

NVS Guidance on Unexpected Seizures in Mice

Description

This guidance relates to the occurrence of unexpected seizures in mice and does not apply to experimentally induced seizures or GA mouse models with seizures as a reported phenotype covered in a PPL. Mice having seizures may show the following behaviour or clinical signs:

- Freezing, often while looking up at awkward angles
- Freezing with repetitive small movements (head bobbing, one limb moving)
- Head twitching
- Falling over and paddling on their sides
- Falling over and staying still with limbs extended

Causes of seizures

Seizures may be due to a wide range of causes. These include:

- Genetic causes: known mutations or unknown genetic causes and/or strains with higher prevalence such as DBA/2 and C57BL/6 animals, and/or spontaneous changes associated with genetic drift
- Ill health
- Experimental adverse effects: eg. after intracranial injections or surgery
- Exposure to noxious or overwhelming stimuli
 - o Loud noises (audiogenic seizures)
 - o Chemical smells
 - o Bright lights or sudden changes in lighting
 - o Handling

Recommended actions

‘Stock’ animals ie. animals not currently undergoing regulated procedures:

- Seizures are not expected to occur in mice
- First seizure
 - o Recommend humanely killing the mouse if seizure lasts longer than 5 minutes, or if mouse is not fully recovered in 24 hours
 - o Record on MCMS as a health observation (Whole body > General > Fitting/Seizure)
 - o Instigate ‘seizure-friendly’ handling practices (below)
 - o Do not breed from this animal
- Second seizure in the same mouse
 - o Recommend humanely killing the mouse

Animals currently undergoing regulated procedures:

- If seizures are an expected adverse effect of the regulated procedure:
 - o Record on MCMS including a description of the seizure, an estimate of duration and a note on how quickly/well the animal recovered
 - o Assign an actual severity and assign to a procedure
 - o Take any actions required in the project licence
- If seizures are not an expected adverse effect of the regulated procedure:
 - o Discuss SC18 requirements with your NACWO, NVS and the licensing team
 - o Consider what impact seizures may have on experimental data

Licensing implications

- Based on data from across UBS facilities (see appendix 1), the NVS team expect seizures to occur at a frequency of 0.5% or less in any given colony or cohort
- If your breeding colony or experimental cohorts are experiencing rates higher than 0.5%, please discuss this with your NACWO, NVS and the licensing team as an amendment to the project licence may be required
- Consider refreshing your colony if past 5 generations bred in-house

Seizure friendly handling practices

Please discuss the implementation of these handling practices with your NACWO(s)

- Be extra careful while moving cages off and on the racks – avoid sudden movements
- Reduce handling as much as possible and always use tunnel handling or cupped hands
- Avoid scruffing if possible
- Use red light in the changing station, and/or consider the use of red light in the room
- Change high risk cages at quieter times of the day
- Reduce environmental noise (eg. turn off music)
- Consider moving cages to a quieter part of the room (eg. away from doors or procedure areas)
- Consider trialling gentle, soft, background music during cage changes or handling, eg. classical music playlists like ‘Mozart for babies’
- Consider trialling glove disinfectants with less strong smells (eg. alcohol free)

Appendix 1. 2024 All Mice Seizure Data

Group	Total number of mice	Number of seizure health observations	% affected
All mice	149 954	147	0.10%
Mice under 30 weeks of age	134 343	104	0.08%
Mice equal to or over 30 weeks of age	15 611	43	0.28%

Weaned mice, with a death date between 1/1/2024-31/12/2024