Purpose of Policy: This policy ensures that signs and reflexes that indicate pain or discomfort in an animal undergoing surgery are not masked by the effects of neuromuscular blockers (NMBs).

Policy Information: The Animal Welfare Act states that “Procedures that may cause more than momentary or slight pain or distress to the animals will not include the use of paralytics without anesthesia” and that such procedures will “be performed with appropriate sedatives, analgesics or anesthetics...”. The National Research Council’s Guide for the Care and Use of Laboratory Animals states that “Acute stress is believed to be a consequence of paralysis in a conscious state...” and that “If paralyzing agents are to be used, the appropriate amount of anesthetic should first be defined...using the anesthetic without a blocking agent.”

NMBs can mask clinical signs such as changes in skeletal muscle tone, rate and effort of respiration and gross purposeful movements that are indicators of the level of anesthesia and, by extension, of pain or stress. Although there may be cases where an NMB is required, in most cases they are not and, therefore, WesternU strongly discourages their use. Any use of NMBs must first be approved by the Institutional Animal Care and Use Committee (IACUC) and will require rigorous scientific justification. If approved, the following policies and procedures will be in effect:

1. It is the responsibility of the principal investigator to ensure that adequate anesthesia is provided throughout the use of an NMB.

2. Documentation on the use of NMBs in animals must be maintained and made available for veterinary and IACUC review.

3. A surgical plane of anesthesia must first be induced and the animals intubated before administering the NMB.
4. Controlled ventilation must be initiated prior to administering an NMB. The person(s) monitoring respiration must be properly trained and skilled in the use of monitoring and ventilation equipment.

5. A surgical plane of anesthesia must be maintained during the entire time the NMB is active in vivo.

6. The NMB must not be administered until after the skin incision has been made to ensure adequate depth of anesthesia and analgesia.

7. NMBs may not be used as a substitute for poor control of anesthesia.

8. Only general anesthetics that provide a surgical plane of anesthesia may be used with an NMB. Therefore nitric oxide cannot be used in this manner.

9. Signs of pain and stress (e.g. heart rate and blood pressure) must be continuously monitored when possible. Baseline measurements must be taken prior to induction of anesthesia and an increase of 20% or more without other explanation suggests the presence of pain or stress and the anesthetic level should be deepened.

10. If performing survival surgery, a means to determine post-operative recovery of neuromuscular function must be employed.