UNIVERSITY OF DELAWARE
OFFICE OF LABORATORY ANIMAL MEDICINE

Cardiac Puncture Blood Collection (Terminal Procedure) SOP #PRO-002

Equipment required:

- Mouse: 23-25 gauge needle and 1-3 ml syringe
- Rat: 20-25 gauge needle and 10-20 ml syringe
- Anesthesia

Technique:

1. Anesthetize animal. **(Surgical plane of anesthesia is required!)**
2. Test for reaction by corneal reflex and toe pinch.
3. Blood may be obtained through a ventral, left lateral, or open approach.
4. **Ventral approach (closed)**
    a. Place animal on back (dorsal recumbency)
    b. Palpate heart
    c. Insert needle slightly left of and under sternum, directed toward animal's head.
    d. Needle and syringe should be held 20-30 degrees off horizontal.
    e. Insert into heart
5. **Left Lateral approach (closed)**
    a. Place animal on right side (right lateral recumbency)
    b. Palpate heart on left lateral thoracic wall (approximately at point of flexed elbows, between ribs 5 and 6)
    c. Insert needle slowly (between ribs and perpendicular to the body) and into heart
6. **Open approach**
    a. Place animal on back (dorsal recumbency)
    b. Wet skin on the abdomen with 70% alcohol
    c. Make a V-cut through the skin and abdominal wall ~1cm caudal to the last rib
    d. Move internal organs to the side
    e. Insert needle through the diaphragm and into the vena cava or heart
7. Gently apply negative pressure on syringe plunger. Heart chamber may collapse if negative pressure is too great.
8. **Never move the needle side-to-side as this could lacerate the heart or vena cava!**
9. If no blood appears, slowly withdraw the needle so that it remains just under the skin or the diaphragm and redirect in a slightly different direction.
10. If blood stops flowing, slowly rotate needle or move it slightly in or out.
11. Withdraw needle after blood has been collected.
12. Perform secondary method of euthanasia to ensure that animal is deceased

Blood Volumes Expected at Exsanguination (~3% of Body Weight):

- **25 g Mouse:** ~0.75 ml
- **300 g Rat:** ~9.0 ml