



# Curtin University Standard Operating Procedure

## BARBERING IN LABORATORY MICE

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**Purpose:** This standard operating procedure (SOP) provides guidelines to manage and minimise barbering in laboratory mice in the laboratory at Curtin University.

### Scope:

This standard operating procedure is designed to be used by laboratory managers, animal carers, and researchers using the animal house facility in Building 300, Curtin University, to prevent mice barbering, and to manage mice which are found to be barbering, during research projects.

### Definitions:

Barbering is defined as abnormal whisker and fur plucking behaviour in mice, commonly seen in laboratory mice. It has been thought to be associated with an expression of social dominance, however this is starting to be questioned and it has been suggested it is homologous to human hair pulling (trichotillomania).

The implications on the research results is still unknown, thus the overall consequences for the research and its validity is unknown. If barbering is widespread within a research group, consideration by the researcher as to the full effects on their results must be taken.

Risk factors appear to be

- 1) A female bias
- 2) Onset during puberty
- 3) Aetiological factors including reproductive status and genetic background
- 4) More likely in C57BL/6 and 129s derived strains
- 5) Husbandry factors such as cage design, cage location, cage mate relationship, and the presence of other barbers

It tends to show clinically as hair loss around the whiskers, dorsal face (including the eyes), between the ears, the dorsal neck, back and rump.

Self –barbering: Barbering to oneself which is commonly seen in mice housed separately. This tends to present as hair loss around the chest, genitals, and the inside and outside of the forearms.



Environmental stimulation: is defined as ‘any measure which promotes expression of natural, species specific behaviours and a decrease in, if not disappearance of, abnormal behaviours. It should be aimed at not just preventing suffering but at having a positive effect on the physical and psychological well-being of the animal’. (Guidelines to Promote the Wellbeing of animals used for Scientific Purposes, 2008).

Some examples which can be used to improve the environment for the mice are

- 1) Paper or plastic tubes
- 2) Igloos / Housing
- 3) Food Treats (depending on research being carried out)
- 4) Chew Toys, Lego, plastic balls, and poker chips.
- 5) Pop sticks

Infected wounds: Wounds can become infected if the biting actually damages the outer layers of the skin and allows bacteria, commonly *Staphylococcus aureus*, to gain entry and form an infection. It is a potential cause of a condition called Ulcerative Dermatitis.

## **Procedures:**

### Prevention:

When planning a research project requiring the use of mice, the likely issue of barbering must be considered prior to the beginning of the project. Researchers must consider the factors which increase the possibility of barbering occurring, and take this into account.

The high risk groups appear to be

- 1) Female Mice. Females when housed in group situations tend to barber, whereas male mice grouped together tend to fight.
- 2) Mice of the high risk genetic backgrounds e.g. C57BL/6 and 129s. It is worth considering using other genetic groups of mice which have less history of developing barbering. This may not be possible as you may need to use a particular model or strain of mouse but investigation of other choices should be done. If you plan on using these strains, you need to justify the use of these two strains in your initial animal ethics application.
- 3) Mice which are kept in the laboratory for longer periods and are over the 12- 14 week age range. It appears mice increase their barbering as they are kept longer in the laboratory. Thus it is important when planning any projects to have the animals in the laboratory for the shortest period possible.
- 4) Husbandry factors such as cage design, cage location, cage mate relatedness, and the presence of other barbers can increase the barbering seen.

In the groups which are considered to be ‘high risk’, measures should be taken to anticipate the likelihood of barbering beginning, and preventative measures taken.



The researcher should plan to minimise the above factors in their experimental design if possible. If some of these factors are unavoidable, then in those groups at high risk, preventative measures should be started as soon as possible. This includes providing environmental enrichment such as rotating bedding more frequently than usual (normally is done fortnightly), and ensuring toys and treats are changed regularly.

### Management:

Once barbering has been identified within a cage, a standard plan of action will be instigated by the researcher and animal carers. Initially closer monitoring of these animals will be started. The group will be monitored twice daily, and an increase in the rotation of bedding and environmental stimulation will be initiated.

The procedures which are to be carried out on affected cages are

- 1) Closer monitoring – once to twice daily inspection of wounds
- 2) Change bedding type weekly rather than fortnightly
- 3) Increase the environmental stimulation and change it weekly
- 4) Centre the cage if possible and put it closer to the ground.

The researcher must decide if the animals affected by the barbering are still suitable for the experimental design. They must justify keeping the animals in the project, and if their condition deteriorates or are not viable for the project, they should be culled immediately.

If the wounds begin to break through the skin and become infected, the affected mouse will be removed and treated for its wounds. Some treatments will make the animal unsuitable for the project and then will need to be culled. It would not be returned to its original cage, but kept separately until the project finishes or the animal is culled due to its unsuitability for the project aims.

Barbering can be graded as:

- 1) Mild -- the mice show some very mild hair loss around face and ears. It appears mainly as a thinner coat cover in these areas. The mouse shows normal behaviours in the cage.
- 2) Moderate – quite a lot of hair loss over head, neck, legs or thorax. In these patches, the skin is still intact and there is no evidence of infection.
- 3) Severe- the hair loss has progressed and the skin is broken through. The skin visible is red and shiny and may appear infected (moist with a discharge). The mouse may or may not be showing other signs of stress or discomfort such as anorexia, quiet behaviour.



If the barbering is considered to be of a severe level, an Adverse Event form needs to be submitted to the AEC.

A self-barber can also be graded in the above way. As it is being housed on its own, researchers should try and minimise the time this animal is used as part of the project and should be culled as early as possible.

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