



## **PASA's 2014 Emergency Healthcare and Rehabilitation Program for Injured African Primates**



### **Workshop Report**

Summary: As human populations expand, African primates are increasingly harmed and brought to one of the PASA member sanctuaries for treatment. To increase the capabilities of sanctuaries to help these animals, PASA held a workshop November 3-7, 2014 at Colobus Conservation in Diani, Kenya to focus on wild primate rehabilitation medicine. This training included two days of theory involving interactive presentations, two days of practical application, followed by one day of extensive evaluation. The workshop was attended by 24 individuals.

## **PASA Veterinary Workshop Goals**

PASA's overarching program goal was to increase the success of reintroducing injured primates back into their native habitat. The workshop built knowledge and skills among African veterinarians and veterinary technicians for wild primate treatment, rehabilitation and release. The following objectives were determined:

1. Provide the best available training and skills-building on emergency treatment of wild primates;
2. Enable practitioners to maximize potential for the release of wild primates through appropriate medical and rehabilitation care; and
3. By working with sanctuary education and public outreach programs, wild primate rehabilitation will help sanctuaries foster public education and awareness/sensitivity to injured primates and the need to conserve wild primates and their habitat.

## **Outcomes**

The 2014 PASA Veterinary Workshops was held in Diani, Kenya and hosted by member sanctuary Colobus Conservation on Nov. 3-7, 2014. Twenty four individuals representing 19 organizations attended the workshop including representatives of the Kenya Wildlife Service (see Appendix A). Moderated by experts from Africa and around the world, the workshop helped to build capacity of primate veterinarians and healthcare workers at PASA member sanctuaries and throughout national parks, wildlife offices and universities. The 2014 training focused on emergency care and rehabilitation of human-injured wild primates preparatory to their release back into the wild (following IUCN guidelines as release protocols) as well as central veterinary topics such as primate diagnostics, treatment, emerging infectious disease, risk analysis, and surgery.

This 5-day, intensive training began with two days of theory involving interactive presentations and lectures (disease outbreak management, animal husbandry, sanctuary case studies, anaesthesia), then two days of practical application (cardiac ultrasound, necropsy, rehabilitation and enclosure design), followed by one day of extensive evaluation, reporting back, and planning for the following year (see workshop program in Appendix B). The Workshop also included donations of medical supplies for participating sanctuaries, and materials for the host sanctuary. Delegates also benefitted from the professional associations and alliances developed, along with access to the PASA veterinary listserve, and ongoing financial support for medications and equipment.



Workshop highlights include:

- Extensive written materials were available for the attendees: Disease Risk Analysis workbook specific to the wildlife sanctuary situation. This is based on, and makes regular referral to, the

IUCN/ OIE Manual of Procedures for Wildlife Disease Risk Analysis. This process was worked through at the workshop and a manual with real life sanctuary examples is forthcoming.

- Expert clinical technical demonstrations: Video of a best practice primate field necropsy, demonstrated at the workshop by Dr. Helene De Nys of the Robert Koch Institute and Dr. John Cooper of Cambridge University. Video of ape cardiac assessment by Aimee Drane, IPHP. These will be a useful resource for future learning opportunities.

In addition to the practical training and skills building, the workshop was an important site for attendees to communicate and build relationships and expand the impact of the PASA Veterinary Network. Outcomes from these activities include:

- Agreement on the SMART objectives for the next edition of the PASA Vet Manual
- Agreement with the Kenyan Veterinary Board that this workshop will be eligible for official CPD status in Kenya in the future
- Confirmation of IPHP support for assessing cardiac health across the PASA vet network
- Facilitated collaboration between PASA member and host Colobus Conservation and the Kenya Wildlife Service

### **Evaluation**

Evaluation is an important aspect of the PASA Veterinary Workshops. The PASA Veterinary Healthcare Panel assessed the veterinary healthcare aspects of each sanctuary's program, offering advice and support where needed. During the workshop, specific medical skills and competency of each delegate (e.g surgery, parasitology, diagnostics) were assessed by the facilitators using pre- and post-quizzes, observation and spot tests. All delegates provided case studies of animal health issues they have been dealing with, and these provide an opportunity for scientific discussion. Feedback from attendees was elicited informally and formally through an evaluation survey (see Appendix C). As the survey indicates, almost all delegates felt that the workshop imparted new knowledge and learnings that they could use in their work to improve the health of the animals under their care. Suggestions will be used to tailor future programs to the needs of participants.

The skills and knowledge of the participants were also evaluated in a number of ways. Appendix D includes one of the quizzes that were provided to participants to help the instructors better understand areas of need and competence.

A full activity report and training evaluation based on Return on Investment (ROI) methodology will be available in 2015 and findings will be disseminated among PASA's worldwide listserve. Future workshops will help to evaluate the impact of the workshop on emergency healthcare and rehabilitation of injured wild primates by evaluation of the outcomes for each primate arriving at the sanctuaries for care.



Ready to Go – I think...



With hosts Colobus Conservation. Demo on bridge building for wildlife



Training in field necropsy safety and sampling methodology from Dr Helene De Nys of the Robert Koch Institute



Kate Brice leading a discussion on good primate enclosure design



Workshop participants

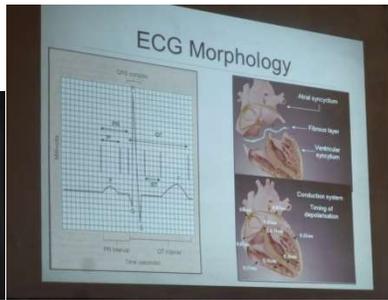


Ultrasound training and basic surgical principles.



This is Felix, from Gorilla Doctors (formerly MGVP). It was confirmed before the workshop that they and several other facilities already have this equipment but don't know how to use it, hence this initial training session from IPHP, which they have committed to continue





Discussions and work through Disease Risk Analysis and other material...

## APPENDIX A. WORKSHOP ATTENDEES

Name	email	Affiliation/ Specialty/ Country
<b>Kate BRICE</b>	k.brice@chesterzoo.org	Chester Zoo. Primate husbandry. UK
<b>Steve UNWIN</b>	s.unwin@chesterzoo.org	Chester Zoo. Disease risk analysis. UK
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<b>Aimee Drane</b>	adrane@cardiffmet.ac.uk	International Primate Heart Project, Ultrasonographer, UK
<b>Yedra Feltrer</b>	<a href="mailto:yedrafeltrer@hotmail.com">yedrafeltrer@hotmail.com</a>	ZSL, Surgery, UK
<b>Daniel Chai</b>	dchivatsi2002@yahoo.co.uk	Primate Research Centre, pathologist, Kenya
<b>Virginia Rodriguez</b>	virginiamat@hotmail.com	Wildlife Veterinarian, Cameroon
<b>Thalita Calvi</b>	thathacalvi@me.com	Chimfunshi, Zambia
<b>Pam Cunneyworth</b>	<a href="mailto:pam@itworx.co.ke">pam@itworx.co.ke</a>	Colobus Conservation, Kenya

## **APPENDIX B. 2014 PASA Veterinary Workshop Program:**

### Day 1. morning:

- Orientation and team building icebreaker
- Evaluation session
- Principles of Monkey Husbandry

### Day 1. Afternoon

- Primate husbandry at the Kenya Wildlife Service
- Introduction to Wildlife Disease Risk Analysis

### Day 2. Morning

- DRA discussion groups - Developing bespoke DRA programmes
- Diagnostic field sampling techniques

### Day 2. Afternoon

- Case Studies (all).
  - Anaesthesia and vacectomies in vervet monkeys Intro to Cardiology
  - Captive gorilla orphans and possible outcomes
  - Prevalence of cervical Papio hamadryas papillomavirus 1 (PhPV1) in a Baboon Colony in Kenya
- Cardiac health assessment
- Primate Contraception

### Day 3. Morning

- Practical Sessions: Surgery and Cardiac Ultrasound (group split)

### Day 3. Afternoon

- Practical Sessions: Necropsy and Primate Rehabilitation: the Colobus Conservation story (including bridge building and the rehabilitation process)

### Day 4. Morning

- Discussion groups: Monkey husbandry and enclosure design
- DRA Discussion groups part 2.

### Day 4. Afternoon

- Practical Sessions: Necropsy and Primate Rehabilitation: the Colobus Conservation story (including bridge building and the rehabilitation process)

### Day 5. Morning

- Welfare and Ethics
- Reporting back on discussion groups
- Evaluation Session.
- Programme concludes 3pm.

### APPENDIX C. Delegate Evaluation Summary

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<b>New Knowledge:</b> Did I gain useful knowledge?	4	10	2		
New Ideas: Did I gain new ideas that will improve the way I do my job?	6	10	1		
<b>Applying the learning:</b> Will I use the information?	7	5	3	1	
<b>Applying the learning:</b> Have I been shown how to impart this knowledge to colleagues and managers?	3	7	4	2	
<b>Effect on results:</b> Do I think the ideas and information provided at this workshop will improve the way I do my job?	3	9	4		
<b>Effect on results:</b> Do I think the ideas and information provided at this workshop will improve the health of the animals under my care?	6	8	1	1	

Best things comments
Friendly atmosphere and a good rapport (largely driven by Steve Unwin) amongst the delegates. A relatively small and adaptable hotel base
Everything!
Networking x3
respect for the people I have met and the work they do
Possible career change!
Disease risk analysis awesome (I think). Practicals cool. Liked the surgical techniques and ethics.
Cardiac ultrasound
Community feeling and professional environment.
The relaxed atmosphere, working together to help resolve problems like DRA. Ethics discussion
Good talks and great environment and very good information shared
Workshop participants and colobus conservation team.
Information specifically targeted to disease risk
Disease risk analysis
Invaluable opportunity for vets working in isolated situations

Things to improve comments	
Would have liked more case studies to share experiences	We did try to give people as much time and opportunity to prepare and present their own case studies. The veterinary manual contains a section of past case studies that you might find useful. The next manual will be out the end of 2015, and this section will be expanded.
Require more than one facilitator - different sessions should be facilitated by different facilitators	The organisers are sorry that this was not made obvious, but there were 4 facilitators: DRA, surgery, necropsy, ultrasound
It needs to be longer :-)	
French translation	
General information about activities and schedule	Noted thank you. This is an area we can always improve
request update on capture techniques and chemical immobilisation	Great idea. Last time we reviewed this in session was 2011.
More on ethics	This was a well received session and we will be expanding it in the future
More time for reflection	We are always trying to get the balance right of introducing new material and allowing people time to reflect. We will relook at this. Thank you
Extend practical sessions x2	We will. Thank you
Request first tyhings PASA members need to learn and how to support them	The PASA operations manual is in the process of being reviewed, but we suggest you check out the current manual on line at the PASA website.
Maybe give one hour on a specific day where people can discuss specific personal issues	We did attempt to do this via the PASA meeting on the 4th day. Past attendess had said this sort of discussion can be conducted during breaks, but we will reassess
Include in introduction that people should not read newspapers during the sessions	This should come under mutual respect :-), but we will consider being specific
Maybe ask to come prepared with work then can be discussed and revised during the workshop. i.e come with communications plan for disease risk spreadsheet.	This year we asked delegates to come with a brief communication. 2 did. As reagrds the DRA material, we made the discission to all do this aty the workshop to avoid potnetial confusion.
Work with national authorities to prepare agenda. Have local authorities give opening and cloising statements x2	The organisers take full responsibility for the miscommunication on this, as that is what we attempted to do, both through the local organisor, and directly with the relavent delegates. We will try harder next time

<b>How will I use the information I have gained comments</b>
To improve the health and housing requirements of captive wildlife
This will help me discuss with management to implement good practise and good protocols for the veterinary, and other, departments
Hopefully improve the animals welfare I look after and pass on information to my co-workers.
Going to try to improve disease screening for sanctuary animals but especially for release animals. Also, going to make people sit down and draft DRA release group.
The simplified field techniques will help me in saving time during procedures (I will use some of the references that I have got)
I will try to apply some thing to my work environment
I will try to apply most of the ideas on our protocols and daily work.
The veterinary workshops with PASA has led to development of a disease prevalence project for Diani primates. Information in the workshops helps to better address these issues.

## APPENDIX D. Quiz for workshop (with Answers).

Circle your preferred answers. For questions that need sentence answers, please be as brief as possible. The results of this will help us determine how good we are at sharing information at these workshops, NOT to test your knowledge as such.

Remember - Some questions have more than one answer      Good Luck

### PARASITOLOGY

1. The main cause of death in malaria is due to:

- A      A high number of parasites in the blood.
- B      The presence of schizonts in the blood.
- C      Anaemia.**
- D      Blockage of capillaries in the deep tissues.

2. Rhabditiform (L1) larvae of *Strongyloides* species can be distinguished from Hookworm species larvae by:

- A      Strongyloides larvae have a short buccal cavity
- B      Strongyloides larvae have a long buccal cavity
- C      Strongyloides larvae have a pointed posterior end**
- D      Strongyloides have a bifocated posterior end.

3. *Dientamoeba fragilis* may be diagnosed by examining

- A      An iodine- stained smear
- B      A ZN stained smear
- C      A methylene-blue stained smear
- D      A Giemsa/Field's stained smear**

### ANIMAL HEALTH PROTOCOLS

4. Define 'biosecurity'

Similar to: Protocols designed to reduce the risk of pathogen transmission

5. Which of the following are components of a disease or pathogen contingency plan?

- A. A list of people and organisations to contact in a disease outbreak, and why they must be contacted.**
- B. Biosecurity protocols**
- C. Methods of disease transmission and management strategies to reduce transmission**
- D. A map of your facility**
- E. background information on the disease of concern**

6. List ways pathogens and disease can be transmitted. (as many as you can).

Faecal-oral, direct contact, Aerosol, indirect (soil/ water/vector), body fluids

7. For each answer to question 6, describe one way of how you can break that transmission

Hygiene (hand washing), PPE, etc

8. Risk is defined as multiplying the likelihood of an event and what else?

The consequences of that event

9. How does a disease risk analysis help with decision making when preparing for a disease outbreak?

Similar to: Risk Analysis is a tool to provide evidence for decision making under uncertainty. The analysis is the process to quantify or qualify this, to assist in animal management decisions. Answer may include Adds science to policy decision making, Transparent method to organize, assess and study a problem/question/issue, Allows successful project succession planning, Increases communication, Multidisciplinary, Identifies data gaps and research needs

10. Define malnutrition

Similar to: Malnutrition occurs when the body does not get the right amount of vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organ function and can occur when an animal is either undernourished or overnourished.

11. What is the OIE and who is your country representative?

The OIE (World Organisation for Animal Health) is the intergovernmental organisation responsible for improving animal health worldwide. Rep will vary by country.

### PRACTICAL ANIMAL HEALTH

12. A monkey stops breathing under anaesthetic. Your emergency resuscitation protocol should include several things, but what should be done immediately?

- A. Begin chest compressions as per CPR protocol ( to the rhythm of 'Staying Alive')
- B. Inject adrenaline
- C. Calmly plan who should be doing what
- D. Confirm airway patency**
- E. Reverse the anaesthetic

13. In 1 sentence, suggest when it is reasonable to consider euthanasia of a primate under your care.

Ethical consideration: Open answers

14. In one or two sentences describe what a polymerase chain reaction (PCR) is and when it should be employed as a diagnostic test?

Similar to: The **polymerase chain reaction (PCR)** is a biochemical technology in molecular biology used to amplify a single or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence. PCR allows for rapid and highly specific diagnosis of infectious diseases, including those caused by bacteria or viruses. PCR also permits identification of non-cultivable or slow-growing microorganisms such as mycobacteria, anaerobic bacteria, or viruses from tissue culture assays and animal models. The basis for PCR diagnostic applications in microbiology is the detection of infectious agents and the discrimination of non-pathogenic from pathogenic strains by virtue of specific genes

15. List AT LEAST 3 other ways to investigate pathogens in the living individual.

At least 3 to get a mark.

### SCIENTIFIC INVESTIGATIONS

16. List the following types of investigative studies in order of result reliability, with the most reliable first

- A. Cohort Studies
- B. Expert Opinions, textbooks, personal experience and the internet
- C. Systematic review
- D. Randomised control trial
- E. Meta-analysis
- F. Single Case report
- G. Case series

C, E, D, A, G, F, B.

17. What are the top 5 sources of information you would make use of when faced with a medical issue you need to investigate

Open to interpretation

18. In reference to TB diagnostics, for each of the following tests, state whether the test is looking for Mycobacteria itself, or for the body reaction to it

A: TST

B: 454 Sequencing

C: Statpak

D: Paralens

E. MAPIA

F. Culture

A. body reaction. B. Organism C. Body reaction D. Organism E. Organism F. Organism

19. (a) List the reasons for putting samples in formalin when doing a post mortem

(b) List sampling methods other than 'in formalin' during a post mortem

Photos to histology. Bonus points if mention multiple aliquots.

20. A. How should you test for Tuberculosis? B. Provide a differential diagnosis list for other pathogens with similar clinical signs to TB.

As many modalities as possible – culture and PCR currently most recommended. Other respiratory pathogens and chronic causes of weight loss.

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