PROTOCOL FOR THE SCORING OF LOCOMOTION IN CAPTIVE ELEPHANTS IN ZOOLOGICAL COLLECTIONS IN THE UK & IRELAND

Introduction

The Elephant Welfare & Focus Groups worked with veterinary and biology students and zoo professionals to develop a system of routinely scoring the locomotor health of captive elephants. The outcomes of this research project are captured below in a simple protocol, to be employed at all elephant holding collections. The data generated will allow collections to monitor the health status of their elephant's locomotion objectively over time, thus providing a tool to 1) assess the welfare and progress of any individual within the cohort and 2) the long-term effects of any environmental changes such that future recommendations on husbandry are evidence-based.

Protocol

1. All animals require four clips of video footage to be taken. The system does not require any direct contact and thus can be employed on any animals in management systems that result in correct movement (either due to positive reinforcement or through free-contact).
2. Each animal is walked/encouraged to walk at a steady speed on a flat, hard surface for a minimum distance of 10 strides, and filmed from four different angles: in front, behind, from the left and right sides. Suitable cameras may need to be pre-placed to achieve these views without obstruction and operator safety must not be compromised.
3. All video footage must include essential details (date, zoological collection and animal ID), preferably electronically in the title of the saved clip.
4. All video clips must be saved electronically in a format and library such that they are readily accessible, and linked to an animal's medical records (ideally in ZIMS) in order they can be related to any other variables (e.g. change in husbandry, season, BCS, weight).
5. From the video clips a score (0 – 7) is allocated to each limb according to absence or presence of certain criteria: 0 = clinically sound; 1 = stiffness (i.e. the joints of the limb do not flex and extend as much as normal); 2 = abnormal tracking (i.e. the limb does not swing forwards and backwards in a straight plane but deviates from it medially or laterally); 4 = reluctance to bear weight (see attached scoring system table). The scores of all criteria present in one limb are added to produce a maximum score per limb of 7 (1 + 2 + 4). The scores for each limb are added to produce the overall score (0 – 28), where 28 means a recumbent animal.
6. All scores are recorded (an example sheet and blank sheet are attached) and saved electronically. The transfer of this data to an electronic dataset (preferably in Excel) that includes all elephants in the collection is essential. It is hoped that in the future a central database covering all elephants in the UK & Irish cohort will be available.
7. Foot scoring, locomotion scoring and body condition scoring should take place each month in rotation such that each score is performed once every three months.

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26 November 2013

Scoring system for locomotor health in captive elephants in the UK & Ireland

Severity (criteria)	Category	Outcome
0 (Clinically sound)	• Unable to discern any locomotor abnormalities • No 'stiffness', no 'abnormal tracking', no 'reluctance to weight bear' • Normal conformation	• No action required • Continue with routine 3-monthly monitoring
1 (Stiffness)	• Reduced flexion/extension of any joint in the limb • Likely to be most visible in the left and right views	• Animal management staff to monitor for a maximum of 48 hours • Veterinary team to be made aware if does not resolve or if juvenile animal
2 (Abnormal tracking)	• Limb does not track entirely in longitudinal plane • Likely to be most visible in the front and behind views	• Animal management staff to raise to awareness of veterinary team • Veterinary team to investigate if does not resolve after 48 hours
4 (Reluctance to weight bear)	• Weight is not distributed entirely evenly across both front or both hind legs • Likely to be most visible during walking as less time spent on that limb (unless bilateral problem)	• Animal management staff to raise to awareness of veterinary team • Veterinary team to investigate within 24 hours and instigate treatment as appropriate
3 (1 + 2)	• Stiffness • Abnormal tracking	As for 2
5 (1 + 4)	• Stiffness • Reluctance to weight bear	As for 4
6 (2 + 4)	• Abnormal tracking • Reluctance to weight bear	As for 4
Max = 7 (All 3 of above criteria)	• Stiffness • Abnormal tracking • Reluctance to weight bear	As for 4

Example score sheet for locomotor health in captive elephants in the UK & Ireland

Collection: ABC	Date: 2 July 2013
Individual elephant ID (name): Nelly	Individual elephant ID (ZIMS): AB1234

Criteria	Stiffness (1)	Abnormal tracking (2)	Reluctance to weight bear (4)	Total (per limb)
Left forelimb	1	0	0	1
Right forelimb	1	0	4	5
Left hind limb	0	0	0	0
Right hind limb	0	2	0	2
Overall score				8

Comments: Usual chronic stiffness apparent in both carpi. Acute lameness noted this morning in RF. Usual chronic outward swinging of RH during forward phase.

Score sheet for locomotor health in captive elephants in the UK & Ireland

Collection:	Date:
Individual elephant ID (name):	Individual elephant ID (ZIMS):

Criteria	Stiffness (1)	Abnormal tracking (2)	Reluctance to weight bear (4)	Total (per limb)
Left forelimb				
Right forelimb				
Left hind limb				
Right hind limb				
Overall score				

Comments: