



Original Research

Air Medical Transportation of Injured Operational Canines

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A B S T R A C T

Operational canines (OpK9s) are frequently injured in the line of duty and may benefit from specialized medical transport, including air medical transport. Reports of such transports can be found in the popular press, but there is a lack of research aimed at quantifying and examining these transports. We sent a survey to 295 programs in the United States identified through the Atlas and Database of Air Medical Services database to inquire about OpK9 transports and program policies and procedures for these transports. Of those 295 programs, we received 147 responses with 15 programs reporting that they have transported at least 1 OpK9. Programs also provided insight into policies and procedures that they have established for these types of transports. Although not all air medical programs will choose to complete this type of transport, we recommend that those that do establish policies and procedures to prepare for successful transports.

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Operational canines (OpK9s) is the collective term for police canines, force protection canines, and search and rescue canines. These animals are often crucial members of their teams. Although injured military working dogs, the military's OpK9s, are routinely transported by air and there are policies and research to support this practice,¹ instances of nonmilitary OpK9 air medical transports have only been documented in the popular press. There have been no studies to look at the prevalence of such transports or to determine what, if any, policies flight programs have in place to address this challenging transport issue. Here we present the results of this uninvestigated topic. We sought to assess the prevalence of OpK9 transports as well as the existence and content of protocols to conduct such a transport should an air medical team be called upon to perform this type of transport.

Methods

This study was submitted to and approved by the Human Subjects Protection Office of the Pennsylvania State College of Medicine, Hershey, PA, and granted an institutional review board exemption (STUDY00005148). We distributed an electronic survey to air medical programs in the United States via the Research Electronic Data Capture (REDCap) program (Appendix 1). Programs were identified using the Atlas and Database of Air Medical Services. Programs that could not be reached via e-mail were excluded. A survey developed by the authors containing up to 23 questions inquiring about OpK9 transports, policies, and procedures was e-mailed to 295 identified programs in January 2017. Survey questions were included in an attempt to gather information about this uninvestigated topic, and, as such, the survey was simply designed to gather basic information and is not a validated survey instrument. Select questions included opportunities for free-text responses to allow for programs to provide additional details. Programs that did not respond to the initial e-mail received follow-up e-mails and a follow-up phone call, with

the survey open through May 2017. Programs were asked to provide their name in the survey for the purpose of analyzing potential data trends. Survey responses went directly to the secure REDCap database to ensure confidentiality, and responses are presented only as aggregates without identification of specific program information to protect the anonymity of respondents.

Results

In total, 147 of the 295 surveyed programs responded for a response rate of 49.83%. Of those 147 respondents, 22 reported receiving at least 1 request to transport an OpK9, and 15 of those programs completed at least 1 transport. A total of 41 transports were reported. Table 1 outlines the demographics of programs reporting at least 1 OpK9 transport. Most of the programs that reported flying an OpK9 were either private or affiliated with law enforcement, but programs affiliated with law enforcement agencies reported the highest number of transports on average (4.2). Private companies, those affiliated with health care systems, and

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Table 1
Demographics of the 15 Programs Reporting at Least 1 Operational Canine Transport

Demographic	Number	%
Private transport company	5/15	33.33
Affiliated with law enforcement	5/15	33.33
Affiliated with health care system	3/15	20.00
Affiliated with academic medical center	2/15	13.33

those affiliated with academic medical centers transported an average of 2.6, 1.64, and 1 OpK9s, respectively. A total of 41 transports were reported. One limitation of our survey was that respondents could only report up to 9 transports.

Programs were also asked to discuss any policies or procedures they use for canine transports, which are outlined in Table 2. Programs that answered these questions affirmatively were asked to provide additional free-text details to better explain their policies and/or procedures. Table 2 provides a summation of the various free-text responses received to these questions.

Discussion

The goal of this survey was to quantify the number of transports for injured OpK9s and to identify any policies or procedures that programs have in place to perform a transport if one is requested. Although supposedly a rare occurrence, 15% of our respondents have reported such a request. Of those requests, the majority of transports were completed.

Medical flight programs should evaluate whether or not they would complete such a transport if one is requested. Although some programs may decide that they will not transport an injured OpK9, those programs that will should establish policies and procedures for this type of mission. Suggestions from programs that have transported an OpK9 are to include training in K9 first aid by veterinarians or law enforcement K9 handlers. Others suggested that familiarizing K9s with the aircraft may be helpful. Several programs reported having specialized equipment for K9s that may be transported. Finally, multiple programs noted that maintaining the safety of the flight crew should always be of greatest importance.

One resource available to programs that choose to adopt a practice of transporting OpK9s is the Veterinary Committee on Trauma²; they released a series of recommendations for the care of injured canines based on expert opinion.³ Consideration must also be given to any state-specific laws governing the actual provision of care by emergency medical service personnel to injured OpK9s because this may be construed as practicing veterinary medicine. A discussion of any proposed care guidelines with the state board of veterinary medicine for your particular state would likely be prudent.⁴

Although not included in our survey, the cost of these transports is another potential concern and area for evaluation. For programs for which this would be a major concern, a cost-benefit analysis would provide

beneficial information that could aid in the decision for pursuing policies and procedures. Baker et al¹ found that military working dogs that sustained gunshot wounds, had injuries that were all identified and treated appropriately, and survived were ultimately able to return to work. Although this study was performed in the setting of the military environment and may not be completely applicable to civilian and law enforcement OpK9s, it does lend some support to air medical transport of OpK9s because it suggests that they are often able to return to work after their injuries.

The limitations of this survey include a potential response bias from programs that have transported or received a request to transport an OpK9. Recall bias is also possible. Surveys were ultimately completed by individuals who may not have been aware of a request or flight. Additionally, because of the technical construction of our survey, any respondent could only report up to 9 transports. Additionally, although included in our original survey, data pertaining to specific OpK9 transports (including types of injuries, actual treatment provided, hospital vs. veterinary destination, and so on) were not included in our analysis because of a lack of response to those questions. This represents an important area of investigation that remains to be addressed in future research.

In conclusion, air medical transport of OpK9s is an infrequent event. However, it does occur. Flight programs are encouraged to determine if they will honor a request for

Table 2
The Reported Protocol and Training Details With Examples of Free-text Responses

Questions About Policies and Procedures With Bulleted Summation of Free-text Responses	Number of "Yes" Responses
1. Have any of your flight staff received special training in canine first aid? <ul style="list-style-type: none"> Tactical medicine K9 care Canine first aid, hemorrhage control, intubation, fluid resuscitation, safe handling Training by veterinarians/K9 officers East Coast Helicopter Operations training 	16
2. Have any of your flight staff received training in other aspects (besides first aid) of canine transport? <ul style="list-style-type: none"> Transporting K9s for nonmedical purposes/transport drills Training by veterinarians/K9 officers/SAR Use of special harnesses 	21
3. Do you have a predesignated emergency vet?	14
4. Does your program have any specialized equipment available for canine transport? <ul style="list-style-type: none"> Harness Muzzle ET tubes size 9-11 Quick clot bandages, CAT tourniquets Specialized BVMs "To go kits" with specialized equipment 	6
5. Do you have provisions in place that would allow the handler to fly with the OpK9?	52
6. Would the aircraft accommodate all crew in addition to the handler and OpK9?	94
7. Does your air medical program have any other protocols in place for transporting OpK9s? <ul style="list-style-type: none"> Handler must fly with OpK9 Safety of crew is paramount Nonprofit group officer K9 care guidelines 	7

BVM = bag valve mask; CAT = combat application tourniquet; ET = endotracheal tube; OpK9 = operational canine; SAR = search and rescue. Summation bullets are provided to indicate the aggregate of the free-text responses provided to these questions.

this type of transport before being called on to make an emergent decision. If the program decides that they will transport an injured OpK9, then we would encourage the flight program to work with law enforcement in their service areas to determine policy and procedures for this type of flight. Programs are encouraged to consider obtaining expert consultation from a knowledgeable veterinary medical professional regarding the legality of provision of care, care protocols, and specialized equipment that they may wish to obtain if called on to transport an injured OpK9.

Appendix 1. Canine Air Transport Survey

Program Name:

Definition: Operational canines (OpK9s) is the collective term for police canines, force protection canines, and search and rescue canines.

For any given question, please select all answer options that apply.

1. Questions about OpK9 transport incidents:
 - a. Has your program ever had a request to transport an OpK9? Yes/No
 - i. If yes: Did your program fly the OpK9? Yes/No
 1. If yes:
 - a. How many OpK9s have your program flown? _ (1 digit limit)
 - i. For 1 OpK9 flown: In what year was the OpK9 flown? ____ (4 digits required)
 - ii. For >1 OpK9 flown: In what years were the OpK9s flown?
 1. Note: For remaining questions please answer for the most recent OpK9 flown.
 - b. What type of injury did the OpK9 have? Select all that apply.
 - i. Head
 - ii. Thorax
 - iii. Pelvis
 - iv. Extremity
 - c. What was the cause of the injury?
 - i. Automobile

- ii. Fall
- iii. Gunfire
- iv. Stabbing
- v. Assault
- vi. Other: _____
- d. What pre-flight or in-flight care did the OpK9 receive?
 - i. Oxygen administration
 - ii. Bleeding control
 - iii. Pain management
 - iv. Needle decompression of the chest
 - v. Other: _____
- e. Who provided this care?
 - i. Handler
 - ii. EMT
 - iii. Nurse
 - iv. Veterinarian
- f. Who accompanied the OpK9 during the flight?
 - i. Handler
 - ii. Regular flight crew
 - iii. Veterinarian
- g. Was any of the regular crew left at the scene to accommodate the OpK9 and/or the handler in the helicopter? Yes/No
- h. How far was the OpK9 flown? ____ miles (3 digit limit)
 - i. What kind of facility was the OpK9 flown to?
 - i. Veterinary Center
 - ii. Medical Center
 - j. What was the approximate time from injury to the time of arrival at the veterinary or medical center? ____ minutes (time – 3 digit limit)
- k. Did the OpK9 survive discharge from the veterinarian?
 - i. Yes
 - ii. No
- iii. Unknown
 - l. Did the OpK9 return to duty?
 - i. Yes
 - ii. No
- iii. Unknown
 - ii. If no: Why was the OpK9 not flown?
 1. No clearance
 2. Policy not to transport animals

3. Resource restrictions
4. Other
 - a. Please briefly explain why the OpK9 was not flown.
2. **Questions about policies and procedures:**
 - a. Have any of your flight staff received special training in canine first aid? Yes/No
 - i. If yes: What has the training included?
 - b. Have any of your flight staff received training in other aspects (besides first aid) of canine transport? Yes/No
 - i. If yes: Please explain.
 - c. Do you have a pre-designated emergency vet? Yes/No
 - d. Does your program have any specialized equipment available for canine transport? Yes/No
 - i. If yes: Please list and describe the equipment.
 - e. Do you have provisions in place which would allow the handler to fly with the OpK9? Yes/No
 - f. Would the aircraft accommodate all crew in addition to the handler and OpK9? Yes/No
 - g. Does your air medical program have any other protocols in place for transporting OpK9s? Yes/No
 - i. If yes: Please elaborate.

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