# IACUC Policy

## Preventing and controlling animal pain and distress

Applicable to all UMKC faculty, staff, employees and students involved in the care or use of University animals

1. **UMKC policy is to minimize the amount and duration of animal pain or distress caused by experimental procedures.** The responsibility to fulfill this policy:

    a) The principal investigator will use experimental procedures to produce the least pain possible.
    b) All staff working with animals are trained to recognize animal pain or distress, and know appropriate action to relieve pain or who to advise.
    c) Action may include administration of anesthetic, analgesic or tranquilizing drugs, termination of the experimental procedure or euthanasia.
    d) Records of both surgical and non-surgical anesthesia and/or analgesia will be kept in accordance with the UMKC records retention policy and USDA regulations.

2. **The accepted guideline for using anesthetic, analgesic and tranquilizing drugs in animals is**: Any procedure that causes pain if performed on a human can be expected to produce pain in an animal.

    a) Delivery of anesthetic**,** analgesic and tranquilizing may be withheld only after IACUC approval when the researcher provides adequate scientific justification with evidence that the drugs interfere with necessary experiments.

3. **Signs of animal pain and distress. Anticipated pain signs must be specified in the protocol, as well as actions to be taken at the appearance of such signs.**

    a) ACTIVITY AND BEHAVIOR
        - Reluctance to move spontaneously
        - Restlessness or agitation.
        - Locomotion irregularities such as limping
        - Licking and/or chewing at procedure site
    b) APPEARANCE
        - Abnormal hunched posture,
        - Rough hair coat, and failure to groom
        - Discharge around eyes or nose
        - Diarrhea or constipation
        - Redness, swelling or discharge at procedure site
    c) TEMPERAMENT
        - Unusual aggressiveness,
        - Reluctance to be handled
        - Apathy
    d) FEEDING BEHAVIOR
        - Reduced water and food intake with reduced body weight
        - Reduced urine or feces output

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# Below is a table of suggested analgesic and anesthetic agents for rodents and appropriate doses to relieve animal pain.

**Analgesic (*dosage/route/frequency)* to be used**

| Analgesics for Mice | | | | | |
|---|---|---|---|---|---|
| **Agent** | **DEA Class** | **Trade Name** | **Dosage (mg/kg)** | **Route** | **Frequency of dosing** |
| | | | | | |
| | | | | | |
| Buprenorphine | CIII | Buprenex | 0.05-0.1 | SC, IP, IV | 8-12 hr |
| Buprenorphine SR (1mg/ml) | CIII | | 1.0 | SC | 24-72 hr |
| Butorphanol | CIV | Torbugesic | 1-5 | SC | 4 hr |
| Carprofen | | Rimadyl | 5-10 | SC, IP | 24 hr |
| Flunixen | | Banamine | 2.5 | SC, | 12 hr |
| | | | | | |
| Ketoprofen | | Ketofen | 1-2 | SC | 24 hr |
| Meperidine | CII | Demerol | 12.5-25 | IP | 2-3 hr |
| Meperidine | CII | Demerol | 20 | SC | 2-3 hr |
| Morphine | CII | | 1-2 | IP, SC | 2-4 hr |

| Analgesics for Rats | | | | | |
|---|---|---|---|---|---|
| **Agent** | **DEA Class** | **Trade Name** | **Dosage (mg/kg)** | **Route** | **Duration** |
| | | | | | |
| | | | | | |
| Buprenorphine | CIII | Buprenex | 0.01-0.05 | SC, IP, IV | 8-12 hr |
| Buprenorphine | CIII | Buprenex | 0.1-0.25 | PO | 8-12 hr |
| Butorphanol | CIV | Torbugesic | 1-2 | SC | 2-4 hr |
| Carprofen | | Rimadyl | 2-5 | PO, SC | 12-24 hr |
| Fentanyl | CII | | 0.01-1 | SC | |
| Fentanyl | CII | | 2-4g/day | PO | |
| Flunixen | | Banamine | 1.1-2.5 | SC | 12 hr |
| | | | | | |
| Ketoprofen | | Ketofen | 1-2 | SC | 24 hr |
| Meloxicam | | Metacam | 1-2 | PO, SC | 12-24 hr |
| Meperidine | CII | | 12.5-25 | IP | 2-3 hr |
| Meperidine | CII | | 20 | SC | 2-3 hr |
| Morphine | CII | | 1-4 | IP, SC | 2-4 hr |
| Xylazine | | Rompun | 5-12 | SC | 2 hr |
| | | | | | |

| Analgesics for Rabbits | | | | | |
|---|---|---|---|---|---|
| **Agent** | **DEA Class** | **Trade Name** | **Dosage (mg/kg)** | **Route** | **Frequency** |
| | | | | | |
| Buprenorphine | CIII | Buprenex | 0.01-0.05 | SC, IV | 6-12 hr |
| Butorphanol | CIV | Torbugesic | 0.1-0.5 | SQ, IM, IV | 4 hr |
| Carprofen | | Rimadyl | 4-5 | SQ | 24 hr |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Carprofen | | Rimadyl | 1-5 | PO | 12-24 hr |
| | Fentanyl | CII | Duragesic | 25 ug | Transdermal | 72 hr |
| | Flunixen | | Banamine | 1.1 | IM | 12 hr |
| | | | | | | |
| | Ketoprofen | | Ketofen | 1-3 | SC | 24 hr |
| | Meperidine | CII | Demerol | 5-10 | SC | 2-3 hr |
| | Meloxicam | | Metacam | 0.3-0.5 | SC | 24 hr |
| | Meloxicam | | Metacam | 0.5-1.5 | PO | 24 |
| | Morphine | CII | | 2.5 | SC | 2-4 hr |
| | Nalbuphine | | Nubain | 1-2 | IV | 4-5 hr |

**Anesthetics *(dosage/route/frequency)* to be used**

| | **Injectable Anesthesia for Mice** | | | | |
|---|---|---|---|---|---|
| | **Agent** | **DEA Class** | **Dosage (mg/kg)** | **Route** | **Duration** |
| | EMTU (Inactin) | CIII | 80 | IP | 60-240 min |
| | Ketamine | CIII | 80-100 | SC | |
| | | CIII | 100 | IP | |
| | | CIII | 50 | IV | |
| | Ketamine/acepromazine | CIII | 100/2.5-5 | SC | 20-30 min |
| | Ketamine/acepromazine/ xylazine | CIII | 100/5-10/2.5 | SC | 20-30 min |
| | Ketamine/diazepam | CIII / CIV | 200/5 | IP,SC | 15-30 min |
| | Ketamine/dexmedetomidine | CIII | 75/0.5 -1 | IP | 20-30 min |
| | Ketamine/xylazine | CIII | 80-100/ 10 | IP, SC | 20-30 min |
| | Pentobarbital | CII | 30-50 | IP | 20-40 min |
| | Propofol | | 12-26 | IV | 5-10 min |
| | Telazol (Tiletamine/zolazepam) | CIII | 80-100 | IP | |
| | Tiletamine/ zolazepam/xylazine | CIII | 20-40 / 5-10 | IP | |
| | Tiletamine/zolazepam / butorphanol | CIII / CIV | 20-40/1.25-5 | IP | |
| | Tribromoethanol (0.25%) (Avertin) | | 125-250 | IP | |

| **Inhalation Anesthesia for Mice** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Isoflurane | 0.5-4% to effect | Inhalation | Requires use of a precision vaporizer |
| | Carbon dioxide/oxygen | 50-80%/20-50% | Inhalation | |

| | **Injectable Anesthesia for Rats** | | | | |
|---|---|---|---|---|---|
| | **Agent** | **DEA Class** | **Dosage (mg/kg)** | **Route** | **Duration** |
| | Pentobarbital | CII | 40-60 | IP | 20-60 min |
| | EMTU (Inactin) | | 80-100 | IP | 60-240 min |
| | Ketamine | CIII | 50-100 | SC | |
| | Ketamine/acepromazine | CIII | 75-80/2.5 | SC | 20-30 min |
| | Ketamine/diazepam | CIII /CIV | 45-80/5-10 | IP | 15-30 min |
| | Ketamine/dexmedetomidine CIII | CIII | 45-75/0.25-0.5 | IP | 20-30 min |
| | Ketamine/xylazine | CIII | 40-90/ 5-13 | IP, | 20-60 min |
| | Tiletamine/zolazepam | CIII | 40-80 | IP | 30-60 min |

| | | | | | |
|---|---|---|---|---|---|
| | Tiletamine/zolazepam | CIII | 20 | SC | 30-60 min |
| | Tiletamine/ zolazepam/xylazine | CIII | 20-40 / 5-10 | IP | |
| | Tiletamine/ zolazepam/ butorphanol | CIII /CIV | 20-40/1.25-5 | IP | 30-60 min |
| | Propofol | | 3-10 | IV | 5-10 min |
| | Tribromoethanol (0.25%) (Avertin) | | 300 | IP | |

| **Inhalation Anesthesia for Rats** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Isoflurane | 0.5-4% to effect | Inhalation | Requires use of a precision vaporizer |
| | Carbon dioxide/oxygen | 50-80%/20-50% | Inhalation | |

| **Injectable Anesthesia for Rabbits** | | | | | |
|---|---|---|---|---|---|
| | **Agent** | **DEA Class** | **Dosage (mg/kg)** | **Route** | **Duration** |
| | Ketamine | CIII | 25-50 | IM | |
| | Ketamine/acepromazine | CIII | 50-75/1-5 | IM | 20-30 min |
| | Ketamine/diazepam | CIII | 20-40/1-5 | IM | 20-30 min |
| | Ketamine/dexmedetomidine | CIII | 25/0.5 | IM | 30-40 min |
| | Ketamine/xylazine | CIII | 22-50/2.5-10 | IM | 25-40 min |
| | Ketamine/xylazine | CIII | 10/3 | IV | 20-30 min |
| | Ketamine/xylazine/ Acepromazine | CIII | 35-40/3-5/0.25-1.0 | IM | 60-90 min |
| | Pentobarbital | CII | 20-60 | IV | 20-30 min |
| | Propofol | | 3-6 | IV | 10 min |

| **Inhalation Anesthesia for Rabbits** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Isoflurane | 4-5% induction 1.-2% maint. | Inhalation | Requires use of a precision vaporizer |

**Sedatives and Tranquilizers for Mice**

| **Sedatives and Tranquilizers for Mice** | | | | | |
|---|---|---|---|---|---|
| | **Agent** | **DEA Class** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Acepromazine | | 2-5 | SC, IP | |
| | Diazepam | CIV | 3-5 | SC, IP | |
| | Midazolam | CIV | 5 | IP | |

| **Sedatives and Tranquilizers for Rats** | | | | | |
|---|---|---|---|---|---|
| | **Agent** | **DEA Class** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Acepromazine | | 2-5 | SC, IP | |
| | Diazepam | CIV | 5-15 | SC | |
| | Midazolam | CIV | 5 | IP | |

| | **Sedatives and Tranquilizers for Rabbits** |
|---|---|

| | Agent | DEA Class | Dosage (mg/kg) | Route | Comments |
|---|---|---|---|---|---|
| | Acepromazine | | 0.75-10 | IM | |
| | Diazepam | CIV | 1-2 | IV | |
| | Diazepam | CIV | 5-10 | IM | |
| | Ketamine | CIII | 5-50 | IM | |
| | Ketamine/Acepromazine | CIII | 40-75/1-5 | IM | |
| | Midazolam | CIV | 2 | IM, IV | |

**Other/Miscellaneous for Mice**

| **Miscellaneous for Mice** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Atropine | 0.04 | SC | Anticholinergic |
| | Atipamezole | 0.1 – 1.0 | IP or SC | $\alpha_2$-antagonist |

| **Miscellaneous for Rats** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Atropine | 0.05 | SC, IP | |
| | Atipamezole | 0.1-1 | IP, SC | |

| **Miscellaneous for Rabbits** | | | | |
|---|---|---|---|---|
| | **Agent** | **Dosage (mg/kg)** | **Route** | **Comments** |
| | Atipamezole | 0.2-0.35 | IV | $\alpha_2$-antagonist |
| | Glycopyrrolate | 0.1 | IM, SC | Anticholinergic |
| | Naloxone | 0.001-0.1 | IV | Opiod reversal |

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