



Positive Reinforcement Training in Nonhuman Primates An Industry Perspective

Introduction

Biomedical research is critical to the discovery and development of new medicines to treat human and animal diseases and improve the quality of life. This often involves the use of nonhuman primates housed under laboratory research conditions. Ethical and humane care is paramount to the conduct of high quality scientific research. Animals that cooperatively participate in research procedures appear to be better adjusted to their environment and more likely to provide high quality data to support essential breakthroughs. Positive Reinforcement Training (PRT) is a useful training technique that can help achieve this goal of reducing stress in research animals.

The International Consortium for Innovation and Quality in Pharmaceutical Development (IQ) is a not-for-profit organization of pharmaceutical and biotechnology companies focused on advancing science and technology and developing transformational solutions that benefit patients, regulators and the broader R&D community.

The IQ 3Rs Leadership Group, composed of senior veterinarian and 3Rs specialists from IQ member companies, meets on a regular basis to review and discuss common scientific and regulatory issues and topics regarding the use of animals in research. Advancing the *Reduction, Refinement* and *Replacement* (3Rs) of animals used in the discovery and development of new medicines, vaccines, medical devices and health care products for humans and animals is a key component to the IQ 3Rs mission.

The IQ 3Rs Leadership Group was interested in developing a better understanding of the use of PRT in nonhuman primate (NHP) programs in an industry research environment. A proposal was put forward at the IQ 3Rs Leadership Group January 16, 2015 meeting, which included gathering data from IQ members on current PRT practices, procedures, programs and summarizing results for the group.

Member companies were surveyed in an effort to understand more about the use of PRT in industry, what types of activities PRT is being used for, and program successes and challenges. Information collected included details on animal training and staff communication.

What is Positive Reinforcement Training?

Positive Reinforcement Training is a system of teaching that uses positive reinforcement (e.g., food treat) in combination with an “event marker” rather than using physical or chemical restraint. An event marker can be a clicker, cue or command that the animal identifies with the task being requested.

Benefits of Positive Reinforcement Training

Member companies responding to the survey indicated they used PRT for NHPs, regardless of the size of the program, the species housed, and the sex or age of the monkeys. The benefits to the animals and staff seemed to far outweigh the challenges faced when implementing PRT.



PRT is used for a variety of reasons, most frequently as an effort to reduce stress, increase efficiency and safety for employees, improve the ability to conduct study procedures and improve animal welfare. PRT has also been used to assist with desensitizing animals that exhibit fearful and/or aggressive behaviors, and has improved administration of veterinary care, improved social housing interactions and decreased and/or eliminated stereotypical behaviors. PRT can create positive staff interactions which many considered a form of enrichment for the animals based on their apparent favorable response. Many of the benefits of PRT identified as a result of this survey are supported by recent publications on the use of PRT in primate laboratories (Bloomsmith, 2012), refinements to pole and collar restraint in rhesus macaques using PRT (McMillan et al., 2014; Bliss-Moreau et al., 2013), and in the development of PRT training programs in primate laboratories (Perlman et al., 2012).

The most frequent activities for which PRT was used included cleaning and cage shifting, collar presentation, injections, cage restraint and blood collection. Other activities included water delivery device (e.g., lixit) checks, and presenting arms or legs for research activity such as injections or blood withdrawals. Less frequently mentioned activities included feeding, treating arms or legs, stationing, turning telemetry devices on and off, holding for inspection or treatment, training for chairing, restraint or masks, social tolerance, self-weighing, coming to the front of the cage or entering a procedure cage, food insertion or removal and presenting face, chest or rump. Although the amount of time it was reported to train NHPs varied depending on the task, the benefits were considered to be clearly worth the effort.

PRT programs are not without their challenges, many of which appear to be universally shared, and most of which are resource driven. These include the lack of dedicated staff for PRT, lack of time for consistent training, and management acceptance/ support. Due to its many benefits to the animals, staff and science, PRT should be considered an essential component of an NHP animal care program, and therefore should be afforded the level of support needed to incorporate PRT into day to day activities.

IQ 3Rs Leadership Group Position on Positive Reinforcement Training

The position of the IQ 3Rs Leadership Group is that the use of PRT should be integrated into all NHP programs and should be the standard of practice for all nonhuman primates housed in a research setting. Improved welfare of the animals results in a benefit to the animals, the science, and the caretakers. Operationally, we are training the animals to voluntarily cooperate in an action, which is intended to help improve animal welfare, enhance research activities, minimize risk of injury to the caregiver and/or animal, and improve efficiencies for husbandry and medical care. The animals seemingly benefit from the opportunity to have better control over their environment, resulting in a perceived less stressful experience; the science benefits from use of a calmer research subject that is less likely to confound study results.



References

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