
1. PURPOSE

This Standard Operating Procedure (SOP) describes the health monitoring program for marmosets.

2. RESPONSIBILITY

Veterinarians.

3. MATERIALS

- 3.1. Anesthetics
- 3.2. Old Mammalian Tuberculin
- 3.3. Blood collections tubes
- 3.4. Fecal collection containers

4. PROCEDURES

- 4.1. Monitor populations that are housed for more than 8 weeks.
- 4.2. Do not perform examinations under anesthesia or tuberculin skin test on pregnant females or marmosets under 2 months of age.
- 4.3. Every 6 months:
 - 4.3.1. General physical examination:
 - 4.3.1.1. Anesthetize animals as per NHP Anesthesia SOP.
 - 4.3.1.2. Record body weight.
 - 4.3.1.3. Perform a complete physical examination.
 - 4.3.1.4. Allow animal to fully recover in crate before returning to housing enclosure.
 - 4.3.2. Blood collection:
 - 4.3.2.1. Collect 1.0 mL of blood for complete blood count and biochemistry for all marmosets 8 years of age or older, or as determined by the veterinarian.
 - 4.3.2.2. Refer to SOP 403 Guidelines for Blood Collection Volumes and Frequency.
 - 4.3.3. Fecal samples:
 - 4.3.3.1. At the discretion of the veterinarian, collect fresh feces from each family/group for ectoparasites, endoparasites, and pathogenic enteric bacteria testing.
- 4.4. Every 12 months, at a minimum:
 - 4.4.1. Blood collection:
 - 4.4.1.1. Collect 1.0 mL of blood for complete blood count and biochemistry for all marmosets actively being used in research protocols, as determined by the veterinarian.
 - 4.4.1.2. Refer to SOP 403 Guidelines for Blood Collection Volumes and Frequency.
 - 4.4.2. Tuberculin skin testing:
 - 4.4.2.3. Anesthetize animals as per NHP Anesthesia SOP.
 - 4.4.2.1. Inject 0.05 ml of Old Mammalian Tuberculin intradermally in the upper eyelid, as close to the edge as possible.
 - 4.4.2.2. Allow animal to fully recover in crate before returning to housing enclosure.
 - 4.4.2.3. Reaction will be evaluated at 24h, 48h, and 72h.

- 4.4.2.4. The description of the reaction or corresponding reaction grade (as per table below) must be entered into the animal's record.

REACTION GRADE	DESCRIPTION OF CHANGES
0	No reaction
1	Bruise – extravasation of blood in the eyelid associated with the injection of tuberculin.
2	Varying degrees of erythema of the palpebrum with minimal swelling.
3	Moderate swelling with or without erythema.
4	Obvious swelling of the palpebrum with drooping and varying degrees of erythema.
5	Marked swelling with necrosis and eyelid closure or partially closed.

- 4.4.2.5. Grades 0, 1 and 2 are considered negative; grade 3 is suspect; grades 4 and 5 are considered positive.

- 4.4.2.6. Upon reading, all grade 3, 4, and 5 must be signaled immediately to a veterinarian.

- 4.4.2.7. After 72 hours, any clinical signs, including grade 1 and 2, must be reported to a veterinarian.

- 4.4.2.8. Retest any suspected cases as determined by the veterinarian.

4.4.2.8.1. Anesthetize animals as per NHP Anesthesia SOP.

4.4.2.8.2. Carefully shave a small section of the abdomen. Inject 0.05 ml of Old Mammalian Tuberculin intradermally. Ideally, use a different lot from the one used in the first testing.

4.4.2.8.3. Allow animal to fully recover in crate before returning to housing enclosure.

4.4.2.8.4. Reaction will be evaluated at 24h, 48h, and 72h.

4.4.2.8.5. The description of the reaction or corresponding reaction grade (as per table below) must be entered into the animal's record.

REACTION GRADE	DESCRIPTION OF CHANGES
0	No reaction
1	Moderate swelling. Height of induration 3-5 mm
2	Moderate swelling. Height of induration 5-10 mm
3	Obvious swelling. Height of induration >10 mm

4.4.2.8.6. Grades 0 and 1 are considered negative; grade 2 is suspect; grade 3 is considered positive.

4.4.2.8.7. Upon reading, all grade 2 and 3 must be signaled immediately to a veterinarian.

4.4.2.8.8. After 72 hours, any clinical signs, including grade 2, must be reported to a veterinarian.

- 4.4.2.9. Consider other diagnostic tests to confirm any suspected cases.

4.5. Health status reports:

- 4.5.1. The facility veterinarian reviews all health monitoring reports.

5. REFERENCES

- 5.1. Lécu, A., Knauf, S., Mätz-Rensing, K., & Kaup, F. (2012). Tuberculosis in Nonhuman Primates, an Overview of Diagnostic Tools.
- 5.2. CCAC guidelines: Nonhuman primates. Canadian Council on Animal Care, 2019.

SOP REVISION HISTORY

DATE	NEW VERSION
2023.02.07	2. Responsibility Veterinary care staff. Veterinarians.
2023.02.07	3.1. Ketamine Anesthetics 3.3. Blood collections tubes
2023.02.07	4.2. Do not perform examinations under anesthesia or tuberculin skin test on pregnant females or marmosets under 2 months of age.
2023.02.07	4.3. Every 6 months: 4.3.1. General physical examination: 4.3.1.1. Anesthetize animals as per NHP Anesthesia SOP. 4.3.1.2. Record body weight. 4.3.1.3. Perform a complete physical examination. 4.3.1.4. Allow animal to fully recover in crate before returning to housing enclosure. 4.3.2. Blood collection: 4.3.2.1. Collect 1.0 mL of blood for complete blood count and biochemistry for all marmosets 8 years of age or older, or as determined by the veterinarian. 4.3.2.2. Refer to SOP 403 Guidelines for Blood Collection Volumes and Frequency. 4.3.3. Fecal samples: 4.3.3.2. Collect fresh feces from each family/group for ectoparasites, endoparasites, and pathogenic enteric bacteria testing.
2023.02.07	4.2. Every 12 months, under ketamine (10 mg/kg IM) anesthesia, at a minimum: 4.4.1. Blood collection: 4.4.1.3. Collect 1.0 mL of blood for complete blood count and biochemistry for all marmosets actively being used in research protocols, as determined by the veterinarian. 4.4.1.2. Refer to SOP 403 Guidelines for Blood Collection Volumes and Frequency. 4.4.2. TB Tuberculin skin testing: 4.4.2.4. Anesthetize animals as per NHP Anesthesia SOP. 4.4.2.1. Inject 0.05 ml of Old Mammalian Tuberculin intradermally in the upper eyelid, as close to near the edge as possible. 4.4.2.2. Allow animal to fully recover in crate before returning to housing enclosure.
2023.02.07	4.4.2.6. Upon reading, all grade 3, 4, and 5 must be signaled immediately to a veterinarian. 4.4.2.7. After 72 hours, any clinical signs, including grade 1 and 2, must be reported to a veterinarian. 4.4.2.8. Retest any suspected cases as determined by the veterinarian. 4.4.2.8.1. Anesthetize animals as per NHP Anesthesia SOP. 4.4.2.8.2. Carefully shave a small section of the abdomen. Inject 0.05 ml of Old Mammalian Tuberculin intradermally. Ideally, use a different lot from the one used in the first testing. 4.4.2.8.3. Allow animal to fully recover in crate before returning to housing enclosure. 4.4.2.8.4. Reaction will be evaluated at 24h, 48h, and 72h. 4.4.2.8.5. The description of the reaction or corresponding reaction grade (as per table below) must be entered into the animal's record. REACTION GRADE, DESCRIPTION OF CHANGES 0, No reaction 1, Moderate swelling. Height of induration 3-5 mm 2, Moderate swelling. Height of induration 5-10 mm 3, Obvious swelling. Height of induration >10 mm 4.4.2.8.6. Grades 0 and 1 are considered negative; grade 2 is suspect; grade 3 is considered positive. 4.4.2.8.7. Upon reading, all grade 2 and 3 must be signaled immediately to a veterinarian. 4.4.2.8.8. After 72 hours, any clinical signs, including grade 2, must be reported to a veterinarian. 4.4.2.9. Consider other diagnostic tests to confirm any suspected cases.
2023.02.07	5. REFERENCES 5.1. Lécu, A., Knauf, S., Mätz-Rensing, K., & Kaup, F. (2012). Tuberculosis in Nonhuman Primates, an Overview of Diagnostic Tools. 5.2. CCAC guidelines: Nonhuman primates. Canadian Council on Animal Care, 2019.
2023.02.23	4.3.3.1. At the discretion of the veterinarian, collect fresh feces from each family/group for ectoparasites, endoparasites, and pathogenic enteric bacteria testing.