

Feasibility of Canine Therapy Among Hospitalized Pre–Heart Transplant Patients

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Objectives: Canine-assisted therapy (CAT) has been used in many settings with much success, yet no study has assessed its feasibility and receptiveness in hospitalized patients awaiting heart transplantation.

Methods: Patients admitted to our institution with a status I for heart transplantation during a 12-month period (April 2014–April 2015) were prospectively included in a feasibility pilot study. Patients were included if there was no history of transmittable disease or active infectious process and consented for study participation. Each patient was visited daily by a canine and quantitative and qualitative data regarding the visit were obtained.

Results: A total of 11 patients were included in the study. Most patients were men ($n = 8$, 72.7%) and the average age was 51.1 years. A total of 146 individual therapies took place, totaling 2718 minutes of CAT during the study period. Each patient had an average of 13.3 visits and each visit had an average duration of 14.7 minutes. Patient receptiveness, as measured by the CAT volunteer, averaged 9.9 (scale 0–10). No reports of infection transmission occurred.

Conclusions: Our study found that CAT among hospitalized pre–heart transplant patients is feasible and is a welcomed adjunct to usual medical care.

Key Words: canine-assisted therapy, complementary medicine, heart transplantation

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It is not uncommon for patients awaiting heart transplantation (HT) to remain hospitalized in an inpatient setting until a donor organ is available. These patients can be hospitalized anywhere from weeks to months, and much uncertainty for both the patient and patient's family members exists. Numerous studies have demonstrated that the reported quality of life in such circumstances is poor, likely a result of the stress and fatigue of the prolonged hospitalization.^{1–8} Other studies have shown that patients undergoing cardiac-related surgical procedures with a high level of either anxiety or depression demonstrate higher morbidity and mortality when compared with patients without anxiety or depression.^{9,10} Numerous experts have recommended that interventions to ease the stress of the hospitalization take place during this tenuous period; however, data are lacking and practice can vary widely among institutions.^{1,3–7}

Canine-assisted therapy (CAT) has been incorporated into the clinical care of both adult and pediatric patients for several decades. Numerous studies exist demonstrating that CAT not only diminishes anxiety and depression but also affects patients in autonomic and neurohormonal aspects, including a reduction in epinephrine and norepinephrine levels.¹¹ The American Heart Association has released a scientific statement recommending pet ownership, particularly dog ownership, as a method for reducing cardiovascular disease risk.¹²

Much literature exists showing the positive effects of CAT during routine inpatient admissions. Reductions in length of stay, increased patient mobility, increased quality of life reports, and, interestingly, increase in quality of life reports from patients' caregivers and healthcare teams are demonstrable outcomes of inpatient CAT.^{13–20} Furthermore, studies have shown that if appropriate guidelines are followed, infection transmission is

Key Points

- Canine-assisted therapy is a welcomed adjunct to usual care among hospitalized patients awaiting heart transplantation.
- Canine-assisted therapy is a high-yield, low-effort modality that can be incorporated in the inpatient setting.
- When formal guidelines are followed, the spread of infection remains low.

Table 1. Patient demographics

Average age, y	51.1
Sex, n (%)	
Male	8 (72.7)
Female	3 (27.3)
Etiology of cardiomyopathy, n (%)	
Ischemic	2 (18.2)
Nonischemic/idiopathic	8 (72.3)
Congenital	1 (9.1)
LVAD implanted, n (%)	4 (36.4)
Transplant performed, n (%)	5 (45.5)
Alive at last follow-up, n (%)	7 (63.6)

LVAD, left ventricular assist device.

rare.¹¹ A more detailed overview on infection concerns is presented in the Discussion.

Patients hospitalized pre-HT are known to have lower quality of life scores and increased burden from stress and anxiety during an unpredictable and prolonged hospitalization. Our study aimed to assess whether the effect of CAT can be applied to this patient population. CAT has been described as being a “low-cost, high-yield” program, yet its feasibility in the pre-HT inpatient population is unknown. Our study assessed whether CAT would be feasible in the inpatient setting and whether such a program would be accepted by these patients.

Methods

A 12-month prospective pilot study was performed at an academic medical center from April 2014 to April 2015. The goal of the project was to explore the feasibility of CAT in the pre-HT hospitalized population. Patients admitted to the hospital with heart failure as a primary cause for admission and active listing as status I for HT were approached to participate in the study on day 1 of hospitalization. Patients were included in the study if they agreed to participate and signed a formal consent. Patients included were those hospitalized on a primary heart transplant floor. Patients were excluded if there was a history of infection requiring contact precaution, including methicillin-resistant *Staphylococcus aureus* infection and *Clostridium difficile*, or if the individual had an active infectious process. If a patient was moved to a higher acuity bed such as the intensive care unit, then dog visits would be temporarily suspended until the patient returned to the pre-HT unit. Presence of central lines or mechanical assist devices did not prohibit CAT.

The Caring Canine volunteer service visited each enrolled patient on all days except for holidays and weekends. The volunteer was instructed to interact with the patient based on each patient’s goal for the visit, and the time spent with each patient was based on the individual encounter rather than a defined time period allotment. Patients would decide how long the therapy would last and would decide how much interaction would take place. Such goals were amenable to change based

on patient preference. Each visit met both institutional pet therapy guidelines and guidelines set by Pet Partners, a national organization that certifies handlers and their animals as therapy animal teams. The Caring Canine volunteer service regularly participates in outpatient visits at our facility, particularly in oncology, yet this was the first inpatient interaction. The Caring Canine group visited each patient during the late morning hours in an effort to reduce interruptions with afternoon rounds and testing and would generally make one attempt to visit with each patient. Following each encounter, the Caring Canine volunteer would document both a quantitative measure of how well received the visit was per observed patient response as well as a qualitative description of how each visit went. A formal template was created by the authors and individual training was given to each volunteer. Following transplantation, no visits took place because patients are generally initiated on high-dose immunosuppressive therapy. Additional clinical data were extracted from the electronic medical record. Average quantitative responses, visit time, number of visits, time of visit, and total time of all visits per patient were prospectively recorded. Dogs of all sizes were used in the study and decisions as to dog breed were made based on the volunteers’ schedule and availability. Mayo Clinic institutional review board approval was obtained before initiation of the study.

Results

A total of 11 patients were included in this prospective feasibility study. Patient demographics are listed in Table 1. The average age on admission was 51.1 years and the majority of patients (n = 8, 72.7%) were men. Most patients were diagnosed as having a nonischemic, idiopathic cardiomyopathy (n = 8, 72.3%); four patients (36.4%) had a left ventricular assist device (LVAD) implanted at the time of admission. Five patients (45.5%) had received transplants at last follow-up and seven (63.6%) were living. Two patients were transiently moved to a higher acuity bed in the medical intensive care unit and the visits were temporarily suspended. Visits were resumed immediately upon return of those patients.

A total of 146 individual visits consisting of 2718 total minutes occurred during the study period (Table 2). Each patient received an average of 13.3 visits, with each visit consisting of an average time of 14.7 minutes. The total average time of all visits spent per patient was 247.1 minutes. The Caring Canine volunteers perceived a high level of patient receptiveness, with

Table 2. Dog visit characteristics

Average no. visits, n	13.3
Total no. visits, n	146
Average visit time, min	14.7
Total visit time, min	2718
Average total visit time per patient, min	247.1
Average well-received score (0–10)	9.9

an average score of 9.9 (on a 0–10 rating). Qualitative remarks are listed in Table 3. No negative remarks were noted.

Discussion

Our feasibility study demonstrates that CAT in the inpatient pre-HT population is extremely well received and can be an important benefit of a prolonged hospitalization. Patients appeared to enjoy CAT, as evidenced by an average visit time of almost 15 minutes. Furthermore, all of the qualitative feedback from the volunteers of the Caring Canines was overwhelmingly positive.

One cited concern for canine therapy is the potential for spread of infection. Pre-HT patients can have weakened immune systems as a result of progressive heart failure, and pre-HT patients with LVADs are at higher risk for infection. While maintaining strict institutional infection control policy, no reports of infection were observed during the study period. Our study adds to the current literature by demonstrating safety in the pre-HT population as well as in patients with LVADs. In addition, no issues with intravenous lines, central lines, or ventricular assist devices were seen.

Our institution has strict protocols for CAT based on guidelines from Pet Partners, a national organization that provides certification. Appropriate hygiene practices are undertaken and all handlers carry alcohol-based hand sanitizers that are administered to each person interacting with the canine both before and following the interaction. In addition, all canines in this study are domesticated and have resided in a permanent home for at least 6 months before participation. All of the handlers and canines are registered with national organizations and at least yearly veterinary visits are undertaken. Before enrollment in CAT, evaluation of canine

temperament is performed in an environment that is unknown to the dog. Although no incidents were reported, our institution has protocols in place to immediately withdraw canines from the program until the event is investigated properly.

Although our study includes only pre-HT patients, the results can be extrapolated, in collaboration with the current literature, to other populations in the inpatient setting, particularly patients with extended stays. Other studies have demonstrated the wide use of CAT in emergency department settings, psychiatry units, general medicine units, and intensive care units.¹¹ Our study adds to the current literature by demonstrating its efficacy and safety among a unique patient population. Our study included a relatively small patient population; however, it should be emphasized that the pre-HT inpatient population itself generally is not large at each individual institution, adding to this limitation.

Future intentions based on these results will be to continue CAT in the pre-HT population and to expand CAT to other patient populations because its benefits are well reported and well received. The authors recommend that other institutions consider CAT in the pre-HT population, especially considering the extended lengths of stay and anxiety-related issues that are experienced commonly. The authors also note that it is of particular importance to ensure appropriate safety, and institutional guidelines should be created based on recommendations from national organizations such as Pet Partners.

Study limitations exist. Our patient population was fairly limited, yet only patients listed as status I for HT were included. Our study does not compare quality of life outcomes with patients who did not receive CAT. As such, it is difficult to

Table 3. Select qualitative remarks from canine-assisted therapy volunteers on patient experience

Patient no.	First visit	Last visit
1	Loved Ivy's [dog] visit. Enjoyed how she cuddled up at his feet.	Great visit with patient. He loves our visits and we spent a lot of time with him today.
2	Patient and son greeted us warmly. Petted dog a lot and thanked us.	Really enjoyed Ivy's [dog] visit—misses his dog so much. The family enjoyed her, too.
3	Was looking forward to Ivy's [dog] visit and loved her! Discussed his chocolate lab service dog.	Talked solid for 45 minutes. Nice visit.
4	We had a great visit with patient. He enjoyed Ashby [dog] and she enjoyed him.	Talkative and nice!
5	He loved Pippa [dog]. He hugged and loved on her for a while. Pippa enjoyed every minute of it. He is a delightful man—look forward to our next visit.	Patient wanted us to stay longer, but Emma [dog] was tired.
6	First visit with Ivy [dog]. Lots of smiles.	n/a ^a
7	First visit. She was delighted to meet Pippa [dog].	Patient appeared delighted to see us and she and family members petted our dog and thanked us.
8	First visit went well.	Enjoyed meeting and visiting with Sherman [dog]. Gave comfort to patient and wife.
9	Great experience! Made patient very happy.	n/a ^a
10	Great experience!	Lovely lady. She was very friendly to Pippa [dog]—loved to pet her.
11	Nice visit.	n/a ^a

^aPatients either currently enrolled in study or deceased during study period.

assess quantified differences; however, the overall study goal was to assess feasibility of CAT among this population.

Conclusions

Our study demonstrates that CAT among hospitalized pre-HT patients can be an important and welcomed adjunct to routine medical care. No infection control concerns were encountered during the study period.

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