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A plan for ^{mutual} ~~prevention~~ protection in animal-human missions -

Objective - To provide a guideline for maximum mutual protection ^{from disease & trauma between} humans and animals in mixed space ^{travelling} ^(insert *) space-missions and simulations. While this document is ~~primarily~~ concerned specifically with the SMD III simulation it is hoped that it will form the basis for ^{a similar} ~~the~~ space shuttle operations ^{document}. This will require generation of additional appendices for added species or variations in the experiments and possible modification of ~~existing~~ this document in ^{light} ~~the~~ of increasing knowledge.

~~For this & other reasons it is recommended that~~
* Format - This plan is in two ^{major} ~~main~~ sections for ease of organization and use. The first is a master plan (top or cover document) which ^{designates} ~~gives~~ the

what ~~and how~~ must be done ^{on flying animals} the general aspects of any mission ~~on species~~ to insure safety in light of current knowledge & practice which may be encountered. The second ~~series~~ appended

portion consists of a series of appended sections ^{detailed protocols for} dealing with each species. This is ~~is~~ ^{is} ~~is~~ Each

species varies so widely in carriage of or susceptibility to pathogens, life span, methods of handling and the like, that a single document ^{impractically complex and} would be ~~unwieldy~~. ~~Even~~ Even in the same species, if individuals are modified in the susceptibility to infection, exposed to unusual pathogens or otherwise significantly changed the protocols must be modified accordingly.

Goals & Limitations: It will probably never be possible to completely know, test for and protect against all agents which

produce disease in man but ~~the~~ danger of infection is very low. Testing for these agents at this time would be prohibitively expensive hence, ^{again} the risk is accepted because it is ~~acceptably~~ small. Conversely there are many agents in many species which can regularly produce disease ^{or} death in man. This must be guarded against absolutely & $\bar{5}$ compromise. Further there can be no break in the chain of protection which is outlined.

Implementation - Since this will be a continuing problem, ^{possibly requiring additional guidelines} whenever an animal is ~~flowing~~ ³ and since surveillance ~~is~~ must be continued throughout SMD III it is strongly recommended that a standing committee be maintained $\bar{c}$ individuals

c expertise in the following areas -

1. Flight medicine
2. Infectious disease
3. Veterinary science ~~preferably~~ including veterinary pathology -
4. ~~In flight~~ Microbiology including virology
5. ~~In flight~~ crew preferably c ~~life sciences~~ biological sciences background

Plan of protection - The following are ^{key} elements of the plan and discussed under these headings -

1. Evaluation of proposed experiment & identification
2. Acquisition of ^{healthy} animals ~~including~~
3. Limitation of exposure ^{and} modification of animal
4. Examinations and protection of animal prior to selection
5. Flight selection ~~was~~
6. Quarantine which includes a. examination
c. ~~A~~ housing & immunization / modification
d. ~~B~~ transport

6. e.g. handling

7. In flight handling including
- a. protective clothing
 - b. housing
 - c. capture/restraint/capture
 - d. disposal of waste
 - e. specimen carcass handling
 - f. experiment techniques

8. Documentation

9. Quality assurance including
1. facilities
 2. handlers
 3. lab determinations

1. Evaluation of ~~personnel~~ experiment-

Clearly the proposed experiment must be within the practical limitations of the space flight operation.

To use an outrageous example it is not

likely that an elephant or even a lion
will be flown for some time to come. Other
examples which would require exceptional circumstances
might be poisonous snakes. There are many
experiments which might involve handling of biological
agents that are even more deadly than snakes. It is
to another common problem which will be encountered
is an investigator which has used ^{a particular} animal model
for many years but which for a number of reasons
might cause great difficulty in space operations. Under
these circumstances alternatives including man
should be considered & trade offs considered.
The animal safety committee should have
inputs early in or after experiment selection &

must have veto power in cases of safety.

2. The animals must be initially procured in a healthy state through legitimate channels & regards for appropriate international laws & regulations. ^{Animals will not be procured from}
~~If there are~~ [↑] areas in which disease, especially carrier disease difficult to detect, is endemic animals ~~will not~~ is endemic.

3. If the animals, such as monkeys, are kept for long periods ~~and~~ prior to selection they must not be used for experiments in which they are exposed to agents or conditions which could result in

as sources of mutual danger in any man/animal interface. Rather, based on existing knowledge and technology the best possible protection must be offered through existing techniques. Conversely if techniques, finances or operational limitations do not allow the best available protection the species or experiment should be eliminated. To expand further: there are Simian viral agents which may be carried $\bar{c}$ harm in the natural host but which are fatal to man. The incidence is small ~~that~~ and by avoiding ~~unavoidable~~ ^{communicable} contact $\bar{c}$ ~~communication~~ routes the risk is acceptable however a finite risk remains until knowledge & technology is available to deal $\bar{c}$ the agent. In a like manner there are many agents ^{in animals} which ~~has~~ may have