BLOOD COLLECTION POLICY

Overview/Purpose

Blood collection or sampling (venipuncture, phlebotomy) is a common and important procedure utilized in the research setting. Animals that are young, aged, stressed, have undergone research procedures, or are suffering from systemic disease may not tolerate the recommended blood collection volumes. This policy was developed to assist researchers with blood collection while minimizing pain and distress.

Definitions

1. **Blood Collection** – Using a closed (hypodermic syringe or vacuumized container) or open (needle or lancet) method to collect venous or arterial blood.

Requirements

Study team members must be appropriately trained for animal handling and blood collection techniques. Training is available free of charge:
http://ular.osu.edu/training/animal-handling-and-technique-training/

1. **Blood Collection**: The selected blood collection technique and volume must be appropriate for the animal species. Animals must not be returned to the housing location until complete hemostasis is achieved. Collection of blood from the retro-orbital sinus requires justification and general anesthesia.

2. **Volume of Blood Collected**: Regardless of species, the maximum volume of blood that can be collected must not exceed 1.5% of the total body weight over a 2 week period. A single blood draw must not exceed 1% of the total body weight. Example calculations of a 1% blood volume removal are below (assuming 1 ml of blood equals 1 gm):
    a. 0.15 ml from a 15 gm mouse
    b. 3 ml from a 300 gm rat
    c. 35 ml from a 3.5 kg rabbit
    d. 400 ml from a 40 kg dog

3. **Terminal Blood Collection**: Terminal blood collection, including cardiac puncture, must only be performed while an animal is under general anesthesia for a non-survival procedure. Death must be verified upon completion and a secondary method of euthanasia is required.

References

1. Animal Welfare Act (AWA, Public Law 89-544, 7 U.S.C.)
2. Animal Welfare Act Regulations (AWAR, 9 CFR, Chapter 1, Subchapter A)
3. Abatan O, Welch KB and Nemzek JA. Evaluation of Saphenous Venipuncture and Modified Tail-Clip for Blood Collection in Mice. *JAALAS 47(3):8 – 15. 2008.*
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5. Health Research Extension Act of 1985 and Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals
6. Whittaker A, Francisco C, Howarth G. 2015. Effects on Animal Wellbeing and Sample Quality of 2 Techniques for Collecting Blood from the Facial Vein of Mice. *JAALAS* 54(1):80-84.
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8. Teilmann AC, Nygaard Madsen A, Holst B, Hau J, Rozell B, et al. (2014) Physiological and Pathological Impact of Blood Sampling by Retro-Bulbar Sinus Puncture and Facial Vein Phlebotomy in Laboratory Mice. PLoS ONE 9(11): e113225. doi:10.1371/journal.pone.0113225
9. Kesavan R, Parasuraman S, and Raveendran R. 2010. Blood Sample Collection in Small Laboratory Animals. Journal of Pharmacology & Pharmacotherapeutics 1(2): 87-93. doi: 10.4103/0976-500X.72350

History of Revisions

006-00 - Original policy; approved 10/25/2002
006-01 – Revised to reflect the volumes for types of collection samples; approved 01/25/2008
006-02 – Revised to focus on activities that must be conducted; approved 06/17/2011
006-03 – Policy revisions reflect the requirements for various blood collection methods; approved 08/15/2014
006-04 – Policy revision includes a training statement in the requirements for blood collection methods; approved 06/16/2017