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Establishing 'quality of life' parameters using behavioural guidelines for humane euthanasia of captive non-human primates

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Abstract

Chronic pain and distress are universally accepted conditions that may adversely affect an animal's quality of life (QOL) and lead to the humane euthanasia of an animal. At most research institutions and zoological parks in the USA, a veterinarian, who has physically examined the animal and reviewed the clinical records, ultimately decides when an animal has reached a humane endpoint. To aid in the difficult process of interpreting pain and distress, we have developed specific behavioural guidelines, in addition to standard clinical information, to help define unique characteristics and traits of primates to assess and promote discussion of an individual primate's QOL, and thereby, to assist in the decision-making process regarding euthanasia. These guidelines advocate the creation of a QOL team when the animal is diagnosed with a life-threatening or debilitating chronic condition, or at the time the animal is entered into a terminal study. The team compiles a list of characteristics unique to that individual animal by utilising a questionnaire and a behavioural ethogram. This list enables the team to quantitatively assess any deviations from the established normal behavioural repertoire of that individual. Concurrently, the QOL team determines the number of behavioural deviations that are needed to trigger an immediate discussion of the necessity for humane euthanasia of the animal. The team remains intact once created, and revisits the animal's condition as frequently as deemed necessary. This process improves animal welfare by continuing the quest to optimally define QOL for captive primates, and potentially for all captive animals.

Keywords: *animal welfare, behavioural assessment, captive management, euthanasia, non-human primates, quality of life*

Introduction

Utilisation of euthanasia to end prolonged suffering in human beings has been the source of philosophical debate for centuries and continues to be one of the most active areas of research in contemporary bioethics (Emanuel 2002; van der Heide *et al* 2003; Dickinson *et al* 2005; Engstrom *et al* 2006; Rebuelto 2008; Orfali 2011; Prokopetz & Lehmann 2012). Similarly, although euthanasia of animals is generally considered an acceptable practice, the appropriate timing of euthanasia for animals afflicted with chronic debilitating conditions remains an ongoing discussion (Lindburg 1999; Manette 2004; Budke *et al* 2008; Jarvis 2010; Lynch *et al* 2011; Freeman *et al* 2012).

To that, it cannot be denied that some people still view euthanasia of animals as a last resort. Furthermore, the individuals with the most extreme views on this side of the argument feel it is inhumane to euthanise an animal without first trying to provide every medical treatment available to prolong life. On the opposite end of the spectrum, there remain people who feel that the act of extending an animal's life through any form of prolonged medical treatment is inhumane. In reality, the views of most reasonable individuals tend to fall somewhere between these extremes and, in turn, most people involved in animal care would generally acknowledge that life should be maintained only for as long as the animal has a reasonable quality of life.

But how does one define quality of life (QOL) for captive non-human primates? At most research institutions and zoological parks, the veterinarians typically follow well-established euthanasia guidelines set forth by the American Veterinary Medical Association (AVMA Guidelines on Euthanasia 2013), their own institutional animal care and use committee (IACUC) and, where appropriate, *The Guide for the Care and Use of Laboratory Animals* (Institute for Laboratory Animal Research 2011) in deciding when an animal should be euthanised based on a perceived loss of quality of life. The guidelines contain descriptions of the process for making morbidity and mortality observations, as well as the method of, and procedure for, euthanasia. They further describe the clinical symptoms (eg movement, skin and hair condition, breathing, bodyweight, appetite, etc) to be monitored in a moribund animal, as well as the personnel responsible (the veterinarian) for making the decision to euthanise. It is further recognised that the inability to participate in 'activities of daily living' (eg eating, drinking, urinating/defaecating, species-typical locomotion, and living

in a social setting) can affect QOL. However, we sought to incorporate more specific behavioural guidelines that better define the unique characteristics and traits of the individual non-human primates in our care, so we can formally measure any behavioural changes that may affect QOL. Using these specific ('personalised') behavioural guidelines thereby allows the veterinarian to obtain and utilise additional information, without completely altering our existing operating procedure, in which the attending veterinarian remains ultimately responsible for making the decision as to the necessity and timing of humane euthanasia.

Assessments of quality of life, using unique characteristics and traits of animals, in concert with clinical and physiological changes to facilitate the decision-making process concerning the timing of euthanasia, is being utilised by some veterinarians in private practice (Villalobos 2004; Oyama *et al* 2008; Yeates & Main 2009; Lynch *et al* 2011). As an example, upon diagnosing a pet with a terminal condition or a chronically debilitating disease, some veterinarians suggest to the animal's owners that they work at compiling a list of behaviours and traits that they feel define a good quality of life for their pet. This list is comprised of traits or responses specific or unique to that pet and, importantly, these traits need not be applicable to all animals (even those of the same species). Ideally, this list is then utilised to stimulate discussion between the veterinarian and the pet owner as to how many changes could be predicted to occur before it could be assumed that the animal has lost significant quality in its life. When this process is initiated at the time of diagnosis, this list often helps pet owners appreciate the subtle changes that are occurring in their pet over time, and can help in the decision-making process for providing a humane death, prior to complete physiological failure of one or more organ systems.

This process of maintaining life in a pet until life is no longer of good quality is achievable because pet owners are familiar with their pet's individual characteristics, habits, routines, and responses to different actions or stimuli (ie food, training, other animals, strangers, familiar people, etc). Arguably, personnel working closely with captive primates often maintain similar knowledge of the animals under their care due to the long-lived nature of the animals and their phylogenetic similarities to humans. Indeed, the practice of utilising a scoring system to assess well-being and/or distress is not without precedent in non-domesticated animals (Broom 1991; Whay *et al* 2003; Föllmi *et al* 2007; Whitham & Wielebnowski 2009; Mason & Veasey 2010). However, using specific behavioural guidelines, considering unique traits, characteristics, or responses of the animal to assess changes in QOL has not yet been formally applied to the decision-making process of humane euthanasia in captive non-human primates.

In response to what we perceive as an industry-wide deficiency in the euthanasia decision-making process for captive non-human primates, our aim was to develop a set of euthanasia guidelines based on specific behavioural parameters that could complement the current clinical and physiological changes that typically factor into making critical end-of-life decisions. Since most of the animals at our facility are captive non-human primates, we have chosen to focus our efforts on these animals in particular. However, although we have written the following QOL guidelines focusing on the non-human primates in our care, it is our opinion that this same methodology could be modified for use with other animals that have unique and readily observable behavioural characteristics.

Outline of the QOL assessment procedure

The QOL assessment is initiated when an animal is diagnosed with a terminal or debilitating chronic illness (eg liver cancer in a chimpanzee) or as the animal is enrolled in any biomedical research study where adverse effects might be anticipated and QOL may deteriorate. A quality of life team is formed that is composed of key staff members, each with specific experience and knowledge of the target animal. This team serves as an advisory body to the attending veterinarian to provide the most complete set of information possible. The mission of the team is to establish and monitor QOL parameters to determine if the animal is maintaining a standard of life that allows for expression of 'normal' behaviours for the animal, including participation in the routine activities of daily living in captivity, such as living socially and performing species-typical behaviours.

Formation of the QOL team

Entry into a terminal study or the diagnosis of a terminal condition from the attending veterinarian initiates the formation of a QOL team. It is imperative that the team includes staff members that have intimate knowledge of the animal's unique characteristics and normal behaviours. Therefore, the team is comprised of, but not limited to, the attending veterinarian, trainer, behaviourist, colony manager, veterinary technologist or technician and, perhaps most importantly, the care staff member that works most often with, and is intimately familiar with that animal's unique characteristics and behaviour. To bring an outside perspective to the committee, we have also chosen to include another veterinarian or a pathologist from within our facility who is unfamiliar with the animal, but who has reviewed the clinical records.

Discuss the clinical diagnosis

The attending veterinarian explains the diagnosis of the animal of concern, including all clinical aspects of the case and any current signs or symptoms that may be identifiable to the team. For this document, we will use an example of a chimpanzee diagnosed with liver cancer. The clinical signs that could be observed in this example case include: jaundice of the skin; a decrease in appetite; lethargy; respiratory issues; weight loss; changes in stool or urine output; excess fluid in the abdomen; and/or oedema of the legs and feet. These symptoms are recorded on the Quality of Life Agreement (Figure 1) document, which can be found in its entirety at http:\\www.kccmr.org on the animal resources page so the QOL team can monitor the animal for any of these clinical changes.

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Figure 1

Behavioural Quality of Life Considerations for Humane Euthanasia of Nonhuman Primates Agreement

Prior to the beginning of a terminal study or at the time of diagnosis or suspicion of a life-threatening terminal or debilitating chronic terminal condition, a list of "normal" behaviours consistent with psychological homeostasis for that specific animal will be amassed and recorded below.

The Team determined that __*(number of behaviours)* behaviors would need to be developed and/or lost for the group to reconvene and discuss **consideration** for humane euthanasia of this animal. The Team will reconvene __*(frequency of meeting)*__ in the event that the illness or study does not cause any change in behaviour or medical condition that warrants meeting sooner. This document serves as a written record and guide as a basis for determining the timeliness of humane euthanasia for this animal.

It has been determined on __*(date)*__ that __*(animal ID/name)*__ is currently at a terminal stage in its life due to: __*(clinical diagnosis/or terminal study #)*__.

Unique behavioural characteristics to monitor:

1.
2.
3.
4.
5.

Physical/clinical signs to monitor:

1.
2.
3.
4.
5.

The *Quality of Life Team* described below has been assembled to determine behavioural parameters that may assist in determining **consideration** for humane euthanasia of this animal, in concert with, or in lieu of, other clinical/physical parameters as set forth established Standard Operating Procedures. Team members include a minimum of three members intimately familiar with or responsible for the care of this animal, and one faculty member outside of the Section that is not familiar with the animal).

For __*(animal ID/name)*__, the QOL Team includes:

Team Member (Veterinarian)
_____Signature_____
Team Member (Veterinary Technologist)
_____Signature_____
Team Member (Behaviorist)
_____Signature_____
Team Member (Colony Manager)
_____Signature_____
Team Member (Animal Technician)
_____Signature_____
Team Member (Pathologist or other Clinical Veterinarian outside of the section)
_____Signature_____
Alternate Member
_____Signature_____

Behavioural quality of life considerations for humane euthanasia of non-human primates agreement.

Define the behavioural characteristics of the animal

Following the discussion of the clinical diagnosis, the behaviour and related unique characteristics of the animal are discussed. Individuals who work closely with the animal typically provide substantial input into the establishment of 'normal' traits and behaviours for this animal. We utilise two methods to initiate discussion of the 'normal' behavioural characteristics of the animal of concern: (i) a behavioural ethogram worksheet (Figure 2); and (ii) a behavioural questionnaire (Figure 3). The behavioural ethogram is a catalogue or inventory of various species-typical behaviours or actions that may be exhibited by the animal. Team members familiar with the animal's daily activities are asked to rate and discuss whether they observe these behaviours on a scale that ranges from 'never seen' to 'always seen'. The behavioural questionnaire is a list of specific questions designed to stimulate discussion about the daily habits, responsiveness, unique characteristics, traits, and tempera-

Figure 2

Behavioural Ethogram Worksheet
The following is a general behavioural guideline to initiate and promote discussion to determine a 'normal' state of contentment (a state of psychological homeostasis) for this animal. If the behaviour is not applicable, place an 'NA' (not applicable) in the comments section.

Affiliates with others (May include grooming, huddling, embracing or proximity to others):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Grooms self (Picking through hair or at skin and removing debris w/hands and/or mouth. Does not include pulling hair):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Plays with others (May include wrestling, pulling, tickling, chasing, play biting or finger/toe games):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Manipulates object(s) (May include scent marking, tool use, nest-making, or displaying interest in an object by handling, touching, moving, smelling, mouthing, tasting, or carrying):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Aggressive to others (May include threatening, chasing, hitting, attacking, fighting, biting, boxing, taking food from others, displacing or supplanting):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Submissiveness to others (May include pant-grunting, lip smacking, bobbing, avoiding, crying, grimacing):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Abnormal (May include pacing, rocking, head-tossing, self-sucking, hair pulling, regurgitation/reingestion, self-injurious behaviour, coprophagy, urophagy):
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Interest in novel situations, objects, foods, and/or people:
○ Never ○ Sometimes ○ Frequently ○ Always
Comment(s): _____

Behavioural ethogram worksheet.

ment of the animal. The ultimate goal is to determine a minimum of 3–5 behaviours or characteristics of the individual animal that would be noticeable if they changed. For example, in the case of the chimpanzee diagnosed with liver cancer, some characteristic behaviours could include: often plays with younger animals in the group; always gets excited and vocalises whenever any care staff member brings juice; never sleeps on the floor — always sleeps on an elevated perch; and always builds a nest to sleep in.

Review historical information

Where possible, to determine whether signs of diminishing QOL were appropriately utilised, the team examines previous animal deaths from the colony that were similar in clinical nature to the case being examined. This exercise allows individuals on the team to identify subtle QOL signs that may have been under- or over-emphasised in the past. Examples of these subtle behavioural signs include an animal: becoming picky about eating (taking food, but not eating it or spitting it out); becoming more sedentary; showing changes in their affect toward cage-mates or humans (eg was not particularly nice to humans in the past, but is now) and; changing their sleeping location or position.

Determine the number of behavioural or clinical changes that will initiate a team discussion of quality of life

After the clinical and behavioural criteria have been established, the team determines the number of defined behaviours and/or clinical symptoms that would have to change to trigger an immediate discussion of euthanasia. There are

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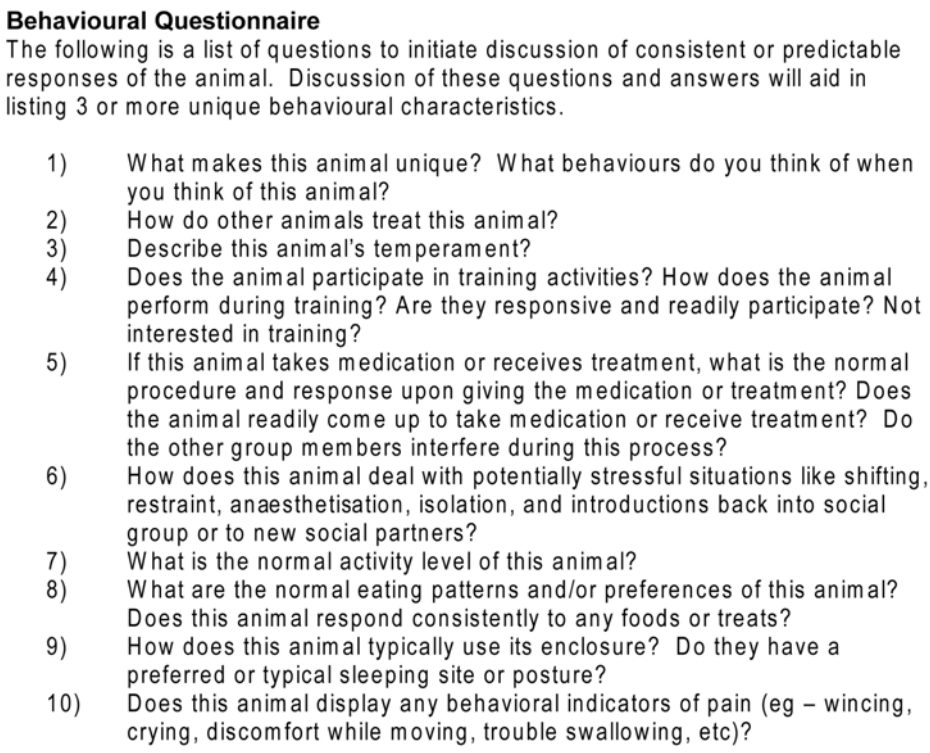
Figure 3



Behavioural Questionnaire

The following is a list of questions to initiate discussion of consistent or predictable responses of the animal. Discussion of these questions and answers will aid in listing 3 or more unique behavioural characteristics.

1) What makes this animal unique? What behaviours do you think of when you think of this animal?
2) How do other animals treat this animal?
3) Describe this animal's temperament?
4) Does the animal participate in training activities? How does the animal perform during training? Are they responsive and readily participate? Not interested in training?
5) If this animal takes medication or receives treatment, what is the normal procedure and response upon giving the medication or treatment? Does the animal readily come up to take medication or receive treatment? Do the other group members interfere during this process?
6) How does this animal deal with potentially stressful situations like shifting, restraint, anaesthetisation, isolation, and introductions back into social group or to new social partners?
7) What is the normal activity level of this animal?
8) What are the normal eating patterns and/or preferences of this animal? Does this animal respond consistently to any foods or treats?
9) How does this animal typically use its enclosure? Do they have a preferred or typical sleeping site or posture?
10) Does this animal display any behavioral indicators of pain (eg – wincing, crying, discomfort while moving, trouble swallowing, etc)?

Behavioural questionnaire.

benefits to discussing and assessing QOL for any change that occurs. Often, when the team assembles, other issues or questions evolve that merit additional attention. If no changes occur, the team chooses a regular interval (weekly, monthly, etc) to continue to review the animal's condition.

Finalise an agreement

It is important that all members of the team contribute and agree on the behavioural information that represents normal behaviours, traits and activities for the animal. The clinical and behavioural information, as well as the pre-determined number of changes that would instigate an immediate discussion of QOL, are then recorded into a formalised agreement (see Figure 1). By signing the agreement, all members of the team acknowledge that they are equal contributors to the process, and that each behavioural factor is equally important to monitor. It also indicates that the team will remain faithful to the process and will continue to monitor the QOL of the animal.

Communicate with staff members

The next step is to communicate to all staff members associated with the animal: that a QOL team has been formed; the reason for forming the QOL team; and that a QOL agreement has been initiated for the animal. Finalising and communicating about the QOL agreement initiates a 'QOL watch', so that the entire staff is engaged to monitor for any physical or behavioural changes in the animal. A 'QOL watch' sign is placed on or near the animal's enclosure that states: (i) the animal's name and identification number; (ii) diagnosis; (iii) each person on the team and their contact information; and (iv) instructions to immediately contact a team member if anything in this animal's condition or behaviour changes. The QOL agreement, along with any directives from the veterinarian, observation forms, meeting notes, and a signed copy of the agreement are placed into a QOL notebook. The notebook is kept near the animal's enclosure for ease of reference.

Observe the animal

The staff member responsible for the husbandry of the animal monitors it multiple times each day, during activities such as health checks, husbandry tasks, feeding, medicating, training, and while distributing enrichment. However, it is important that each member of the team regularly observes the animal as well, to monitor for changes in quality of life. This removes the burden of responsibility from one person and places it on all members of the team, as well as ensuring that there are multiple sets of 'eyes on the animal'. For example, if a caregiver sees a primate several times in one day, then that person may be less likely to notice a change (especially subtle or seemingly insignificant changes) than other people who do not see the animal as often. To assist in this process, a checksheet of the clinical symptoms and behavioural characteristics of the animal is created and kept in proximity to the animal's enclosure to ensure that all personnel are aware of the specific signs to monitor.

Discussion

The principle benefit of establishing this QOL process is that it incorporates formal behavioural assessments of unique characteristics and traits of the individual animal into an established clinical protocol, ensuring a more in-depth evaluation of the animal's quality of life and well-being. This enables us to establish an objective set of guidelines for when QOL has decreased sufficiently and euthanasia should be considered. Monitoring animal behaviour is an invaluable assessment tool for the management of all captive animals (Mason & Veasey 2010), regardless of clinical diagnosis or stage in life.

A second benefit of this process is that it also provides official documentation concerning the ethical considerations that have gone into overseeing the overall well-being of individual animals and into the decision-making process that may ultimately lead to euthanasia. If questions arise concerning the timing of euthanasia for an individual animal, the use of the QOL procedures described above should provide ample documentation to assure institutional staff, governing bodies, and regulatory agencies that euthanasia was indeed performed at an appropriate time. This can be especially relevant when clinical observations, blood work, or necropsy findings might suggest that euthanasia was perhaps performed prematurely or that an animal was kept alive for too long.

Other notable benefits of the QOL process include enhanced communication and monitoring of primate health and well-being across disciplines, and increased staff empowerment for the animals under their care. It is not uncommon for only 'management' to be involved in the decision-making process regarding euthanasia of captive animals, and thus, husbandry personnel are frequently surprised when it is announced that an animal is to be or was euthanised. Rogelberg and colleagues (2007) surveyed animal shelter employees that were involved in euthanasia to get suggestions as to what these individuals thought could be done to deal with euthanasia-related employee stress. A large number of the respondents believed that management should actively solicit employee input about euthanasia-related decisions and practices. An inclusive process, such as suggested here, thus ensures that staff will be better informed and may even reduce the stress associated with dealing with the euthanasia process.

At our facility, the QOL process is considered to be a work in progress, which is likely to continuously evolve and improve with the incorporation of the information gleaned from each and every case. One potential area of refinement that may merit further discussion is to re-evaluate the point at which the QOL process is initiated. Optimally, the process should begin when: i) the animal is healthy, allowing for the development of better behavioural baselines; and ii) well in advance of the point at which this information becomes required for end-of-life decision-making processes. An additional improvement may be to discuss a weighted scale for the unique behavioural characteristics that are defined for each animal to assess QOL. Some behaviours may be more indicative of quality of life than others and, thus, would be more influential in assessing quality of life than other, less meaningful behaviours.

The ultimate goals of this process are not to change personal beliefs or to perfect a system, but rather to be proactive in assessing an animal's quality of life. Globally, this refined and inclusive process ensures a better system of checks and balances. By instituting a team approach, the QOL assessment process described above enables the veterinarian to efficiently utilise a number of different data sets and weigh all of the information available when making the ultimate euthanasia decision.

Animal welfare implications and conclusion

It is evident that there are differing views regarding the necessity and timing of euthanasia for captive animals. However, the overriding consideration for those of us who oversee the care of primates is that we do not want to see any animal have to endure undue pain or suffering. The development and inclusion of behavioural guidelines that help make critical decisions regarding humane euthanasia are steps forward in improving animal welfare and continuing the quest to effectively define quality of life for captive primates, and potentially for all captive animals.

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