Animal Monitoring and Humane Intervention Points

Intent

These guidelines are to inform investigators about the AEC's expectations for animal monitoring and to provide them with details of how to develop a monitoring plan, monitoring records and how to set humane intervention points and endpoints for their projects.

The principal aim of monitoring animals used for scientific purposes is to detect or predict pain, suffering, changes in animal health or wellbeing or any other adverse or unplanned effects so that action can be taken. Animals may also be having certain measurements taken or observations made that relate specifically to the project or research or teaching activity they are involved in, however, monitoring an animal's overall wellbeing must be carried out in addition to obtaining research results.

Careful animal monitoring is also important for scientific outcomes. Changes in an animal's wellbeing can affect physiological responses and research results. Monitoring records can be reviewed in the face of outliers and aberrant results and help in any investigation and to justify the exclusion of animals.

The description of how animals will be monitored during a project needs to be outlined in the monitoring plan which must be described in the AEC application. Once a project is approved, the animals must be monitored exactly as described in application or else it will be considered a breach of approval.

Developing a Monitoring Plan

When developing a monitoring plan for animals in a project, the following should be taken into account:

- Animal details i.e. species, strain/line, phenotype (particularly if it is genetically modified), sex and age
- Project details i.e. The types of procedures, the level of impact at each stage, housing type and stocking rate/density
- Available resources i.e. Remote monitoring systems and telemetry, anaesthetic monitors and handling equipment
- The levels and frequency of monitoring required and whether different monitoring regimens are required at different stages or for different procedures. E.g. Acclimation, pre-research, post-surgical monitoring, anaesthetic monitoring, monitoring of new strains of gm animals
- The personnel who will be carrying out the monitoring, whether they are competent or may require training and supervision in order to reach an acceptable level of competence
- Scientific endpoints: the monitoring plan should take into account the earliest time the animals can be removed from the project
- Pre-determined humane intervention points

Previous experience, pilot studies and literature reviews should be used to determine likely effects of the research on the animals and assist in the development of monitoring plans and humane intervention points.

Level of Monitoring

The level of monitoring refers to the degree of interaction with the animal during monitoring, for example, different levels of monitoring may include: inspecting the animal in their cage or environment from a distance with no interaction, undisturbed observation of the animal at rest, handling the animal for closer observation or restraint and physical examination.

Animals must be monitored at a level appropriate to the species, type of housing and impact of the procedures being undertaken.

The level of monitoring needs to be sufficient to detect clinical signs and behavioural changes indicative of pain or distress resulting from their use in the project and should at least be to a level of close individual observation, but during and after high impact procedures should involve a physical examination.

Generally, monitoring animals will involve making an initial assessment of their behaviour and appearance from a distance, without disturbing them, before making a closer observation or examination. This is because the many animal species have survival instincts that means that they are likely to change their behaviour when they feel they are being observed in a way that disguises signs of pain or distress.

Monitoring Criteria

Monitoring criteria are generally observable indicators of an animal's wellbeing that can be measured and are known to change when an animal is in pain, distress or unwell. Where possible they should be objective observations of clinical signs the animal is exhibiting rather than subjective diagnoses of specific problems. This takes away personal bias from the assessment and allows the observations to be interpreted at a later date by someone else.

Monitoring criteria can include any of the following:

- Behaviour: activity, response to stimuli, including their interaction with other animals (interacting or isolating themselves), presence of stereotypic behaviour
- Basic bodily functions: food and water consumption, defaecation and urination
- Body weight and/or an assessment of body condition and changes in body weight/condition over time
- Physical appearance: coat, posture, ear position, head position
- Physiological/clinical parameters: blood pressure, heart rate, body temperature, respiration rate
- Criteria related to specific procedures: suture line, surgical site, cannulations, tumour size, lesion size

Frequency of Monitoring

Animals should be checked frequently enough for the onset of any adverse events to be detected as soon as possible after they begin so that distress, pain or discomfort can be minimised.

Animals that have had undergone an invasive procedure or procedures that lead to physiological or mental stress should be monitored more frequently than animals that have not. After an invasive procedure, or after the onset of physiological/mental stress, it would be expected that an animal would include an examination of any incisions up until the time that healing was complete.

Animals should be checked by someone at least daily, even on weekends.

Records and Documentation

Animals must have a monitoring records showing that all the necessary criteria have been assessed at each of the monitoring timepoints, although one record may be used for multiple animals if the impact of the research is low.

Separate monitoring records should be developed for monitoring during anaesthesia and procedures and these must be kept in the animal facilities.

For all animals, it should be easy to cross-match an animal with its monitoring record and AEC approval. To achieve this, the following information should be on the monitoring record:

- Animal ID (except fish housed in groups)
- Cage/tank/pen number
- Species
- Age or date of birth (if known)
- AEC approval number

And the following information should be on the cage/pen/tank:

- Animal ID(s) or number of animals in the Cage/tank/pen (for group housed fish and livestock)

- Cage/tank/pen number
- AEC approval number

Monitoring records should also show when an animal has undergone a procedure, requires or receives treatments such as analgesia or other medications.

The cages or pens of animals requiring extra monitoring, treatments or medication must be appropriately flagged to indicate the requirement for extra care.

Animal monitoring records, anaesthetic and procedure monitoring records, AEC Approvals and details of the person responsible for the animals and their emergency contact details must be available in the animal rooms at all times and accessible to all people involved in the care of the animals. They must be made available to the AEC (or delegate) as required.

The minimum monitoring requirements for a low impact project should include:

- When the animal is fed/watered/cleaned
- Body weight or an assessment of body condition
- Look for any obvious physical or behavioural abnormalities

Records for the animals should be available in the facility up to the time the animals leave or are killed. After this, the records can be removed and archived.

There are many reasons that the AEC may request animal monitoring records, including: during a complaint investigation, following an adverse event, when reviewing annual and final reports, or during announced or surprise inspections. If, when requested, the records cannot be provided, the AEC will assume that monitoring was not carried out and action may be taken against those responsible for the animal monitoring. It's therefore important to monitor and record details as outlined in the AEC application.

After the completion of a project, monitoring records should be retained in line with the University's record retention requirements for laboratory books.

Examples/templates of monitoring records can be found in the appendices.

Personnel

Animals must be monitored by competent people at all stages, and the person or people responsible for monitoring must be clearly outlined and communicated to all parties.

Animal care staff may do basic monitoring of animals, including checking food, water and bedding as a part of their role in the routine husbandry of the animals, but all monitoring related to the scientific project needs to be done by research or teaching staff who understand the project and its potential effects om the animals. At the beginning of a project, it should be made clear who will be responsible for what aspects of animal care and monitoring, including on weekends and holidays (if applicable).

Animal carers may be involved in more intensive monitoring related to the project if they have received a copy of the AEC protocol and trained in, and agree to, their roles. They also need to be named on the AEC protocol as co-investigators if this is happening.

Adverse Events

All adverse events or abnormalities with animals need to be recorded and communicated to the Principal Investigator or other responsible person. If action isn't taken within a reasonable time, the facility manager, AEC or AWO can be contacted. All Unexpected Adverse Events (UAE) must also be reported to the AEC within 48 hours according the UAE Reporting Procedures.

Monitoring New Genetically Modified Animal Lines

The Code says that where new genetically modified lines of animals are to be created, and the impact of the genetic modification is unknown, the lines must be monitored sufficiently until the effect of the modification on

the animals can be determined. This will in turn allow the animal technicians care for the animals in a way that will minimise the effects that the genetic modifications may have on their wellbeing.

The monitoring of GM lines involves observing the animals at various stages of life, from birth until death or euthanasia, noting abnormalities at each stage including body weight, physical characteristics, reproductive ability, fertility/fecundity including litter size and changes in litter size over time.

Once sufficient data has been collected, a report can be submitted to the AEC outlining the phenotype and the line can be approved for general use.

Note that the phenotype referred to in the Code related to the animals' day-to-day functioning and wellbeing when not challenged by experimental conditions, rather than a phenotype that related to specific physiological pathways that may only become evident once specific experimental stressors are imposed.

Setting Humane Endpoints/Intervention Points

When animals are used for scientific purposes it is the legal and ethical obligation of all involved to:

- Ensure the animals are only used for the shortest period of time necessary for the scientific or teaching outcomes to be reached
- Prevent or minimise any pain and distress to that which is unavoidable for the purpose of achieving the scientific outcomes.

Therefore, an animal's involvement in a project must end when:

- A scientific endpoint has been reached
- For some reason, there is no way the scientific outcome can be met
- The animal develops severe pain or discomfort that does not respond to analgesia, or
- The animal develops a morbidity that is unexpected, not part of the study terminal or that cannot be treated without interfering with the scientific outcomes

When an animal is in pain or distress that cannot be relieved, the animal must be removed from the situation. That could mean removing the animal from an experiment or activity either temporarily or permanently, euthanasia, ceasing the activity, releasing the animal or abandoning observations.

At all times, the welfare of the animal takes precedent over reaching a research or teaching outcome.

Humane intervention points are a set of clear (objective) criteria or clinical signs that define the point at which investigators must intervene to prevent unnecessary pain, distress, suffering or treat any underlying conditions. If the intervention is euthanasia or removal from the study, then this is called a humane endpoint.

Setting pre-determined criteria allows investigators and animal care staff to make decisions independently, leading to prompt treatment or removal of animals from an activity if pain and/or distress develop if the person responsible for the animal cannot be contacted.

For low impact work such as teaching, trapping or observational studies, humane intervention points may refer to a time where animals are seen to stressed or exhibiting behaviour that is affecting the observation such as avoiding returning to a nest.

When considering what humane endpoint criteria may be relevant, investigators should consult published literature related specifically to their particular projects or contact other scientists experienced in the area.

If death is a likely outcome from the use of animals in a project, then a pre-terminal humane endpoint must be chosen in place of death.

If the impact of a project on the animals is not known at the beginning of the project, such as in the development of a new surgical model, a pilot study should be conducted to determine the monitoring requirements and to set the humane endpoints.

In lower impact studies such as teaching activities or wildlife or aquatic animal research a humane intervention point is unlikely to result in euthanasia, but they are nonetheless applicable. In these cases, humane intervention points may refer to a time where animals are seen to stressed or exhibiting behaviour that is affecting the observation. Examples of humane intervention points in low impact activities include signs of stress or distress that mean the activity should be abandoned, such as:

- When trapping a marsupial, the animal exhibits behaviour that mean it is at risk of developing capture myopathy, or is risking injury to itself
- Signs of stress in marsupials that meant that they may drop their pouch young
- Changes in behaviour of birds being observed that could risk the lives of any young by avoiding the nest
- Animals showing stress or aggression during a teaching practical, and so require removal from the activity and a rest from use

As with monitoring criteria, where possible, intervention/endpoints should be clear clinical signs or measurable physiological or behavioural changes rather than subjective terms such as stressed, in pain, sick or injured, which are open to interpretation. They should also be species specific. Eg if the endpoint is that a mouse is stressed, then it would be expected that there would be a description of the signs of stress in mice, since stress is a subjective term that means different things to different people.

Examples of intervention points include:

- Vocalisation
- Inactivity
- Body weight loss of greater than 20% of the previous maximum
- Drop in body temperature by more than 2 degrees
- Aggression – biting, scratching, striking or growling at personnel
- Paralysis of hind limbs

There are also certain humane endpoints that are fairly universal across the species and types of animal use, that indicate an animal is in severe distress or pain which is unlikely to be reversed and euthanasia is necessary. There are outlined in appendix 2.

Investigators must develop a monitoring plan that is capable of detecting when a humane endpoint has been reached.

Investigators must include all relevant humane intervention points in the application to the AEC.

Related policy instruments

NA

Schedules/Appendices

[Provide the name(s) and hyperlink to any JCU schedules and appendices relevant to the policy.

Schedules **must not** be included in the policy. They should be placed on the business unit/policy author's website and linked to from this section of the policy.

Appendix/appendices are a section or table of supplementary information. They should be placed on the business unit/policy author's website and linked to from this section of the policy.]

Related documents and legislation

Animal Care and Protection Act

Australian code for the care and use of animals for scientific purposes.

Administration

Approval Details

Policy Sponsor	Animal Welfare Officer
Approval Authority	Animal Ethics Committee
Date for next review	09/03/2021

Revision History

Version	Approval date	Implementation date	Details	Author
1.0	09/03/2018	09/03/2018	Guideline published	Craig Godfrey, Animal Welfare Officer

Keywords	Humane endpoint, animal monitoring, animal ethics, animal research

Appendix 1: Examples of humane endpoints/intervention points

The guide below has been provided to assist investigators in devising a thorough monitoring plan, setting humane endpoints/intervention points and deciding what actions may be required if clinical signs develop.

SCORE	0	1	2
SEVERITY	Normal or expected	Moderate	Critical
DESCRIPTION	Within the normal or expected limits for an animal in that situation	Moderate, possibly reversible or resolving deviation from normal/expected that indicate the animal is experiencing a degree of pain, distress or suffering	Severe generally irreversible deviation from normal/expected that may progress rapidly to death or may cause a physiological response that affects research outcomes
ACTION REQUIRED	No action, continue monitoring as planned	Action is required to address any abnormalities and monitoring intensity and frequency may need to be increased until the animal returns to an acceptable state. Further investigation or intervention is required to determine the diagnosis or investigate and treat the cause of the pain or distress. Consult a veterinarian, notify the facility manager and the Principal Investigator, continue monitoring unless a humane endpoint has been reached.	Urgent action is required, and euthanasia is strongly recommended in line with the predetermined humane endpoints. If a humane endpoint has not been reached, and this is not an unexpected adverse event, and the animal is not to be euthanised, monitoring should be intensive, and the frequency should be increased until the animal returns to an acceptable state. If the animal's condition does not improve in a short period of time, euthanasia should be performed. Further investigation or intervention is required to determine the diagnosis or investigate and treat the cause of the pain or distress. Consult a veterinarian, notify the facility manager and the Principal Investigator.

MONITORING CRITERIA	METHOD OF ASSESSMENT / LEVEL OF MONITORING	CLINICAL SIGNS	0	1	2	POSSIBLE DIAGNOSES OR INTERPRETATION OF THE CLINICAL SIGNS
Food consumption	Visual, weight or volume	Changes in intake, in particular decreased intake	Normal/expected	Noticeable but mild change	Inappetence	Debilitation, pain, locomotion problem, nausea, inflammation of the mouth
Water consumption	Visual, volume	Changes in intake	Normal/expected	Mild changes	Unable or not willing to drink without assistance/progressive dehydration	Decrease – Debilitation, pain, locomotion problem Increase – Renal failure, high temperature, diabetes, infection
Social behaviour	Best observed from a distance without disturbing animal	Separated from others, fighting, sexual behaviour (inappropriate or unintended), aggression/fighting	Normal	Intermittently separate from others	Completely separate or isolated from others	Separation/withdrawal from the group can indicate pain or distress, aggressive behaviours of other animals in the group, imminent parturition or oestrus as well as overcrowding Needs to be interpreted based on species and situation (including housing)
Vocalisation	Listen before disturbing animals and take note when handling and approaching them	Excessive vocalisation, species-specific noises that indicate distress, pain, aggression or fighting/aggression (grouped animals)	Vocalisation is appropriate for the species and situation	Vocalises when a particular area is palpated, there is aggressive vocalisation indicating fighting (undisturbed animals), some vocalisation before or during handling	Vocalises when picked up, extreme vocalisation indicating severe distress and suffering or failure to vocalise in animals that would normally respond with vocalisation	Vocalisation is species-specific, and must be interpreted on the basis of the situation Vocalisation can indicate aggression, pain, distress, stereotypical behaviour or fighting in grouped animals. Failure to vocalise in animals that would normally vocalise may indicate pain or that the animals may be becoming moribund.
Activity level and behaviour	Best observed from a distance without disturbing animal	Level of alertness, movement, aggression, reduced or increased activity, changes in reaction to stimuli (including people),	Normal – mobile and active	Mild reduction or increase in activity	Immobile/inactive or extreme excitation with abnormal behaviour	Pain and distress, or non-specific, a sign further examination or observation is necessary or analgesia is required
Body posture	Visual, telemetric	Hunched, wide stance, head lowered	Normal	Asymmetric posture, mild hunching	Persistent/severe hunching or abdominal splinting	Abdominal pain, pain, debilitation, weakness, paresis
Gait and locomotion	Observation, physical examination, neurological examination	Lameness, paralysis, tremor, paresis (weakness)	Normal (or normal for an animal in that situation)	Limping, walking on tiptoe, reluctant to move, mild incoordination, non-weight bearing or paralysis in one limb only	Incoordinated, paralysis in more than one limb, non-weight bearing in more than one limb	Musculoskeletal strain or disease, trauma, fracture, arthritis, bruising, pain in feet or neurological

MONITORING CRITERIA	METHOD OF ASSESSMENT	CLINICAL SIGNS	0	1	2	POSSIBLE DIAGNOSES OR INTERPRETATION OF THE CLINICAL SIGNS
Response to stimuli	Observation, telemetry and other remote assessment tools	Level of alertness, movement, aggression, reduced or increased activity, changes in reaction to stimuli (including people),	Normal response to approach of personnel, handling and manipulation	Reduced or abnormal response to handling/other stimuli, aggression, vocalisation	Little or no response to stimuli	Abnormal response could be due to pain and distress, or non-specific, a sign further examination or observation is necessary, or analgesia is required. If completely unresponsive then euthanasia is required
Body condition	Visual scoring with palpation	Loss of body condition compared to normal Obesity	Normal for that species, sex and age	Mild loss of condition/ thin or mild increase in fat cover	Emaciated with bony prominences clearly showing or obese to the point of impairment of mobility	Inappetence, cachexia, increased metabolic demand or disease state, paraneoplastic syndrome Increase in body condition may indicate metabolic changes, overeating or too much food being supplied for the activity level
Coat quality or plumage	Visual assessment and physical examination	Unkempt coat, ungroomed or soiled, hair, feather or scale loss	Normal, well groomed	Some porphyrin staining of fur, rough coat, mild piloerection. Evidence of fighting wounds	Infected wounds, severe fighting wounds, severe self-mutilation. Severe porphyrin staining, severe piloerection	Non-specific sign of pain, distress debilitation, failure to groom (mouth ulceration), self-mutilation (stereotypy), pruritus (itch/irritation), infection, self-mutilation
Skin	Visual assessment and physical examination	Dermatitis, hair loss, excoriations, colour, bleeding or discharge from an orifice, tenting of skin/loss of elasticity, lumps and asymmetry, wounds	Normal	Inflammation of skin, scaling, hair loss, tumour, small number of small wounds, mild tenting	Ulceration of skin, bruising, large tumour(s), large and or infected wounds, severe tenting	Pruritus (itchy), infection, self-mutilation, trauma, dehydration, clotting disorder or severe bleeding internally, tumours or swelling of underlying structures, ascites, fighting (bite wounds)
Respiration	Observation, auscultation (stethoscope), palpation	Rapid or slow breathing Laboured respiration, shallow, abnormal chest sounds, wheezing, coughing	Normal rate and effort	Increased rate, mildly laboured but no cyanosis or distress	Increased rate, effort, noise on respiration, evidence of cyanosis and clear distress	Anaemia, shock, infection/pneumonia, stress or exertion, pneumothorax, cardiovascular disease, blood loss, dehydration, metastatic disease
Eyes, nose, oral cavity and mucous membranes	Visual assessment and physical examination	Colour - jaundice, pallor, cyanosis Ulcerated, discharge, inflamed, oedematous	Normal appearance and symmetry	Discharge from eyes or nose (porphyrin or other), intermittent squinting of eyes, mild redness of eyes, mild swelling of lids, mild jaundice (sclera)	Eyes closed, sunken, lids swollen prevent sight, severe jaundice (sclera), severe discharge	Jaundice (liver failure, GIT), trauma, clotting disorder, infections, see also skin for nose, ears, foreign body, exposure to irritant/burns, fighting, deformities

MONITORING CRITERIA	METHOD OF ASSESSMENT	CLINICAL SIGNS	0	1	2	POSSIBLE DIAGNOSES OR INTERPRETATION OF THE CLINICAL SIGNS
Body weight	Measurement on scale	Weight loss or a failure to gain weight as expected	Normal weight gain	Less than 15% weight loss (from baseline if adult or from expected weight for an animal in that situation). In young animals, failure to gain weight	15% or greater weight loss (from baseline if adult or from expected weight for an animal in that situation)	Inappetence, cachexia, increased metabolic demand or disease state May be related to pain
Faeces	Visual, smell, analysis, examination of cage/environment Observe defaecation event	Reduced output/production Change in consistency (diarrhoea), Change in colour – red, black, white/pale Unusual smell Painful defaecation, straining	Normal amount/appearance/small Norma defaecation	Slightly loose, soiled perineum or abnormally dry for less than 3 days Slight straining, or uncomfortable defaecation, reduced output	Persistent diarrhoea or failure to pass faece for 3 or more days, no faeces for 48 hours, or frank blood in faeces Pain on defaecation, straining with or without production of faeces	Constipation, dehydration, inappetence Gastrointestinal infection, parasitism, GIT bleeding, liver disease Foreign body, tumour, injury (fighting), secondary to surgical procedure (intentional or not), neurological/spinal disease
Urine	Visual, smell, analysis, examination of cage/environment Observe urination event	Increased/decreased production, changes in colour - red, brown, glucose positive on test Abnormal urination, straining, pain on urination, failure to express urine, enlarged bladder with reduced urination	Normal amount/appearance/smell Normal urination	Slight change colour/volume/smell Slight straining or discomfort on urination, reduced flow, increased time, decreased production	No urine for 24 hours or incontinent, soiled perineum, dehydration with increased production Intense straining/pain on urination, minimal urine passed, full bladder with minimal urination	Urinary tract disease, renal disease, jaundice/liver disease, high blood pressure, diabetes, infection, trauma Blockage, tumour, crystals, foreign body, post-surgical swelling, neurological/spinal disease
Surgical/injection site	Visual, physical examination	Sutures missing or loose, underlying tissues evident or protruding, discolouration, swelling at injection site, discharge or ulceration, loss, bleeding	Normal colour and appearance, clean	Mild swelling and/or reddening, loose or missing sutures, mild pain on palpation, some bleeding	Severe infection/discharge, uncontrollable bleeding, exposed viscera or body cavity, ulceration	Wound break-down, chewed out sutures (common), infection, injection reaction or infected injection site
Tumour size	Visual, measurement with instruments (imaging, callipers), or blood tests if haematogenous	Changes in blood results, ulceration, interfering with locomotion, anaemia, Graft versus host disease (pruritus, scaly skin, organ failure signs), emaciation	Normal or expected	Approaching size limit, not ulcerated, not affecting mobility	Tumour size > $1cm^3$. Ulcerated tumour. Tumour of any size interfering with normal locomotion or causing pain.	Graft versus host disease (some grafted blood tumours), excessive growth of tumour, cachexia

Appendix 2: Compulsory Humane Endpoints

Humane endpoints consist of procedure and species-specific objective criteria: measurements or observations that indicate the development of pain or distress in the animals or that the animals have reached a point where they must be removed from a project. The following list contains a list of clinical signs or conditions that, when detected, mean an animal has reached a state where it is suffering or will suffer severe pain and distress, which is unlikely to resolve or improve in condition (will result in death) and euthanasia is necessary, regardless of whether it was included as a humane endpoint in the AEC application.

Euthanasia is necessary when these signs have been detected.

- Impaired mobility preventing an animal from reaching food and water
- Unexpected excessive weight loss (more than 30% of starting body weight, or in growing animals, failure to gain weight compared to untreated/normal animals of the same age, species and strain)
- Generalised decrease in grooming over an extended time
- Signs of irreversible organ failure including severe jaundice, severe diarrhoea
- Reduced/absent response to stimuli
- Convulsions
- Sustained low or unresponsive decreasing body temperature
- Severe or sustained respiratory distress
- Significant tumour growth, whether solid or haematogenous where the animal's ability to move or defend itself from infection is severely compromised
- Severe oral ulceration that may prevent it from eating or drinking
- Significant loss of blood or uncontrollable bleeding especially if the bleeding has no obvious traumatic cause
- Severe stereotypic behaviours or self-mutilation
- Severe and unresolved bradycardia, low blood pressure (absence of pulse), cyanosis
- Signs of (unplanned) trauma including fractures, wounds, puncture of body cavities
- Signs of (unplanned) infection
- Signs of pain or distress that do not respond to interventions

Appendix 3: Example Monitoring Records

The next pages provide examples of monitoring records that can be customised for use and submission to the AEC with the AEC application.

1. Low impact – eg for use in low impact projects such as animal holding/display or group housed fish
2. High impact – eg for use in rodents or animals following surgery, invasive or stressful procedures such as induction of disease
3. High impact – eg for use in rodents or animals following surgery, invasive or stressful procedures such as induction of disease
4. Medium impact requiring monitoring more than once daily – eg for rodent toxicity/safety studies
5. Low to medium impact 1 month per page – eg for rodent behavioural studies

AEC Approval Number		Principal Investigator	
Pen/Cage/Tank No.		Phone contact:	
Species		Number animals	

Date	Activities	Comments	Initials

ANIMAL MONITORING SHEET									
Project ID:		**AEC Project #**:				**Animal ID:**			
PI:		**Contact Phone:**				**Office/Phone**:			
Species:		**Sex:**		**DOB:**			**Cage #:**		
Procedure: ☐ Laparotomy ☐ Liver Resection ☐ Traumatic Brain Injury						**Date:**			
Endpoint	**Score**	**Day 0 (pre-op)**	**Day 0 (post-op)**	**Day 0 (pm)**	**Day 1 (am)**	**Day 1 (pm)**	**Day 2 (am)**	**Day 2 (pm)**	**Day 3 (am)**
Body Weight (g)									
Weight Loss (% change)									
<5%	0								
5-10%	1								
10-20%	2								
>20%	3								
Temperature (°C)									
Behaviour/Alertness									
Normal	0								
Docile, low attention	1								
Hunched/Aggressive when handled	2								
Severe distress/ vocalisation	3								
Mobility									
Normal	0								
Low motion/ limping	1								
Reluctance to move	2								
Severely restricted mobility/ paralysis	3								
Appearance/Coat Condition									
Normal/groomed	0								
Rough coat/Porphyrin staining	1								
Nasal/Ocular discharge/Ruffled/Unkempt	2								
Encrusted eyes/nose/ Self-mutilation	3								
Wound Healing									
Normal	0								
Discharge	1								
Bleeding Discharge	2								
Open Infected Wound	3								
Breathing/Respiration									
Normal	0								
Rapid, shallow	1								
Rapid, abdominal breathing	2								
Laboured, irregular, skin blue	3								
Food/Water Intake									
Normal	0								
Reduced food/water intake	1								
Inappetence	2								
Not eating/drinking, severely dehydrated	3								
Faeces									
Normal	0								
Moist but formed	1								
Loose, soiled perianal area, mucoid	2								
Watery/no faeces for 48 hr/ blood	3								
TOTAL SCORE									
Monitor Signature									
Analgesia									

Humane Endpoints: Any animal with a cumulative score ≥15 *or* receiving a score of 3 in any one category will be euthanized immediately with i.p. injection of 100 mg/kg 'Lethabarb". Animals expressing pain behaviours and/or with a cumulative score ≥10 will receive additional opioid anaesthesia (0.01 mg/kg s.c. buprenorphine) and be monitored hourly.

AEC No.						
Phone:	**Researcher/Trainer**		**Comments**			
Email:	**Procedure**		**Species/Strain/Sex/Age**		**Cage/Box/Animal ID**	
Date of surgery:	**Day**	**Day**	**Day**	**Day**	**Day**	**Day**
Clinical Observation						
DATE:						
Activity ***(Normal=0,; isolated=1; huddled/inactive=2; moribund/fitting/=3)***						
Posture ***(Normal = 0; hunched = 2; trembling=3)***						
Movement/Gait ***(Normal=0; slight incoordination=1; tiptoe walking or reluctance to move=2; staggering/limb dragging/paralysis=3)***						
Coat condition ***(Normal/groomed=0; rough=1; ruffled/unkempt=2; bleeding or infected wounds or self mutilation=3)***						
Eating/drinking ***(normal=0; decreased intake during the 1st 24 hrs day=1; decreased intake more than 1 day=2; decreased intake over 48hrs=3)***						
Breathing ***(normal=0; rapid,shallow=1; rapid,abdominal breathing=2; laboured, irregular,skin blue=3)***						
ON HANDLING						
Alertness ***(normal=0; dull or depressed=1; little response to handling=2; unconscious=3)***						
Body weight ***(gram)*** ***(normal weight & growth rate=0; reduced growth weight=1; chronic weight loss>15% =2; weight loss = or >20%=3)***						
Dehydration ***(none=0; skin less elastic=1; skin tenting=2; skin tenting & sunken eyes=3)***						

Mice will require immediate veterinary treatment when a score of 2-3 for clinical observations in any criteria.

References:
•http://www.dpi.vic.gov.au/agriculture/about-agriculture/legislation-regulation/animal-welfare-legislation/codes-of-practice-animal-welfare/care-of-laboratory-mice-rats-guinea-pigs-rabbits
•Morton D.B. 2000. A systematic approach for establishing humane endpoints. ILAR Journal 41(2): 80-86.
•Morton D.B., and P.H.M. Griffiths. 1985. Guidelines on the recognition of pain, distress, and discomfort in experimental animals and a hypothesis for assessment. Veterinary Record 116:431-36.

		Day (before injection, 1hr post, 6 hrs post)																																
TEST/CONTROL mouse #	SCORE	0	0	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	11
Time of injection: DAY 0 DAY 1 DAY 2 DAY 3 DAY 4 DAY 5 DAY 6 Day 7 DAY 8 DAY 9 Time of cull: Day 10	**Activity** (normal=0, slightly isolated=1, inactive, no contact with other mice=2, moribund=3)																																	
	Posture (normal=0, hunched=1, trembling=2)																																	
	Movement (normal=0, slight incoordination=1, limping=2, paralysis=3)																																	
	Coat condition (normal=0, ruffled/unkempt=1, bleeding=2)																																	
	Eating/Drinking (normal=0, decreased intake over 24hr=1, decreased intake over 48hr=2)																																	
	Breathing (normal=0, rapid and shallow=1, laboured/irregular=2)																																	
	Weight (before injection; before cull; following necroscopy)																																	

Additional Notes:

AEC Number:		AEC Title:			
Researcher:		Species:		Mouse ID:	
Date start:		Strain:		Cage No:	

Date/Timepoint														
Body weight														
Normal														
Abnormal (below)														
Activity/alertness														
Coat														
Eating/drinking														
Hydration														
Body condition														
Urine/faeces														
Nest making														
Injection														
Analgesia														

Date/Timepoint														
Body weight														
Normal														
Abnormal (below)														
Activity/alertness														
Coat														
Eating/drinking														
Hydration														
Body condition														
Urine/faeces														
Nest making														
Injection														
Analgesia														

X = Normal, ++ = large increase, + = slight increased, - - = large decrease- = slight decrease