ORANGUTAN CONSERVANCY
2015 ORANGUTAN VETERINARY ADVISORY GROUP WORKSHOP
August 2 – 6 2015
JOGJAKARTA, INDONESIA

ORANGUTAN CONSERVANCY

ORANGUTAN VETERINARY ADVISORY GROUP WORKSHOP

2015 REPORT

Photos provided by OC/OVAG participants
Orangutan Conservancy Veterinary Workshop Orangutan logo courtesy Amy Burgess

Prepared with organizing committee of the Orangutan Conservancy 2014 Orangutan Veterinary Advisory Group (OVAG) Workshop, Jogjakarta, Indonesia June 21-26, 2014
R. Commitante, S. Unwin, R. jaya, Y. Saraswati, F. Sulistyo, C. Nente (Editors). Orangutan Conservancy (OC). 2015. *Orangutan Conservancy 2015 Orangutan Veterinary Advisory Group Workshop Report.*

Additional copies of the *Orangutan Conservancy 2014 Veterinary Advisory Group Workshop Report* and previous years' reports can be found on the Orangutan Conservancy website, **www.orangutan.com**

Orangutan Conservancy 2015 Orangutan Veterinary Advisory Group (OVAG) Workshop

August 2 – 6, 2015

Universitas Gadjah Mada, Facultas Kedoktoran Hewan, Jogjakarta, Indonesia

Participating Organizations (38):

Orangutan Conservancy, United States
Chester Zoo / NEZS, United Kingdom

ABAXIS Europe, Germany
Birmingham Zoo, United States
BKSDA Aceh, Indonesia
Borneo Orangutan Survival Foundation, Indonesia
Cardiff Metropolitan University, Wales
Center for Orangutan Protection (COP) Indonesia
Faculty of Veterinary Medicine, Gadjah Mada University, Jogjakarta, Indonesia
Fort Wayne Children's Zoo
Frankfurt Zoological Society/Jambi SOCP Orangutan Release Site, Sumatra, Indonesia
Indonesian Veterinary Association (PDHI/IVMA)
Indonesian Wildlife Rescue Center, Jogjakarta, Indonesia
International Primate Heart Project (IPHP)
International Animal Rescue, Indonesia (IAR)
Jejak Pulang (Vier Pfoten Indonesia)
Liverpool School of Tropical Medicine, United Kingdom
Liverpool Vet School, United Kingdom
Matang Wildlife Center, Sarawak, Malaysia
Murdoch University, Perth, Australia
Orangutan Foundation United Kingdom (OFUK) Central Kalimantan, Indonesia
Orangutan Foundation International (OFI)

Orangutan Information Center, Aceh, Sumatera, Indonesia
Primate Research Center (PRC) Bogor Agricultural University, Bogor, Indonesia
Pusat Studi Satwa Primata (PSSP), Bogor, Indonesia
Restorasi Habitat Orangutan Indonesia (PT Rhoi), BOSF, Indonesia
Rutgers University
Semenggoh Wildlife Center, Sarawak, Malaysia
Sinka Zoo, Singkawang, South Kalimantan, Indonesia
Sumatran Orangutan Conservation Programme (SOCP), Indonesia
Sintang Orangutan Center, West Kalimantan, Indonesia
Taman Satwa Taru Jurug (Solo Zoo), Java, Indonesia
University Syiah Kuala (Unsyiah/Pusat Kajian Satwa Liar) Aceh, Indonesia

Supporting Organizations

Orangutan Conservancy, United States

Chester Zoo/ NEZS, United Kingdom

The Orangutan Project (TOP) Australia

Fort Wayne Children's Zoo

ABAXIS, Germany

Hosted By:

Faculty of Veterinary Medicine, Gadjah Mada University, Jogjakarta, Indonesia

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

Table of Contents

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop

2015 REPORT

Section 1

Executive Summary

This year, the Orangutan Conservancy/Orangutan Veterinary Advisory Group **(OC/OVAG)** held its 7th consecutive annual workshop. This year we also continued our collaboration between Chester Zoo, Universitas Gadjah Mada (UGM), and its Fakultas Kedokteran Hewan (Department of Veterinary Medicine). We also had for the very first time an Indonesian team of OC/OVAG vets develop, organize, and run the entire workshop. This was very exciting as it really signaled to us all, that this is indeed the veterinarians' group and workshop. Another new and important development was the accreditation for the OC/OVAG workshop given by IVMA (the Indonesian Veterinary Association) as an acknowledged Continuing Professional Development (CPD) program. This allowed all Indonesian veterinarians attending the 2015 workshop to receive credit points on their veterinary licenses. These points translate as an acknowledgment of their participation in the OC/OVAG program and as proof of their competency in their field. This recognition of the work OC/OVAG does by such a prestigious organization is truly an honor. Our next step is to develop a special designation for veterinarians who are able to show a high competency in orangutan medicine, which IVMA is very open to. Hopefully in the coming months, and possibly by next year, we may have that recognition as well!

As in 2014, the 7th annual workshop was held in Jogjakarta, Indonesia. The week-long workshop ran from August 1 to August 6. The workshops, inaugurated in 2009, continue to gather together veterinary teams and wildlife staff working in Indonesia, Malaysia, and internationally. Together, we hope to increase collaborations with local and foreign government entities, universities, field sites, rescue/rehabilitation/release centers, zoos, non-profit organizations, businesses and private parties to conserve, protect and increase awareness for the only great ape found indigenously outside of Africa.

As a true global community, we believe that only in working together can we truly effect positive change and prevent the possible extinction of wild orangutans in our lifetime.

The fight we have before us is a big one. Not only do we need to fight greed for land conversion, natural resource depletion, mis-information, the pet trade, little to no funds going to conservation organizations, but we also have to fight the weather! Fires are raging out of control throughout Borneo and Sumatra. El Nino conditions, peat swamp areas and fires set by humans are proving once again to be a lethal combination. Our veterinarians, their co-workers, and volunteers (both locally and foreign) are in the midst of it all.

OC/OVAG remains ready to support the work needed to be done! As we continue to build our group, adding new participants and collaborators, we also hope to build the contribution we can make toward orangutan health and well-being, and through that, human health and well-being. It is not just about saving orangutans, it is about saving all of us.

The 2015 OC /OVAG Workshop continued its work with parasite identification and treatment, focused on improving surgery techniques, increased skills on grant writing and writing for publication, and reviewed the One Health perspective. We also are closer to building a wild life medicine program within the Veterinary Faculty at UGM. Our belief is that in the next year, we can begin the program to increase the skills of emerging veterinarians who may begin their careers working with wildlife.

This year, three of our OC/OVAG veterinarians had a paper accepted for publication. Rosalie Dench, Fransiska Sulistiyo and Joost Phillipa (who is currently working with gorillas in Africa) had their article titled "EVALUATION OF DIAGNOSTIC ACCURACY OF THE COMPARATIVE TUBERCULIN SKIN TEST IN REHABILITANT BORNEAN ORANGUTANS (PONGO PYGMAEUS)" published in The Journal of Zoo and Wildlife Medicine.

The 2015 OC /OVAG Workshop was co-sponsored by the Orangutan Conservancy (USA), and Chester Zoo/ NEZS (United Kingdom). We thank Chester Zoo for becoming a core ongoing funding supporter for OC/OVAG!!! OC/OVAG received additional support from The Orangutan Project (TOP – Australia), Fort Wayne Children's Zoo (USA), Abaxis (Europe), and of course, Universitas Gadjah Mada (Indonesia).

This year we had our largest group yet with nearly 60 participants. Our 2015 groups of participants included not only veterinarians, but wildlife conservationists from Sarawak, Malaysia, university professors, zoo staff, orangutan rescue and rehabilitation teams, Indonesia Forestry Department, human medical teams, and for the second time, managers of orangutan facilities were able to join us along with many others.

As a result of our growing number of participants, at this year's OC/OVAG Committee meeting we discussed the possibility of offering membership status to on-going participants. As we have veterinarians, researchers, instructors, zoo personnel, various experts and observers, it is getting difficult to determine who should get full funding, partial funding or be self-funded. Also discussed was whether membership should include a yearly fee. We will be working on this and hopefully have more information before the 2016 workshop.

We also had many of our veterinarians travel outside of Indonesia to increase their professional development. Ricko Laino Jaya and Yenny Saraswati were invited to America by Fort Wayne Children's Zoo and Fort Worth Zoo for extra training and sharing of experiences in working with wildlife. Winny Pramesywari and Fransiska Sulistyo traveled to England to work with Chester Zoo, Jersey Zoo, and Liverpool University. Anta Rosetyadewi is in Australia working on her PhD. We wrote in last year's report that OC/OVAG veterinary staff are at the frontline of addressing the welfare and conservation needs of ill or injured orangutans and other wildlife, and that enhancing their knowledge and skills with continuing professional development opportunities would help them ensure the best outcome for each individual in their care. Well, we have achieved that and hope to continue to provide similar opportunities for others in the future. OC/OVAG work is also currently being evaluated by Chester Zoo to assess our conservation impact. The results of this report will tell us how well we are doing and help us improve our service even more.

OC/OVAG veterinarians and scientists continue to be a major force in shaping conservation medicine work across Indonesia and Malaysia. OC/OVAG will continue to provide expert training on relevant disease investigation techniques as well as improve conservation management on a global scale.

Thank you and remember, **together we can do anything!**

Raffaella Commitante, B.F.A., M.A., PhD
Steve Unwin, B.Sc., B.V.Sc., Dipl ECZM, MRCVS
Ricko Laino Jaya, drh.
Yenny Saraswati, drh.
CitraKasih Nente, drh., MVS (Conservation Medicine)
Fransiska Sulistyo, drh., MVS (Conservation Medicine)

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

August 2 – 6, 2015

Budget

	US DOLLAR
Air International	12,514
Air Domestic	4,750
Hotel	7200
Ground travel	200
Catering	500
T Shirts/Banners	400
Office Misc.	500
Veterinary Supplies	400
Veterinary Continuing Education Support	4,200
Bank Transfer Fees	200
Misc.	300
TOTAL	**31,164**

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

August 2 – 6, 2015

Section 2

Letter of Invitation

Dedicated to the Conservation of Orangutans and their Rainforest Homes

OC/OVAG 2015

RE: **Orangutan Conservancy / Orangutan Veterinary Advisory Group Workshop 2015**
Orangutan Conservancy / Lokakarya Kommunitas Dokter Herwan Orangutan 2015

To Whom It May Concern:

This letter shall serve as an invitation to attend the Orangutan Conservancy/Orangutan Veterinary Advisory Group (OC/OVAG) Workshop 2015 sponsored by the Orangutan Conservancy (OC), a United States not-for-profit organization, Chester Zoo (a zoological park in The United Kingdom) and in collaboration with the Faculty of Veterinary Medicine of Universitas Gadjah Mada (UGM).

The workshop will be held at Faculty of Veterinary Medicine, UGM and the LPP Convention Hotel, Jl. Demangan Baru 8, Yogyakarta.

Contact information for OC/OVAG Organizing Committee in Indonesia: Fransiska Sulistyo (sulistyo.fransiska@gmail.com), Ricko Jaya (rickojaya@gmail.com), Yenny Saraswati Jaya (yenny.jaya@gmail.com),Citrakasih Nente (citrakasih@gmail.com) / Contact information for Orangutan Conservancy: Raffaella Commitante (rcommitante@gmail.com). Contact information for Chester Zoo: Steve Unwin (s.unwin@chesterzoo.org). Contact information for UGM, Vice Dean: DR. Indarjulianto Soedarmanto (indarjulianto@yahoo.com).

Our seventh workshop, will continue the work we began in 2009 to improve ourselves and the care we give to orangutans. It will be held:

August 2 – August 6, 2015 (arrival on the 1st and departure on the 7th)

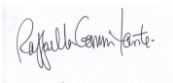
OC/OVAG and UGM would like to extend an invitation to the person/s listed below to attend this international workshop.

(_____)

We thank you for your participation in allowing your staff to attend.

Travel expenses for the workshop and accommodation will be paid for by the Orangutan Conservancy during the length of the workshop for the person(s) named above. Accommodation information will be sent directly to participants.

Respectfully,

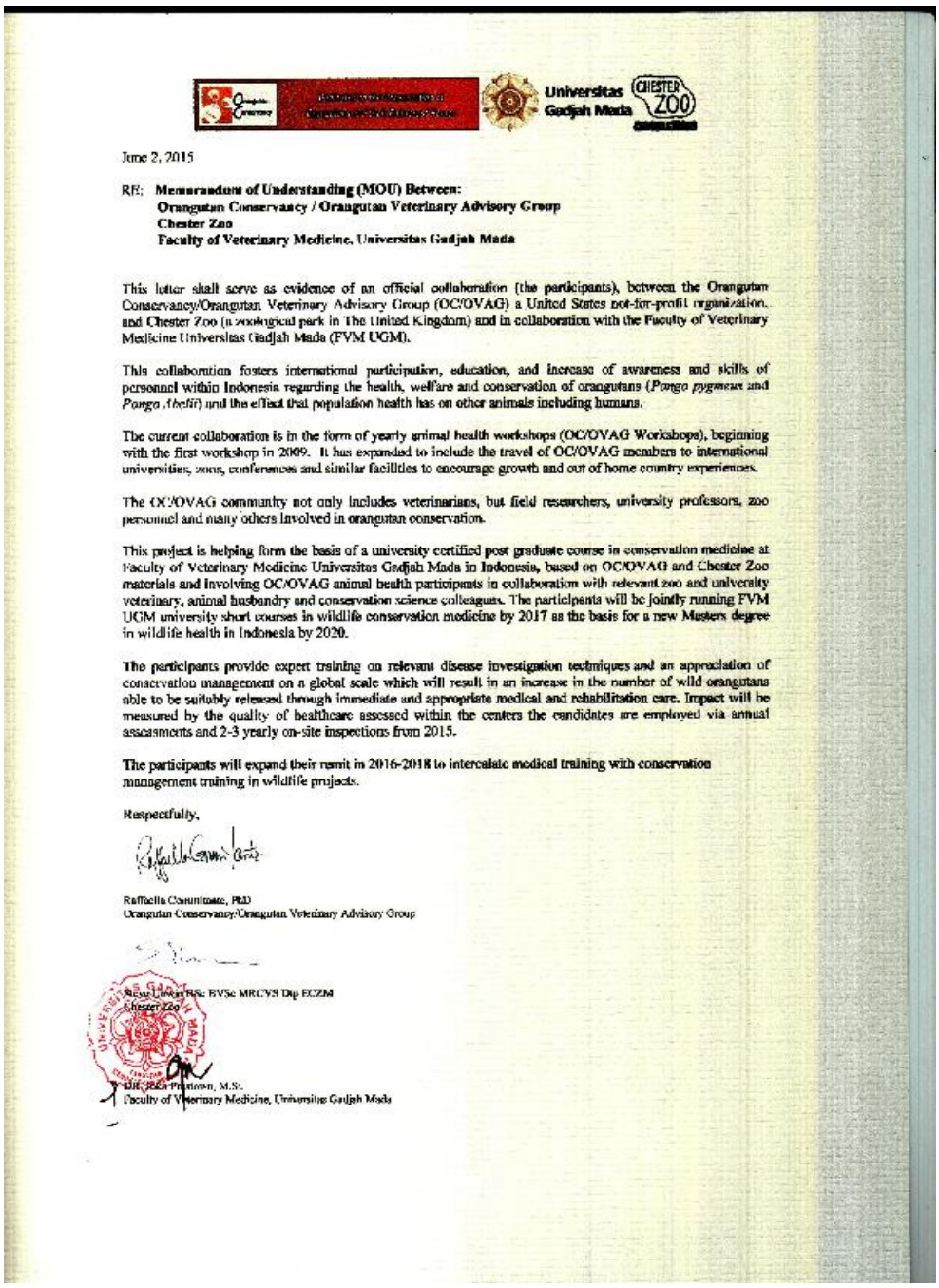


Raffaella Commitante, PhD
Orangutan Conservancy/Orangutan Veterinary Advisory Group

Orangutan Conservancy / P.O. Box 513 / 5001 Wilshire Blvd. / #112
Los Angeles, CA 90036/USA / www.orangutan.com / info@orangutan.com

Memorandum Of Understanding:

Orangutan Conservancy/Chester Zoo/Faculty of Veterinary Medicine, Gadjah Mada University



June 2, 2015

RE: **Memorandum of Understanding (MOU) Between:**
Orangutan Conservancy / Orangutan Veterinary Advisory Group
Chester Zoo
Faculty of Veterinary Medicine, Universitas Gadjah Mada

This letter shall serve as evidence of an official collaboration (the participants), between the Orangutan Conservancy/Orangutan Veterinary Advisory Group (OC/OVAG) a United States not-for-profit organization, and Chester Zoo (a zoological park in The United Kingdom) and in collaboration with the Faculty of Veterinary Medicine Universitas Gadjah Mada (FVM UGM).

This collaboration fosters international participation, education, and increase of awareness and skills of personnel within Indonesia regarding the health, welfare and conservation of orangutans (*Pongo pygmaeus* and *Pongo Abelii*) and the effect that population health has on other animals including humans.

The current collaboration is in the form of yearly animal health workshops (OC/OVAG Workshops), beginning with the first workshop in 2009. It has expanded to include the travel of OC/OVAG members to international universities, zoos, conferences and similar facilities to encourage growth and out of home country experiences.

The OC/OVAG community not only includes veterinarians, but field researchers, university professors, zoo personnel and many others involved in orangutan conservation.

This project is helping form the basis of a university certified post graduate course in conservation medicine at Faculty of Veterinary Medicine Universitas Gadjah Mada in Indonesia, based on OC/OVAG and Chester Zoo materials and involving OC/OVAG animal health participants in collaboration with relevant zoo and university veterinary, animal husbandry and conservation science colleagues. The participants will be jointly running FVM UGM university short courses in wildlife conservation medicine by 2017 as the basis for a new Masters degree in wildlife health in Indonesia by 2020.

The participants provide expert training on relevant disease investigation techniques and an appreciation of conservation management on a global scale which will result in an increase in the number of wild orangutans able to be suitably released through immediate and appropriate medical and rehabilitation care. Impact will be measured by the quality of healthcare assessed within the centers the candidates are employed via annual assessments and 2-3 yearly on-site inspections from 2015.

The participants will expand their remit in 2016-2018 to intercalate medical training with conservation management training in wildlife projects.

Respectfully,

Raffaella Cascinmoc, PhD
Orangutan Conservancy/Orangutan Veterinary Advisory Group

Steve Unwin BSc BVSc MRCVS Dip ECZM
Chester Zoo

Dr. Ida Pramono, M.Sc.
Faculty of Veterinary Medicine, Universitas Gadjah Mada

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

Agenda

Saturday August 1 Arrival
Sunday August 2 (Day 1)

08:00 – 09:00	Opening Ceremonies: drh. Ricko Jaya, Master of Ceremonies. Speakers: DR. drh. Joko Prastowo, Dean, Faculty of Veterinary Medicine, UGM. OC/OVAG mascot and conservation ambassador, Gavo: Travel video
09:00 – 10:00	Discussion of new certification of Orangutan Specialized Veterinarians and orangutan medicine short course
10:00 – 11:00	Ice Breaker Activity/Break
11:00 – 11:30	Evaluation of OC/OVAG Workshop Effectiveness
11:30 – 13:00	Overview of Rehabilitation and Release Processes/Orangutan Center Managers
13:00 – 14:00	Lunch
14:00 – 15:00	Center manager's overview continued
15:00 – 16:30	Disease Risk Analysis (DRA)
16:30 – 17:00	Break
17:00 – 18:00	Public Speaking tips
18:00 – 18:30	Post It Board Instructions

Monday August 3 (Day 2)

08:00 – 08:30 Group Photo

08:30 – 09:00 DRA/Scenarios

09:00 – 10:30 Orangutan Ethics

10:30 – 11:00 Break

11:00 – 12:00 Grant Writing

12:00 – 13:00 Enrichment

13:00 – 14:00 Lunch

14:00 – 15:00 Human First Aid

15:00 – 16:00 Emergency Medicine

16:00 – 16:30 Break

16:30 – 18:30 Post Release Monitoring

Tuesday August 4 – UGM (Day 3)

08:00 – 10:30 Parasitology

10:30 – 11:00 Break

11:00 – 13:00 Case Studies

13:00 – 14:00 Lunch

14:00 – 15:00 Medical Data Recording

15:00 – 16:00 Soft Tissue Surgery Part 1

16:00 – 16:30 Break

16:30 – 18:30 Soft Tissue Surgery Part 2

Wednesday August 5 (Day 4)

08:00 – 10:00 Epidemiology

10:30 – 11:00 Break

11:00 - 12:00 Scientific Writing

12:00 – 13:00 Cardiology Assessment

13:00 – 14:00 Lunch

14:00 – 18:30 Afternoon Tour of Jogjakarta

Thursday August 6 (Day 5)

08:00 – 09:00 Internal Diseases

09:00 – 10:30 Report from Sarawak, Malaysia

10:30 – 11:00 Break

11:00 – 12:00 Indonesian Veterinary Medicine Association

12:00 – 13:00 Orangutan Parasites

13:00 – 14:00 Lunch

14:00 – 14:30 USA Trip

14:30 – 15:00 Evaluation

15:00 – 15:30 Post It Session

15:30 – 16:00 Break

16:00 – 18:30 Closing Session/Wrap Up

19:30 Workshop Closing Dinner

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

2015 Participant List

1	Abdul Syamil bin Patahol Wasli	abduls@sarawakforestry.com	Matang Wildlife Centre
2	Adi Irawan	adi@internationalanimalrescue.org	International Animal Rescue
3	Aimee Drane	adrane@cardiffmet.ac.uk	Cardiff Metropolitan University
4	Aldrianto Priadjati	aldrianto2005@yahoo.com	RESTORASI HABITAT ORANGUTAN INDONESIA
6	Andhani Widya Hartanti	andhani_widya@yahoo.com	FZS Jambi
7	Antasiswa Rosetiadewi	antarosetyadewi@yahoo.com	UGM/Murdoch Unniversity
8	Agus Fahroni	agusfahroni@orangutan.or.id	BOSF Nyaru Menteng
9	Arga Sawung Kusuma	arga@orangutan.or.id	BOSF Nyaru Menteng
10	Ayu Budi Handayani	handayaniayubudi@gmail.com	International Animal Rescue
11	Ayu Ningtias Wahyu Andari	ekochyo@yahoo.com	Sinka Zoo, Singkawang, Kalimantan Barat
12	Baerbel Kohler	BaerbelKoehler@abaxis.de	ABAXIS
13	Bambang Setyawan	senyumlangit@yahoo.com	OFUK
14	Citrakasih Nente	citrakasih@gmail.com	Jejak Pulang/Samboja
15	Chong Jiew Han	jhchong@sarawakforestry.com	Semenggoh Wildlife Centre
16	Claire Parry	c.parry@chesterzoo.org	Chester Zoo
17	Dewi Candra	dewicandra91@gmail.com	Jejak Pulang/Samboja
18	Diah Pawitri	drh.diahp@gmail.com	Primate Research Center (PRC) Bogor Agriculture
19	Erni Sulistiawati	e_sulistia16@yahoo.com	Primate Research Center/IPB,Diploma Program
20	Fransiska Sulistyo	sulistyo.fransiska@gmail.com	BOSF
21	Hery Wijayanto	herykh@ugm.ac.id	UGM, Lecturer
22	Heru Setijanto	pb_pdhi@yahoo.com	PDHI / IVMA
23	Imam Arifin	imam@cop.or.id	Central Orangutan Protection
24	Ivona Foitova	ivona_foi@hotmail.com	Masaryk University, Czech Republic
25	Javier Martinez	javiermartinez_71@hotmail.com	Cardiff Metropolitan University
26	Julius Paolo Siregar	juliusp.siregar31@gmail.com	FZS Jambi
27	Marie McIntyre	K.M.Mcintyre@liverpool.ac.uk	Institute of Infection & Global Health, UoL
28	Mukhlisin	mukhlis_a2@yahoo.co.id	SOCP/Jantho
29	Murtadza	murtadzao@sarawakforestry.com	Semenggoh Wildlife Centre
30	Popowati	iccaros@yahoo.com	OFI
31	Purnomo	agusfahroni@orangutan.or.id	BOSF Nyaru Menteng
32	Raffaella Commitante	rcommitante@gmail.com	Orangutan Conservancy
33	Ricko Laino Jaya	rickojaya@gmail.com	Orangutan Information Centre
34	Rosa Rika Wayuni	sha_12024@yahoo.co.id	BKSDA Aceh

35	Sarah Jayne Edwards	sjedwards1986@gmail.com	Independent Vet
36	Siali Anak Aban	siali@sarawakforestry.com	Matang Wildlife Centre
37	Stephanie McCain	smccain@birminghamzoo.com	Birmingham Zoo, US
38	Steve Unwin	s.unwin@chesterzoo.org	Chester Zoo
39	Tiara Debby Carinda	debbycarinda@yahoo.com	Taman Satwa Taru Jurug (Solo Zoo)
40	Tom Mills	thom@orangutan.com	Orangutan Conservancy
41	Tri Wahyu Pangestiningsih	estifkh@ugm.ac.id	UGM Lecturer
42	Vicktor Vernandes Nainggolan	vicktorvernandes@gmail.com	Sintang Orangutan Center
43	Wahdi Azmi	wahdiazmi@yahoo.com	Unsyiah/ Pusat Kajian Satwa Liar Aceh
44	Waluyo Jati	b.waluyojati@outlook.com	BOSF Samboja Lestari
45	Wendi Bailey	jwendiwoo@gmail.com	Liverpool
46	Wendy Erb	erbivorous@gmail.com	Rutgers Unversity
47	Yenny Saraswati	yenny.jaya@gmail.com	SOCP
48	Yumni Khairina Ghassani	yumni.khairina.ghassani@gmail.com	Independent/ Researcher
49	Slamet Raharjo	raharjo_vet19@yahoo.com	UGM, Lecturer
50	M. Tauhid Nursalim	tauhidnursalim@yahoo.de	UGM, student volunteer
51	Daryl Lum Mun Yoong	daryllum39@gmail.com	UGM student volunteer
53	Venisri Prithivi Raj	venisri.prithivi.23@gmail.com	UGM student volunteer
54	Sri Widowati Anjarsari		UGM student volunteer
55	Riyadi Dwi Prasetya	riyadi.dp@gmail.com	UGM student volunteer
56	Vincentia Trisna Yoelinda	vincentia_ty@yahoo.com	UGM student volunteer
57	Dr. drh. Joko Prastowo	joko2465@yahoo.com	Dean, UGM Vet School
58	Dr. drh. Indarjulianto	indarjulianto@yahoo.com	Vice Dean, UGM Vet School
59	Dr. drh. Wishnu Nurchayo	Wisnu-nc@ugm.ac.id	UGM, Lecturer

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

Section 3

Proceedings of the OC/OVAG 2015 workshop are available electronically with all presentations and teaching materials on request. Complete digitized proceedings are always given to each delegate including all past workshop reports at the end of the workshop.

Day One: August 2, 2015

Opening Ceremonies:

Ricko Laino jaya, MC (and translator) / Committee Introductions:
Steve Unwin/CitraKasih Nente/Yenny Saraswati/Fransiiska Sulistyo/Raffaella Commitante

Welcome to the participants:

UGM: Dr. drh. Joko Prastowo, Dr. drh. Indarjulianto, Dr. drh. Wishnu Nurchayo, Ibu Uti

Official Opening of the Workshop: Dr. drh. Joko Prastowo (Dean of Faculty of Veterinary Medicine)

The new Memorandum of Understanding (MoU) between OC/OVAG and UGM and the cooperation to increase veterinary learning between OC/OVAG and faculty of veterinary medicine at UGM. For this year's workshop, the credit points being awarded to Indonesian veterinarians by the Indonesian Veterinary Medicine Association (IVMA) are 7.5 for participating veterinarians and 8.5 for presenting veterinarians.

Welcome from Steve Unwin, Chester Zoo and OC/OVAG

Review of working agreement:

As with all our workshops, all ideas are valid, all work is documented, all get to speak, we listen to each other, we respect each other, we try to respect time frames!

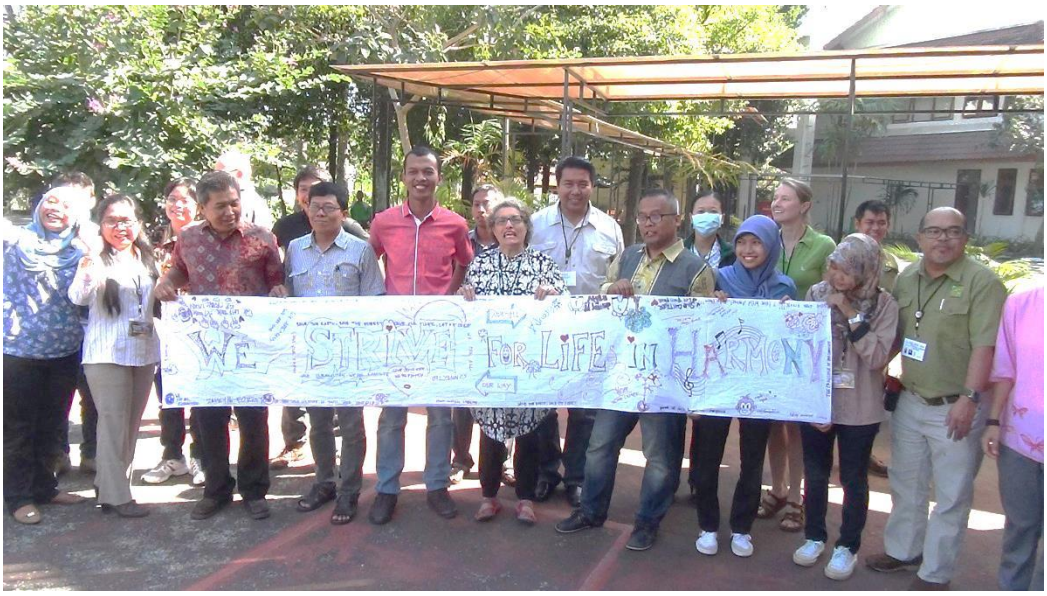
Main focus:

OC/OVAG expects all participants to have knowledge of the basics of orangutan health, with the 2015 workshop focusing on an understanding of ethics and release, post release monitoring, grant writing, scientific publications, parasites, surgical techniques, epidemiology, review of good and bad husbandry, and contingency plans for disease risk.

OC/OVAG is not only for the purpose of furthering knowledge for veterinarians, but for all who are interested in orangutan health. OC/OVAG aims to be as inclusive as possible to help all orangutan care workers, no matter where they work: centers, zoos, the wild, etc. Everyone participants:
"what you have to say is important – this workshop is for you!!!!!"

For this year's workshop materials, some documents are available in printed form, but most materials will be accessible electronically through flash drive loading or through Google drive.

Ice Breaker – Break out into two groups: each group working to create banners which begin with individual ideas about conservation, to then expand to encompass the entire group's ideas.



The Story of Gavo: (Video Log of Gavo's Travels – Steve Unwin)

Gavo's Message – From Indonesia, England, the United States, and many other countries around the globe; meeting with people working in conservation: We work together to protect the environment and in so doing, protect the human race – Efforts to conserve our environment are vital for our own survival.

Gavo's Journey - video of his travels from Indonesia to UK, to Scotland to Wales, to California, to Australia, to China, to India, to Africa – all in his first year of travel!!!!!– His journey will continue… Gavo has his own Instagram account with many supporters.

Evaluation Quiz

Anonymous quiz to get indication of some basic health issue knowledge – some information discussed in previous workshops, some questions added new for this year's sessions (see appendix)

Video Diary from Steve Unwin and Claire Parry of Chester Zoo from OC/OVAG 2014

Some work/some play (karaoke) includes video of each participant from 2014 stating in one word (both in Bahasa and English) their perception of the OC/OVAG workshops.

Manager Sessions:

Rehabilitation and release overview from managers: Facilitator: drh. CitraKasih Nente, Jejak Pulang and OC/OVAG Sharing knowledge and learning what other facilities are doing/comparing protocols, etc.

drh. Bambang Setyawan: Orangutan Foundation United Kingdom (OFUK)
Pangkalan Bun, Kaltengah (SM Lemandau). Ashley Lieman, founder of OFUK. Includes five camp sites in the Lemandau Nature Reserve where 150 rehabilitated orangutans have been released since 1999. In addition to releases, OFUK also tries to protect the area, not just the orangutans. The 150 orangutans that have been released were from OCCQ (Orangutan Care Center and Quarantine), managed by OFI (Orangutan Foundation International). OFUK employs two methods: soft releases and hard releases.

Soft release: orangutans are taken to the forest daily and are provisioned. Once they gain forest skills, they progress to the hard release phase.

Hard release: if an orangutan is wild and has good skills, they can go straight to a hard release (translocation). These wild orangutans are from the area and often have to be translocated to forests further away from villages. A pre-release health check is performed before any translocations. If the orangutan is healthy, strong, shows no clinical symptoms and tests clear of diseases, it can be transported straight to the forest. About 40 orangutans have been rescued and translocated since 2011.

Un-releasable: some orangutans are so damaged that they cannot be released. Ex. One orangutan had 100 air rifle bullets in her body – they were able to remove some, but other bullets are in places that are difficult to remove. She is also blind because of the bullets.

60 released orangutans are still being monitored and have been reproducing – 60 infants have been born in 16 years. OFUK still continues to monitor all released orangutans. Detailed records are kept about all orangutans in the area regarding illnesses, breeding and other basic facts. Bambang feels confident that releases are successful due to the reproduction rate of the released females. Reproduction can be used as a parameter to indicate whether releases are successful.

Health Issues found: strongyloides/ancyllostoma/worms. These problems are checked and monitored every three months. No serious issues have been found other than those above. Visual indicators are used for worming, Ex. if an orangutan is on the ground, or not making a nest…these could be visual indicators that there may be a health problem. All deaths are explored through necropsies to try to determine cause.

Mukhlisin – Sumatran Orangutan Conservation Program (SOCP Aceh – Jantho Reintroduction Center)
Jantho is in the Aceh Besar District in Cagar Alam which extends to Ulu Masen Reserve. A regulation was made during the Aceh-Helsinki Peace Deal that all orangutans from Aceh must return to Aceh. Since 2009, staff has been trained in data collection. The Jantho site officially opened in 2011. Area surveys showed that there were many fruiting trees as well as non-fruit stuffs typically eaten by wild orangutans. The area is surrounded by a natural barrier of dense forest and a river system (though there is open savannah as well as a local community present in the area). The area is still very difficult to access, so it was a good choice for a release site. As it is good orangutan habitat, it prompted these questions: where are they? Why are there no wild orangutans in the area? This needs further research. Jantho has been in operation for 5 years now, and since 2011, 70 orangutans have been released in the area.

Health issues for orangutans appear to be: diarrhea, malaria and respiratory disease.

Julius Paolo Siregar – Sumatran Orangutan Reintroduction Center (SORC)
Project collaboration with Frankfort Zoo. An evaluation was conducted of the release area to establish if there is proper vegetation, abundant fruiting trees, little to no disturbance, carrying capacity and if any wild orangutans are in the area. From one to four weeks are spent in pre-release cages where orangutans are still dependent on humans. Food is given along with natural enrichment. Pre-release protocols include social training, forest adaptation, a soft release and then permanent release.

Once released, diet information, behavior and any medical issues are recorded by means of daily nest-to-nest monitoring from one to three months. Beginning with the fourth month, orangutans are monitored for seven to ten days each month (to continue for two years). Monitors use an extensive pre-established trail system along with radio telemetry (chips were implanted, but they do not really work as they become fragmented). Data collection matches wild orangutan study protocols. Orangutans have been observed making nests, re-using old nests and even sleeping on the forest floor or in the release cages. If orangutans are observed not making nests, they are returned back to the training program to try to get them in the trees and finding forest foods. If an orangutan appears to be unwell, it is monitored daily in case human intervention is needed. Some newly released orangutans may spend time near release cages, indicating they may need more time to adapt to the forest and therefore may need supplemental feeding. They are fed but are encouraged to move further into the forest. Supplemental feeding is hung high in the trees and orangutans are never fed on the ground.
A one armed male orangutan that was released (his left hand had to be amputated below the elbow) is doing very well and is able to climb and find food.

The release site is Bukit Tigapuluh –and has already received 164 individuals. Four are in an adaptation cage,

23 have died, there is no data on 79 individuals and 6 babies have been born. Data is in hand for 81 orangutans. The national park area release site is located just northeast of Jambi and south west of Riau in the center of Sumatra.
Release process:
Transferred from SORC to socialization cages and adaptation cages, to forest adaptation stage; this includes the soft release, and then to release with post release monitoring and evaluation continuing.

Criteria for release site: Condition of vegetation / Food tree abundance / Little to no disturbance / Amount of orangutans already released before considering introducing any other individuals. Orangutans are taken to release area in hand carried transport cages through the forest, across river systems etc.
Post release monitoring occurs daily from 1st through 3rd month, 7 to 10 days starting with the 4th month, to continue up to 2 years (using radio telemetry). Charts are generated indicating movement of any individual throughout the area. Data is analyzed and evaluated. Monitors look for orangutans to have a high level of activity. If an orangutan is showing signs of stress or not eating, then special monitoring is required. Sometimes when the rain is very hard, they can experience some stress.

Problems encountered: Poor health / Topographic issues / Weather issues / Technician error with data collection / Other problems.

Future challenges: Changes in local government policies / Changes in the interest of local government and stake holders / Increasing encroachment from plantations in the Bukit Tigapuluh landscape. The area outside of the national park is subdivided and zoned for a variety of uses.

Future Plan: Protect the remaining buffer zones from encroachment / Improve socialization and cooperation with the local government and other stakeholders / Increase community awareness / Increase training and capicity building.

drh. Agus Fahroni (for Denny Kurniawan – manager) Borneo Orangutan Survival Foundation (BOSF) Nyaru Menteng Reintroduction Program, Central Kalimantan
Their vision: Save the orangutan and their habitat through collaboration with the community. The working area is in a village at the border of a national park at the outskirts of the city of Palangkaraya. Release site is in Batikap Protected Forest and is about 32,000 hectares. They are currently searching for a second release area nearby. Islands are used for pre-release training. Since opening in 1999 with no orangutans, they have had as many as 700 orangutans (huge surge in 2006-2007). As of 2015 there are about 500 orangutans in the center. There are many young orangutans with a staff of baby technicians to look after them. Older individuals are also brought to the center with a variety of health conditions. All orangutans receive health checks, learn forest skills, and the center ensures a high level of health care and welfare: all within the IUCN and National guidelines. Since 1999 a total of 1,182 orangutans have come through the center. 40% of them were rescued (needing translocation), and the balance (60%) were government confiscations.

There are three criteria for release:
- Age: at least 7 years old
- Must have forest skills
- Must be free from diseases that do not exist in the wild

Genetic information is taken to ensure that orangutans are released into the proper areas (specific to their subspecies) In Central Kalimantan; the subspecies *Pongo p. pygmaeus* is resident.
Preparation for release: from orangutan islands (operating as soft release sites) each individual receives a thorough health screening, a transmitter is implanted, followed by a two month quarantine in a pre-release quarantined area. This is then followed by a release ceremony, after which the orangutans are loaded onto a helicopter for transport to Batikap. Batikap currently has 136 released orangutans with three babies having been born there.

It takes orangutans about 3 months to adapt to the new area until they are able to find food on their own. Based on analyzed data, if it appears that an orangutan may be at risk, closer monitoring is enforced. Observations cover foods being eaten and ranging distances. They have had some instances of orangutans raiding the observer's camp or the nearby village area. Any damage caused by orangutans is replaced but never paid for by the center. Community development is engaged via employment of local people near the release area as monitoring staff. They also liaise with BKSDA (Ministry of Forestry) to assist in patrolling the area, helping to ensure orangutan post release safety.

drh. Popowati (for manager) Orangutan Foundation International (OFI)
Their mission: to save orangutans and protect their habitat. In 1971 Birute Galdikas established the rehabilitation center in Central Kalimantan, in the village of Pangkalan Bun. New arrivals are quarantined, and then taken to a forest school/nursery, then on to pre-release quarantine area then to release. If there are persistent health issues orangutans are taken to the health care facility. The actual location is TNK (National Park) Tanjung Puting /Camp Leakey. In 1998, The Orangutan Care Center and Quarantine was built initially to hold only 60 orangutans, as of 2015 there are 325. The quarantine period lasts for 30 days for a general health check. Body measurements are taken, along with blood, feces, urine, and hair samples. Orangutans are tested for TB, Widal, and Hepatitis B (HBsAg and HbsAb). Each is microchipped for identification. Photographs are also taken (face, distinguishing marks, palm, and sole of foot).

Soft Release:

Must be healthy
Must be about 4-5 years of age (could be younger if adopted by older female)

Hard release:

Must be healthy
Must be over 8 years of age Have good forest skills (able to find food and make a nest)
Still retain some 'wild' instincts
Must not be too dependent upon humans

Release site is in Seruyan. Between 2008 and 2014, 106 orangutans have been released. Some orangutans have been translocated to Seruyan. Orangutans are taken to the release site either by car or by boat (klotok). Out of the 325 at the care center, 58 are able to be released. Some orangutans that are injured or have other issues cannot be released. Some are either too big or too old and have difficulty transitioning to wild living. The release site is surrounded by oil palm plantations. OFI's challenge for the future: save orangutans and protect their habitat from illegal practices.

They would also like to build a sanctuary for un-releasable orangutans. They also have a secondary release site at the outer edges of Tanjung Puting where they have already released 80 orangutans which includes 20 translocated orangutans.

Group Discussion: *Concerns were expressed about an incident at Jantho Release Area, North Sumatra of aberrant behaviors, such as a female and her offspring (one of twins) being attacked and the baby killed by a large male (presumed in the male's attempt to mate with the female), and if any other sites experienced similar post release issues. Some mentioned that they had very low aggression (possibly due to released individual knowing each other pre-release). Another suggestion was: in order to reduce aggression, to not use only one release point as it would create strong competition among males and females for territory. Captive born infants and youngsters might not know how to manage males who wanted to mate with their mothers. Perhaps considering the composition of the group being released in order to lower any aggression; or considering keeping a dominant male around to protect females – keeping other males away.*

Also discussed: the managing and accessing of carrying capacity of orangutans in a release forest and having a plan in place when the limit is reached. Following the IUCN guidelines is helpful as translocated orangutans need to be considered as well. What is the condition of the forest? A rough standard used for guidance is one orangutan for every 10km^2, also looking at phenology and health of the forest and what it can hold. Also how new releases become integrated into the area as the aim is to create a sustainable population, and the need to consider the minimum number that would create a sustainable population – looking at births, genetics of the individuals, age and sex distribution between individuals, etc.

Concern was expressed for the cause of death of the 23 orangutans in Bukit Tigapuluh, Jambi. Possibly they were in cages for too long and could not make the adjustment. Some could possibly have been attacked by predators; some may not have been able to find enough food. Older orangutans seem to have a more difficult time, for younger ones, stress seems to play a part in their deaths. Sometimes orangutans need more time to study the forest so they can learn to stay off the ground – they are used to human foods and so learning the forest and what is edible is a real challenge for some. While it may seem that 23 dead is a high number, in the world of reintroductions, 23 out of 160 is really a good indicator of the survival of released individuals. This led to whether there are "stupid" orangutans …males seem to be more stupid than females… Some felt that females do appear to be smarter and faster learners. Given time, males will develop their skills – maybe age plays a part rather than gender. It is very difficult to estimate the age of an orangutan, and there is an assumption that there is an overestimation in the relationship between age and dentition as judged by orangutan professionals. Apparently orangutan deciduous teeth begin transitioning to permanent teeth at the age of 4 (from unpublished paper). What determines a "stupid" orangutan? As that is a very subjective term. If we can make a comparison between human males and females – males do mature slower than females – that does not mean they are stupid – just that they need more time as males mature physically faster than females…so we do need to keep this in a biological perspective – and comparing great apes to humans as higher level primates – the same may apply.

IUCN will soon release updated info on post release monitoring of released great apes.

Comment was made regarding the need for more information about orangutan behavior for 2016.

Disease Risk Analysis (DRA) Session - Steve Unwin, Chester Zoo and OC/OVAG

What are threats to biodiversity? Humans, restricted resources, technology, pollution, climate change, lack of education and awareness.

Habitat loss and degradation: Invasive non-native species

Human-wildlife conflict: Over exploitation of natural resources

IUCN has a manual of Procedures for Wildlife Disease Risk Analysis which can be found at:

http://www.cbsg.org/content/iucn-manual-procedures-wildlife-disease-risk-analysis

https://portals.iucn.org/library/node/43386

Important: communication and evaluation

Principals of Risk Analysis: **Disease Risk** **Disease Ecology** **One Health**

RISK: a combination of the likelihood of hazards interacting and the consequences. More emphasis is on the consequences rather than the likelihood. Risky situations are usually uncertain which in turn causes people to react with uncertainty. Risk analysis is a scientific process to reduce uncertainty in any situation.

Ex. Hantavirus – from rodents…it causes panic – zoonotics tend to cause panic

DRA can reduce panic and allow for decision makers to make better decisions.

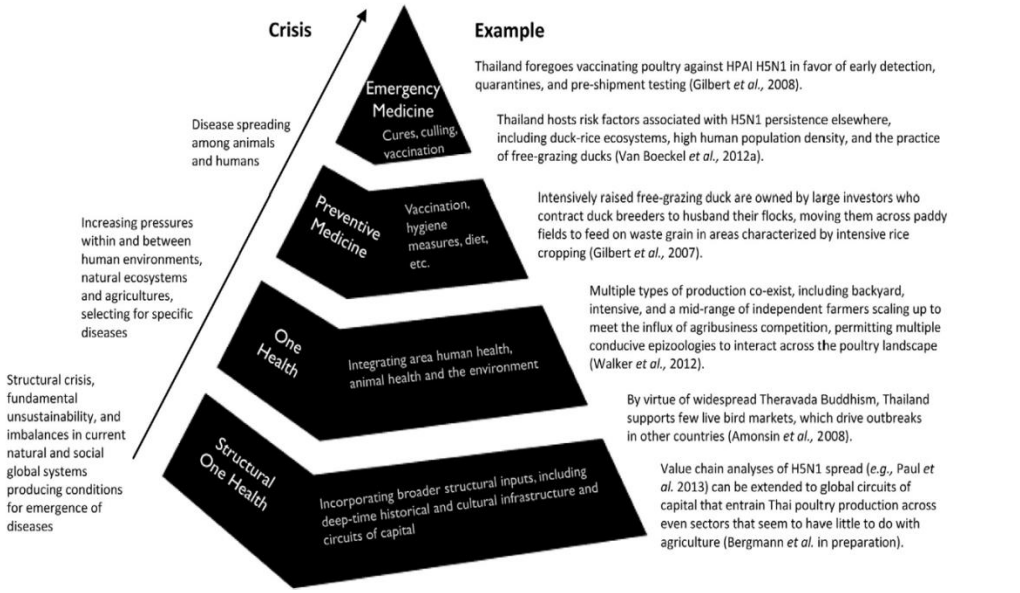
Ex. The gray squirrel is an imported species and is killing red squirrels which are native to the UK – DRA can assist with hazard identification – not only diseases.

Risk analysis adds science to policy decisions – it highlights what is not known and what the data gaps are. Is not always disease focused – allows for a visual representation of relationships that may not be immediately obvious – it is a management tool as well as a veterinary one.

Challenges: Complexity / Uncertainty / Multiple stakeholders / Transdisciplinary terminology differences / Resources

One Health – the collaborative efforts of multidiscipline organizations working locally, nationally, and globally to attain optimal health for people, animals and the environment.

A more modern way of looking at one health is a pyramid:



On the left of the pyramid are examples of crises. Most animal health work is conducted at the emergency medicine or preventative medicine level, with occasional but increasing examples at the One Health level. For true sustainability of the pathogen spread method, efforts should be concentrated at the One Health and Structural One Health level. An example of H1N1 in Thailand is presented on the right. There are many websites on One Health and many institutes for One Health. There is a resource centre that is attempting to collate the growing resources for One Health practitioners in an online website.

Considering the human population: more food needs to be produced in the next 40 years than has been produced in the last 8,000 years! This need puts pressure on biodiversity and the environment – Disease outbreaks often occur at boundaries as these are the areas under the most stress. Pathogens transferring from great apes to humans are rather high due to our genetic proximity – more so than any other species. Land that has been altered by humans holds 84% of terrestrial mammals. The remaining 16% are where people are not usually found because those areas are too difficult for humans to access.

Human-Wildlife Interaction / Livestock – Wildlife Interactions / Wildlife Management / Climate: all lead to individual effects to population effects to eco system effects.

Human-Wildlife Interaction:

Amphibian declines due to poor habitat, in 1934 – pregnant female urine applied to these frogs could determine if a woman was pregnant – massive amounts of frogs were imported around the world to be used as pregnancy tests. If they had DRA – they would have been able to analyze the decline – and the virus killing them.

Chimpanzees died in Cote d'Ivoire due to viruses they got from humans studying them. That is why it is important to follow proper procedures – masks, limited contact, etc. Humans can easily spread germs to the very group they are researching and trying to conserve.

Visitors (outside of researchers) coming into contact with wildlife are a real cause for concern. There are 335 infectious diseases that come from wildlife, however, the diseases humans get from wildlife is actually quite a small number. The numbers are much higher the other way – humans to wildlife rather than wildlife to humans.

Case studies of domestic animals and human interactions:

Rabies: people are dying more from rabies than ever before. Ex. Vulture victims - pain relief for cattle increased the risk to people from rabies. Domestic animal and wildlife interaction can occur in a variety of ways. For example, through direct or indirect contact, erection of fences, use of pesticides or of veterinary drugs. This is an example of livestock-wildlife interaction due to human behavior, that then has an impact on the human population. This example highlights a non- infectious disease. Diclofenac (NSAID) has been used for pain relief in India, Pakistan and Nepal in cattle allowed to die naturally following Hindu beliefs. Vultures scavenged the carcasses, Diclofenac residues in the cattle was highly toxic to vultures – up to 99% mortality. This rapid severe decline in vultures favored an increase in packs of rabies-carrying feral dogs scavenging on the cattle carcasses. The number of cases of rabies in people due to dog bites has since increased. A DRA conducted now could help determine impact of diclofenac in other species (particularly other scavengers) and help guide future production and licensing of similar compounds.

Epidemiology study: horses become infected; vets doing post mortems become infected. Study on the henipavirus Hendra virus in Australia (Plowright *et al* 2014) investigated risk factors in disease spread to horses and then on to humans. The study used One Health principles enabling a disease risk analysis that highlighted the following: Winter in subtropical Australia is the peak of resource scarcity for both bats and horses. Bats move into human-dominated landscapes to find alternative food, increasing their co-occurrence with horses, their vulnerability to nutritional stress and possible excretion of hendra virus. Cool temperatures may maximise virus survival, increasing the cumulative dose available to horses. Low productivity of pastures leads to horse consumption of contaminated fruit or grass, as well as poor horse condition and higher susceptibility. So: change in reservoir host distribution, increased pathogen shedding, increased pathogen survival outside the host, spill over host (horse) exposure in conjunction with increased spill over host susceptibility, and then to increased human exposure.

Crayfish Catastrophe: Wildlife management actions may include animal movements, reintroductions, veterinary treatments, vaccination, fencing (ex. creation of a wildlife reserve). North American crayfish *Pacifastacus leniusculus* subclinically carry a fungus *Aphanomyces astaci.* These apparently healthy crayfish were translocated and released into European cray fisheries in the 1970's. Native crayfish species were susceptible to the fungus, eliminating over 80% of the population since the 1970s. A DRA in this situation would have highlighted the lack of knowledge about potential pathogen spread and may have led to appropriate testing.

Climate impacts: Climatic anomalies associated with the El Niño–Southern Oscillation phenomenon and resulting in drought and floods are expected to increase in frequency and intensity. They have been linked to outbreaks of malaria in Africa, Asia and South America. Climate change has far-reaching consequences and touches on all life-support systems. It is therefore a factor that should be placed high among factors that affect human health and survival.

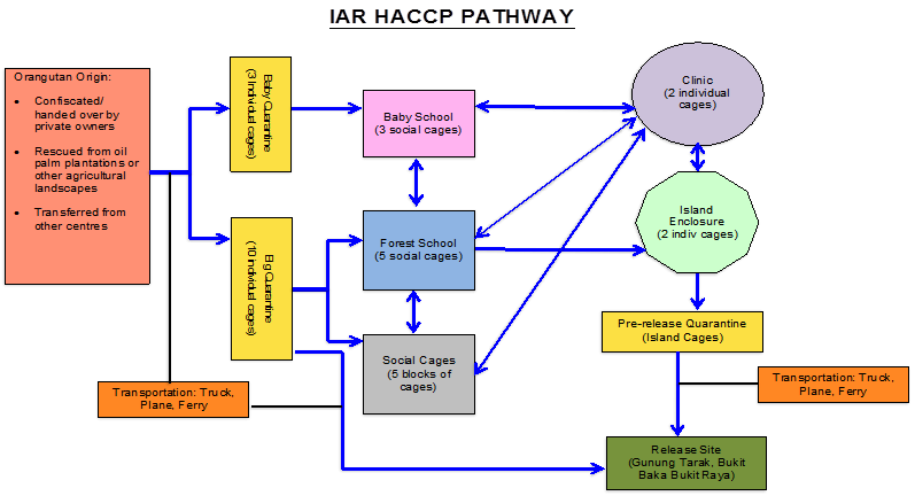
After identifying and evaluating possible sources of bias, climate change was found to be the most likely explanation for the observed patterns of change in parasite epidemiology, although other hypotheses could not be refuted. Seasonal rates of diagnosis showed a uniform year-round distribution for *Teladorsagia* and *Trichostrongylus* infections, suggesting consistent levels of larval survival throughout the year and extension of the traditionally expected seasonal transmission windows. *Nematodirosis* showed a higher level of autumn than spring infection, suggesting that suitable conditions for egg and larval development occurred after the spring infection period.

DRA in Practice: drh. Ayu Budi Handayani – International Animal Rescue (IAR)

IAR is a fairly new center which was started in 2009. There are still only a few orangutans in residence and thus very little disease. As of July 2015 there were 86 orangutans.

In order to establish DRA protocols, firstly, hazards must be classified for the population, and then which diseases are problems. IAR has identified hazards and has compiled a list of diseases relevant to their population and devised a number system to be able to rate each risk. Using information from past workshops, IAR has been able to develop their own DRA. They developed their own HACCP flow chart which can be amended depending upon a specific disease or any emerging disease.

They also created SOP (Standard Operating Procedures) to deal with each CCP. Things such as human injury risk, proper disinfection of cages, platforms, transport cages and such, DRA is an ongoing process and needs constant re-assessment to match the level of changes in the environment. Ex. IAR has also been involved in slow loris rescue, necessitating the need for revised DRA for slow loris .



The risk analysis model is available in the IUCN manual. Many centers have already employed DRA in their facilities. Here is the link to the IUCN Procedures for Wildlife Disease Risk Analysis Manual: **http://www.cbsg.org/sites/cbsg.org/files/documents/IUCN%20Wildlife%20DRA%20Manual%20PUBLISHED%202014_0.pdf**

Speaker Session

Public Speaking - Presented by drh. Wahdi – Unysiah (University in Aceh, Northern Sumatera)

"Conservation is not about wildlife. Conservation is primarily about people"

Steve Unwin

Things to consider when speaking publicly: who is your target audience and who are you? Miscommunication happens because we often do not know who we are. Are we talking to the right audience? You may have a good argument, but if it is delivered to the wrong people, your message is lost.

Some organizations to become familiar with that might be your target audience:

BKSDA / the National Park authorities / the Local Community / the Private Sector / Law Enforcement / Local government / Politicians / Legislators

Very few people have collaborations with political or legislative bodies (only about 4%) and yet they are the ones who legalize land use planning, make local regulations, allocate the conservation budgets, etc.

Non-government organizations tend to focus on species specific issues and needs, but sometimes you need to be more inclusive –ex. in Aceh, conservation efforts are made more for elephants, and organizations feel if they focus only on elephants they will be successful – but opening the scope to other species, and other issues that include elephants, that may benefit elephants in the long term. When dealing with busy legislators, it is best to have an umbrella topic as that may grab their attention more. Once you have their interest in the broad sense, you can then approach them on specifics. Once a dialogue has been opened, it paves the way for more discussions that can be species specific. We sometimes overemphasize one species.

Group Discussion: *Our battle is not to stop illegal activities but to stop legal activities as well. Also, mention was made about the willingness of members of OC/OVAG as a group so willing to share and speak up, the sense of family being very strong.*

Review of First Day's Post It Notes:

Group sharing their responses to questions posted:

Questions about deworming: deworming done fairly regularly. Vets also follow groups everyday taking fecal samples – and check health visually – this is done every month (for released groups).

Protocols for every new arrival: check fecal, deworm, (not every month – only if an orangutan has symptoms) and only when needed for released orangutans. Because of overcrowding and over population, there can be serious issues with parasites – at Nyaru menteng, there are 500 orangutan and 250 people, so disease spread is high. Checks are made in nursery group every month (for three consecutive days). In forest school once a month – many positive results – due to playing in the same place over and over again. They also sleep in one cage (sometimes as many as twenty) as they do not have place to alternate, germs are easily spread. Always more than 20% show positive results – so deworming is a monthly treatment as a result of the overcrowding – the fear is that they will become resistant to the medications – but if not done, the fear is that it may cause too many fatalities. In the forest school there can be as many as 100 – currently there are about 60 – so advice from other centers would be helpful. They need to expand but area is difficult to find. Post release – they do fecal and urine samples, they evaluate overall condition – if orangutan appears healthy – they do not intervene – if the orangutan shows clear signs of symptoms, they will intervene. At OFI, they deworm every 3 months. If they have enough help, they will take three samples per one cage (not each orangutan). If it appears in one of the samples, then they will intervene. They also try to alternate medications so as not to make them get used to them.

Issues about Telemetry: imperative to take a course in proper telemetry – but often there are no funds for that. It is difficult to find an orangutan in the forest. The technicians need to remember where they last saw an orangutan – or they must do nest to nest follows so they know where they are at all times. Telemetry is often not enough – some terrain is difficult – BOS has orangutans on islands – very difficult to track. More often they rely on visual identification. Also the equipment for telemetry can be very expensive to buy and to maintain. The location to implant is usually between the shoulder blades and the battery life is short as is the range. Also, the signal is often blocked. Telemetry can also be used to locate dead orangutans. SOCP wants better technology – so they prefer nest to nest. BOSF uses nest to nest monitoring supported by radio telemetry tracking…this is a management problem – not a vet one. IAR uses nest to nest follows – the telemetry is not reliable as they lose the signal or the battery becomes weak.

Day two: August 3, 2015

Group Photo (8:00 am)

Around the room self - Introduction of participants

Disease Risk Assessment (DRA) continued - Steve Unwin, Chester Zoo and OC/OVAG

DRA Group Scenarios Assignment: Background information of a disease outbreak distributed to three teams to address the three individual scenarios. One team : Two team leaders.

Team one: Evaluating the situation and what possible disease hazards may be present

Team Two: Communications/Information distributors

Team Three: Management/Decision makers

Group Discussion of scenarios – each team presented their work

Team One – Arga Sawung Kusuma of BOSF presented on behalf of his team: Possible disease hazards: Ebola, Anthrax, Dengue, Blood parasites, Poisoning, African swine fever (the top 6) based on the variety of symptoms. Still need lab results to confirm – two weeks needed to make final diagnosis. Lack of information can contribute to disease risk – as can lack of preparation.

Recommendation: close park and community area until more information is known – cattle that have been in park should be quarantined, no movement in or out of the area for two weeks until final results are received.

Team Two – Aldrianto Priadjati of Restorasi Habitat Orangutan Indonesia presented on behalf of his team**:** Releases will be postponed until results come back from lab. Contact national Park and ask to close the border – contact tourism and trade to alert them that there may be a dangerous situation, develop a task force team to inform all stakeholders. There should be a hotline list of numbers for important persons that can be contacted immediately, give information to media as often as possible to control misinformation. There should be protocol in place for internal groups and another protocol for external groups with names and contact phone numbers.

Team Three – Siali Anak Aban of Matang Wildlife Centre presented on behalf of his team: Their aim is to release …there are ongoing disputes about the national park boundaries. Many decisions need to be made based on given or known information regarding not only releases, but also what is happening in the human population and what is the disease that is causing the deaths of animals (both domestic and wild) and making the farmer sick. They must also be sure they are following the IUCN guidelines. It is very difficult to make management decisions when you have little information.

Group Discussion: *As in a true scenario, everyone was frustrated. Team One did not have full information, enough time, lack of trust, too much technical language that others did not understand, communication in dealing with media bias – they want the more fantastic message to present to the public. Team three wanted answers and was frustrated when they could not get black and white information (when it is often shades of gray), they want scientific certainty – but in science things are dynamic – People are also usually very resistant to change. Message problems – Communication problems – Receiver problems Many of the problems can be addressed with pre-planning as many components as can be pre-planned*

What actually occurred in the scenario: Anthrax ….Symptoms of farmer Cattle tick fever

<u>Ethics Group Discussion</u>, Facilitated by Steve Unwin, Chester Zoo/OC/OVAG and drh. Fransiska Sulistyo, Borneo Orangutan Survival Foundation (BOSF) and OC/OVAG

In Indonesia, the government has mandated that all orangutans must be released and by 2017 no orangutans should be in any center. It is difficult to approach such a huge problem. How can this be achieved given the fact that suitable release sites are difficult to find, the numbers needing to be released, and those that can never be released.

FORINA (Forum Orangutan Indonesia), a network among Indonesian NGOs working with orangutans, will try to approach the short time frame for releases with the government.

Discussion points: *Is it better for orangutans to die in the forest or in the cages? For vets, the responsibility does not end with release; therefore releasing them when you know they may die is difficult. Orangutans are coming into centers at higher numbers than those being released, if we wait for the ideal situation, that may be a long time in coming… do we release any way? Keep them in cages where they will become less and less able to make the adjustment back to the wild? The situation may never be perfect, but continued care may be needed – some animals may die but those that survive, might become a viable population. We need to consider the original goal of reintroduction - which was/is to release them - if we leave them in cages, does that achieve our initial goals as reintroduction centers? If we release, does that meet the goal better – even though some may die? And how do we consider animal welfare issues? We are really at the crossroads – individual welfare of animals versus the welfare and longevity of an entire species. We should make sure they can survive before they are released – because if they do not survive, it is a waste of considerable resources. We need to ensure that we have done the best we could to prepare them – we cannot control whether they survive or not – but at least we should know that we have done the best job possible of preparing them for life back in the forest. BOSF Nyaru Menteng has 650 orangutans needing to be released, if we expect half of that number of orangutans to die… what should be done? This is why this is an ethical and moral dilemma.*

The government decree –was initiated by NGO's to force the government to make a target – it is not the government at fault… actually each year FORINA holds meetings to evaluate what is happening, what is the progress and what are the problems. Orangutans may die as easily in cages as they can in a forest. If we do not release, center overcrowding will continue which will reduce level of good animal welfare – We should only not consider health but behavior. Most orangutan deaths are usually not from disease but from behavioral issues – releasing animals because the center is full is not conservation – it may be a consideration but it is not in the frame of conservation. Then does it go back to what are the goals of your facility? Finding areas should be addressed first before releases can be effective…sometimes forest areas are classified as forest but in actual fact, there may not be any trees… it is very difficult finding areas. This may mean orangutans are kept in centers for longer periods of time. Sometimes information coming from forest assessments is incorrect as well. In Sarawak, there are 2,500 orangutans (p. p. pygmaeus). There are only two wildlife centers in Sarawak. There are 27 orangutans in one and 30 (11 released) in another. They are free in the center – they feed themselves but if there is little food in the forest – they come to the center. Only 2% of orangutans are in the centers. There are release site problems as well in Sarawak. They must learn to sleep in the trees – 6 additional candidates are ready to be released – but is there area for release? What is important is that they get the right food, they do not get sick, and they have enrichment – they are happy in the cages as all their needs are met – in the wild, there are many dangers. Sometimes no matter what we do, it is difficult to prevent death. There is a group that is trying to get Borneo as one ecosystem – not divided into three countries – but centers holding the same species could share information more regardless of country borders. Yes, animals live longer in captivity, but if each day is miserably – is that really optimum for their well-being? Some feel that it is better to be free and die young, than living longer in sometimes miserable conditions or in a cage for 60 years. Every orangutan should have a chance to return to the forest – as long as we feel confident that they can….what brings orangutans into centers? We must not only think we are saving just orangutans, we save the forest and save multiple species as well….we need to address the issue of saving forests so orangutans no longer need to come into centers. Orangutans are a flagship species – but our goals should be to save the forest – we can then save orangutans, other animals and save ourselves as well.

Further discussion on sex ratios: what is ratio of males to femalesin rehabilitation cetners? About 50-50 – in some cases, some say males will not stay in a small range – they will range farther – into villages, plantations etc. and get into conflict with humans. This is yet another problem. Human-wildlife conflict is just waiting to happen! Bringing discussion back to the original purpose of centers. What are the numbers in captivity? What is the wild population? There has been a new census for Sumatra. The new estimate is 14,600 in Sumatra – BUT - they looked at more areas than in previous counts. The areas where the first census was taken, density is lower than it was– the rate of decline is accelerating – even though more individuals have been found. It is the same situation in Borneo – wild orangutan numbers are 50,000 to 54,000 but it is a matter of areas and researches – but the habitat is decreasing so numbers are as well. In Europe and the US, there are about 250 orangutans in each region. In rehabilitation centers/sanctuaries in Indonesia and Malaysian there are about 2,500 (roughly) – but do the governments have an exact number for the rehab population in their respective centers?

In 2014, an evaluation was done of rehabilitation centers and orangutans continue to come into centers, there are also some new centers opening – the government does not have a number – there also is a conflict of interests in deciding what the numbers are.

Things to consider for further discussion:

What is in the best interest of the animal? What needs to happen to make this happen? What can you do in this situation to remove suffering/improve welfare?

Are we being too anthropomorphic? Anthropomorphism is usually perceived as being too subjective – a better word may be primatamorphic – as primates and as members of the great ape family we can have 'scientific empathy'.

Grant Writing – Dr. Raffaella Commitante, Orangutan Conservancy and OC/OVAG

Grant writing can be a challenge, but if approached correctly conservation organizations can be successful in gaining money for their projects – **but** there are some very important items to keep in mind:

Number one: know your grantor – what do they fund? - does your organization fit with what they focus on?
Number two: have a clear idea of what you are asking funding for and how much is needed
Number three: learn the rules of their grant process and follow the directions for how they want their grants written. Each grant is different…they each have their own personality!!!
Number four: stay organized and confident throughout the process
Number five: the money is NOT free, grantors are giving money in exchange for information about how their money was able to assist your project and it is important to file updates and a detailed final report in a timely manner

Basic components of a grant typically include:
The first Page - This page usually provides sections to fill in regarding the following (this can vary):

1. The title of the project
2. The principal investigator, the co-investigators, collaborators. etc. (those in charge of how the money will be spent)
3. Project details (including length of time to complete what project the money is being asked for)
4. The monetary request
5. Study population, or whatever your project will cover

Abstract - This is usually best to write last, as it is a concise summary of your proposal. There is usually a limit to how many words an abstract can contain (usually 200 words) – and it is a very important part of your application.

Curriculum Vitae - Most grants require a brief biography/summary of the experience of ALL the people that will be involved in the work (they may also ask for attached full curriculum vitae).

Budget- This is very important and needs to be realistic! It helps if you have grants already in hand, and this grant would add to it, (if it is a big amount that is needed). Salaries are very difficult to justify, and if you are adding salary information, it must be clear and well explained. Be prepared to produce an explanation for the budget items (in case more clarification is required).

Explanation of your Proposal - This section can have many names, but this is the most important part – it requires a detailed account of exactly what you plan to do, the timing, the tasks, etc. This section is where the background and import of your project is explained. This section should have many citations and explanations, cite previous studies, and the importance of the project. There are usually strict guidelines regarding word count – so you really need to choose your words carefully. It is important to keep in mind that the work MUST be accomplishable!!!

There may be a separate section on the specific aims/goals of your project. Each aim should have an objective that is do-able within the time frame. If there is a specific aims section, they may also ask for background and significance of each aim (this varies per grant). It is this section that the grantor will determine how knowledgeable you are in your field. You can cite both published and (if you need to) unpublished data.

Methods - Some grants have a separate methods section (if not, the methodology would be integrated with the specific aims section). Your methods should match your aims, and list any statistical methods you will use to evaluate the work.

Collaborators, matching grants etc. - Be sure to include any information regarding collaborations outside of the people listed in the grant title page. Provide proof that the collaborations are valid.

Cited Reference List - Make sure this is written in the format required by the grant as it can vary. Having many citations is always best – but they must be applicable ones.

Letters of Support - Some grants require letters of support from experts in the area you are asking funds for.

Getting Started: Make an outline with a timeline for the project (keeping in mind grant deadlines). Check if the grant you are applying for requires a Letter of Intent before a grant can be submitted. Letters of Intent may also have a specific format that must be followed. Pre-research MUST be done so you have all the possible information needed before you begin. Develop clear goals and objectives – be precise – do not include anything that is not needed.

Review, review and review again!!!! Silly errors can disqualify you. Always support your objectives/goals with evidence (citations), or if citations/evidence are not available then make a strong emotional argument for the project. If the specific instructions/guidelines are not followed precisely, it can disqualify your application. Pay particular attention to the word count for each section of the application. Inform yourself of what has been done that was similar to what you want to do and use that to your advantage. While it is important to state clearly and simply what your objectives are, it is equally important to include enough detail to keep the grantor interested .Your application must be a confident one – do not be shy!!!! Be prepared to be rejected your first time – as there really is an art to grant writing and it may take a few tries before you reach success….however, each time you write a grant you learn more about the process.

Enrichment Session for released orangutans – Claire Parry, Chester Zoo

Using enrichment as a route to orangutan independence. How can we help released orangutans through enrichment?

Orangutans need to learn how to navigate their new environment, how to find food, how to avoid danger, and many other learned skills.

In order to learn how they need to move around, orangutans need to have sufficient climbing structures: hammocks, poles, and/or strapping – things that will get them up and off the ground. This will allow them to build muscle strength and confidence.

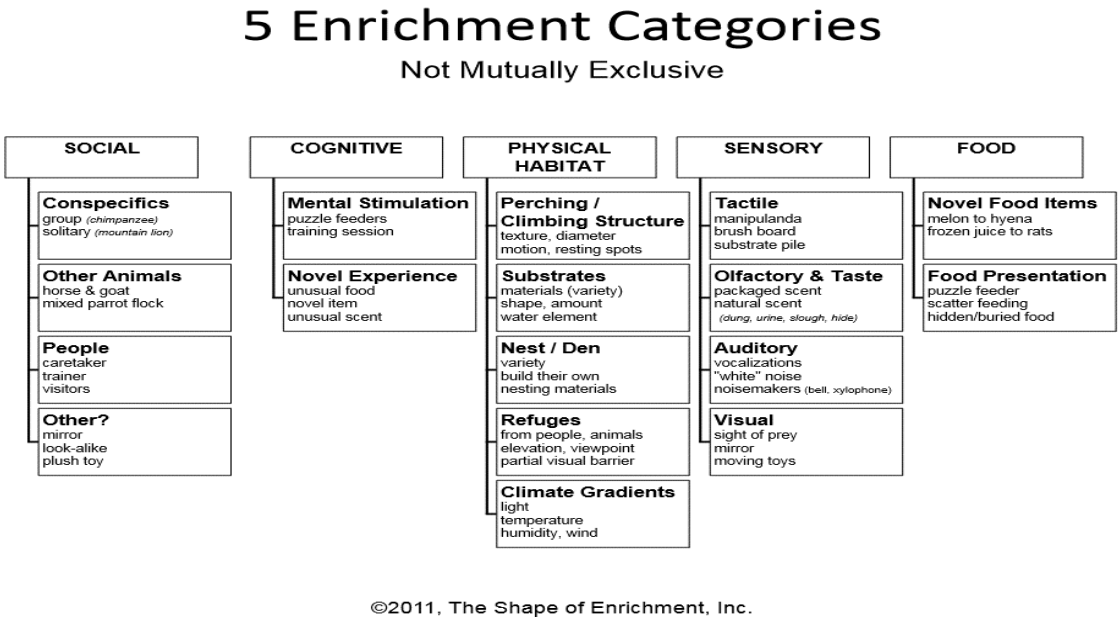
Employing better feeding strategies – there should be no specific feeding times. Feeding times should vary. Where food is placed should also vary. Food should be placed high and at different places to encourage them to look for food up off the ground (roof feeding?). The youngsters learn really quickly and gain confidence as they learn.

Dealing with dangers such as snakes, toxic plants, other orangutans, humans, falls, etc. is always a challenge. Other things to consider: Do they have the opportunity to socialize? How much human socialization have they had?

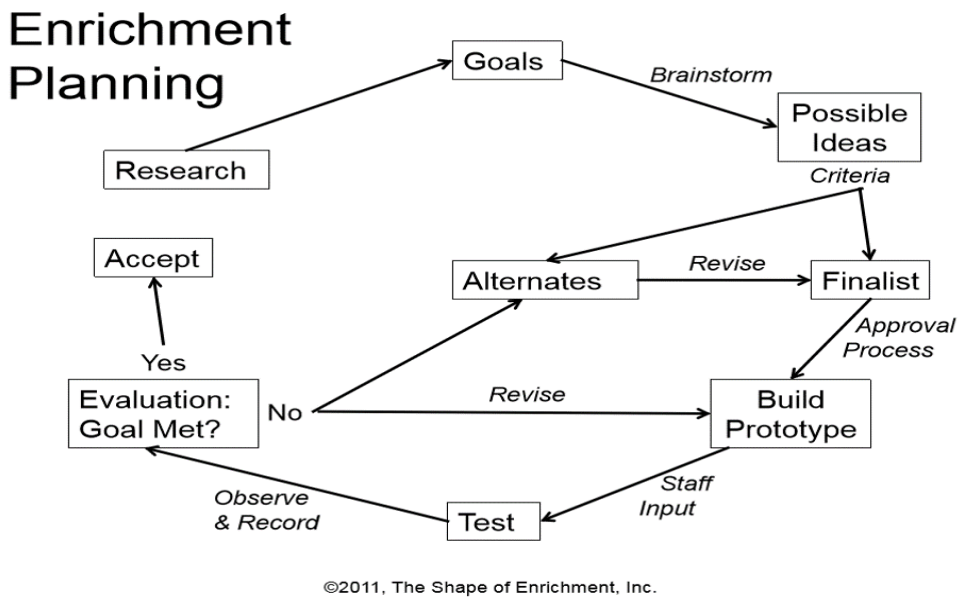
There are three sections of enrichment:

Constant – permanent in the environment
Periodic – roof feeds – regular but not all the time
Novel – something not seen before or rarely seen

There are five enrichment categories:



Enrichment planning: Focus on orangutan specific needs…Ex. are they afraid to climb? Then focus on climbing structures. Browse should be added to enclosures. Fire hose can be used with pieces of food hidden inside.



What is it we want to achieve for the orangutans? The opportunity to learn by themselves and to encourage independence. Providing them with knowledge that will ultimately allow them to live wild in their new environment.

Useful websites:

http://projectorangutan.com/animals/enrichment/

http://www.enrichment.org

Enrichment: from a center perspective – drh. Yenny Saraswati, Sumatran Orangutan Conservation Program (SOCP) and OC/OVAG.

It is important when considering enrichment for releasable orangutans that you stay away from human items – materials must be natural, such as real branches that can be placed in cages. Wrapping food with palm leaves (a food parcel) then giving the parcels to each individual.

Orangutans would be able to unwrap the parcels to get the food. Some orangutans can open parcels quickly (in a minute or under), but others may take a longer time to figure out how to open the parcel. This could be used as an indicator of preparedness for release.

Make items really challenging which would allow slower orangutans to observe faster (brighter) orangutans how to access the enrichment. Also, Infants needs enrichment too! Climbing structures can be made from bamboo rather than pipe – as they are small – bamboo works well as it will hold their weight.

Food can be hidden in between leaves and branches so they know that that is where they would find food in the forest – not in a rice sack! At SOCP, orangutans get branches twice a day – once in the morning and again in the afternoon. Forest foods are included as enrichment. It is given unopened so orangutans can learn how to open forest foods – rather than cutting food into small pieces. If possible – put them in real trees as trees are the best enrichment. Enrichment is not just a tool or for fun but it should stimulate natural behaviors.

Group discussion: *Concerns were expressed on how to teach orangutans to stay away from toxic plants and foods. This can be very difficult and controversial: do you expose them to such items or not in order to teach them? Older orangutans might be able to provide such information to youngsters. Thus far most centers have never tried to train orangutans to avoid poisonous foods. If they come across something bad, they usually take a small taste and move on. Chimpanzee babies seem to know to stay away from snakes, even if they have never seen them. Orangutans do seem to know to avoid danger such as snakes. Orangutans are fairly cautious when they eat – so toxic plants not really be an issue. Ground predators are a problem, so encouraging them to stay up in the trees is best rather than trying to teach predator avoidance. Staying up in the trees should keep them safer. Especially making sure they are capable of making tree nests and not ground nests.*

CPR/Human Emergency Medicine Session: Steve Unwin, Chester Zoo/OC/OVAG and Aimee Drane, Cardiff Metropolitan University

Two full dummies / 2 half dummies

(FROM UK 2010 RESUSCITATION GUIDELINES)

Basic life support consists of the following sequence of actions:
1. Make sure the victim, any bystanders, and you are safe.
2. Check the victim for a response. Gently shake his shoulders and ask loudly, 'Are you all right?'
3A. If he responds: Leave him in the position in which you find him provided there is no further danger. Try to find out what is wrong with him and get help if needed. Reassess him regularly.
3B. If he does not respond: Shout for help. Turn the victim onto his back and then open the airway using head tilt and chin lift: Place your hand on his forehead and gently tilt his head back. With your fingertips under the point of the victim's chin, lift the chin to open the airway.
4. Keeping the airway open, look, listen, and feel for normal breathing. Look for chest movement. Listen at the victim's mouth for breath sounds. Feel for air on your cheek.

In the first few minutes after cardiac arrest, a victim may be barely breathing, or taking infrequent, noisy, gasps. This is often termed agonal breathing and must not be confused with normal breathing. Look, listen, and feel for no more than 10 s to determine if the victim is breathing normally. If you have any doubt whether breathing is normal, act as if it is not normal.

5A. If victim is breathing normally: Turn him into the recovery position (see below). Summon help from the ambulance service by mobile phone. If this is not possible, send a bystander. Leave the victim only if no other way of obtaining help is possible. Continue to assess that breathing remains normal. If there is any doubt about the presence of normal breathing, start CPR (5B).

5B. If he is not breathing normally: Ask someone to call for an ambulance and bring an AED if available. If you are on your own, use your mobile phone to call for an ambulance. Leave the victim only when no other option exists for getting help.

Start chest compression as follows:

Kneel by the side of the victim.
Place the heel of one hand in the center of the victim's chest (which is the lower half of the victim's sternum (breastbone)).
Place the heel of your other hand on top of the first hand.
Interlock the fingers of your hands and ensure that pressure is not applied over the victim's ribs. Do not apply any pressure over the upper abdomen or the bottom end of the sternum.
Position yourself vertically above the victim's chest and, with your arms straight, press down on the sternum 5 - 6 cm.
After each compression, release all the pressure on the chest without losing contact between your hands and the sternum Repeat at a rate of 100 - 120 min.
Compression and release should take an equal amount of time.

6A. Combine chest compression with rescue breaths:
After 30 compressions open the airway again using head tilt and chin lift.
Pinch the soft part of the victim's nose closed, using the index finger and thumb of your hand on his forehead. Allow his mouth to open, but maintain chin lift. Take a normal breath and place your lips around his mouth, making sure that you have a good seal.
Blow steadily into his mouth whilst watching for his chest to rise; take about one second to make his chest rise as in normal breathing; this is an effective rescue breath.
Maintaining head tilt and chin lift, take your mouth away from the victim and watch for his chest to fall as air comes out. Take another normal breath and blow into the victim's mouth once more to give a total of two effective rescue breaths. The two breaths should not take more than 5 s. Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions. Continue with chest compressions and rescue breaths in a ratio of 30:2. Stop to recheck the victim only if he starts to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally; otherwise do not interrupt resuscitation.

If the initial rescue breadth of each sequence does not make the chest rise as in normal breathing, then, before your next attempt: Check the victim's mouth and remove any visible obstruction. Recheck that there is adequate head tilt and chin lift. Do not attempt more than two breaths each time before returning to chest compressions. If there is more than one rescuer present, another should take over CPR about every 1-2 min to prevent fatigue. Ensure the minimum of delay during the changeover of rescuers, and do not interrupt chest compressions.

6B. Compression-only CPR
If you are not trained to, or are unwilling to give rescue breaths, give chest compressions only.
If chest compressions only are given, these should be continuous at a rate of 100 - 120 min-1.

Stop to recheck the victim only if he starts to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally; otherwise do not interrupt resuscitation.

7. Continue resuscitation until: qualified help arrives and takes over, the victim starts to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally, OR you become exhausted.

Further points related to basic life support: Risks to the rescuer and victim
The safety of both the rescuer and victim are paramount during a resuscitation attempt. There have been few incidents of rescuers suffering adverse effects from undertaking CPR, with only isolated reports of infections such as tuberculosis (TB) and severe acute respiratory distress syndrome (SARS). Transmission of HIV during CPR has never been reported. There have been no human studies to address the effectiveness of barrier devices during CPR; however, laboratory studies have shown that certain filters, or barrier devices with one-way valves, prevent transmission of oral bacteria from the victim to the rescuer during mouth-to-mouth ventilation. Rescuers should take appropriate safety precautions where feasible, especially if the victim is known to have a serious infection such as TB or SARS. During an outbreak of a highly infectious condition (such as SARS), full protective precautions for the rescuer are essential.

During the first few minutes after non-asphyxial cardiac arrest the blood oxygen content remains high. Therefore, ventilation is less important than chest compression at this time.

Day three: August 3, 2015

<u>Post release Monitoring/Veterinary Case Studies and Protocols</u> – Facilitator: drh. Yenny Saraswati, SOCP and OC/OVAG

Drh. Andhani – Frankfurt Zoological Society/SOCP Jambi

Three orangutans have recently been released in Jambi. Procedures: Deworming/physical exam/ leading toward issuing an Animal Health Certificate/ once they are clear then orangutans receive anesthetic for transport to release area/start of monitoring. Staff make note of orangutan hydration status, stress from transport and the safety of the people involved in the release.

Video shown of release in 2012 of Rocky and of the 150 orangutans that have been released in Jambi over the years, narrated by Peter Pratje of Frankfort Zoo. Rocky was released into an area that allowed for observation of his adjustment after which long term monitoring began.

Vets should evaluate orangutan health condition, deworm if needed, and if there are any illnesses or injuries, the vets should intervene and manage nutrition; and determine if additional food is needed once orangutans are released. During initial pre-release examination, a chip is inserted for telemetry follows, there is evaluation of behavior, checks of fecal and urine, and evaluation of overall appearance. Jambi uses Body Condition Scoring system (BCS): 1- dull hair/deflated stomach. 2 – ribs faintly visible, deflated/flat stomach. 3 – pelvic bones faintly visible, ribs cannot be seen, flat stomach with little abdominal fat. 4- pelvic bones and ribs not easily visible, obvious abdoimi9ncal fat. 5 – high fat deposits in pelvic area and ribs, obvious abdominal fat. Before release, orangutan should be at ideal BCS.

Group Discussion: *Use of how and when anesthetics were used was discussed – is it needed? Is it safe? How much? In emergencies, what kind of first aid treatment is needed (minimal capability in the forest), timing of transportation… when is the best time? What should we do if transport back to center is needed? How do we keep the staff safe through this process? Some incidents seen post release in 2013: snake bite, gastritis, predator attacks, vulnus laceratum, bone fracture, suspected herpes. In 2014, fall from tree (trauma), active chronic fungal infection, vulnus and fracture needing amputation, broken transmitter. Actions taken: broken transmitter was replaced/ open would was stitched and oral antibiotic given, bone fracture: if needed, surgery (bone pinning) and supportive therapy, respiratory stress treatment given based on type of clinical signs – if no change or improvement, then taken back into captivity for x-ray etc. and more aggressive treatment if needed. If poor BCS and loss of appetite: find the cause (weather, gastritis, parasites), take blood and or fecal sample – maintain good cage sanitation and if needed, back to center or support with additional food. Emergency treatments: (usually for shock, dehydration) – check airway, check heart and pulse rate, CRT, respiratory rate, skin turgor. Vet stories: 5 year old female released July 10th 2015: climbs and eats well, another orangutan shared food with her and another shared her nest – after that they moved through area together.*

drh. Agus Fahroni, BOSF Nyaru Menteng

Post release monitoring in Bukit Batikap Protected Forest. Batikap is 35,267 hectares of dryland forest**.** Batikap Camp was established in 2012. It sits on stilts due to flooding from rain.

The camp was recently rebuilt to withstand elements. From February 2012 to 2015, 136 orangutans have been released. The aim is to evaluate their adjustment to their new habitat: are they finding sufficient food?, are they behaving 'normally'?

Procedure: from confiscation to health check: if healthy they are moved to forest school, to island, or to release area. If unhealthy, they are moved to clinic for treatment. There are four islands which serve as pre-release areas; they range from 40 to 126 hectares.

Orangutans are transported to the release site in various types of vehicles. Orangutans are anesthetized, put into transport cages and loaded onto a plane. From the small plane they are transferred to a helicopter, then from the helicopter they are hand carried into the forest (possibly by boat, if the helicopter cannot land). The orangutan transport cage is then opened and orangutan is released into the forest. Breakdown of those released is: 41 males, 71 females, and 24 independent infants.

Monitoring team uses radio tracking and visual observation. There are currently 124 still alive and there have been three births.

Vet responsibilities: Be present at transport and provide escort, participant in one month minimum follows for post release observation, provide intervention if needed (sedation, operate if needed), perform routine check of fecal and urine, assist with staff medical needs and even medical needs of local people (as they are so far from any medical clinic or human doctor), conduct malaria tests (using blood smear), stitch minor wounds, remove birth control implants, assist release team with monitoring, phenology, radio tracking. Investigate any deaths and identify individuals (perform on site necropsy). Evaluate any intervention (food provisioning etc.) There has been a field operation of an air sacculitis case – as a result of that case, no orangutan is released with air saccultiis unless it is clear for one year and has not had any relapse.

Monitoring is nest to nest where the orangutan condition is monitored; also patrols are conducted by staff to do head counts in order to check the population number. Regular observations are made. Long term intensive monitoring is done on a few individuals only (those that are deemed 'at risk' are usually observed and monitored in the long term). In May 2014 alone, the team logged in 5,700 hours of observation. Distinction is made between semi wild (orangutans that are wild when they come into the center and are taken directly to the island for 6 months prior to release) and rehabilitated orangutans (those that have gone through the entire rehabilitation process). Phenology is mapped out according to: young leaves, fruits and flowers (month by month).

ThSome tool use has been observed. Ex. use of sticks to test river depth. Threats: snakes, sun bears, hornbill squawking, shrilly birds, wasps. Bornean orangutans seem to spend more time on the ground than Sumatran orangutans.

Direct or indirect contact with humans slows the reintroduction process, along with lack of awareness about predators and dangers and the proper response to them. People coming into the forest to hunt small mammals may encounter a released orangutan and shoot it.

drh. Adi Irawan (manager), International Animal Rescue
Post release monitoring in West Kalimantan: 86 orangutans currently are at the center. They have translocated about 30. They began with 12 when they opened in 2009.

The pilot release included the two orangutans Helen and Peni. Helen was rescued when she was two or three years of age. She was classified as semi wild. The decision was made not to keep her too long in a cage, so she was released in 2010. After four months post release, she was reported as having lost a lot of weight – she was brought back to the center and four years later was re-released. Today she is doing well. Peni was rescued in 2014 and also about three years old. She had good forest skills and was released in 2013. She was monitored for one month when they lost sight of her. When she was found again, she also appeared to have lost too much weight and was brought back to center.

Release candidates: Must be free from disease (hepatitis and TB), express standard orangutan behavior, and exhibit good forest survival skills (such as finding food and making nests).

Release site: Gunung Tarak (Protected Forest) in Ketapang West Kalimantan just southeast of Gunung Palung National Park. It is about 32,000 hectares of secondary lowland forest. Orangutan population density in 2013 was about 326-482 orangutans (approx. 1.36 orangutans per km^2). The area can be accessed by road from the center in about four to five hours.

Release protocols: Health checks to determine if orangutan is healthy, if healthy, then on to transport cage, to transport vehicles, to release site to release and monitoring (with the team is a keeper, a vet and the driver). At release site there is always a keeper, a vet, a driver and the monitoring team.

In 2014, three orangutans were reintroduced into Gunung Tarak (Helen, Prima, and Peni). There is conflict between orangutans and humans in and around the area. Orangutans were micro chipped and a transmitter is used along with nest to nest follows.

Medical checks post release: IAR tries for monthly regular health checks, fecal and urine tests, but sometimes there are not enough vets, so they rely on the monitoring team to ask for a vet if assistance is needed. Animal keeper may also join team once a month to assist in condition checks. They are trained in first aid so they can take care of simple problems on their own – if condition is severe, they can contact medical team via satellite phone. Protocols are ongoing.

Problems: Orangutans coming in are higher than those going out. There is ongoing forest conversion for mining, logging, and conversion to housing, all of which are what are causing conflict between humans and orangutans. They are still looking for other areas suitable for release. The conflicts bring orangutans in contact with humans who possibly have TB. They have two species in west Borneo, Pongo pymaeus pygmaeus and Pongo pygmaeus wurmbii, so they must be careful which orangutans they release and where.

Group Discussion: *When should we intervene after an orangutan has been released? If they are not eating, it is important to intervene…or if they are not active, or if their overall condition is poor. Checking urine and fecal periodically to see if there is anything there worth worrying about. If monitoring team sees they are*

sick, it is worth intervening. You need to know the personality of the orangutan so you can tell if there is a problem because then you would know if something in their behavior has changed. If an orangutan falls and is injured, intervention is needed to fix fracture or set the break.

Day Four: August 4, 2015 - at UGM

<u>Parasite Session:</u> Wendi Baily

This practical session reviewed field parasite diagnostics (on samples brought from the field), parasite identification, testing of participant's knowledge and discussion on various parasitological techniques.

Orangutan Case Studies Session:

drh. Ayu Budi Handayani, International Animal Rescue, Ketapang, West Kalimantan

Orangutan Budi: severe malnutrition. Budi was kept for 10 months before he was rescued from the owner in December 2015. He was fed 10 bottles of condensed milk per day (150-300 ml/bottle). The owner did not give him fruit because he thought Budi would die if he ate fruits. Therefore, they only fed him condensed milk.

He was kept in a chicken cage, where he could not move. He had severe edema when rescued. Once rescued, Budi cried whenever touched. His bones felt "crunchy" to the touch. Treatment: x-rays were taken; he was given a drink mix with powdered soy milk. Upon waking, he would sit up for a while but was always lying down. In January, he began climbing into his hammock. He is now a member of the Baby School. He is very smart and easily finds forest fruits.

Group Discussion: *When he was confiscated, did he have edema throughout his whole body? Yes. Was his total calcium or ionized calcium checked? Total Calcium was checked. He was given Metoclopramide, why then give him Ranitidine as well? Metoclopramide & Ranitidine are not given at the same time.*

Metoclopramide was only given twice, in the beginning. After that he only received Ranitidine. Did you administer Tramatadol and Paracematol at the same time? No. Paracematol was only given in the beginning because of high fever. Tramadol was given later because he looked as if he had pain throughout his body. How did you perform physiotherapy if the bone was so weak (crunchy)? Movement was initiated very slowly. Gradually the intensity of movement wad increased.

drh. Ricko Laino Jaya-Human Orangutan Conflict Response Unit (HOCRU) and OC/OVAG
Climbing Technique for an Orangutan's Rescue at Orangutan Information Centre (YOSL-OIC), Medan, North Sumatera. Aim: To rescue an orangutan safely, once it was sedated and had become stuck in branches. Human safety is important when doing such rescue activities such as climbing a tree to achieve a better shooting position. In the past, many times the rescue team climbed trees without any safety equipment. It was not safe at all!

There are two techniques in climbing: Double Rope Technique (DRT) and Spiking.
DRT equipment is needed for people (rescuers): Shoes, carabiner, harness, ropes
DRT equipment for orangutan is simpler than for people.
DRT set up: Use something heavy to throw the ropes so they can pass over the branch. Grab the ropes, get into position, and climb!
Secure the orangutan, and send it down to rescuers below.
Spiking Technique: Use shoes with spikes on the soles for climbing.
Climb the tree using the spikes.
Secure the orangutan, and send it down to the rescuers below.

Group Discussion: *Which method did you prefer? It depends on the situation in the field. DRT takes time and preparation compared to the spiking technique. Spiking works best for tree without many branches (big tree) while DRT is best used for a tree that has branches. Budget estimation, how much for the equipment? It depends on the brand, around 15 million IDR per set for people, half price for orangutan. Total is around 20-25 million IDR for 1 set. It is much more expensive for a brand such as Petzl.*

drh. Yenny Saraswati, (SOCP and OC/OVAG), Sibolangit, North Sumatera
Ankle Dislocation - orangutan Wenda was injured when a tree was struck by lightning and fell on her on July 25, 2015 during a heavy rain and thunderstorms in Jantho Release site. She fell down and a branch fell over her right leg. On July 26 she was transferred to the quarantine, and on July 29, surgery was conducted.

The femoral gland was swollen. Radiography was performed for the whole body and it was found that the os calcaneus was not in the correct position. Two sides were opened (front and back). Two screws were inserted that were taken out six weeks after surgery. Medetomidine and ketamin were used as initial anesthesia, and for maintenance propofol was administered intravenously as pain relief, and diazepam to calm her.

Group Discussion: *Tips & Tricks. First, when applying a cast at a joint, better to put the edge of the cast in the middle of the cast area, making it difficult for the orangutan to open the cast. Second, put cast on whole area of the leg even though the whole area of the leg does not need a cast. This makes the cast stay on longer and also it cannot be easily opened by orangutan. Lastly, when putting on cast, try to bend the leg, rather than keeping it straight, again, it will be difficult for the orangutan to open it.*

drh. Dewi Candra, Borneo Orangutan Survival Foundation-Samboja Lestari (BOSF-SL), East Kalimantan and Jejak Pulang, East Kalimantan.

Prevalence and Management of Air Sacculitis at BOS-Samboja Lestari 2010-2015. Air sacculitis is the second most occurring case in Samboja Lestari. It is not clearly understood why air sacculitis exists more within the captive orangutan population than in other species with air sacs (Fox, 2006). Most air sacculitis cases that happened were relapses. The management of air sacculitis in handling chronic cases can prevent relapses and the emergence of new cases.

Case 1: Gavin, Bornean orangutan, male, 18 years old, 54 kg. Gavin is housed in an individual cage in a socialization complex which is part of the ex-TB population. His first episode of TB was in 2007. Between June 9th – July 29th, 2010 Gavin's treatment included reflushing (four times: 25/06; 11/07; 17/07; 29/07). Therapy : Ciprofloxacin (June 9th-10th, 2010); Cefadroxil (June 12th-25th, 2010); Ciprofloxacin (July 11th-28th, 2010). He had his first relapse on Sept 25th – Oct 8th, 2012. Therapy : Amoxicillin (Sept 25th – Oct 8th, 2012). His second relapse occurred Nov 23rd, 2012 – Jan 7th, 2013. Treatment: Reflushing 3x (08/12/12; 28/12/12; 11/01/13.) Therapy : Cefadroxil (Nov 23rd – Dec 7th, 2012); Ciprofloxacin (Dec 8th – 14th, 2012); Levofloxacin (Dec 28th, 2012 - Jan 10th, 2013); Doxycycline (Jan 11th-24th, 2013). Third relapse was on June 5th – July 19th, 2013. Treatment: Reflushing 3x (21/06; 05/07; 19/07); Therapy: Ciprofloxacin (June 6th – 17th, 2013); Ofloxacin (June 21st – July 5th, 2013); Doxycycline (July 6th-19th, 2013). Fourth relapse: Feb 16th, 2015 – present. Treatment: Reflushing 4x (25/03; 08/05; 20/07; 29/07). Therapy : Ciprofloxacin (Feb 17th – Mar 3rd, 2015); Levofloxacin (Mar 4th – 17th, 2015); Ciprofloxacin (Mar 25th, 2015 - now) → based on last C&S. Latest condition (31/07/15): Drainage still open and looks wet around the drainage area; Pus does come out from the drainage; Nasal discharge and halitosis; Mouth breathing can be seen sometimes; Noisy breath and coughing; however he has a good appetite. Conclusion: Gavin has not recovered after five years of treatment including several reflushings and appropriate oral antibiotics based on culture and sensitivity test results. His current condition related to TB: stable.

Case 2 : Masdar, Bornean orangutan, male, 17 years old, 66 kg. Masdar is housed in an individual cage in a socialization complex which is part of an ex-TB population. First episode of TB occurred in 2008. Masdar's therapy : Cefadroxil (Sept 14th-28th, 2012). First relapse occurred on Oct 10th, 2012-Jan 30th, 2013. Treatment: Reflushing 3x (01/11/12; 31/12/12; 15/01/13). Therapy : Ciprofloxacin (Oct 5th-18th, 2012);

Levofloxacin (Oct 19th-31st, 2012); Ofloxacin (Nov 2nd-15th, 2012); Doxycycline (Dec 31st, 2012-Jan 14th, 2013); Cefadroxil (Jan 15th-30th, 2013). Second relapse: May 28th – June 26th, 2013. Treatment: Reflushing 1x (June 10th, 2013). Therapy : Ofloxacin (May 29th-June 10th, 2013); Doxycycline (June 12th-26th, 2013). Third relapse: Dec. 29th, 2014-Jan 25th, 2015. Treatment: Reflushing one time (Jan 12th, 2015). Therapy : Ciprofloxacin (Dec 29th, 2014-Jan 11th, 2015); Doxycycline (Jan 12th-25th, 2015). Current condition (31/07/15): Drainage still open and looks wet around the drainage area; Pus does come out from the drainage; Nasal discharge; No cough;Good appetite. His current condition related to TB: stable.

Several more similar cases were also presented.

Group Discussion: *Take the sample for lab diagnosis from tracheal/bracheo lavage, not from the pus because it can be misleading to identify the bacteria that is causing the pus, and not identifying the bacteria that is causing air sacculitis. Flushing using chlorhexidine or woundguard. Flushing can be repeated every two to three days. Yes, it should be brancheo lavage. Also, some cases of air sacculitis are related to sinusitis, therefore sinusistis surgery can be considered.*

How about orangutan husbandry and the model/type of cage? The husbandry is good, the cages are cleaned at least twice a day. The cage structure is also good, it is high off the ground so the orangutan cannot reach food that has fallen through. Maybe the cage is overcrowded, humid? Yes, it is quite humid around the cage because of high trees and some cages hold more orangutans than they should.

drh. Waluyo Jati-Borneo Orangutan Survival Foundation-Samboja Lestari (BOSF-SL), East Kalimantan.
Peritonitis, Epididymitis-Orchitis, and Suspected Brucellosis in a Male Bornean Orangutan (*Pongo pygmaeus morio*) "Noel" BOSF Samboja Lestari, East Kalimantan. Noel, a male Bornean orangutan, 32 kg, 14 years old, blood type : A, was released into Kehje Sewen Forest on May 2013 and was brought back to BOSF-SL in November 2014 where he was put into an individual cage. His previous health history: in February of 2011 he was diagnosed with air sacculitis. Symptoms: loss of appetite, coughing, nasal discharge and weakness. Treatment: Amoxicillin 500 mg T.I.D PO; Tramadol 50 mg T.I.D PO; Reflushing. In January of 2015 he was diagnosed with typhoid fever. Symptoms: 37.7 degree Celsius fever, loss of appetite, diarrhea, weakness. Treatment: Ceftriaxone 1,8 g IM S.I.D. In April 2015, he had similar symptoms with the addition of weight loss. Treatment: Ceftriaxone 1 g IM S.I.D. In May 2015, he continued to have similar symptoms. Diagnosis: typhoid fever and malaria. Treatment: Ceftriaxone 1 g IM S.I.D, Arthemeter ID 100mg, MD 50 mg. d.3.d. Additional symptoms: tremors, swollen left testicle and left lgl. Inguinalis (palpation: pain; consistency: hard, color: redness, lung auscultation: clear in both lungs. Differential diagnosis: suspect cholestasis, malaria, hepatitis, orchitis, and suspect Brucelosis. New treatment: on June 19th 2015 : blood transfution (250 cc). Therapy 19-23th June 2015: Fluid therapy (NaCl 0,9 %, ringer lactat, and glucose 5 %). Therapy 19th june-2nd July 2015, inj/ Ceftriaxone 1 g IM, inj/ Enrofloxacine 160 mg IM, inj/ ranitidine 50 mg IM. Juni 22th – 26th 2015 : R/ meloxicam 7,5 mg id PO. Therapy 22-03 July 2015: palpation: left testis pain response, appeared softer than before; diarrhea. Metronidazole 500 mg suppositoria; Therapy 26th juni-03 July 2015: Albendazole 400 mg PO (fecal check : Strongyloides sp egg), inj/ Hematodin 1 ml IM,inj/ Ranitidin 50 mg IM. Therapy 30th june-3rd Juny 2015, fluid therapy (NaCl 0,9 %, ringer lactat, and glucose 5 %); Therapy July 2nd - 4th 2015: inj / Metochlopramid 1,2 mg, inj / Buscopan 20 mg.

Noel died on July 3, 2015. Necropsy revealed: Foreign body in Noel's stomach: unidentified rubber material. Was thought to be from enrichment item given at Samboja Lestari, or from some human tools that he ingested when he foraged in a village near the release site. It was thought that the foreign body had been ingested for a while and just recently erupted from the jejunum and caused severe peritonitis. Elevation of blood liver values (ALT, AST, ALP) was thought also caused by the foreign body.

Follow up: Re-assess the use of material for enrichment, make sure there's no loose ends / parts that may risk to be swallowed by the orangutans. Improve diagnostic tests, e.g. X-ray on stomach.

Overview: The laboratory data is quite complete, especially on blood data, thus from these data you can get a better diagnosis by doing POA (Problem Oriented Approach).
Blood results→Clinical signs→Differential diagnose→Run culture→Necropsy
During necropsy if you find abnormalities on the lung →smear→check →ZN Stain (Klebsiella,TB, etc) When liquid found, take sample→ centrifuge→ check the sediment.

drh. Fransiska Sulistyo, MVS (ConMed)- BOSF and OC/OVAG (multiple partners involved)
Encephalomyocarditis Virus (EMCV) in a Population of Captive Bornean Orangutan. EMCV is a virus that infects mammals worldwide. Most outbreaks are associated with captive animals: swine production units, primate research center, zoos. Animal shed virus in feces, urine, and nasal secretions. Reservoir: rodent. Transmission → fecal-oral. There was an outbreak at BOSF-Nyaru Menteng. The affected location was the main compound which included: cages, forest school, office, clinic, and storage facilities, etc. Infected orangutans were eight males and three females between nine and twelve years of age. All were long term residents of the center. They were in different enclosures, but most were within the forest. Virus seemed to randomly affect individuals in group cages. Rats were present in the areas. Clinical signs: lethargy, coughing, vomiting, chronic renal failure, arrhytmia, bradycardia, dyspnoe and sudden death occurred. Differential diagnosis: Intoxication / EMCV / Leptospirosis / Clostridiasis / Salmonellosis (S.typhi) / Shigellosis / Anthrax / Strongyloidosis / Coccidiosis. Treatment: Symptomatic: Ranitidine / omeprazole; Tramadol; Metoclopramide; Blind treatment with active charcoal (suspect intoxication); Blind antibiotic treatment: cephalosporin; Anthelmenthic. Prognosis: Poor. Nine orangutans out of eleven died within 24 hours or were found dead. One was sick for three days; one was in intensive care for 17 days.

Post mortem: five individuals had frothy trachea and lungs; six had haemorhagy / dark areas on lungs; eight: hydrothorax; ten had white patches / pale heart; eight had enlarged hearts; two showed pleuritis; two had pericardial effusion / pericarditis; ten: gastrointestinal hemorhagic; eight had enlarged liver; nine showed enlarged spleen; one had a necrotic kidney.

Histopathology: eight individuals, myocarditis multifocal to thorough, lymphohistiocytic; three, oedema pulmonum; one, alveolar hystiocityc (pneumonitis); three, depleted spleen; two, hepatitis; and one, necrotic coagulative kidney.

Follow up: Treatment: none for EMCV infected animals. Prevention: vaccinations for the animal collection (since then, no more deaths have been reported); rodent control; report sent to authorities as an exotic disease and update. Future: ntemortem diagnostic: serology; pre and post vaccination; annual / bi-annual vaccination; continuous rodent control. Conclusion: epidemiology (more males, young ages); clinical signs (non-specific, sudden death); gross pathology and histopathology (myocarditis); molecular analysis. The outbreak of sudden death at the orangutan population in 2014 at BOSF Nyaru Menteng was caused by EMCV infection.

This is the first case of EMCV reported in Indonesia.

Group Discussion: *EMCV has also been found in DR Congo (rehabilitation) and in Sierra Lone (rehabilitation). Vaccine sometimes produces a local reaction in a few individuals such as swelling in area where vaccine is injected. EMCV vaccine is produced by Taronga Zoo, Sydney after they had EMCV outbreak in their collection. Therefore, maybe the effectivity and side effects may differ in other places or species. Is there any criterion for giving vaccinations? Vaccinations are given to 5 to 15 year olds. It is effective for one to two years. To measure the titer before and after vaccination cannot be done yet in Indonesia. There is a pig farm about 500m away from Nyaru Menten (NM), several pigs have died, and the owner who works in the NM Centre usually takes leftovers from NM area. So it seems that the pigs were infected from the NM population. Enforces that biosecurity was needed in that situation and reinforces that we do not really know what is going on.*

Wound Management and Reconstructive Surgery Session drh. Diah P. Kristiono.

What is a wound? Definition: Cut off tissue continuity because of injury or surgery.
Response:
1. cleaning damaged cells and any unnecessary elements
2. protecting healthy tissue
3. reconstructing lesion area.
Wound Healing Mechanism:
1. Regeneration of missing tissue with the same materials.
2. Replacing damaged tissue with connective tissue (scar)
Wound healing consists of: consists of four steps:
1. Hemostatic phase formation of a fibrin– platelet clotting at the site of injury.
2. Inflammation phase, one to four days neutrophil, macrofagositosis. Inflammation is initiated within the wounded tissue, and this event is followed closely by removal of wound contaminants and damaged or dead tissue
3. Proliferation phase four to twenty-one days: macrofag, limphosite, angiosite, neurosit, fibroblast, keratinosite neovascularization and cellular proliferation repairing. The phase of repair of wounded tissue during which blood flow, components of the extracellular matrix, and epithelial covering of the wound are all

restored. The duration of this phase is dependent upon many variables (wound size, location, the age and health of the individual animal).

4. Maturation phase (remodeling/maturation) 21 days to two years, fibrosite: maximal strength dominated by reorganization of collagen and return of some level of pre-wound tissue strength.

Overview:

If there is a wound bite, check how deep the wound is because sometimes on the surface the wound looks small and can appear only shown as a small tooth hole, while in fact, the wound is wider under the surface. Giving corticosteroid and vitamin A at the same time is useless because they inhibit one another. Wound hydration is very important for tissue development. It is similar to grafting a tree, it needs humidity to support the root growth of the tree part being grafted. For debridement, at least use Na Cl physiologic. Nowadays, wound debridement contains chlorhexidine. When using Povidone Iodine 10%, it can kill the cells →make it a 1% solution. For chronic wound, it needs additional oxygen, for example, Oxoferin, PetGel, etc.


RUANG PERIKSA

Day Five August 5, 2015

<u>Epidemiology Session/Using R</u> – Dr. Marie McIntyre, Institute of Infection & Global Health, University of Liverpool.

What is epidemiology & how can it help field conservation efforts? The true impact of disease cannot be assessed without considering it at the population level as opposed to the individual level; this is important for resource allocation of treatment and research towards prevention, ex. Malaria vs malnutrition.

Examining disease in populations helps to diagnose ailments when individual clinical signs are not obvious or the cause is unknown.

Examining behaviour and inter-relationships between disease and a population (acquisition of information on its ecology and natural history) may aid discovery of disease causes.

Prevention of disease is better than a cure; epidemiology is all about planning, monitoring and assessment to aid preventative measures.

Incidence: Is a RATE and is defined as: the number of individuals who fall ill with a certain disease during a defined time period (often one year), divided by the total population. INCIDENCE OVER TIME Prevalence is the product of incidence and duration at a specific time. Prevalence is a more interesting measure for chronic or protracted diseases, as it will give some indication of the risk of exposure to others in the population. So, a person or animal who falls ill adds '1' to the incidence of the disease. It will also add '1' to the prevalence for the duration of its disease, until individual either recovers or dies. When comparing the incidence or prevalence of a disease between two populations, the size of the groups must be taken into account (the denominator). This concept becomes very important when trying to compare different areas on a map of disease incidence. If you don't know the denominator (population size) then you should not use the term 'incidence' at all, and refer simply to the number of cases.

Epidemiology is largely a matter of perspective. Epidemiology is about putting animals into groups which then allows for the study of disease in populations. They are all individuals, and no two patients are ever exactly alike. However, there are a number of characteristics that can be used to group animals. They are either male or female, they are of a certain age, they are from a certain geographical region etc., and they share these characteristics. Epidemiology identifies such groups, ignoring the uniqueness of its members, and tries to determine whether this division of animals into groups tells us something more than we could have learned by merely observing each animal separately. Since epidemiology is a branch of medicine, our interest is usually to describe, analyse or understand patterns of disease in such groups. The most common situation occurs when we find one group of animals who are ill with some disease, and another group of individuals (often within the same group!) who are not. What is the difference between these groups? Is there some characteristic that seems to differ between them?

1. Epidemiological outbreak investigation steps: Prepare for field work

2. Establish the existence of an outbreak
3. Verify the diagnosis
4. Construct a working case definition
5. Find cases systematically and record information
6. Perform descriptive epidemiology
7. Develop hypotheses
8. Evaluate hypotheses epidemiologically
9. As necessary, reconsider, refine, and re-evaluate hypotheses
10. Compare & reconcile with laboratory & environmental studies
11. Implement control and prevention measures
12. Initiate or maintain surveillance
13. Communicate findings

Data Collection and entering for Analysis Practical using R:

Each observed orangutan should have its own row in the data sheet – it is much easier to organize data in this way. Every item should have its own column – with one piece of information in each cell; again in this way a researcher can choose which items are wanted for analysis – if multiple items are entered in a single cell, it will be very difficult to isolate individual items in the cells. Do not use merged cells. Make sure column titles are specific – ex. rather than the date, label the column 'sample collection date' so it is always clear what the date stands for. In excel, save work in 'save as' **text tab delimited** and it can then be imported into R. **(**The R package was preinstalled on participant's laptops)

Review of using the R package/entering workbook information was digitally distributed to participants.

Cardiac Session - Aimee Drane, Cardiff Metropolitan University/ International Primate Heart Project (IPHP)

Overview: Anecdotal and now empirical evidence exists showing that cardiac disease is the leading cause of death in captive apes: Idiopathic fibrosis in male gorillas (US Great Ape Heart Project) / Similar data in Chimpanzees from small scientific collections / General lack of data.

Cardiac disease is an "umbrella" term – there are congenital causes such as: Hypertrophic Cardiomyopathy / Arrhythmogenic right ventricular cardiomyopathy / Long QT and there are acquired such as: Atherosclerosis / Myocarditis / possibly Idiopathic Fibrosis.

For older great apes it is more normal to expect heart issues to happen, but when it occurs in younger individuals, that is not the norm.

Transferring human skills and knowledge to the ape community using such tools as electrocardiograms and electrocardiographs is very possible. For humans, diagnostic criteria for each of these diseases exist but human parameters cannot be directly correlated to great apes.

Using tools such as: Electrocardiogram (EKG) (for arrhythmia, ischemia, and enlargement) is useful for both congenital & acquired disease. But it is important to know what is normal before determining what is abnormal.

Chimpanzee Findings:

	Young Chimpanzee	Adult Chimpanzee
Heart Rate (b.min-1)	71±9# (53-89)	63±9 (46-80)
PR Interval (ms)	150±23# (105-195)	173±35 (104-242)
QRS Duration (ms)	70±9# (53-87)	81±11 (59-103)
QT interval (ms)	358±30# (299-417)	386±30 (327-445)
P axis (°)	49±40 (+6 to +90*)	47±28 (-18 to +75*)
QRS Axis (°)	49±26 (+5 to +72*)	51±23 (-7 to +78*)
T axis (°)	55±44 (+13 to +141*)	53±21 (+10 to +90*)
Sokolow-Lyon criteria for LVH (RV5+SV1) (mV)	3.3±1.0# (1.4-5.3)	3.8±1.0 (1.7-5.8)

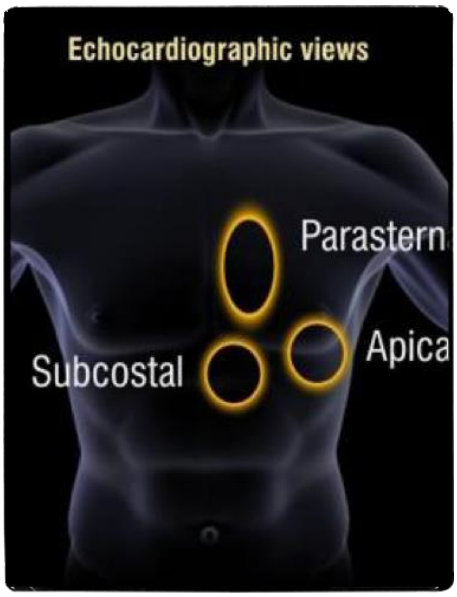
*range data calculated as 5th-95th centiles.# indicates significantly different from adults.

	Prevalence Young	Prevalence Adult
Rhythm		
Sinus	88%	89%
Sinus & Ventricular Premature Complex	2%	0%
Low Atrial	10%	10%
P wave morphology		
Normal	51%	53%
Small	41%	29%
P Mitrale	8%	14%
P Pulmonale	0%	2%
P Mitrale & P Pulmonale	0%	2%
Q Waves (small with <25% R wave)	16%	16%

	Prevalence Young	Prevalence Adult
T Wave Inversion		
≥ 2mm	0%	2%
< 2mm	45%	59%
ST Segment		
Depression ≥ 1mm	0%	0%
Elevation ≥ 1mm (inferior leads)	16%	6%
Elevation ≥ 2mm (chest leads)	18%	10%
Left Bundle Branch Block (QRS duration ≥0.12s)	0%	0%
Right Bundle Branch Block		
Complete (QRS duration ≥0.12s)	0%	0%
Incomplete (QRS duration <0.12s)	0%	2%
Slurred upstroke of QRS complex	65%	49%
J Waves	92%	94%
LVH (RV5+SV1 >3.5mV)	47%	61%

Atencia *et al.* (In review) Electrocardiogram reference intervals in clinically normal wild-born chimpanzees.

Echocardiography: Ideally, use of lateral recumbency is best, but often dorsal recumbency is adequate. Useful for looking at cardia structure such as: wall thickness / cavity dimensions / volumes / Valve integrity as well as cardiac function both systolic and diastolic: wall thickness and cavity dimension / (M-Mode) / septal thickness (systole & diastole) / left ventricular internal cavity (systole & diastole) / aortic root / left atrial diameter. Combining different views to provide a comprehensive view of the heart is best.



Cardiac Biomarkers: Humoral markers for cardiac disease are widely used in human cardiology for diagnosis, risk stratification, and evaluation of treatment. There is significant potential to monitor apes because it is relatively non-invasive, does not require significant training to undertake, sensitive to early changes in cardiac health B-Type Natriuretic Peptide (BNP or NT-ProBNP), can measure of volume overload / ventricular stretch / ventricular stress, cardiac troponin (cTn), and can measure cardiac damage.

The IPHP provides a full cardiovascular report, which includes: Blood Pressure / Morphometrics / ECG and Report / Echocardiogram Images and Report / Biomarker results.

The IPHP take home message: Cardiac disease is a problem in great ape populations. The exact aetiology is not known. A number of useful tools exist that can help identify disease (Echo, ECG, Cardiac Biomarkers). Diagnostic criteria do not exist at present but the IPHP is working to establish protocols and diagnostic criteria in each of the great ape species. Toward that end, Aimee will begin to gather orangutan data starting with BOSF NM this year.

Brief Communication Publication Session – Steve Unwin and Raffaella Commitante

Break Out groups: Streamed

Stream 1: the basics of writing / preparing To Write

A. SEARCH and RESEARCH: Comprehensive Literature Review

1. Use the Internet wisely and well. Find out what is already published. For literature searches from the forest, ask your colleagues as someone may have university access to scientific search engines if you don't either at local Universities or abroad. Use the internet (ex. Google Scholar, Pubmed, IVIS, AAZV) to locate abstracts. If you have an article that cannot be retrieved, ask colleagues to find it for you and email it. How do you determine if the source is reputable?

- It is an online version of a reputable published source
- It includes a list of works cited
- It is affiliated with a reputable educational or research institution
- The authors of the site are identified, with information about how to contact them

2. Tap other informal and formal communication channels. Use email as a timesaving resource – consult the 'invisible' college – your colleagues. Formal communication channels include: professional conference presentations, personal journal libraries, electronic journals (NB – not all evaluate submitted articles), and research report reference lists.

Your research: The big picture – regularly assess your research design, progress and direction.

B. CHOOSE A COMMUNICATION VENUE

Formal publication: the message determines the medium. Are there other ways to publish?

C. PLAN TO SUCCEED: organize and plan your message – brainstorm – lists, mind maps, issue trees. Avoid plagiarism – always write notes in your own words.

Use the Process Approach to take charge. When applied to writing, the Process Approach involves methodically breaking the task into discrete stages, and tackling each stage in the most systematic, efficient and effective way you can determine.

1. Plan, gather and organize information

2. Organize your thoughts with (ex.) outlines, bubble charts, tables, figures.

3. First draft –use a standard format and fairly conversational style, working as continuously as possible without stopping to fine tune anything. Then it should be set aside to 'cool' for a bit, so that it can be revised more dispassionately.

4. During this writing: pause, pay attention to visual aids (tables, figures, graphs, etc.). This includes oral presentation ideas.

5. First revision – concentrate on organization, logic, clarity, readability and brevity

6. Second revision – concentrate on word choice and style

7. Third revision – concentrate on grammar and punctuation

8. Fourth revision – submit to colleagues for any further suggestions

9. Submit to publication outlet.

Stream 2: Getting Published

GUIDELINES FOR BRIEF COMMUNICATIONS (from JOURNAL OF ZOO AND WILDLIFE MEDICINE)

PURPOSE: To provide substantive information on research observations or clinical cases that involve a single animal and/or reports of common medical/surgical conditions in new species. Brief Communications differ from full papers in scope and completeness, but not in quality of information. Reports involving single animals and common medical conditions, even if the conditions are being described for the first time in a particular species, should be presented as Brief Communications unless a full Case Report can be clearly justified. Cases involving multiple individuals or descriptions of new medical/surgical conditions or techniques are more appropriately presented as Case Reports.

FORMAT: Brief Communications should include a title page (with author's names, addresses, etc. presented in the usual style), an abstract (in the usual style) on a separate page with key words, and the narrative, which should begin on a new page. The only headings should be "BRIEF COMMUNICATION," located at the beginning of the narrative, and "LITERATURE CITED," which should be at the beginning of a new page.

LENGTH: not more than 1500 words (not including the abstract)

ABSTRACT: 100-150 words or less (not part of the 1500 word total)

TEXT/PAGE LENGTH: not more than 1500 words (excluding abstract); not more than 6 pages, single sided, double spaced, font size 12 pt. type, and with margins as described in Instructions to Authors.

ILLUSTRATIONS: not more than two (either table and/or figure).

REFERENCES: Maximum of 10-12.

AUTHOR RESPONSIBILITY: the author must make it clear that the material being submitted should be treated and reviewed as a Brief Communication.

REVIEW PROCESS: Sent to an Associate Editor who will assign one or more additional reviewers.

Questions to ask before writing: Is your work worth publishing? Is it new, relevant? Does it answer a question that needs to be answered?

Group Discussion: Lively *sharing of both questions and answers within the whole group*

Giving Effective PowerPoint Presentations – Steve Unwin, Chester Zoo and OC/OVAG

The world's current fascination with technology has led presenters inexorably toward presentation software. However it is important to realize that other options continue to be available, and for some situations may still be a better choice. In fact, the very popularity of PowerPoint and Keynote has raised problems.

Presentations can be so predictable and generic that for the audience, they all start to look and feel the same. Everyone present is lulled into complacency, including the speaker. When PowerPoint takes front and center stage in a presentation, a speaker can lose the opportunity to connect with his or her audience. At one time or another, probably all of us have had the sense that text-dominated slides in such a presentation are serving more as notes for the speaker than as aids for our own understanding.

Presentations should be concise and specific but relatable to the audience. It was suggested delegates visit **www.ted.com** to review public speaking on scientific topics. Many of the presentations are subtitled in Bahasa Indonesia.

Afternoon Session – Exploring Jogjakarta

Day Five 6 August 2015

Wildlife and Orangutan Medicine Session (Zoo based) – Steve Unwin, Chester Zoo and OC/OVAG

Veterinarians at Chester Zoo are concerned with the health and welfare of the collection. They practice both reactive care: repair – response and proactive care: preventative medicine. Even though most OC/OVAG participants work with orangutans, occasionally work with other wildlife species and animals is necessary. All species have diverse anatomy and physiology. Oftentimes there is little published information to assist those that work with multiple species. Knowing a species and its health is very important if an animal is going to be returned to the wild or is going to stay in captivity for the rest of its life – both must be taken into consideration in order to have a positive end result.

Always consider the welfare of the individual – if an invasive procedure is needed, will it cause the animal harm? Or leave it alone and cause more harm?

Preventive medicine:

Birth or import vs death or export? Even once at release sites, the orangutans are still under veterinary care.

Things to be considered:

Pre import testing / Quarantine / Animal ID / Sexing / Nutrition / Hoof/nail/horn/skin care / Parasite monitoring / Opportunist disease monitoring / Collection physiological data / Reproductive assessment / Control of reproduction / Welfare audit / Pre export exam / Post mortem

The whole animal management team should be involved in decision making decisions – the decisions are not solely the responsibility of the vets.

Case review: A six year old female Sumatran orangutan was in mild oral pain, there were signs of improvement but then she slept most of the day up in a hammock and would not respond to keepers. Continued to be sleepy and unsteady but still ate and drank. She was started on potentiated penicillin and 3rd gen cephalosporin and seemed bright and responsive. Then she began to become more and more unsteady, by morning she was found dead.

Diagnosis? *Ecoli*/ *Streptocssus* / viral? Fungal? Bacterial? *Stepticossis septicemia*

The gross examination revealed pathological changes affecting multiple organs highly suggestive of a septicaemia process. The lungs were diffuse discoloured red and consolidated consistent with pneumonia. The kidneys exhibited multifocal infarction, which are suspected to be caused by septic emboli. Similar change was observed in the brain, characterised by a focal area compatible with necrosis (infarction due to septic emboli?).

The liver was markedly enlarged and the mitral valves showed subtle changes that could fit with mild endocarditis. Further examinations are needed to characterise the lesions and elucidate the pathological scenario. Histological and bacteriological examinations are in process. Because of the antibiotics, bacteriology was unrewarding, but most likely culprit would be Streptococcus pneumoniae.

Pathogen review: Pathogens found in orangutan – (OC/OVAG has compiled a list). There is a big overlap of many pathogens and diseases with the other apes, including humans.

Orangutan Published info:
Air sacculitis (Cambre *et al* 1980, Clifford *et al* 1977, Greer *et al* 2008, Lawson *et al* 2006, Mcmanamon *et al* 1994)
Hepatitis (Warren Thesis 1999, Warren *et al* 1999, Vershoor *et al* 2001, Greeth *et al* 2000)
Tuberculosis (Shin *et al* 1995)
Internal parasites – non enteric (Hanley *et al* 2006, Foitova *et al* 2007)
Internal parasites – enteric (emphasis on Strongyloidiasis) (Warren *et al* 2001, Mul *et al* 2007, Foitova *et al* 2006 and 2008, Kuze *et al* 2010, Labes et al 2009)
Plasmodium (Singh *et al* 2010, Reid *et al* 2008, Peters *et al* 1976)

There are also a variety of case reports on other infectious issues and non-infectious: dental disease, malnutrition, asthma, diabetes, and trauma.

Prevalence of intestinal parasites in orangutans – we do not try to prevent all parasites only those that will cause harm**.**

Review of air sacculitis:

Some air sacculitis is caused by upper respiratory tract infections. Infection in nasal passages that extend into the air sac and possibly further – mucous drainage can get into trachea – constant drainage cause a change in the structure of the passages in the nasal cavities which causes air saccultis. The change in anatomy causes turbulence and that causes other infections to take hold. Not all sinusitis cases will develop into air sacculitis. Some air sacculitis cases can develop into full blown pneumonia. Orangutan nasal area is very close to the human structure. Sinusitis is extremely painful, with a sense of thick headedness – the swelling and inflammation causes the pain. Areas that normally have drainage are blocked and so it just sits there, attracting cysts.

Review of Video for CGT scan and sinusitis procedure (Vicky the orangutan) from last year.

If you use a laparoscope with a light and look up the nostril you should be able to tell if there is a problem, if you cannot get a 3mm scope up into the nasal passages – you definitely have a problem. Most orangutans will typically relapse – ventilation in the area is a good idea. Air sacculitis is most common in older orangutans, though it can occur in younger individuals. Sometimes it is obvious that they have air sacculitis (enlarged throat sac), most times however, there is no outward sign. In order to protect others, a seven

meter distance needs to be maintained from infective air flow. Overcrowded conditions can cause more cases as the infected air flow is breathed in by others.

Antibiotic treatment for a few weeks is needed, with a recheck of condition. However, if antibiotics are overused, there is a real risk of the orangutan becoming resistant to antibiotics.

A big problem in centers is that lab work can be unreliable or give wrong information. You can ask a lab to check their processes to ensure that their diagnosis is correct or set up your own lab (which would still need to be checked continuously for accuracy).

Use of a diluted form of F10 in a nebulizer, two to three times a day for some cases has worked as it is a good antibacterial and anti-viral.

If surgery is needed, begin with seven to ten days of antibiotics before a surgery, followed by 3 additional weeks after surgery. For surgery, if not an extreme case, the mucus may be still watery and can be more dangerous as it is easier to spread in liquid form, useful to do a CT scan so you can see exactly where the buildup is.

Case Studies Session (Continued):

Arga Sawung Kusuma, BOSF Nyaru Menteng

Enucleation treatment in orangutan. A 10 year old orangutan had a wound in the lower right eyelid, with swelling and itchiness (previously he had eye cornea issues signally a recurring condition). Initial treatment

was started with tramadol 50mg s2dd and meloxicam 5mg s1dd. The following day, orangutan was sedated with ketamine 40mg and xylasine 20mg in order to conduct an eye examination. High intraocular pressure was detected in the right eye, which appeared swollen and bigger in size and protruded further out than the left eye. A small vesicle was present, and a fluorescent test confirmed it was not an ulcer. Subsequent treatment involved dexametasone injection on subconjungtiva, intravenous tramadol, intramuscular amoxicillin LA and topical oxytetracycline ointment. Haematology results showed a leukocyte count of 8.35 x 10^9/l (reference range 5.2 – 16.4 x 10^9/l), with normal haemoglobin levels of 10.1 g/dl (reference range 7.7 – 12.5 g/dl).

Although the orangutan was still active post-treatment, the eye condition did not improve over the next week. A second examination was conducted on March 13th 2014, orangutan was immobilized using an intramuscular injection with ketamine 60mg and xylasine 30 mg. Further sedation was administered with ketamine 40 mg and xylasine 20 mg after 15 minutes due to a poor response to the initial dose. Anesthesia was maintained with isoflurane 2.5% in oxygen after intubation. Direct examination showed the condition had worsened. The eye remained swollen, and three new bumps were present on the cornea. No abscessation was present in the globe, and the bumps were identified as inflammatory debris within the eyeball or behind the lens using ultrasonography. The final diagnosis was glaucoma resulting from trauma, and enucleation was considered as the most appropriate treatment method.

Transpalpebral Enucleation was performed. The eyelid was sutured and a periocular incision was made. Dissection was carried down to expose the optic nerve. During enucleation, the optic nerve was tied off below the clamp, as the retinal artery runs within the optic nerve in orangutans. A transfixing ligature was performed to secure the optic nerve during the removal of the globe. Sutures were performed to close the layers of the eye; on the orbital cone, periorbital fascia, subcutaneous tissue and outer skin. Ceftriaxone 1 gram intravenous, tramadol intravenous and meloxicam intramuscular injections were given during the operation. Other post-surgery oral medications included tramadol 50 mg s2dd, meloxicam 2.5 mg s1dd, and clavamox 500mg s2dd. After 5 days of therapy, the closed orbit was dry and post-operative swelling had subsided.

Orangutans are often reported with eye problems. Some conditions can be fixed by non-invansive medicine. Enucleation should be regarded as the last resort for cases that cannot be fixed by any other means.

Yenny Saraswati, SOCP and OC/OVAG
Brief overview of procedure performed on an orangutan with an ongoing ulcer. There is a British eye doctor working in America at Fort Worth Zoo that may be interested in coming out and do some ulcer demonstrations for centers.

Agus Fahroni (given by Arga Sawung Kusuma), BOSF Nyaru Menteng
Malaria treatment for orangutans. Plasmodium sp. caused by the anopheles mosquitoof which there are ten species in Indonesia.

Preventative maintenance: Spray insecticide for mosquitos around cages. If infected, confirmated by microscopic test DDR or RDT. Recommended treatment: Artemisinin based Combination Therapy (ACT).

Monitor drug effectively. Artemisinin has broad specificity for any malarial phase. Gametocytocide is more effective than other antimalaria drugs. It is safe for liver/renal function, as it has no interaction with other drug and no clinical side effects.

Malaria treatment must be total/radical in order to reduce relape and build resistance.

Chong Jiew Han, Semonggoh Nature Reserve, Sarawak

Semonggoh Wildlife Rehabilitation Center was established in 1975. It sits within the Semonggoh Forest Reserve. Within the area are four management zones. 1) The Botanical Research Center, 2) the Semonggoh Wildlife Center, 3) the Seed and Bank Nursery, and 4) the Sarawak Biodiversity Center. In 1962, trials were made to release some orphaned orangutans into Bako National Park (oldest national park in Sarawak established in 1957) but trails failed. The program was moved and initiated in Sepilok, Sabah, where efforts have been successful.

In the late 1970's, the first surrendered orangutan was received by the Semenggoh Wildlife Centre and it is currently caring for 27 "semi-wild" orangutans. In 1998, a second wildlife center was established, the Matang Wildlife Center which acts as a sister rehabilitation facility to Semenggoh, where 30 orangutans (of which 19 are in captivity) are being cared for.

The Semonggoh Center's initial objectives: Build holding facilities for confiscated or surrendered wild life species that have either been injured in the forest or kept illegally as pets. Act as field research and study center for the release of rehabilitated wildlife.

The current objectives: Conservation of released "semi-wild" orangutan population, education and research, and Eco-tourism.

Currently, 16 orangutans have been born from the original stock of 11 rehabilitated and released individuals. Most of the year, the orangutans are self-sufficient. They are still occasionally provisioned. Orangutans will continue to be monitored even after release to ensure that they are coping well in the forest environment.

Conservation education programs are in place for the general public especially for school children and local stakeholders to educate them in the importance of nature and wildlife.

Siali Anak Aban, Matang Wildlife Center, Sarawak Group

Matang Wildlife Center sits **c**lose to the main city of Kuching in Kubah National Park. It is rich rain forest with more than 80 species of palms, and many frogs (including the 2nd smallest frog in the world!). Covering 2,000 hectares, it can accommodate only four adults but there are plans to extend the area. The surrounding park area does contain human settlements and palm oil plantations. The center itself was established in 1998 and is 180 hectares and is a sister organization to the Semenggoh Wildlife Center.

The center focus is on orangutans and sun bears (though all the sun bears have been released). They currently have 30 orangutans, 12 which are semi-wild and they have no human contact except for their keepers.

IVMA (Indonesian Veterinary Association) Session: Dr. Heru Setijanto

Certification of Indonesian veterinarians and extra points for practicing license for veterinarians attending OC/OVAG.

20,000 vets operate within Indonesia – but only about 8,000 are registered. The balance of 12,000 is practicing illegally. There are certain regulatory steps toward certification which includes further education, professional development, commitment to their profession, working with a professional organization, competency certificates/evaluations. There are different levels of competency: for those attending OC/OVAG workshops, the credit points granted are set at 7.5 pts for participants and 8.5 for presenters.

There needs to be better communication between wildlife veterinarians and IVMA and ASLIQEWAN (the wildlife veterinary association under IVMA). Achieving some of the regulatory steps encompasses several competency levels. There is a competency assessment being prepared for conservation medicine (Pelayanan medik conservasi 17 cluster), and another for international competency. Under conservation medicine, there

are many categories such as performing disease risk analyses, managing a wildlife population *in situ* and *ex situ*, transportation of wildlife, management of zoonotic diseases, etc.

There are also regulations in place for when foreign vets come into Indonesia to assist local veterinarians.

Orangutan Parasites - Ivona Foitova, Masaryk University, Czech Republic.

Ivona collaborates on her parasite diversity research with UGM. She also researches self-medication.

Parasites can have significant impact on orangutan health and there are many noninvasive methods that can be used on both captive/center/wild orangutan populations. Her team collects behavioral data, fecal samples and phenology. The main aim is self-medication: most studies have been done on chimpanzees. There have been no documented cases of self-medication in orangutans. Local people seem to feel orangutans do self-medicate, but it is difficult to see whether they do or not as orangutans stay in the upper canopy. But they have been seeing some instances of orangutans self-medicating – using the same plants as local people use for the same uses. Looking currently at use of Sirih-sirih – *Piper aduncum* L Piperaceae.

The most prevalent parasites seen in orangutans are: *Balantidium* spp. / *Entamoeba* spp. /m *Trichuris* sp. / *Strongyloides* sp. / *Oesophagostomum* sp. / Enterobiinae. A New species discovered *Pongobius hugoti*, *Lemuricola pongoi.*

What works well in viewing parasites is scanning electron molecular (SEM) in addition to standard corporology analysis. Balantidium coli, is the second most prevalent in orangutans and they found three different species of balantidium. Under a normal microscope, they all look the same, but with the scanning method it is clearly seen that they are different. Some are pathogenic some are non-pathogenic. There seems to be a clear connection to carbohydrates.,

Group Discussion: *Ivona asked for fecal samples from OC/OVAG vets in centers of cases of balantidium for her team to analyze to see which species are present. But this is something that needs individual contact from Ivona's project to each center in the form of an MoU so that sample exchange and research ownership is clear. Ivona also feels that orangutans in the wild are using a plant to control malaria. They currently have permits until the middle of 2016 to try to access samples from multiple centers.*

Continuing Education trip to the USA - Ricko Laino Jaya, HOCRU and OC/OVAG and Yenny Saraswati, SOCP and OC/OVAG

Ricko and Yenny spent eight weeks participating in a short study program in zoo and wildlife medicine. They were in the USA from 3 March to 3 May 2015. The trip was in collaboration with the Ft. Wayne Children's Zoo and Fort Worth Zoo, Texas. There was the opportunity to also visit various other zoos.

Both Ricko and Yenny worked hands-on with great ape keepers on husbandry issues and zoo procedures.

At the Ft. Wayne Children's Zoo, they worked with orangutans, Sumatran tiger, red panda, and various birds. They were able to do this not only with the support of the zoos, but also by asking for collective monies from various organizations – a little bit from everyone made it happen.

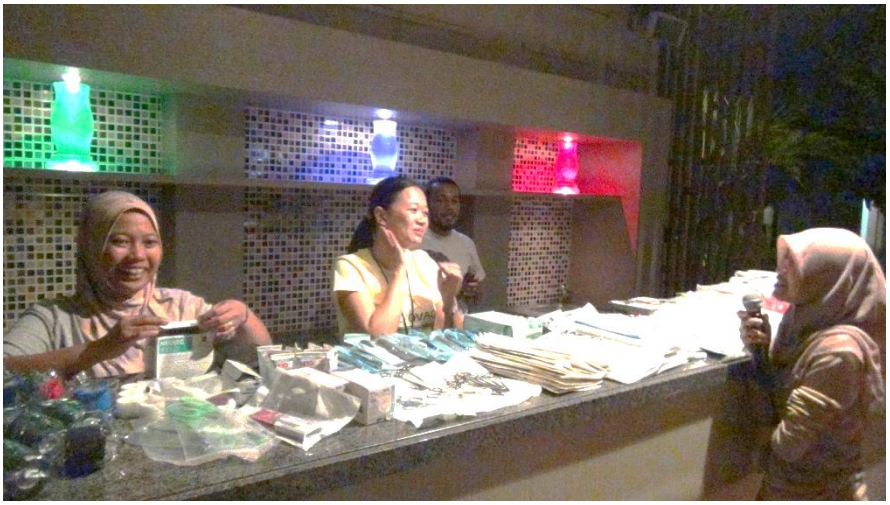
What was very impactful was working with anesthetics….especially for different species; the maintenance of the quarantine and other areas. Yenny felt the anesthetic procedures were really useful…keeping data on each procedure and documenting. She realized the more you do it, the better you get at it, and that one must be open to learning many things.

Ricko made a very important point: OVAG has allowed him to meet vets from around the world, he has been able to express his ideas and execute them, so he is really glad to be a part of OC/ OVAG because it has allowed him to do all these things!!!!

Steve assured the group that there will be more and more opportunities coming in the years ahead for visiting other countries.

Short session on Parasite Review which was presented on August 4

Veterinary Supplies Auction – Veterinarians brought items to be auctioned amongst themselves.



Final evening: OC/OVAG Closing Dinner/Presentation of OC/OVAG 2015 Certificates

Orangutan Conservancy
Orangutan Veterinary Advisory Group (OVAG) Workshop
2015 REPORT

August 2 – 6, 2015

Section Four

Participant's Feedback

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
New Knowledge: Did I gain useful knowledge?	24	5			
New Ideas: Did I gain new ideas that will imporve the way I do my job?	16	13	1		
Applying the learning: Will I use the information?	18	11	1		
Applying the learning: Have I been shown how to impart this knowledge to colleagues and managers?	12	17	1		
Effect on results: Do I think the ideas and information provided at this workshop will improve the way I do my job?	18	8	4		
Effect on results: Do I think the ideas and information provided at this workshop will improve the health of the animals under my care?	16	11	3		

Best things comments

Sharing, meeting old friends. Meeting new colleagues. Boost your spirit
Even though we have parasitology practicals/ sessions every year and it may look repetitive it is always a fun and useful session
Grant writing is very useful
Fun and learn, Sharing knowledge
I always gain knowledge here especially with the practical.
Amazing best networking and new information
Always giving new knowledge and information
OVAG has a very strong committee with high dedication that makes this group very useful. Brave!
Direct practice applications from the information given
CPR and intubation session. Auction night for vet equipment

There was so much information that I didn't know before. Thanks OVAG and all the people.
Warmness, Family, Sharing knowledge. Love GAVO
DRA management, Case studies, suture practical, 'Post it' Discussion
The atmosphere in this workshop is amazing. Great collaborative network. As wildlife vets we need to share the experiences and information we get
Reunited with friends and sharing new experiences and knowledge
There is no judgement, just fair and transparent discussions to share and improve
I love OVAG! This collaboration is so worthwhile and effective it can only help improve efforts to conserve the species and biodiversity generally
DRA was really useful and fun. Surgery was the best
Discussion of the cases really interesting
Networking, new knowledge from others experiences, practical
Liked combination of lectures, discussions and hands on
All topics very informative and good chance to meet experts (student)

Things to improve comments	**Organizer response**
More information on Orangutan Behaviour	
Time management. Participation from Delegates.	We are striving to improve this every year
Perhaps next year we can have a workshop session where participants actually write a grant?	Being prepared for 2016 yes.
It would be good to invite an orangutan behavior person	This will be Raffaella and others. Being planned for 2016
Describe assessments during post release monitoring	Being prepared for 2016
Selection of participants and new members. So many people would love to come and participate in this workshop	The OVAG committee is working on solutions to this issue. Any more than 35-40 actual participants and the learning benefits decrease. We are looking at the possibility of sharing workshop and conference rolls with UGM
More study cases from each centre	We do try with this and it is up to each centre to actually provide cases.
More time for surgery practise	In 2016 we will have fewer topics and more time for each
Bone and dental surgery	Orthopaedics is being prepared for 2016
Maybe we can add a game during a session so that will become more interesting	
Session on how to do a good necropsy	This was last covered in 2012 and we will look at doing a refresher in future

Anaesthesia practical	This will be investigated, needs to be at a center, and maybe better suited to smaller groups/ breakout workshop
Something for breakfast other than rice??	Toast was available :-)
Contraception in orangutans	This could easily be covered in 2016
Suggest exchanging vets/ staff between projects to improve skills	Several centres are already doing this and is an excellent idea
Maybe need translation for the discussions	Most of this was discussed in Bahasa in 2016. Delegates can request clarification for translation as needed
More practical sessions	
Perhaps more involvement for Forestry people (student)	We are working with UGM to improve OVAG outreach to non-clinical wildlife and forestry workers
Mail list for OVAGers' Dropbox or Facebook?	There is an OVAG What's App group. We did try with Dropbox, but people kept downloading and removing information. We are looking at a member only web system that is more secure than Dropbox or Google drive.

How will I use the information I have gained comments:

The information will be very useful to improve my lecture materials
I will use scientific writing section points
Share to colleagues, Check resources, Keep in contact with colleagues
Will apply information learnt to our health management
I'll inform the manager of my centre and all the vet colleagues of my centre and hopefully use
I'll make recommendations for animal protocols and I feel more confident to apply it to manager since management team was also invited to OC/OVAG.
I'll implement several ideas/ protocols I got from OC/OVAG and I will inform this new information to the manager and colleagues.
I have improved my suturing technique
Share DRA and hope to apply this
Try to apply the wound management presentation
This helps me to know colleagues working in a similar field, people with experience I could ask in case of having difficult case
Present materials back at centre
I'll share the lessons to my workers and colleagues to expand the knowledge learning.
Allah bisa karena biasa
I will use it to improve our rehabilitation protocols
Very useful for me as I want to be involved in wildlife conservation as a future vet (student)
Share DRA with management
Improved my spirit to write journal again and to share the spirit to other vets so we have more practice
OC/OVAG will help me develop and implement new ideas to improve the captive environment and the general welfare of the animals under my care

QUIZ

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'

_____
_____
_____

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).

_____
_____

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

_____
_____
_____
_____

8. Define disease risk

_____
_____
_____

9. Define malnutrition

_____
_____

10. What does epidemiology study?

_____
_____
_____
_____

PRACTICAL ANIMAL HEALTH

11. An orangutan 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

12. Heart disease has been widely reported as a major cause of mortality in captive great ape populations. What should be the **initial** diagnostic tool of choice in the assessment of cardiac health in non human great apes?

A. 12 lead ECG
B. 4 lead ECG
C. Ultrasound
D. Cardiac biomarkers
E. Thoracic radiographs

13. In 1 sentence, suggest when it is reasonable to consider euthanasia of an orangutan.

_____

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

_____
_____
_____

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

_____
_____
_____

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 reviewD. Randomised control trial
E. Meta-analysis
F. Single Case report
G. Case series

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

_____
_____
_____
_____

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

A: TST B: 454 Sequencing C: Statpak D: Paralens E. MAPIA F. Culture

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

_____
_____
_____
_____

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

_____
_____
_____
_____

ANSWERS

1. C
2. A
3. D
4. Similar to: Protocols designed to reduce the risk of pathogen transmission
5. They all are
6. Faecal-oral, direct contact, Aerosol, indirect (soil/ water/vector), body fluids
7. Hygiene (hand washing), PPE, etc
8. Similar to: Disease Risk is the likelihood of the occurrence and the magnitude of the consequences (severity) of a pathogen entering a population – for this you need a vulnerable population and the possibility of exposure, to a particular pathogen. The analysis is the process to quantify or qualify this, to assist in animal management decisions.
9. 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.
10. Epidemiology is the study of disease in populations. Makes trends, allows spread prediction, and allows management. Wildlife spread to human/ domestic and vice versa. Transboundary spread etc.
11. D
12. A and C
13. Open.
14. 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-cultivatable 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. At least 3 to get a mark.
16. C, E, D, A, G, F, B.
17. Open to interpretation
18. A. body reaction. B. Organism C. Body reaction D. Organism E. Organism F. Organism
19. a and b Photos to histology. Bonus points if mention multiple aliquots.
20. As many modalities as possible – culture and PCR currently most recommended. Other respiratory pathogens and chronic causes of weight loss.