

Chapter #

THE TRANSPORTATION OF ORANGUTANS: PROBLEMS AND PROTOCOLS

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1. ASSESSMENT OF THE RISK OF TRANSPORTATION

The primate staff at the Perth Zoo undertook a detailed analysis of orangutan transportation to identify factors that might contribute to mortality as well as stress to the animals being moved. The resultant list of recommendations may help eliminate these factors. We intend for these suggestions become part of zoo great ape transport protocols.

2. MATERIALS AND METHODS

We gathered data from the International Studbook records for 1,975 captive individuals in 810 institutions for 1946 to 1994. SPSS for Windows version 6.0 was used to analyze the studbook data. Since censored and uncensored data were present, we used “Life Tables” for the analysis platform and the Wilcoxon (Gehan) statistic to test survival. We set a significance level of 0.05 for all statistical tests.

Additionally, we analyzed in detail and from start to finish the transport of the following apes:

- a fifteen year old Sumatran female orangutan (*Pongo pygmaeus abelii*) named Karta from Adelaide Zoo, Australia to Perth Zoo, Australia.
- a ten year old Sumatran male orangutan (*Pongo pygmaeus abelii*) named Puluh from Perth Zoo, to Chester Zoo, U.K.

Both of these transport events occurred without any major problems. We further make reference to problems experienced during the transport of two adult chimpanzees (*Pan troglodytes*) from Perth Zoo to Hyderabad Zoo, India.

3. RESULTS

The data indicate that of the 1,278 orangutans transported from one zoo to another, 34 (3%) died during transport, 54 (4%) died within one month of transport, and 147 (12%) died within one year of transport. We tested the data for survival during the first year after arrival at the zoo to assess if the age of the orangutan at the time of transport was a significant factor in its survival but found no significant difference in survival rates between the different age groups (Figure 1; $p=0.8470$, $df=3$). We further analyzed the data to test if the year in which the orangutan was transported had a significant impact on its survival. We found no significant difference in survival rates between the different time periods (Figure 2; $p=0.5787$, $df=3$). Finally, we tested whether sex (male or female) was a significant factor influencing survival following transportation. We noted no significant difference in survival rates between the two sexes (Figure 3; $p=0.8312$, $df=1$).

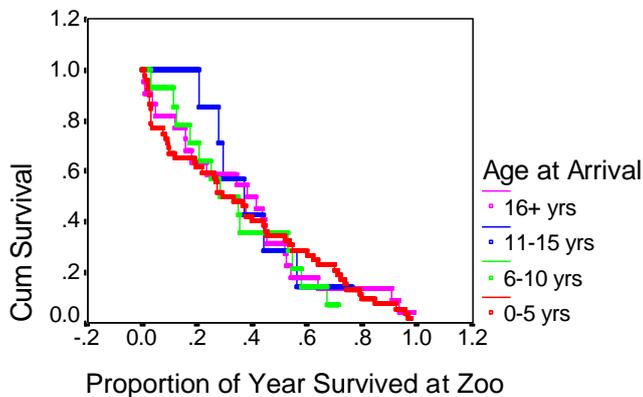


Figure 1. Survival at zoo during first year arrival vs. age at arrival.

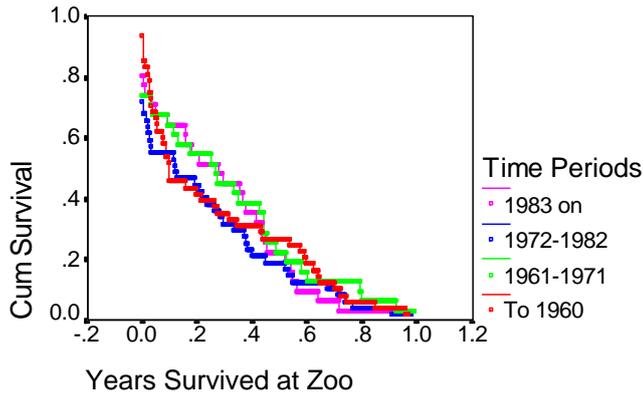


Figure 2. Survival at zoo during first year of arrival vs. time period.

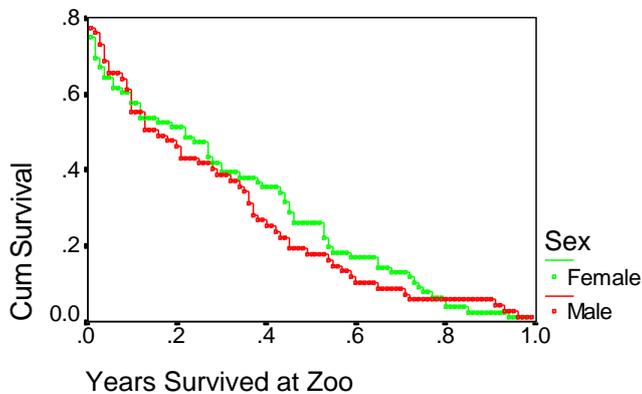


Figure 3. Survival at zoo during first year of arrival vs. sex.

4. DISCUSSION

Age, sex, or time period when the transport occurred do not appear to significantly influence orangutan survival during the first year following the transport event. Nonetheless, there is a high risk of mortality that characterizes such movements. Death is the most extreme expression of a negative influence on well-being, so presumably transport mentally and physically challenges an even higher percentage of orangutans than the

mortality figures would indicate. Our case study of two successful orangutan transports may help to clarify mortality and stress risks and how these might be minimized.

4.1 Before Transportation

4.1.1 Crate Construction

A quick and efficient move decreases the potential for stress, and the shipping crate should be designed to facilitate the process. In addition to following the International Air Transport Association regulations, other factors need to be considered in the construction of the transport crate. For example, it was difficult to move Pulu's crate through the Chester Zoo's orangutan corridor. Dimensions of service corridors for both the sending and receiving institutions need to be known prior to the construction of the crate. Thought must go into the possible need of turning corners when moving a crate to its intended destination. A second example was how we opened Karta's crate upon arrival at Perth Zoo. A handle on the top or the side will allow easy access for the ape to enter a den, but this detail is easily forgotten when constructing the crate.

4.1.2 Climate of Receiving Institution

The decision of when to send an ape to a new institution must take into account season and climate. The decision to send Karta from Adelaide to Perth was purposely rushed to prevent a move during the hot summer period. Unfortunately, when Pulu was sent from Perth to Chester he endured an unavoidable 25°C temperature change. A similar problem arose with the chimpanzees sent to India when traveling by truck during the heat of the day. Where possible in transit between journeys, apes should be kept at stable room temperatures inside buildings.

4.1.3 Medical Examinations

Pulu required more than one general anaesthetic before the day of transportation because he gave a false positive to the intradermal test for tuberculosis. This required putting him under an additional general anaesthetic to allow a chest x-ray combined with gastric and tracheal wash for examination and culture. As 62.5% of orangutans appear to give false positives to intradermal tests (Wells, *et al.*, 1990), we suggest that a chest x-ray and tracheal wash should be performed when the ape is first

anesthetized. These cultures take six to 12 weeks for a confirmation of the ape's disease status.

4.1.4 Crate Training

There are two methods for moving an ape into a crate: sedation and training. Training is the safer and better way to crate apes. The involvement of staff time and resources are the major disadvantages of this method. If a crush cage is available, it is preferable to have the ape moving through the crush as part of its routine as soon as possible. In both recent cases at Perth Zoo the orangutans were sedated and placed in the crates. In previous transfers of seven orangutans to India, no sedation was given and the animals were moved into the crates using the crush cage.

4.1.5 Tarmac Access

All travel arrangements should be made as early as possible. This includes access on to the tarmac at the airport so that keepers are able to supervise the handling of the apes. Security passes often have to be arranged well in advance with the cargo manager for both the outgoing airport and for any stopover airports.

4.2 During Transportation

4.2.1 Crating

Two keepers should be directly involved in the process of transporting apes. One keeper should assume the responsibility of crating and transporting the apes to the airport. The other, an experienced keeper who the apes trust, should accompany them on the trip. During this stressful period of their lives, apes are more likely to readjust to new surroundings if a familiar person is present and if their usual routine is maintained. A keeper familiar with the apes will be aware of their individual behaviors and favorite food items.

If crate training is not possible, chemical sedation is required. Great care must be taken to place the ape in the crate so that its airway is not blocked, and it is important that the ape is given enough time to recover prior to transport. During this time, the ape should be offered food and water and its general well-being should be monitored. An ape given inadequate time to

recover will be stressed upon recovering to find itself in an unfamiliar environment.

4.2.2 Protection During Transport

Keepers should plan for the ape's protection from the elements during transport. Apes should not experience temperature extremes. In high temperatures, shade and adequate ventilation must be provided. If a tarpaulin is used during transport, this should be kept out of the ape's reach. A fully covered truck with some climate control is ideal under cold conditions, such as that used in the U.K. for Pulu.

4.2.3 Loading/Unloading

A forklift is the quickest, most efficient, and least disturbing way to unload crates from trucks. Wooden skids should be placed underneath the crate for ease of access. If the crate is being moved outside of working hours, a forklift operator should be hired to help with the move. The crate should also have chains attached for possible lifting by crane as an alternative plan.

4.2.4 Convoy to Airport

Ideally, the truck transporting the animal crate should travel with another vehicle, so that a security check may be made while on the road. This allows for any potential problems that may arise with the crate and vehicle.

4.2.5 Supervision and Access at Airport

The keeper involved with transporting the apes to the airport should remain with them until the last possible moment. Inside the airport holding facilities, there may be airport staff wishing to view the orangutans. Unsupervised, this has a great stress potential for the animal and poses a safety risk for airport staff. The keeper should be present to supervise the situation. Another problem is that live animal crates are often treated like other baggage. For example, the chimpanzee crates were literally buried under other crates, seriously affecting ventilation. This occurred because the keeper was unable to remain near the chimpanzees and supervise handling. Airport staff did not appear to appreciate the effect exposure to weather can have on the animals. On one occasion the animal's crate would have been left exposed on the tarmac in direct sunlight on a hot day if the airport staff had not been advised by the keeper to move the crate.

The lack of proper housing of the crate during transport in the plane is often overlooked. If the keeper is able to gain access to the hold, last minute preparations may be made such as refilling water, checking ventilation, and keeping control of the temperature.

It is important that the keeper is able to make checks during stopover flights. Inspecting Pulu in the hold while in transit was invaluable. During this time, unsupervised baggage handlers who were unaware of Pulu's presence proceeded to pile baggage around his crate, blocking his air holes. Once notified of his presence, they wanted to interact with him through the mesh. Undesirable problems with animal welfare and airport staff safety may have arisen. The burlap over the crate's mesh was pulled into the crate by Pulu and destroyed, even though the mesh only had fine holes. There was no water in the bowl and the nozzle in the drinking bottle was pulled out. He appeared thirsty when offered water. During the transport phase both Karta and Pulu readily accepted food from the keeper, but both reduced their food intake on arrival and refused to accept food at first from the keeper.

4.3 After Transportation

4.3.1 Release at the New Zoo

Advance arrangements should be made with a local veterinarian to inspect the animal upon its arrival. The examination should be done as soon as the animal has been released into its new temporary or permanent enclosure.

The orangutans reacted differently when being moved from the travel crate to the new den. Karta left the crate immediately with little fuss, but Pulu hid in the crate for some time and eventually ran from the crate to the den. When Karta was released there were only three staff involved, whereas there were nine staff present when Pulu was released. The den door was modified to fit the crate when Karta arrived at Perth Zoo, so the delay in releasing her was much shorter. Another factor may be experience: Karta had already moved from San Diego to Adelaide, while Pulu had not been moved before.

4.3.2 Recovery

Both the orangutans observed in the periods after transportation showed similar behavioral requirements. They preferred to be as high as possible, as far away from the den mesh as possible and covered by as much nesting

material as possible. They both appeared more active and explored the night quarter, initially when no staff was present. This suggests that a private environment is an important factor in relaxing the animal. The period of constant hiding at the top rear of the night quarters when keepers were present lasted three weeks for Pulu and two weeks for Karta.

During the observations of this recovery period, it is important to distinguish between normal and abnormal behavior. Orangutans tend to be highly individualistic, and it is important for the accompanying keeper to transfer information on what is normal behavior and routines for each animal.

4.3.3 Food and Water

In the period after arrival it may be difficult to move the orangutans between dens. It is essential that food and water be provided without staff having to enter the den. At first only familiar and favorite food items are likely to be accepted. The provision of a familiar diet and food items during this period after arrival appears to be beneficial. Food consumption returned to normal after three weeks for Pulu and after one week for Karta.

The transportation of apes to a new institution can be accomplished with relative ease given careful planning and communication. There is always a potential for problems, but a timely response can minimize these. The first concern must be for the ape's health and well-being during the process (Sodaro, 1997). In this way, mortality and stress risks are reduced or avoided.

5. CONCLUSIONS

To increase the chance of a successful and less stressful move, these steps should be considered:

1. The mechanics of crate movement should be planned well in advance of the transport day. The dimensions of the crate should be checked with the service corridors at sending and receiving institutions.
2. The animals must be protected from temperature extremes during transport.
3. Unnecessary extra anesthesia and false TB positives can be avoided by the use of chest X-rays and tracheal washes.
4. The ape should be trained to use the crush cage as part of its daily routine prior to transportation.
5. A keeper familiar with the animal should accompany it to its destination and help the animal to settle in its new environment.

6. The use of a forklift with crates saves time and reduces handling of and stress to the ape.
7. When in transit by road, transport staff should travel in convoy with another vehicle.
8. A keeper should always supervise handling of apes by airport staff.
9. A keeper should have access to the ape during all stopovers while in transit.
10. Minimal staff should be involved in releasing the ape from the crate to its new den.
11. Ample vertical space and privacy following release into the new den must be provided.
12. The diet and routine at the new facility should be as familiar to the ape as is possible.

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