

# Recruiting Rats to the Research Resort (All the Rs and how to use them) The importance of well trained resort personnel

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Bringing laboratory rodents into an animal research facility can be likened to the relocation of an elderly relative to a rest home: the “Nana relocation programme”. The

similarities are remarkable and are detailed in this presentation. This picture is of “Roger the Rat”. He has been relocated.

## Roger the Rat visits the resort

We should remember that Roger did not:  
Sign the consent form;  
Choose the resort venue;  
Select the health care staff.

*“Welcome Roger, to our luxury resort and spa centre where your every need is provided for by a team of professionally trained experts.”*

*“Water sports, spa and exercise facilities are available.”*

*“Our health service provider has a comprehensive package of insurance options which are designed to reduce, refine or replace your current policy.”*

*“Roger, you will enjoy the relaxed atmosphere of our resort centre, under the watchful and caring management of our fully qualified*

*in-house academic and technical personnel. They will ensure your optimal care and welfare throughout your stay with us.”*

*“Assisted living and hospice facilities are also provided for you Roger, as required. In our State, the optional euthanasia policy is always available, should you decide to terminate your stay with us”.*

There are clearly differences in rest home facilities. Some are better than others. All families faced with the “Nana relocation programme” struggle with issues of service delivery and quality. What would we want Nana to experience? What services would we expect? What standards could we reasonably demand? Would we expect to see best practice? We have the same concerns for Roger following his relocation to the research resort.

## The best research resort?

Scientists’ choice is limited by their institution.

Which has the best programme?

Which resorts are fully accredited?

What would we expect to find?

What key elements are important?

Key elements to enhance the resort experience for Roger:

—Humane endpoints used to limit suffering;

—Monitoring strategies to identify suffering;

—Training of personnel to manage suffering;

—Definition of suffering.

“Suffering is an unpleasant state of mind that disrupts the quality of life. It is the mental state associated with unpleasant experiences such as pain, malaise, distress, injury and emotional numbness (e.g., extreme boredom).” (Physiology and behaviour of animal suffering. Neville G. Gregory 2004 )

How these key elements function to improve the quality of Roger's stay at the resort, are described as follows:

## 1. Humane endpoints

When correctly applied, can limit suffering;  
Provide agreement on animal disposition;  
Avoid problems resulting from cultural differences.  
Cultural differences often present as follows:

"This rat of yours is in bad shape—it's in a lot of pain. Euthanasia is best in this case..."

"OK, it's in pain- so....? So what's the problem? It's only a rat!"

If the suggestion is made to euthanase a sick animal, the response is sometimes...

"But these animals have to survive another 2 weeks to reach the study endpoint. Why can't we do something to help them survive longer so I can get all my data? The animals must not be euthanased because that will reduce the numbers. I am supposed to have N=8 per group. I can't manage with only 7 in the group. This is not good enough.....!"

However, the resolution is simple. The animal user can be reminded that the humane endpoint has been reached; furthermore, it can be pointed out that there was agreement signed off by their supervisor and the AEC. All that remains is to ask the animal user what tissues need to be collected after euthanasia?

Humane Endpoint examples include:

- Animals losing 20% of body weight compared with controls;
- Weight loss of 10% or more over 24 hours;
- Tumours greater than 10% of body weight;
- Euthanasia of any animal found moribund or with unalleviated pain;
- Self-mutilation or CNS signs such as convulsions;
- Severe clinical condition which warrants euthanasia as determined by the veterinarian;
- Euthanasia when animal meets predetermined clinical score criteria.

## 2. Monitoring strategies

- To identify normal behaviour;
- To identify suffering;
- To identify adverse events;
- To anticipate problems.

Consider the English philosopher Edmund Burke's quotation:

*'The only thing necessary for the triumph of evil is for good men to do nothing.'*

I would suggest that pain triumphs when good people know nothing and do nothing about it. Let me explain what I mean by this.

Scientists as animal users are generally assertive positive people who don't like to be wrong. Sometimes they consider personal experience as evidence. They are focused on research evidence, for this is the basis of the scientific method. However, all too often in my experience, their reasoning is flawed, as illustrated by this typical example:

"I see no evidence of pain. Therefore the animal cannot be in pain. Hence no analgesics are required."

The appropriate response to this reasoning is: "*But what if you missed the signs of pain? Can you identify the basic pain behaviours of rats?*"



Dr Johnny Roughan et al. have identified the pain behaviours of rats. The pain behaviours disappeared when analgesics were administered. Dr Roughan reports similar findings in mice and rabbits.

All animal users who perform survival surgery on rats should be able to identify the six basic signs of pain behaviour in the rat. The welfare of Roger the Rat depends on mastery of this knowledge. One could ask the question: "how many researchers could actually list these six pain behaviours?" In my experience an alarmingly large number of senior academics working with laboratory rats could not.

How to remember these six signs? If one cannot recall the behaviours, then this important research data cannot be applied to manage Roger's welfare.

The six signs of pain in the rat are:

- Writhing;
- Arching back;
- Staggering;
- Belly pressing;
- Falling;
- Twitching.

Many people working in the life sciences have had to remember the twelve cranial nerves: olfactory; optic; oculomotor; trochlear; trigeminal; abducens; facial; vestibulocochlea; glossopharyngeal; vagus; accessory; and hypoglossal. A number of memory devices have

been created to assist students learn this list. The mnemonic taught to me as a veterinary student at Massey University is not fit for publication and is to be recalled with relish, only by those in the brotherhood.

Mindful of the difficulty of remembering the six signs of pain, I offer the device as taught by the Animal Welfare Office at Otago:

*“Wicked Andrew Seduced Penny For Tea”*

Animal welfare monitoring score sheets are used to record key parameters which can indicate the post-operative health status of Roger following surgery.

One sheet is used per animal

The observer looks for the six pain behaviours.

Basic parameters are recorded:

- Water intake;
- Body weight;
- Surgical wounds;
- Dehydration;
- Eye discharges;
- Monitoring water intake: Water intake is one of the most useful measures of wellbeing. Animals should drink 10% of BW per 24 hours; Weigh the water bottle every 24 hours; Record fluid intake on the score sheet; Provide subcutaneous fluids as necessary.

When animal users realise that the score sheet indicates a problem, what should they do? We encourage them to contact the Animal Welfare Office for assistance in the first instance. This develops a working relationship between the animal user and the veterinarian. It allows one-on-one training in post-operative management and teaches basic skills which can then be applied to subsequent cases as necessary.

### 3. Training of animal users

What should be the extent of the training? To provide a broad based programme? To meet immediate animal manipulation needs of the user? Should the technical aspects be contracted to a specialist on behalf of the researcher?

There are practical time constraints in science education and the curriculum is already overloaded. Some academics would forego formal animal use training and provide in-house instruction instead.

But the quality of in-house instruction is variable and some students do not receive appropriate training. For example, how many senior academics can identify the six signs of pain in the rat? They can't teach what they don't know.

Training of animal users should include the following fundamentals in my view:

- Handling and restraint techniques;
- Drug administration;
- Blood sampling;
- Aseptic techniques;
- Anaesthesia and surgery;
- Monitoring and welfare;
- Non-experimental variables;
- Compliance requirements.
- Animal modelology; the study of animal models.

The study of animal models is not taught in the science curriculum. Animal models are simply taken from the literature like a recipe from a book. Some well-established models in the literature need significant refinement to comply with current welfare standards.

Science education does not teach:

- The identification of sick animals;
- Principles of anaesthesia and analgesia;
- Species-specific biology.

I believe that the animal user has a duty of care to understand these issues. A working knowledge of these key factors underpins animal welfare. If Roger the Rat becomes sick, he will suffer, unless his clinical signs are recognised as such and appropriate action is taken. Exactly the same problems occur in rest homes. When Nana develops a urinary tract infection and it is not identified, possibly because she has dementia and cannot communicate her pain, she will suffer, unless the nursing staff are experienced and qualified to deal with this situation.

Most new animal users have no understanding of the clinical signs of illness in animals. However, all have some experience of sick people.

What does a sick animal look like?

What does a sick person look like?

- Lack of personal hygiene, hair not combed;
- Coughing, sneezing, nose discharges;
- Eye discharges, diarrhoea, dehydrated;
- No interest in food;
- Tired and depressed;
- Skin rash or skin lesions;
- Sore aching joints, reluctant to move;
- Stay in bed.

A similar set of signs apply to sick animals and examples of typical clinical presentations were illustrated at the meeting.

Many animal users fail to appreciate that general anaesthetics do not provide post-operative analgesia. Hence additional drugs are needed to provide pain relief following surgery.

## Anaesthetics are not analgesics

### Consider the ‘Schofield Hammer Treatment’

Anaesthetise the patient then smash their thumb with a hammer 5 times. The patient feels nothing during the “hammer treatment”.



Does the patient wake up in pain?

Animals have a right to best analgesic practice—the animal’s point of view. Should an animal wake up in pain when we have measures to prevent pain?

Administration of general anaesthetics alone is not acceptable for most surgical procedures.

Species specific biology has to be considered. The metabolic rate and food intake of rodents is markedly different from humans.

For example, the drug ketamine is administered to humans at a rate of 1mg/kg, whereas the dose for Roger the Rat is 75mg/kg.

For example, rats eat approximately 10% of body weight in 24 hours, while mice eat 20% of body weight in this period. To illustrate this remarkable, but normal species-specific biology, the following illustrations were presented:



## The “United Nations challenge”

So far we have considered the key aspects of humane endpoints, monitoring and training. To put these into the context of the research resort, it should be remembered that the resort personnel looking after Roger the Rat are students who are the primary care givers at the research resort. The students receive on-the-job training as they go. The students need guidelines to follow. Those readers who work on a regular basis with students will appreciate the issues that this work force brings to the research resort. Hence there exists a significant challenge.

### The challenge....

- Different
  - educational backgrounds;
  - cultural perspectives;
  - communication skills;
  - CV embellishments;
  - confidence levels;
  - attitudes towards women.

Let me illustrate this challenge with some examples:

#### Mohammed

- From Nigeria;
- Introspective and shy;
- Sensitive and caring;
- Follows instructions;
- Terrified of rats;



#### Susan

- From Eketahuna;
- Extrovert;
- Confident;
- ‘Can do’ attitude;
- Is dangerous.



#### Julio

- From Brazil;
- Lazy, doesn’t listen;
- Dismissive of women;
- Almost unteachable;
- Stupid beyond belief.



## Yiwen

From Philippines;  
Self-assured;  
Professional, quiet,  
Competent;  
Knows limitations.

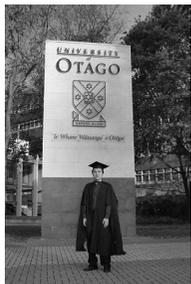


## Common features...

All want a PhD from Otago.  
All want good research results.  
All want to be published in *Nature*.  
They work alone and largely unsupervised.  
They use initiative and invention if not properly instructed.  
Their focus is research data not animal welfare.  
Saving face is an important factor.  
Some students are reluctant to seek prompt assistance.

## Reputational risk

The Otago graduate is an ambassador;  
Institutional obligation to ensure that best practice is mastered;  
Mastery of the fundamentals.



## Science education constraints

Given the limitations of the science curriculum, in my view the institution needs to ensure students master the set moves they need, in order to complete their project. Conversely, there is insufficient time to learn the entire repertoire of chess moves to master the whole game.

Nurturing supportive programmes for graduate animal users need to be established to ensure that students successfully climb the steep learning curve they face. The programme must ensure they are taught

the skills necessary to ensure that Roger's stay at the resort is as comfortable as possible.

The programme should stress the fundamentals:  
—Humane endpoints;  
—Monitoring sheets;  
—Appropriate training so that students understand 20% wt loss & clinical signs; observe twice daily and record problems; and can identify pain and respond accordingly.

Albert Einstein once said:

“Only a life lived for others is a life worthwhile.”

I would suggest that Roger the Rat's life was worthwhile.

## Obituary notice

Roger's family would like to thank the research resort staff for their nursing services throughout his stay with them.

He is survived by a publication in *Nature*.

