Department of Laboratory Animal Resources

**Guidelines on the Use of Pentobarbital in Rodent Surgery**

The management of surgical pain requires a specific plan which is appropriate to the species and the procedure being performed.

As new information develops on the suitability of specific agents, policies on the use of anesthetic/analgesic drugs evolve accordingly. The University of Toledo Institutional Animal Care and Use Committee (IACUC) is responsible for assuring that all procedures are conducted in ways which minimize pain and discomfort in research animals.

Pentobarbital has been used for many years in surgical protocols involving rodents; however, contemporary information about the use of this drug in rodents has brought into question its appropriateness for many surgical procedures. Using the common toe pinch withdrawal test, for example, has been found to not correlate well with the level of consciousness and pain perception, although this has been a common method of determining depth of anesthesia. It has been demonstrated that doses sufficient to abolish this response will frequently result in overdosing complications, including prolonged recoveries and mortalities.

The growing consensus in the biomedical research literature is that the safety level of pentobarbital is narrow compared to other available options and that the levels of analgesia achieved are inadequate for invasive procedures when used as a single-agent anesthetic. Problems with this drug are further complicated by pentobarbital’s pronounced interference with thermoregulatory capabilities, exacerbating heat losses associated with general anesthesia in animals of small body size.

Since many other agents or drug combination protocols offer fewer complications, pentobarbital should be used in limited contexts, and will require special, documented justifications which the IACUC will evaluate on a case-by-case basis. Pentobarbital is not acceptable as the sole anesthetic/analgesic agent in major surgical procedures.

Common alternative anesthetic protocols include isoflurane, sevoflurane, ketamine-xylazine, and ketamine-xylazine-acepromazine combinations. The Dept. of Laboratory Animal Resources staff can assist research staff in selecting anesthetic regimens which match surgical procedure requirements.

Reviewed July 25, 2011