

Lucy's Treatment Program
***Edmonton Valley Zoo's plan to implement expert
recommendations***

November 13, 2009

Introduction

In August 2009, the Edmonton Valley Zoo contacted Dr. James Oosterhuis to examine Lucy, the Zoo's 34-year-old Asian elephant. In particular, the Zoo was seeking an expert evaluation of Lucy's breathing problem and the possible connection to a malpositioned molar, which fell out in August.

Dr. Oosterhuis is a Doctor of Veterinary Medicine and a lead researcher with the Colyer Institute, a non-profit centre for the study of oral disease and nutrition with exotic animals. He has 35-years experience working with elephants.

Dr. Milton Ness, the Valley Zoo's veterinarian, and Dr. Oosterhuis examined Lucy on September 10, 2009. During the examination a three-metre-long endoscope was used to observe the inside of Lucy's trunk. The scope showed that Lucy's nasal passages are severely constricted, which makes it difficult for Lucy to breathe through her trunk. Lucy has adapted by learning to breathe through her mouth, despite the fact that elephants are obligatory nasal breathers. In a follow up letter to the Zoo, Dr. Oosterhuis stated: "Her current respiratory problems preclude any thought of moving her and in fact it would (be) life threatening for her to be placed under that kind of stress."

Subsequently, Dr. Oosterhuis provided a full written report to the Zoo outlining his findings and proposing a medical diagnostic and treatment protocol aimed at restoring Lucy's breathing capacity, and providing input on other improvements the Valley Zoo could make in the ongoing treatment and care of Lucy.

Dr. Oosterhuis delivered the report to the Zoo on October 3rd, 2009 when he attended the Canadian Association of Zoos and Aquariums annual conference in Edmonton. Dr. Ness received the report at that time and reviewed the recommendations with Dr. Oosterhuis. Given that Lucy's breathing challenges are significant and unique, the two doctors agreed that a broad exploration of her respiratory system is the number one priority. As this would be an intensive and lengthy process, the doctors also determined that a parallel treatment path would be undertaken to address Lucy's symptoms. This parallel path would include the use of medications and ensuring Lucy continues to have regular exercise opportunities that are not weather dependent.

In his report, Dr. Oosterhuis notes that Lucy's good nature and her relationship with the elephant care team will be key to the continued and successful management of Lucy's health problems.

The Edmonton Valley Zoo developed the following action plan to address Lucy's needs. The plan builds on the strengths of Lucy's relationships with the elephant care staff and her veterinarian, providing additional staff support to aid in restoring breathing capacity, increasing physical activity and flexibility and promoting weight loss.

Part One: Medical Treatment Program

Dr. Oosterhuis outlined a medical treatment program for Lucy as opposed to a surgical treatment plan at this time in order to see if her respiratory difficulties could be resolved through prescription medication. To implement Dr. Oosterhuis' proposals, Dr. Ness developed the following medical treatment program.

- 1) **Antibiotic treatment:** Dr. Ness did a bacteria culture October 14, 2009, the result of which was inconclusive. A follow-up culture was done on October 22, 2009, and the results were clear, indicating no bacteria was present. Without being able to identify any specific bacteria, Dr. Ness consulted with Dr. Oosterhuis. They decided it would still be prudent to start Lucy on antibiotics in case there is bacteria present in Lucy's system that Dr. Ness was not able to culture. Lucy was started on a four-week course of *enrofloxacin* November 9. In addition, Dr. Ness did a third culture on November 9.

- 2) **Anti-inflammatory treatment:** Upon consultation with Dr. Sandra Reid, an Edmonton veterinarian who specializes in rehabilitation therapy for animals, Dr. Ness decided to wait to start Lucy on her first course of anti-inflammatory medicine until after Dr. Reid could do a complete physical assessment of Lucy and benchmark her range of motion. It was important for this to be done prior to new medication being prescribed, so Dr. Ness could evaluate the effectiveness of anti-inflammatory medications. To do so, he will use the September 10 endoscope exam as a benchmark for respiratory improvement and the range of motion exam as a benchmark for improved flexibility.

- 3) Dr. Reid and Dr. Ness completed the physical assessment of Lucy and range of motion benchmarking on Thursday, November 5. Based on this assessment, Dr. Ness started Lucy on *flunixin* November 9 for a four-week period.

In addition to the anti-inflammatory prescription, Dr. Reid will develop a treatment plan for Lucy along with an exercise program as noted in the *Exercise and Weight Reduction* section of this plan.

(NOTE: the timeframe or type of anti-inflammatory and/or antibiotic may be adjusted during this period based on how Lucy tolerates the medications.)

- 4) **Follow-up endoscope exam and potential biopsy:** Dr. Ness is planning to conduct a follow-up endoscope exam in December 2009. If there is no noticeable improvement in Lucy's constricted airways, Dr. Ness will also biopsy Lucy's upper respiratory tract tissue at this time.

A biopsy will inform Dr. Ness of areas that can't be seen or accessed directly. For instance, Lucy may be hosting bacteria that can't be accessed through a culture or the biopsy may pick up allergies or other inflammatory irritants that can be treated. A biopsy is also used to diagnose more serious issues such as cancer, although Dr. Oosterhuis noted in his consultation with Dr. Ness that he saw no evidence of anything that looks like a mass or a tumor.

- 5) **Results of the endoscope/biopsy:** Dr. Ness will consult with Dr. Oosterhuis and other elephant veterinary experts and other specialists to review the findings of the endoscope exam and biopsy to determine the next steps in treatment.

Part Two: Exercise and Weight Reduction Program

Dr. Oosterhuis notes that exercise and weight reduction will be beneficial to Lucy, especially in regard to her respiratory problem. He recommends continuing the gradual weight loss program she is currently on, while cautioning staff not to over stress Lucy to the point where she is forced to open mouth breathe.

Dr. Ness and the elephant care team are continually making adjustments to support continued weight loss success, as losing weight should help Lucy's respiratory condition. An animal nutritionist was engaged in June 2009 to evaluate and modify Lucy's diet. Changes to Lucy's diet were made at this time. Dr. Oosterhuis is in agreement with her prescribed diet and notes that it must be strictly followed.

Given the recent diet modification and the recommendations by Dr. Oosterhuis, Dr. Ness felt that Lucy's exercise program should be increased to help with her weight loss. Given the restrictions placed on exercise by Lucy's respiratory condition, Dr. Ness feels an activity program should be based on frequent and moderate exercise sessions, instead of on one or two aggressive sessions each day. Based on this advice, the Valley Zoo has taken the following actions:

1. Increased the elephant care staff hours by one full-time position, so that Lucy has continuous interaction with two elephant care staff throughout the day. This change will provide for ongoing exercise and physical stimulation as two care staff are required for direct physical contact with an elephant. Staff are on site caring for Lucy about 16 hours each day.
2. Engaged Dr. Reid to develop an appropriate exercise program to increase Lucy's activity level and flexibility to support ongoing weight loss. Her goal for this program will be developing suitable exercises so that Lucy can be active throughout the day even during colder weather when she spends more time indoors.

Part Three: Facilities Modification

Lucy's enclosure is approximately 13,000 sq feet – 2,100 sq feet indoors, and 11,000 sq feet outdoors.

The Dr. Oosterhuis report recommends three key improvements to Lucy's facilities. As making changes to the facilities are in Lucy's best interest, the following actions are underway to address the report:

1. The floor in a second room of Lucy's indoor enclosure will be covered in sand.
2. Valley Zoo staff are sourcing rubber mats for the large area of Lucy's enclosure with the plan to install mats as soon as they are available. It's important to note that rubber mats have been installed previously, but Lucy has pulled them up. Therefore, Valley Zoo staff are working to source products that are more appropriate.
3. The recommendation to increase the indoor space available to Lucy during the winter months (or install an elephant treadmill) will be explored by a special committee. This committee will be tasked with recommending solutions to

increase Lucy's indoor exercise space. Their review will include consulting with other facilities and experts, including the Canadian Association of Zoos and Aquariums and Dr. Oosterhuis. As the Zoo's plan is to not house elephants in the long term, the committee has also been asked to look at options that could be used for other purposes in the future and/or could be multi-purpose space over the short-term.

The Committee will be comprised of the following participants and asked to provide recommendations by March 31, 2010:

- Dr. Milton Ness, Edmonton Valley Zoo veterinarian
- Denise Prefontaine, Director Edmonton Valley Zoo
- Dr. Clement Lanthier, President Calgary Zoo
- Becca Hanson, Zoological Facility Designer, Principal of Studio Hansen/Roberts
- Roger Jevne, Director Community Facility Development, Community Services
- Chris Ward, Manager, Buildings Design and Construction, Capital Construction

Part 4: Implementing foot care and husbandry recommendations

Foot Care

As Dr. Oosterhuis states, the Valley Zoo elephant care team should continue their impressive work with Lucy's foot care protocols, providing special attention to areas of concern. Her front feet are being soaked twice daily: once with an astringent such as Epsom salts and once with a disinfectant such as apple cider vinegar.

Dr. Oosterhuis recommended new foot pedestals be built or existing ones modified to promote easier access while caring for Lucy's feet. The Valley Zoo hired a local contractor to adapt the pedestals for Lucy's use and Lucy is now being trained to use the modified pedestals.

Husbandry

In addition to training Lucy to use the foot care pedestals, the elephant care team will also train her to use the yolk stand for pad care.

Given Lucy's dental issues, Dr. Oosterhuis also offered advice to staff on ways to get Lucy to open her mouth to the full extent possible for better examination of her upper molars. Elephant care staff are now acting on this advice to train Lucy in this area.

Conclusion

The Edmonton Valley Zoo has developed this comprehensive treatment plan to fully address the recommendations of Dr. Oosterhuis. As always, the key priority of the City of Edmonton and Zoo staff is ensuring Lucy receives the best possible care. To that end, the strategies laid out in this plan will be closely followed by all involved.

During this time, Lucy will be carefully monitored to ensure she remains calm and comfortable. In addition, Dr. Ness will evaluate her health progress against the following benchmarks established this fall by Lucy's team of caregivers:

- Weight benchmark: 4230 kg (9300 pounds) as of September 10, 2009
- Respiratory benchmark: endoscope exam on September 10, 2009
- Range of motion benchmark: as determined during rehabilitation therapy exam November 5, 2009.

The Valley Zoo will report on Lucy's progress in these areas in April 2010 along with the recommendations of the special committee established to study improvements to Lucy's indoor space.