal of the Institute of Animal Technology. Nov. 1985, v. 36 (2), p. 97-103. ISSN: 0264-4754. Ref.  
NAL Call no: QL55.I5  
Descriptors: laboratory animals, pain, improvement, analgesics, anesthetics.

Flecknell, P.A., (1994), **Refinement of animal use - assessment and alleviation of pain and distress.** *Laboratory Animals.* London: Royal Society of Medicine Services. 1994, July, v. 28 (3), p. 222-231. ISSN: 0023-6772.

NAL Call no: QL55.A1L3  
Descriptors: pain, distress, assessment, alleviation, animals.

Flecknell, P. A., (1993), **Anaesthesia of animals for biomedical research.** *British Journal of Anaesthesia.* Dec. 1993, v. 71 (6), p. 885-894. ISSN: 0007-0912. Ref.  
Descriptors: anaesthesia, methods, laboratory animals, anaesthetic administration, dosage.

Flecknell, P.A., (1993), **Anaesthesia and perioperative care.** *Methods in Enzymology.* 1993, v. 225, p. 16-33. ISSN: 0076-6879.  
NAL Call no: QP601.M49  
Descriptors: anaesthesia, administration, dosage, animals, surgery.

Gaynor, J.S., (1999), **Pain management: Ensuring a fair profit from a valuable service.** *Veterinary Medicine.* Lenexa, KS: Veterinary Medicine Publishing Group. Apr. 1999, v. 94 (4), p. 358-361. Incl. ref. ISSN: 8750-7943.  
NAL Call no: 41.8 M69  
Descriptors: pain management, profit, service.

Gleed, Robin; Seymor, Chris, (1999), *Manual of small animal anaesthesia and analgesia.* 2<sup>nd</sup> ed. Cheltenham: British Small Animal Veterinary Association. 1999, 312 p., ill. ISBN: 090521448X.  
NAL Call no: SF914 B25 1999  
Descriptors: small animal, anaesthesia, analgesia.

Hansen, B., (1996), **Epidural anesthesia and analgesia.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1996, v. 10, p. 429-431.  
NAL Call no: SF605.N672  
Descriptors: epidural, analgesia, anesthesia.

Hansen, B., (1996), **Analgesic therapy in the critical ill.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1996, v. 10, p. 427-428.  
NAL Call no: SF605.N672  
Descriptors: analgesia, therapy, critical ill.

Hardie, Elizabeth, M.; Kyles, Andrew E., (1995), **Pharmacological management of pain in the surgical oncology patient.** *Veterinary Clinics of North America Small Animal Practice.* 1995, v. 25 (1), p. 77-96. ISSN: 0195-5616.  
NAL Call no: SF601.V523  
Descriptors: pain, surgical, oncology, management.

Heard, Darryl J., (1997), **Anesthesia and analgesia.** Wildlife & Zoological Medicine Service, College of Veterinary Medicine, University of Florida, Gainesville, FL. *Avian medicine and surgery.* W.B. Saunders Co., Philadelphia, London etc. 1997: i-xv, 1-1070, Chapter pagination: 807-827, ill. ISBN: 0721654460.  
NAL Call no: SF994.A95 1997  
Descriptors: anesthesia, analgesia.

Heard, Darryl J., (1993), **Principles and techniques of anesthesia and analgesia for exotic practice.** *Veterinary Clinics of North America Small Animal Practice.* 1993, v. 23 (6), p. 1301-1327. ISSN: 0195-5616.

NAL Call no: SF601.V523  
Descriptors: anesthesia, analgesia, principles, exotic practice.

Hellyer, P.W., (1996), **Analgesics on the market.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1996, v. 10, p. 6-7. Meeting held Jan. 13-17, 1996 Orlando, FL.  
NAL Call no: SF605.N672  
Descriptors: analgesics, market.

Isaacs, J.P., (1999), **Carprofen.** *Compendium on Continuing Education for the Practicing Veterinarian.* Trenton, NJ: Veterinary Learning Systems. Mar. 1999, v. 21 (3), p. 246-248. ISSN: 0193-1903.  
NAL Call no: SF601.C66  
Descriptors: carprofen, analgesics.

Kohn, Dennis F., (1997), **Anesthesia and analgesia in laboratory animals.** *American College of Laboratory Animal Medicine series.* San Diego: Academic Press. c1997, xvii, 646 p. ill. ISBN: 0124175708.  
NAL Call no: SF996.5.A54 1997  
Descriptors: laboratory animals, analgesia, anesthesia.

Kyles, A. E., (1998), **Transdermal fentanyl.** *Compendium on Continuing Education for the Practicing Veterinarian.* Trenton, NJ: Veterinary Learning Systems. Jun. 1998, v. 20 (6), p. 721-722, 724-726. ISSN: 0193-1903.  
NAL Call no: SF601.C66  
Descriptors: skin, analgesia, transdermal fentanyl.

Lipa, S.M.; Kavaliers, M., (1990), **Sex differences in the inhibitory effects of the NMDA antagonist, MK-801, on morphine and stress-induced analgesia.** *Brain Research Bulletin.* v. 24 (4), 1990, p. 627-630, ill. ISSN: 0361-9230.  
Descriptors: sex differences, nmda antagonists, morphine, analgesia.

Looney, A.L., (1998), **Neurophysiology of pain and acupuncture analgesia.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1998, v. 12, p. 3-7. Meeting held Jan. 10-14, 1998, Orlando, FL.  
NAL Call no: SF605.N672  
Descriptors: pain, neurophysiology, acupuncture.

Mason, D.E., (1995), **Analgesia for trauma and surgery patients, I.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1995, v. 9, p. 14. Meeting held Jan. 14-18, 1995, Orlando, FL.  
NAL Call no: SF605.N672  
Descriptors: trauma, surgery, analgesia.

Mason, D.E., (1995), **Analgesia for trauma and surgery patients, II.** *Proceedings North American Veterinary Conference.* Gainesville, FL: Eastern States Veterinary Association. 1992-1995, v. 9, p. 15.  
NAL Call no: SF605.N672  
Descriptors: trauma, surgery, analgesia.

Matthews, Nora S., (1999), **Clinical anesthesia.** *The Veterinary Clinics of North America Small Animal Practice.* ISSN: 0195-5616, v. 29, no. 3. Philadelphia, W.B. Saunders.

c1999, viii, p. 611-835, ill.  
NAL Call no: SF601.V523 v.29 no.3  
Descriptors: clinical anesthesia, pain.

Moore, P.F.; Larsson, D.L.; Otterness, I.G.; Weismann, A.; Kadin, S.B.; Sweeney, F.J.; Eskra, J.D.; Nagahisa, A.; Sakakibera, M.; Carty, T.J., (1996), **Tenidap, a structurally novel drug for the treatment of arthritis: Antiinflammatory and analgesic properties.** Central Research Div., Pfizer, Inc., Eastern Point Road, Groton, CT 06340. *Inflammation Research.* 1996, v. 45 (2), p. 54-61. ISSN: 1023-3830.  
NAL Call no: RS122.A3  
Descriptors: tenidap, analgesia, antiinflammatory.

Otto, K.A.; Short, C.E., (1998), **Pharmaceutical control of pain in large animals.** *Applied Animal Behavior Science.* Amsterdam, N.Y.: Elsevier. 1984-Aug. 1998, v. 59 (1-3), p. 157-169. In the special issue: *Ethics, ethology and animal welfare*, edited by F.W. Quimby. ISSN: 0168-1591.  
NAL Call no: QL750.A6  
Descriptors: pain, control, large animals, drugs.

Pan, P.M.; Huang, C.T.; Wei, T.T.; Mok, M.S., (1998), **Enhancement of analgesic effect of intrathecal neostigmine and clonidine on bupivacaine spinal anesthesia.** *Regional Anesthesia and Pain Medicine.* Jan. 1998, v. 23 (1), p. 49-56.  
Descriptors: analgesia, effect, enhancement, spinal anesthesia.

Papich, M.G. (1997), **Principles of analgesic drug therapy.** *Seminars in Veterinary Medicine and Surgery Small Animal.* Philadelphia, PA: W.B. Saunders Co. May 1997, v. 12 (2), p. 80-93. In the special issue: *Pain.* Edited by Bernie Hansen. ISSN: 0882-0511.  
NAL Call no: SF911.S45  
Descriptors: analgesic drugs, therapy, principles.

Pascoe, P., (1997), **Local and regional anesthesia and analgesia.** *Seminars in Veterinary Medicine and Surgery Small Animal.* Philadelphia, PA: W.B. Saunders Co. May 1997, v.12 (2), p. 94-105. ISSN: 0882-0511.  
NAL Call no: SF911.S45  
Descriptors: local, regional, anesthesia, analgesia.

Raffe, M., (1997), **Recent advances in our understanding of pain: How should they affect management.** *Seminars in Veterinary Medicine and Surgery Small Animal.* Philadelphia, PA: W.B. Saunders Co. May 1997, v. 12 (2), p. 75-79. In the special issue: *Pain*, edited by Bernie Hansen. ISSN: 0882-0511.  
NAL Call no: SF911.S45  
Descriptors: understanding pain, management, advances.

Read, M., (2002), **Long Acting Neuroleptic Drugs.** *Zoological Restraint and Anesthesia*, edited by D. Heard. [http://www.avis.org/special\\_books/Heard/read/chapter\\_frm.asp?LA=1](http://www.avis.org/special_books/Heard/read/chapter_frm.asp?LA=1)

Sackman, Jill E., (1997), **Pain and its management.** *Veterinary Clinics of North America Small Animal Practice.* 1997, v. 27 (6), p. 1487-1504. ISSN: 0195-5616.  
NAL Call no: SF601.V523  
Descriptors: pain, management.

Sawyer, D.C., (1998), **Pain control in small animal patients.** *Applied Animal Behavior Science*. Amsterdam, N.Y.: Elsevier. 1984-Aug. 1998, v. 59 (1/3), p. 135-146. In the special issue: *Ethics, ethology and animal welfare*. Edited by F.W. Quimby. ISSN: 0168-1591.  
NAL Call no: QL750.A6  
Descriptors: pain control, small animals.

Short, C.E., (1994), **Pain and its control in small animals - diagnostic, medical, or minor surgery management.** *Proceedings North American Veterinary Conference*. Gainesville, FL: Eastern States Veterinary Association. 1992-1994, p. 35-41. Meeting held Jan. 15-20, 1994, Orlando, FL.  
NAL Call no: SF605.N672  
Descriptors: pain, control, small animals, management.

Short, C.E., (1998), **Fundamentals of pain perception in animals.** *Applied Animal Behavior Science*. Amsterdam, N.Y.: Elsevier. 1984-Aug. 1998, v. 59 (1-3), p. 125-133. In the special issue: *Ethics, ethology and animal welfare*. Edited by F.W. Quimby. ISSN: 0168-1591.  
NAL Call no: QL750.A6  
Descriptors: pain perception in animals, fundamentals.

Simkins, M.D.; Shadiack, A.M.; Burns, C.A.; Molino, L.J.; Amaratunga, D.; Hall, J.; Rogers, K.E.; Clark, L.P., (1998), **Evaluation of post-operative analgesics in a model of neuropathic pain.** *Contemporary Topics in Laboratory Animal Science*. Memphis, TN: American Association for Laboratory Animal Science. Nov. 1998, v. 37 (6), p. 61-63. ISSN: 1060-0558.  
NAL Call no: SF405.5.A23  
Descriptors: post-operative, analgesics, evaluation, pain.

Strauss, E., (1998), **New nonopioid painkiller shows promise in animal tests.** *Science*. Washington, DC: American Association for the Advancement of Science. Jan. 2, 1998, v. 279 (5347), p. 32-33. ISSN: 0036-8075.  
NAL Call no: 470 Sci2  
Descriptors: nonopioid, pain, animal tests.

Thurmon, J.C.; Sarr, R.; Denhart, J.W., (1999), **Xylazine sedation antagonized with tolazoline.** *Compendium on the Continuing Education for the Practicing Veterinarian*. Trenton, N.J.: Veterinary Learning Systems. Jan. 1999, v. 21 (1, Suppl.), p. S11-S20. Ref. ISSN: 0193-1903.  
NAL Call no: SF601.C66  
Descriptors: xylazine sedation, antagonized, tolazoline.

Thurmon, John C.; Tranquilli, William J.; Benson, G. John, (1999), **Essentials of small animal anesthesia and analgesia.** Philadelphia: Lippincott, Williams & Williams. c1999, viii, 580 p., ill. ISBN: 0683301071.  
NAL Call no: SF914 E77 1999  
Descriptors: small animals, anesthesia, analgesia.

Tranquilli, William; Grimm, K.; Lamont, L., (2000), **Pain management for the small animal practitioner.** ISBN: Book 1893441075; Book & CD ROM 1893441164. Teton New Media, P.O. Box 4833, 125 South King Street, Jackson, WY 83001. <http://www.tetonnm.com> Descriptors: pain management, small animals.

Tricklebank, M.D.; Curzon, G. (eds.), (1984), **Stress-induced analgesia.** John Wiley & Sons, Chichester, N.Y. 1984: i-x, 1-

194. III.  
Descriptors: chordates, vertebrates, mammals.

Whelan, G.; Flecknell, P.A., (1992), **The assessment of depth of anaesthesia in animals and man.** *Laboratory Animals*. London: Royal Society of Medicine Services. Jul. 1992, v. 26 (3), p. 153-162. ISSN: 0023-6772.  
NAL Call no: QL55.A1L3  
Descriptors: laboratory animals, anaesthesia, man.

Wolfe, T.L.; Liebeskind, J.C., (1983), **Stimulation-produced analgesia.** *Animal pain: Perception and alleviation*. Edited by Kitchell, R.L. and Erickson, H.H., American Physiological Society, Bethesda, MD. 1983: i-x, 1-221, Chapter pagination: 107-115.  
NAL Call no: QP451.4.A54  
Descriptors: analgesia, stimulation.

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## Amphibians & Reptiles

Aguilar, N.G.; Palcios, C.A.M.; Ross, L.G., (1999), **Controlled anaesthesia of *Rana catesbeiana* (Shaw) and *Rana pipiens* (Schreber) using xylocaine delivered by spray.** *Aquaculture Research*. v. 30 (4), p. 309-311. ISSN: 1355-557X.  
NAL Call no: SH1.F8  
Descriptors: frog, anesthesia.

Arena, P.C.; Richardson, K.C.; Cullen, L.K., (1988), **Anaesthesia in two species of large Australian skink.** *Veterinary Record*. Journal of the British Veterinary Association. 1988, v. 123 (6), p. 155-158. ISSN: 0042-4900. Ref.  
NAL Call no: 41.8 V641  
Descriptors: lizards, Sauria, reptiles, anaesthesia.

Arena, P.C.; Richardson, K.C., (1990), **The relief of pain in cold-blooded vertebrates.** *Australian Council for the Care of Animals used in Research and Teaching, ACCART-News*. 1990, v. 3 (1), p. 1-4. Ref.  
NAL Call no: SF405.5 A3  
Descriptors: analgesics, anaesthesia, pain, cold-blooded vertebrates.

Brenner, G.M.; Klopp, A.J.; Deason, L.L.; Stevens, C.W., (1994), **Analgesic potency of alpha andrenergic agents after systemic administration in amphibians.** *Journal of Pharmacology and Experimental Therapeutics*. 1994, v. 270 (2), p. 540-545. ISSN: 0022-3565.  
NAL Call no: 396.8 J82  
Descriptors: analgesia, amphibians, alpha andrenergic agents.

Bush, M., (1990), **Anesthesia of amphibians and reptiles.** 1990 Forum, American College of Laboratory Medicine, Columbia Inn, Columbia, MD. May 3-6, 1990, p. 103-105.  
NAL Call no: SF914.A53 1990  
Descriptors: anesthesia, amphibians, reptiles.

Downes, Hall; Koop, Dennis R.; Klopfenstein, Beth; Lessov, Nickola, (1999), **Retention of nociceptor responses during deep barbiturate anesthesia in frogs.** *Comparative Biochemistry and Physiology Comparative Pharmacology*

*Toxicology and Endocrinology*. Oct. 1999, v. 124 (2), p. 203-210. ISSN: 0742-8413.  
NAL Call no: QP901.C6  
Descriptors: frogs, barbiturate anesthesia, responses.

Firestone, Susan; Firestone, Leonard L.; Ferguson, Carolyn; Blanck, Damian, (1993), **Staurosporine, a protein kinase C inhibitor, decreases the general anesthetic requirement in Rana pipiens tadpoles.** *Anesthesia and Analgesia*. 1993, v. 77 (5), p. 1026-1030. ISSN: 0003-2999.  
Descriptors: Rana pipiens, tadpoles, anesthetic, staurosporine.

Harvey, Clark C., (1993), **Midazolam fails to sedate painted turtles, Chrysemys picta.** *Bulletin of the Association of Amphibian and Reptilian Veterinarians*. 1993, v. 3 (1), p. 7-8. Ref.  
Descriptors: injectable anaesthetics, benzimidazole, anaesthesia, turtles.

Machin, Karin L., (1999), **Amphibian pain and analgesia.** *Journal of Zoo and Wildlife Medicine*. v. 30 (1), p. 2-10, March 1999, ill. ISSN: 1042-7260.  
NAL Call no: SF601.J6  
Descriptors: amphibian, pain, analgesia.

Malley, D., (1997), **Reptile anaesthesia and the practicing veterinarian.** *In Practice*. London: British Veterinary Association. 1979-Jul./Aug. 1997, v. 19 (7), p. 351-368. ISSN: 0263-841X. Ref.  
NAL Call no: SF601.I4  
Descriptors: reptiles, anesthesia, intravenous injection, inhaled anesthetics.

Okabe, K.; Natsume, M., (1994), **Total synthesis of a frog poison, (plus or minus), epibatadine, a potent non-opioid analgesic.** *Chemical and Pharmaceutical Bulletin*. Tokyo, 1994, v. 42 (7), p. 1432-1436. ISSN: 0009-2363.  
NAL Call no: RM1.C5  
Descriptors: non-opioid analgesic, frog poison.

Pezalia, P.D., (1983), **Morphine-induced analgesia and explosive motor behavior in an amphibian.** *Brain Research*. 1983, v. 273 (2), p. 297-305. ISSN: 0006-8993.  
NAL Call no: Film S-1779  
Descriptors: amphibian, morphine analgesia, effects.

Raymond, Stephen A., (1992), **Subblocking concentrations of local anesthetics: Effects on impulse generation and conduction in single myelinated sciatic nerve axons in frog.** *Anesthesia and Analgesia*. 1992, v. 75 (6), p. 906-921. ISSN: 0003-2999.  
Descriptors: amphibians, local anesthetics, frog.

Schaeffer, Dorcas O.; Kleinow, Kevin M.; Krulish, Lee, (1992), **The care and use of amphibians, reptiles, and fish in research.** *Scientist Center for Animal Welfare*. 1992, vii, 196 p. ill. Ref. Proceedings from a SCAW/LSUSVM sponsored conference, Apr. 8-9, 1991, New Orleans, LA. NAL Call no: SF406.C35 1992  
Descriptors: amphibians, reptiles, fish, laboratory animals.

Stevens, C.W.; Rothe, K.S., (1997), **Supraspinal administration of opioids with selectivity for mu, delta and Kappa opioid receptors produces analgesia in**

**amphibians.** *European Journal of Pharmacology*. 1997, v. 331 (1), p. 15-21. ISSN: 0014-2999.  
NAL Call no: QP901.E8  
Descriptors: supraspinal opioids, analgesia, amphibians.

Stevens, C.W.; Klopp, A.J.; Facello, J.A., (1994), **Analgesic potency of mu and kappa opioids after systemic administration in amphibians.** *Journal of Pharmacology and Experimental Therapeutics*. 1994, v. 269 (3), p. 1086-1093. ISSN: 0022-3565.  
NAL Call no: 396.8 J82  
Descriptors: analgesia, potency, opioids, amphibians.

Stevens, C.W., (1988), **Opioid antinociception in amphibians.** *Brain Research Bulletin*. 1988, v. 21 (6), p. 959-962.  
Descriptors: analgesia, amphibians, review.

Stevens, C.W.; Zutphen, L.F.M. van; Balls, M., (1997), **An alternative model for testing opioid analgesics and pain research using amphibians.** *Animal Alternatives, Welfare and Ethics*. Proceedings 2<sup>nd</sup> World Congress, Utrecht, The Netherlands, 20-24 Oct. 1996. 1997, 247-251 p. Ref. Elsevier Science Publishers, Amsterdam. ISBN: 0444824243.  
NAL Call no: QL1.D48 v. 27  
Descriptors: alternative model, pain, amphibians, analgesics.

Stevens, Craig W.; Kirkendall, Kenan, (1993), **Time course and magnitude of tolerance to the analgesic effects of systemic morphine in amphibians.** *Life Sciences*. 1993, v. 52 (15), p. 111-116. ISSN: 0024-3205.  
NAL Call no: 442.8 L62

Descriptors: amphibians, tolerance, morphine.

Stevens, Craig w.; Sangha, Soni; Ogg, Brian G., (1995), **Analgesia produced by immobilization stress and an enkephalinase inhibitor amphibians.** *Pharmacology Biochemistry and Behavior*. 1995, v. 51 (4), p. 675-680. ISSN: 0091-3057.  
NAL Call no: QP901.P4  
Descriptors: amphibians, analgesia, stress.

Stevens, Craig W., (1996), **Relative analgesic potency of mu, delta and kappa opioids after spinal administration in amphibians.** *Journal of Pharmacology and Experimental Therapeutics*. 1996, v. 276 (2), p. 440-448. ISSN: 0022-3565.  
NAL Call no: 396.8 J82  
Descriptors: analgesic potency, mu, delta and kappa opioids, amphibians.

Stevens, Craig W.; Brenner, George M., (1996), **Spinal administration of adrenergic agents produces analgesia in amphibians.** *European Journal of Pharmacology*. 1996, v. 316 (2-3), p. 205-210. ISSN: 0014-2999.  
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NAL Call no: QP901.P4

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Descriptors: analgesic effects, xylazine, flunixin, frogs.

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Descriptors: amphibians, opioids, effects.

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NAL Call no: 442.8 L62

Descriptors: amphibians, opioid, adrenergics, effects.

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Descriptors: anaesthesia, inhaled, isoflurane, cockatoos.

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NAL Call no: QL55.Z46  
Descriptors: anaesthesia, analgesics, birds, injectable, inhaled.

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Descriptors: pain suppression, chicken, naloxone, reversal.

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Descriptors: quinaldine anesthetic, fish.

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Descriptors: anesthesia, rainbow trout, swimming.

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Descriptors: anesthesia, stress, trout.

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Descriptors: anaesthesia, circulation, fish.

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Descriptors: tropical fish, anesthesia.

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Descriptors: naloxone, analgesia, pain perception.

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Descriptors: anesthetics, fish, quinaldine.

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Descriptors: benzocaine, freshwater fish, anesthetic.

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Descriptors: anaesthetics, marine molluscs, squid.

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Descriptors: quinaldine, fish, anesthetic.

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Descriptors: salmonids, electrical anesthesia.

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Descriptors: benzocaine, catfish, disposition.

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Descriptors: anaesthesia, scallop.

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Descriptors: hypothermia, salmon, anesthesia.

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Descriptors: salmonids, anesthesia, methylpentynol.

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NAL Call no: SH1.F8

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NAL Call no: 512 SO2

Descriptors: albino mice, acetaminophen, effect.

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NAL Call no: 512 SO2

Descriptors: cimetidine, acetaminophen, analgesia, mice.

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NAL Call no: QP901.P4

Descriptors: morphine, mice, cumulative dosing.

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Descriptors: ethanol, analgesic potency, mice.

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NAL Call no: QP901.E8

Descriptors: transgenic mice, opioid analgesia, differences.

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NAL Call no: 396.8 J82

Descriptors: butorphanol, mice, effects, mu receptors.

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NAL Call no: QP351.N3

Descriptors: calcitonin, pertussis toxin blockade, opioid analgesia, mice.

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Descriptors: intrathecal, morphine, mouse.

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NAL Call no: QP351.N3

Descriptors: non-opioid effects, kyotorphin, mice.

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NAL Call no: RS11.J6

Descriptors: thiazolotriazine, synthesis, antinociceptive effects, mice.

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NAL Call no: 442.8 IN2

Descriptor: sumatriptan, antinociceptive effect, mice.

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Descriptors: sch 32615, analgesia, mice.

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NAL Call no: QP901.E8

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NAL Call no: Film S-1779

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NAL Call no: RB127.P34

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NAL Call no: 410 P56

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NAL Call no: QP901.P4

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## Rabbits & Rodents

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Descriptors: rodents, anesthesia, analgesics.

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Descriptors: rabbit, midazolam, smooth muscle, mesenteric artery.

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NAL Call no: 41.8 V641  
Descriptors: rats, pain, analgesics, drug effects.

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NAL Call no: RS164.P59  
Descriptors: medicinal plants, edema, analgesics, rats, pain, rubiaceae.

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Descriptors: morphine, local, infant rats, effect.

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Descriptors: rats, analgesics, diabetes, pain drug effects.

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Descriptors: pain perception, analgesia, brain, rats, bradykinin receptors.

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NAL Call no: Film S-1779

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NAL Call no: QL55.A1L3

Descriptors: rats, anesthetics.

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NAL Call no: QL55A1L3

Descriptors: rats, buprenorphine jello, oral, postoperative analgesia.

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NAL Call no: 41.8 V641

Descriptors: rats, analgesics, pain, ketoprofen, oral administration.

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Language: German with a summary in English.

NAL Call no: DISS F1994069

Descriptors: rat brain, neurotransmitters, dopamine, noradrenaline, effects.

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NAL Call no: Film S-1779

Descriptors: pain, analgesia, sensory systems, rat.

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NAL Call no: QL55A1L3

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NAL Call no: QL55.A1L3

Descriptors: rats, anesthesia, fentanyl, agonists, antagonists, drug combinations.

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NAL Call no: 442.8 L62  
Descriptors: rat, analgesics, audible, ultrasonic, pain.

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Descriptors: physical activity, sensitivity, morphine tolerance, rats.

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Descriptors: rats, flunixin, analgesics, overdose, drug toxicity, adverse effects.

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NAL Call no: QP901.C6  
Descriptors: method, analgesic effect, detecting, pain, rat.

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Descriptors: rats, analgesic, agmatine, morphine, enhancement.

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NAL Call no: 442.8 L62  
Descriptors: morphine, tolerance, rats, arthritic.

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Descriptors: rats, morphine, naltrexone, oral administration, analgesics, pain.

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Descriptors: rats, flunixin, analgesics, pain, laparotomy, drug combinations.

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Descriptors: pain, surgery, rats, analgesics.

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NAL Call no: QL55 A1L3  
Descriptors: rats, analgesics, postoperative care.

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Descriptors: rats, anesthesia, halothane, analgesics, food and water consumption.

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NAL Call no: QL55.F43 1993  
Descriptors: rats, pain, analgesia, animal welfare, experimental surgery.

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NAL Call no: RM300.J6  
Descriptors: analgesic drugs, effects, rat, pain.

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NAL Call no: 396.8 J82  
Descriptors: pain, inflammation, rats, kappa-opioid, agonist, effects.

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NAL Call no: RS164.P59

Descriptors: rats, traditional medicine, Brazil.

Marsh, Deborah; Dickenson, Anthony; Hatch, David; Fitzgerald, Maria, (1999), **Epidural opioid analgesia in infant rats I: Mechanical and heat responses**. *Pain*. Jul. 1999, v. 82 (1), p. 23-32. ISSN: 0304-3959.

NAL Call no: RB127.P34

Descriptor: epidural opioid, infant rats, analgesia, response.

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NAL Call no: RB127.P34

Descriptors: infant rats, opioid, analgesia, carrageenan, capsaicin.

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NAL Call no: QP351.N3

Descriptors: rat, metamizol, single motor units, effect.

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NAL Call no: RC900.5.U7

Descriptors: rats, kidney disease, toxicity, analgesics.

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Descriptors: rats, mice, anti-inflammatory, analgesic,

Pinto, Luisa; Borrelli, Francesca; Bombardelli, Ezio; Cristoni, Aldo; Capasso, Francesco, (1998), **Anti-inflammatory, analgesic and antipyretic effects of glaucine in rats and mice**. *Pharmacy and Pharmacology Communications*. Oct. 1998, v. 4 (10), p. 502-505. ISSN: 1460-8081.

Descriptors: rats, mice, anti-inflammatory, analgesic, antipyretic, effects, glaucine.

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NAL Call no: QP901.E8

Descriptors: spinal analgesia, endomorphins, rat, neuropathic pain.

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Descriptors: fentanyl, MK-801, effect, rats.

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Descriptors: morphine, desipramine, serotonin, combinations, rat.

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NAL Call no: 442.8 L62

Descriptors: rats, analgesia, inhibitor, diprotin A, naloxone.

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NAL Call no: QL55 A1L3

Descriptors: rats, anaesthetics, analgesics, ketamine, buprenorphine, pentobarbitol.

Saito, Yoji; Kaneko, Megumi; Kirihara, Yumiko; Sakura, Sinichi; Kosaka, Yoshihiro, (1998), **Characteristics of tolerance to somatic and visceral antinociception after continuous epidural infusion of morphine in rats**. *Anesthesia and Analgesia*. Dec. 1998, v. 87 (6), p. 1340-1345. ISSN: 0003-2999.

Descriptors: morphine, rats, epidural infusion, tolerance.

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NAL Call no: QP901.E8

Descriptors: rat, brain, nervous system, morphine, glucose.

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Descriptors: alcohol, tolerance, glucose, rats, morphine, drug tolerance, analgesia.

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NAL: Call no: RB127.P34

Descriptors: rats, anesthesia, analgesics, stress, pain.

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Descriptors: visceral analgesic tolerance, rats, butorphanol.

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Descriptors: analgesia, non-steroidal, anti-inflammatory, combinations, rats.

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NAL Call no: QP1.P4  
Descriptors: rats, suckling, undernutrition, analgesics.

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NAL Call no: QL737.R666 W38  
Descriptors: surgical techniques, experimental techniques, rat.

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NAL Call no: QL55.A1L3

Descriptors: anaesthesia technique, rats, mice, etorphine-methotrimeparzine, midazolam.

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NAL Call no: QL785.A725  
Descriptors: pain, rats.

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NAL Call no: RB127.P34  
Descriptors: rats, oxytocin, pain, drug effects, heat.

Yu, Hsiu Hing; Sun, Pin; Hou, Wen Yuong, (1998), **Prolonged local anesthetic affect of bupivacaine liposomes in rats.** *International Journal of Pharmaceutics*. Amsterdam. Dec. 30, 1998, v. 176 (1), p. 133-136. ISSN: 0378-5173.  
NAL Call no: RS122.A115  
Descriptors: prolonged local anesthetic, bupivacaine, rats.

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NAL Call no: RB127.P34  
Descriptors: morphine, analgesia, rats.



#### [Disclaimers](#)

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May 23, 2002  
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