



## Curtin University Standard Operating Procedure

### CARDIAC PUNCTURE BLOOD COLLECTION (Terminal Procedure) IN MICE AND RATS

Number: SOP TEC 26

Version: 1.0

Date: 15/12/2015

**Aim/Purpose:** To provide guidelines for researchers carrying out terminal cardiac puncture techniques in order to collect blood from rats or mice at Curtin University.

#### **Definitions:**

Cardiac Puncture:

Anaesthetic:

#### **Equipment Required:**

- **Mouse – 23-25 gauge ½ inch needle and 1-3ml syringe**
- **Rat: 20-25 gauge ½ to 1 inch needle and 3-5ml syringe**
- **Approved anaesthetic – either injectable or inhalational (see SOP TEC 01)**

#### **Procedure:**

1. Anaesthetise animal using the method approved by the AEC application.
2. Test to ensure deep anaesthesia using the toe pinch on each toe and corneal reflexes.
3. Prepare the required syringe and needle.
4. Blood may be obtained using a ventral, left lateral, or open approach
5. Ventral Approach (1 inch needle for rats / ½ inch needle for mice):
  - a. Place animal into dorsal recumbency (on back)
  - b. Palpate the heart by feeling for the heart beat
  - c. Insert the needle slightly left of, and under the sternum, directed towards the animal's head.
  - d. Needle and syringe should be held 20-30 degrees off the horizontal
6. Left Lateral Approach (1/2 inch for both mice and rats):
  - a. Place animal in dorsal recumbency (on back).
  - b. Palpate along chest cavity moving in a caudal direction until the location with the strongest heartbeat is isolated.
  - c. Insert the needle into the thoracic cavity between two rib spaces in an area approximately at the back of the elbow where the heartbeat is strongest, coming in from the lateral left side.



- d. Use the edge of the table to assist to stabilise the hand and minimise movement.

7. Open Approach

- a. Place animal in dorsal recumbency (on back)
- b. Wet the skin with 70% alcohol / ethanol
- c. Make an incision running down the midline of the animal from the mid chest region to the mid abdomen.
- d. Cut through both the skin and abdominal wall.
- e. Move the internal organs to the side
- f. Open the diaphragm
- g. Insert the needle into the heart.

- 8. Gently apply negative pressure on the syringe plunger. The heart chamber may collapse if the negative pressure is too great.
- 9. Never move the needle from side to side as this could lacerate the heart or vena cava.
- 10. A small amount of blood should appear in the hub of the needle when the needle is in the correct location.
- 11. If no blood appears, slowly withdraw the needle so that it remains just under the skin and redirect in a slightly different direction.
- 12. Aspirate slowly as to allow the heart to refill to allow the collection of the most blood possible
- 13. If the blood stops flowing, slowly rotate the needle or move it slightly in or out.
- 14. Withdraw the needle after the blood has been collected.
- 15. Store the blood immediately in the appropriate blood tube / container
- 16. Perform secondary method of euthanasia to ensure animal is deceased- see SOP TEC 03.

Blood Volumes Expected at Exsanguination (approx. 3% of Body Weight)

- 25g Mouse: approx. 0.75ml
- 300g Rat: approx. 9ml

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**Date of Approval:** 15/12/2015  
**Reviewed:**

DATE					
REVIEWER					