

1. PURPOSE

This Standard Operating Procedure (SOP) provides guidelines on humane intervention points for rodent research models that involve a progressive ascending paralysis.

2. RESPONSIBILITY

Principal investigator (PI) and their research staff, veterinarian, veterinary care staff, Facility Animal Care Committee (FACC).

3. CONSIDERATIONS

- 3.1. Rodent models that involve progressive ascending paralysis include experimental autoimmune encephalomyelitis (EAE) and other models of neurodegeneration such as models of amyotrophic lateral sclerosis (ALS).
- 3.2. Paralysis typically progresses from the tail to the hind limbs, then to the fore limbs and is occasionally followed by urinary retention.
- 3.3. Scoring mechanisms for disease progression are not only part of the experimental data gathering but are useful tools for determining humane intervention points and monitoring frequency.
- 3.4. Body weight, body condition scoring, and hydration status should be evaluated in conjunction to the paralysis scoring.

4. PROCEDURES

- 4.1. Paralysis scoring:
 - 4.1.1. Motor deficits and ascending paralytic disease are commonly described and quantified using a scoring system.
 - 4.1.2. The scoring system must be described in the approved Animal Use Protocol (AUP).
 - 4.1.3. Sample scoring system of disease severity on a 0–5 numerical scale:

SCORE	CLINICAL SIGNS
0	No disease, no obvious changes in motor function.
1	Lack of tail tone (flaccid tail) but normal gait and ability to climb.
2	Limp tail and mild hind limb weakness. May have difficulty grasping or climbing up from underside of a cage cover grid, may misstep on the top of a cage cover. Animals may appear ataxic or clumsy, balance is poor. Animals exhibit poor righting reflex.
3	Severe hind limb weakness/partial hind limb paralysis. May drag hind limbs. Occasional urinary retention. The animal is not able to hang on underside of a cage cover, but still moves spontaneously.
4	Paralysis of one or both hind limb and little or no spontaneous movement. Animal is unable to right itself. Possible auto-mutilation.
5	Quadriplegia or moribund stage

- 4.2. Recommended intervention points:
 - 4.2.1. Weight loss exceeding 15% of baseline bodyweight.
 - 4.2.2. Body condition score (BCS) less than 3.
 - 4.2.3. Moderate dehydration.
 - 4.2.4. Score of 0 or 1: No treatment required.
 - 4.2.5. Score of 2, 3, or 4: Provide wet food at the bottom of the cage and ready-to-use nesting material. Consider using a soft bedding, e.g., Envigo Teklad Diamond Soft cellulose bedding. If urinary retention is present, express bladder manually twice daily.
 - 4.2.6. Score of 4: Euthanasia if no improvement is observed within 24 hours.
 - 4.2.7. Score of 5: Euthanasia.
- 4.3. Frequency of monitoring:
 - 4.3.1. Animals should be observed daily.
 - 4.3.2. Score of 0, 1 or 2: scoring and bodyweights weekly, at a minimum.
 - 4.3.3. Score of 3: scoring and bodyweights twice weekly, at a minimum.
 - 4.3.4. Score of 4: scoring and bodyweights daily.
- 4.4. Recordkeeping:
 - 4.4.1. Monitoring is the responsibility of the PI and research staff.
 - 4.4.2. A Humane Intervention Monitoring Log may be requested by the Facility Animal Care Committee.
 - 4.4.3. Log all monitoring activities, observations, and paralysis scores.

5. REFERENCES

- 5.1. Takeuchi C., Yamagata K., Takemiya T. Variation in experimental autoimmune encephalomyelitis scores in a mouse model of multiple sclerosis. *World J Neurol.* Sep 28, 2013; 3(3): 56-61.
- 5.2. Bradl M., Lington C. Animal Models of Demyelination. *Brain Pathology*, Volume 6, Issue 3 July 1996, Pages 303-311.

SOP REVISION HISTORY

DATE	NEW VERSION
2023.05.15	3.2. Paralysis typically progresses from the tail to the hind limbs, then to the fore limbs and is occasionally followed by urinary incontinence retention.
2023.05.15	3.4. Body weight, and body condition scoring, and hydration status should be evaluated in conjunction to the paralysis scoring.
2023.05.15	4.1.1. Motor deficits and ascending paralytic disease are commonly described and quantified using a scoring system. 4.1.2. The scoring system must be described in the approved Animal Use Protocol (AUP). 4.1.3. Sample scoring system of disease severity on a 0–5 numerical scale:
2023.05.15	4.2.1. Weight loss exceeding 20% 15% of baseline bodyweight. 4.2.2. Body condition score (BCS) less than 2 3 . 4.2.3. Moderate dehydration.
2023.05.15	4.2.4. Score of 0; or 1 or 2 : No treatment required.
2023.05.15	4.2.5. Score of 2, 3 or 4 : Provide wet food at the bottom of the cage and ready-to-use nesting material. Consider using a soft bedding, e.g., Envigo Teklad Diamond Soft cellulose bedding. If urinary retention is present, express bladder manually twice daily.
2023.05.15	4.2.6. Score of 4: Euthanasia if no improvement is observed within 2–3 days 24 hours .
2023.05.15	4.3.2. Score of 0, 1 or 2: scoring and bodyweights weekly, at a minimum .
2023.05.15	4.3.3. Score of 3: scoring and bodyweights twice weekly, at a minimum .