QUALITY-OF-LIFE ASSESSMENT TOOLS TO INFORM END-OF-LIFE DECISION-MAKING IN ZOO ANIMAL PATIENTS

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INTRODUCTION

At the Detroit Zoo we have an increasing number of geriatric animals under our care. The captive environment and ready access to food and health care often allows zoo animals to live much longer than they would in the wild. We currently have a flamingo that is 60 years old, a penguin that is 43, two Chinese alligators that are 38 years old and several chimpanzees in their forties. In our older patients we see a predictable array of ailments, including arthritis/ lameness, spondylosis, cataracts, dementia, heart disease, neoplasia and wounds that are slow to heal. Many of these conditions are managed for months to years prior to the animal’s death or euthanasia. We have a comprehensive preventative medicine program at the zoo, and are committed to providing the best possible care throughout each animal’s lifespan. With an increasing number of available nonsteroidal anti-inflammatory drugs, pain relievers and other pharmaceuticals and supplements designed to improve joint health and comfort, our opportunities for sustaining animals with chronic health problems have expanded. We spend a large proportion of our time and resources caring for animals in the last years of their lives.

Wild animals are especially adept at hiding signs of illness and discomfort- an individual who lags behind the group, is slow to rise, or shows abnormal posture or lameness is the one most likely to be singled out by a predator. As a result, even very subtle signs of discomfort or distress are investigated by the veterinary staff. Physical exam with palpation, x-rays and ultrasound can help the zoo veterinarian diagnose problems that have the potential to reduce quality of life. Postmortem assessment of the joints, skeletal system and other organs also helps to correlate symptoms seen before death with anatomic abnormalities seen on necropsy. Even with this information, any assessment made of an animal’s degree of pain and suffering is subjective. There are currently no reliable, validated measures for welfare and pain in domestic or zoo animals. When we manage animals with arthritis and/or other potentially painful chronic ailments, we have a responsibility to do our best to understand and address suffering. Often we are relying on subjective information to make these assessments.

On a day to day basis, zoo keepers are the staff responsible for daily care, including feeding, assessing appetite and behavior and monitoring urine and fecal output. Veterinarians rely on zoo keepers to be our eyes and ears, and to report anything out of the ordinary. For any given animal, there may be up to seven people responsible for care, including a morning keeper, main “5 day”
keeper, closing keeper, one or two relief keepers for off days and two night keepers. There are also supervisors, curators and multiple veterinary staff who oversee care. All of these individuals bring their own set of perceptions to the assessment of an animal’s quality of life; it’s important to honor the special relationship that zoo keepers have with the animals they care for and to invite everyone to have a voice in the discussion of quality of life issues. Last spring I introduced the concept of a Quality of Life Assessment tool. The goal was to create a tool that would serve to bring all stakeholders to a similar understanding of the factors affecting quality of life, the measures being taken to alleviate QOL concerns, and their limitations. A second goal was to begin to define the observations by which we could assess each animal’s welfare, and to collect data that is as objective as possible to assist with end-of-life decision making. QOL tools are developed for animals for which the quality of life is compromised and expected to remain so even when all available treatments have been provided. Rather than develop a single tool for all animals, it was decided to develop a unique tool for each animal, addressing factors important to that individual animal. The QOL Monitoring tool can be used for short duration concerns, or to manage geriatric patients as they near the end of their lives.

**CREATING A QOL MONITORING TOOL**

The most effective method for developing a QOL tool is to bring all of the stakeholders (veterinarians, supervisors, zoo keepers, etc.) together for a meeting. Generally the veterinarian leads the discussion, making sure that all constituents are given an opportunity to be heard. The first step is for the veterinarian to provide a summary of the medical problems that are being managed, including the past and current treatments/ husbandry measures used to address these concerns. We also describe the prognosis for return to function, and the expected degree of pain, discomfort or distress caused by the medical problem(s).

Next, the attendees discuss and define 5-8 functional activities that they have observed are restricted in the animal. This approach was borrowed from the human medicine realm where patients are asked to rank their ability to perform “normal activities of daily living”. This approach can be confusing at first, as it seems reversed to describe things they should be able to do rather than deficits.

**DEFINING FUNCTIONAL ACTIVITIES THAT ARE COMPROMISED:**

Locomotion and movement are commonly compromised in geriatric patients. For animals exhibiting lameness, the functional activities that are compromised may include “walking without pain/lameness” or “walking without reluctance.” Other normal forms of locomotion that could be compromised include “ascending a ramp”, “climbing”, “jumping up to a resting platform”, “getting up from a lying position first thing in the morning” or “getting in and out of a pool.” These are examples; other locomotion and movement deficiencies can be defined.
Animals may develop sensory deficits that impact quality of life. Examples include development of cataracts and hearing loss. “Vision” and “hearing” are examples of functional activities that can be compromised.

“Having full access to an outdoor enclosure” and “having full access to the available social group and/or other animals” are examples of functional activities that may be lost temporarily or permanently as a result of decline in health or other management situations. The impact on the quality of life with these changes varies tremendously depending on the species and individual animal. These issues do not always have a negative impact on QOL, but should be considered for all animals, even those not normally found in social groups in the wild.

Animals with chronic illness may lose interest in eating or be unable to consume the expected quantity of food on a daily basis. “Eating a normal quantity of diet” and “ability to maintain body weight” are functional activities that can be lost. Animals that are losing weight usually experience reduced quality of life from the physiological effects of wasting. Appetite is always included as a functional activity to be measured.

**CREATING A MEASUREMENT SCALE:**

After the above is completed, a grading scale is created for each measure. We often discuss how an animal looks at its best and worst, and create a scale between. The grading scale should strive to define objective measures that can be observed by any of the zookeepers and supervisors that care for the animal. Having all keepers in attendance allows a discussion of how different scores will look, and helps with consistency. Veterinarians help the Life Science Staff determine the best measures and appropriate scales. New functional activities may need to be added if animal health changes during the assessment period.

**Example grading scales:**

Grading Scales to assess “Eating a normal amount of diet “:

<table>
<thead>
<tr>
<th>Diet Consumption:</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90-100%</td>
<td>75-90%</td>
<td>50-75%</td>
<td>25-50%</td>
<td>&lt; 25%</td>
</tr>
</tbody>
</table>

For lameness/walking without pain, a suggested scoring system is:

5= no lameness
4= slight lameness
3= moderate lameness
2= marked lameness, severe enough that visitors are expected to complain
1= placing no weight on the leg of concern.
RECORD KEEPING AND COMMUNICATION

Once a QOL Monitoring tool has been defined for an animal, it is used to measure and record daily observations for each functional activity. The tool is created in Excel, and is available to everyone on a shared common drive. It is helpful to capture movies of the animal as part of the QOL documentation. A movie taken at the onset of monitoring is suggested whenever possible. We have found the tool to be a very effective method for communicating day to day changes in our patients with ongoing problems. When changing drug regimens or dosages, it’s very useful to reference the tool for response to therapy. Prior to use of the tool, it was more common to have keepers record in their daily reports that an animal was “having a bad day”, or “did not seem themselves”. Developing a vocabulary for describing an animal’s condition has resulted in more objective observations and feedback. By tracking an animal’s scores over time, we hope to be able to notice trends that will inform our treatment modalities and discussions of quality of life.