

## Original Article

# Animal-Assisted Activity at A. Meyer Children's Hospital: A Pilot Study

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The authors systematically studied the introduction of animal-assisted activity into a children's hospital in Italy. This pilot study examined the reactions of children, their parents and the hospital staff and the hospital-wide infection rate before and after the introduction of animals. The SAM (self-assessment manikin), three behavioral scales, analysis of children's graphic productions, a parent questionnaire and a staff questionnaire were used to evaluate the effectiveness of the intervention. The children's participation was calculated. The analysis of the hospital infection rate was completed independently by the Hospital Infections Committee. The authors found that the presence of infections in the wards did not increase and the number of children at the meetings with pets in the wards was high (138 children). The study also found that the presence of animals produced some beneficial effects on children: a better perception of the environment and a good interaction with dogs. All parents were in favor of pets in the hospital, and 94% thought that this activity could benefit the child, as did the medical staff, although the staff needed more information about safety. The introduction of pets into the pediatric wards in an Italian children's hospital was a positive event because of the participation of hospitalized patients, the satisfaction expressed by both parents and medical staff, and the fact that the hospital infection rate did not change and no new infections developed after the introduction of dogs.

**Keywords:** pet therapy – animal assisted activity – children's hospital – children

## Introduction

In the past 30 years several different studies have focused on the interaction between children and animals (1–4). The company of an animal increases children's socialization and their ability to be with others, especially children with health problems (5). For children who are severely ill and hospitalized, and therefore cut off from their everyday lives, animals can be so important that they have been described as a 'liaison with hope'(1). Animals can also help children to cope with separation from their families, chronic diseases, pain, death and bereavement (6).

The term 'pet therapy', a neologism of Anglo-Saxon origin, is a common one and is becoming more so in Italy, even if it is

not a medically exact term. More appropriate terms are 'animal-assisted activity' (AAA) or 'animal-assisted therapy' (AAT).

The goal of AAA is to improve the quality of life of certain categories of people (old people, blind people, terminally ill people), while AAT represents the fundamental part of therapy for some pathologies such as autism and depression (3). In Anna Meyer Children's Hospital a project was planned around AAA. This project was developed by the Pain Service, with the idea of improving the quality of life of hospitalized and non-hospitalized children as well as their parents, and it was part of the 'Pain-free hospital' project because many alternative and complementary techniques are used in the treatment of pediatric pain and anxiety (7,8). Children in difficult situations, such as when they are hospitalized, can interact with animals because animals can act as a 'therapeutic instrument' (9). An intense man–animal relationship is a psychological stimulus that can embrace various aspects of an individual's

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life (social, intellectual, emotional) (10). It has been verified that contact with animals can ease the consequences of separation and loneliness, and it can bring comfort and gratification (11). The relaxing effect of animals has been observed in children affected by attention deficit hyperactive disorder (ADHD) (11) and autism, and it has been found to increase their self-esteem, their capacity to socialize and their language skills (12). Experiments concerning the introduction of animals have been conducted for adult patients in hospitals throughout the United States, Canada and England in the past several years (13–17).

The goal of this pilot study was to evaluate the possibility of carrying out a long-term AAA project in Italian children's hospitals by examining the reactions of children, their parents and medical staff, in terms of appreciation.

## Methods

The project 'Pets in Hospital' started in June 2002 at the A. Meyer Children's Hospital and it was carried out in partnership with the Livia Benini Volunteer Foundation and ONLUS Antropozoa (an association dealing with AAT and AAA). The project took shape as AAA with the goal of gradually introducing animals into hospitals. The animals were four dogs: three female labradors (aged 3, 6 and 8 years) and a 5-year-old mixed-breed male dog. Dogs were trained with regard to their behavior and carefully inspected by a vet: the sanitary protocol that was followed was drafted according to the guidelines of the Delta Society (Draft Guideline for Environmental Infection Control in Healthcare Facilities).

The study protocol was approved by the hospital ethics committee and consent was obtained from both parents and children (if they were able to give it) prior to the study. Animals were treated according to the international ethics agreement of the Delta Society. Animals were introduced in three different phases, as follows:

- (i) Initial phase (3 months)
- (ii) Introduction into the hospital (3 months)
- (iii) Introduction into the wards (6 months)

At first the activity took place in the hospital garden for 3 months (Phase 1); then animals were taken to the hospital emergency room for 3 more months (Phase 2) and finally directly into the wards, where they met children for 6 months (Phase 3). The activity took place once a week for 2 h (usually on Wednesday from 9 a.m. to 11 a.m.) with two animals at a time and with the participation of a multidisciplinary staff made up of an expert in AAA and AAT, a staff member of the hospital's Pain Service and a volunteer from the Livia Benini Foundation. The staff were trained during several preparatory meetings.

This study was conducted during the third phase of the project (January–June 2003), in which animals were introduced randomly into the different wards and allowed to interact with hospitalized children.

Animals were taken into the wards during the 2 h of activity and children were invited to walk to the nearest available space (usually the hallway or the playroom), where there was a specific set-up made up of two blankets spread out on the floor, along with games, drawing materials, dog brushes and informative posters regarding the activity for parents. The goal of this activity was to stimulate children to interact with a dog by walking it, brushing it, combing it and talking to it while staying with it.

## Project Evaluation

We studied the following five factors to determine the success of the project 'Pets in Hospital'.

### Children's Participation

The number of children who took part in the activity was carefully calculated (Table 1) by considering 20 meetings with animals that took place from January to June 2003 (during 20 weeks), predicting that children would interact with animals for at least 5 min. A different ward was chosen for each day of activity, according to the ward's own activity and the possibility of introducing the dogs.

### Infections in the Hospital

After 1 year of dogs being present in the hospital weekly (indoors and outdoors), the Hospital Committee of Infections (CIO) was requested to verify the level of hospital infections and compare it with the previous year's rate, when dogs were not present.

### Children's Pleasure

The children's level of pleasure and ability to participate was evaluated on different scales: the self-assessment manikin (SAM), three behavioral scales and the analysis of the children's drawings (18). The SAM is a non-verbal, pictorial assessment technique that directly measures the pleasure associated with a person's affective reaction to a wide variety of stimuli (19). There are five drawings showing five people with different expressions, the first one is very happy, the last one totally sad. Children were asked which image resembled their current situation. The SAM was shown to 28 children aged 4–12 years right after their time with dogs, and it was shown again to the same children a second time the day after at the same hour (control group). The three behavioral scales were completed by two independent observers during the meeting. The scales evaluated (i) child–animal interaction; (ii) child–environment interaction; (iii) the child's level of intellectual awareness. Scale number 1 (child–animal interaction) was composed of nine items (1, brushing; 2, ordering the dog; 3, petting; 4, playing; 5, nourishing; 6, talking; 7, taking; 8, walking; 9, watching), to which we attributed four scores (active, active if solicited, resistant, passive); scale number 2 (child–environment interaction) had one item, with

five choices of answers (1, interaction adequate; 2, interaction occasional; 3, interaction stimulated; 4, interaction minimal; 5, interaction absent). Scale number 3, which evaluated intellectual awareness, also had only one item with five scores (attention during the activity, attention for the greater part of the time, attention at intervals, lack of attention, incapable of attention). To appraise the scales' reliability in terms of internal coherence (inter-item consistency), Cronbach's alpha was used. Finally, drawings made by children during the activity were analyzed.

### Parents' Level of Satisfaction

Parents whose hospitalized children participated at a meeting with dogs completed a questionnaire (Table 2) with three closed and three open questions concerning their satisfaction with the initiative.

### Staff Members' Level of Satisfaction

To evaluate the interest of staff members a questionnaire with seven questions was completed (Table 3).

**Table 1.** Participation of the children and their parents in the wards

Ward	Meetings	Children present	Parents present	Bedsides
Pediatric clinics	7	61	66	4
Surgery	4	24	24	2
DH AIDS	2	12	7	-
Infectious diseases	2	14	12	-
Blood testing	2	17	15	-
Intensive care unit	1	1	3	1
Oncohematology	1	4	4	-
Diabetology	1	5	6	-
Total	20	138	137	7

**Table 2.** Questionnaire for the parents

Questions	Answer 1	Answer 2	Answer 3
Have you ever heard about animal-assisted activity (or pet therapy)?	No = 21%	Yes = 50%	A little = 29%
What do you think about the interaction between animals and children in a hospital?	Favorable = 100%	Not favorable = 0	Don't know = 0
Do you think that this activity can benefit the child?	Yes = 94%	No = 2%	A little/don't know = 4%
Do you think that this activity can be dangerous for the child?	No = 81%	Yes = 0	Don't know = 19%
Open questions			
What did you like the most?	The welcoming environment (2), children's well-being (4), possibility of interaction with the animals (2), obedience/kindness of the dogs (5), games with the dogs (9), the idea (8), the effort of the personnel (7), the relationship between dogs and children (6), improvement of the hospitalization (2), contact with nature (2), happiness (3), everything (3)		
What did you like less?	Only one dog (1), dogs on a leash (1), the excessive presence of parents and adults (2)		
Which suggestions can you give for the continuation of the activity?	To repeat the initiative (9), to bring other animals (5), dogs in the wards (1), to have more meetings (3)		

## Results

The study found the following results:

- (i) Participation: 138 children took part in the activity (~13 per day, 6.5 at every meeting in the wards). The average age of the participants was 3.5 years, with a prevalence of pre-schoolers and elementary and junior high school children (1–3 years: ~29%; 7–11 years: ~35%; >11 years: ~9%). Table 1 identifies the number of children who participated, the wards visited and the number of parents present at the meetings.
- (ii) The CIO found neither an increase in infections or microorganisms nor contagious diseases transmitted by dogs during their presence in the hospital.
- (iii) For the level of pleasure evaluated through the SAM, the results are given in Fig. 1. The agreement between the two observers who codified the scales data (kappa of Cohen for each item of the three scales) gives broadly significant results, with values among between 0.86 and 0.98. The results of the observation of the interaction of 15 children are shown in Table 4. Finally, 77 children's graphic expressions were collected: 43 were drawings representing 'dogs and animals', 25 were typical pre-schooler drawings and 9 were short poems or thoughts.
- (iv) Forty-six parents completed questionnaires regarding their perception of the dogs' visits. Three parents declined to participate. The answers are given in Table 2.
- (v) A questionnaire was distributed randomly to 55 members of the hospital staff. Out of these, 52 staff members (34 nurses, 16 physicians and 2 assistants) answered. Their responses are shown in Fig. 1.

## Discussion

A. Meyer Children's Hospital, which is in one of Italy's largest cities, has started a project that involves taking small animals

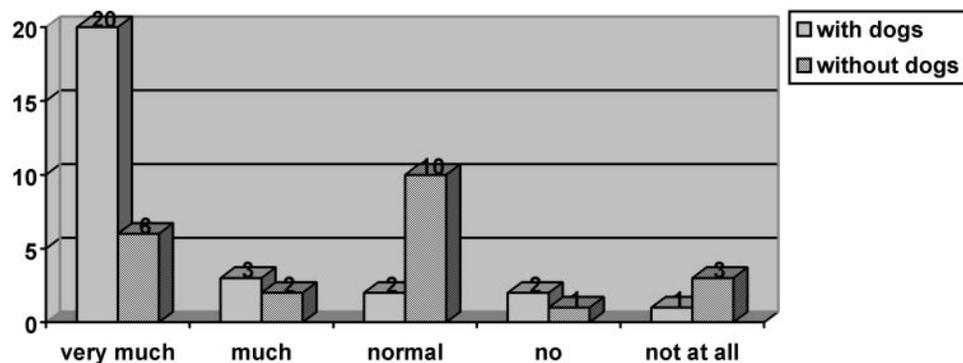


Figure 1. Evaluation of the child's pleasure on a SAM visual scale.

Table 3. Questionnaire for the medical staff

Questions	Answer 1	Answer 2	Answer 3
(1) What do you think about the idea of having children meet with animals in the hospital?	Favorable 48 (92%)	Not favorable 2 (4%)	Indifferent 2 (4%)
(2) In your opinion can this activity benefit the child?	Yes 50 (96%)	No 2 (4%)	Don't know 0
(3) In your opinion can this activity benefit the parents?	Yes 44 (84%)	No 2 (4%)	Don't know 6 (12%)
(4) In your opinion can this activity benefit the medical staff?	Yes 28 (54%)	No 12 (24%)	Don't know 22 (22%)
(5) Do you fear that the dogs might transmit diseases?	Yes 8 (16%)	No 38 (70%)	Don't know 6 (12%)
(6) Do you think that the dogs might bite?	Yes 8 (16%)	No 36 (64%)	Don't know 8 (12%)

into different wards as a means of support for hospitalized children. The aim of the project 'Pets in Hospital' was to introduce dogs into the wards (20,21); only the third phase of the project was evaluated (the introduction of animals into the wards) because the first and second phases were preparatory.

The average data for each ward range between 5 and 16 children per visit, and 6.5 children interacting with the dogs is an acceptable number. The wards involved were primarily general medicine and surgery because the children were hospitalized for a longer period, and they benefited more from the dogs visits. The result given by the CIO is crucial to the success of the project because it shows that the introduction of dogs into the hospital has neither increased infections nor developed new infections. The project was deliberately kept out of the wards where breastfed, newborns and premature babies were hospitalized, as they could not interact with the animals. This explains the prevalence of pre-schoolers (56%), primary school children (35%) and the remaining 9% of pre-adolescent and adolescence patients among our patients. For the evaluation of the children's response, a self-described mood of pleasure and some positive behavioral capacities were

Table 4. Evaluation using a behavioral scale of the ability of the children to participate during meetings with the animals

Observational scale	Score	Final median score
Child-animal interaction	Minimum score 6 Maximum score 42	36
Child-environment interaction	Minimum score 0 Maximum score 4	2
Level of awareness of the child	Minimum score 0 Maximum score 4	3.2

observed due to the dogs' presence. The SAM scale was used at two different times to compare the presence and the absence of animals. After playing with a dog, children usually described their experience as a positive one compared with the following day, when the dog was not there (Fig. 1). From the three different scales of observation regarding the participation of children in the activity, it can be observed that the score on the scale of interaction with the dog is 50% higher than the average score (36 in a range of 0–42), and on the awareness scale the level reached by children during the meeting is 60% higher than the average score (3.2 in comparison to 2 in a range of 0–4). The scale of interaction with the environment is an exception, the score is 2 (in a range of 0–4). These observational data show that children are actively engaged during meetings with dogs in the wards, not only with the animal but also with their environment (personnel and staff); therefore, we can confirm that children are stimulated in terms of their awareness and their relationships with others while participating in the project. For the children's drawings, the study found that more than 50% of children did a drawing or wrote a thought, depending on their age. These data confirmed children's participation and the interest in the pet's presence in the hospital; in fact, children show their emotions and feelings through drawings (16). A questionnaire was given to 49 parents (94% of whom filled out the questionnaire); 100% were in favor of this initiative and 94% thought that the initiative benefited their

children. Nevertheless, the favorable opinion of parents had a negative aspect, because the parents' presence often exceeded that of children, and considering the reduced space for small patients there was often not enough room for parents, who also tended to interact with dogs (see Table 1).

In terms of the doctors and nurses of the children's hospital, 92% of them are favorable toward the project 'Pets in Hospital', acknowledging that it is beneficial for children (96%), for parents (84%) and for the staff themselves (54%), but 16% of the staff fear that dogs might bite or bring diseases into the hospital; therefore, more information is necessary to dispel these fears, as no problem with animals was experienced during 12 months' work, and nothing negative has been reported.

In conclusion, the introduction of AAA into the pediatric wards of a children's hospital seems to be feasible considering the hospitalized patients' participation in this activity, the satisfaction expressed by parents and personnel, and the absence of problems. However, the project needs some adjustments. First, more information is required and parents must be asked to leave their children during meetings with dogs to allow them to become acquainted with the environment. The second critical aspect is to awaken the sensibility of the medical personnel and to give parents better information about the safety of being with the dogs, since for the project to work well it is necessary to have the collaboration of the hospital staff and positive parents. The authors leave one methodological aspect open concerning the need to measure the effectiveness of the dog's presence on the psychological mood of hospitalized children. This pilot study showed that meetings with the animals in the hospital create a sense of well-being and comfort in children inside the hospital environment. However, more studies will be needed to evaluate the psychological and behavioral consequences of interaction between hospitalized children and animals.

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## References

1. McMahon SM. Pets: a source of hope for children with life-threatening illness. In: Addaris D, Deveau E (eds). *Beyond the Innocence of Childhood*, Vol 2. New York: Baywood Publications, 1995.
2. Hart LA. Methods, standards, guidelines, and consideration in selecting animals for animal assisted therapy. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
3. Natoli E. Activities and therapy mediated by animals (pet-therapy): international picture and state of the art in Italy. *Ann Ist Super Sanità* 1997;33:267-72.
4. Friedmann E. The animal-human bond: health and wellness. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
5. Hart LA. Psychosocial benefits of animal companionship. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
6. Tsao JC. CAM for pediatric pain: what is state-of-the-research? *Evid Based Complement Alternat Med* 2006;3:143-4.
7. Tsao JC, Zeltzer LK. Complementary and alternative medicine approaches for pediatric pain: a review of the state-of-the-science. *Evid Based Complement Alternat Med* 2005;2:149-59.
8. Gorgzyca K, Fine A, Spain CV. History, theory and development of human-animal support services for people with AIDS and other chronic/terminal illnesses. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
9. Geisler AM. Companion animals in palliative care: stories from the bedside. *Am J Hosp Palliat Care* 2004;21:285-8.
10. Beck AM. The use of animals to benefit humans: animal-assisted therapy. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
11. Katcher AH, Beck AM. *New Perspectives on our Lives with Animal Companions*. Philadelphia: University of Pennsylvania Press, 1983.
12. Voelker R. Puppy love can be therapeutic, too—medical news and perspectives. *J Am Med Assoc* 1995;274:1897-9.
13. Granger BP, Kogan L. Animal-assisted therapy in specialized settings. In: Fine A (ed). *Handbook on Animal-Assisted Therapy. Theoretical Foundations and Guidelines for Practice*. New York: Academic Press, 2000.
14. Robinson I. Pet therapy. *Nurs Times* 1999;95:33-4.
15. Donowitz LG. Pet therapy. *Pediatr Infect Dis J* 2002;21:64-6.
16. Farkas M. A cold nose can warm the heart. *Mich Health Hosp* 1997;33:38.
17. Davis S. Pet therapy... a pet project. *Director* 1994;2:25.
18. Malchiodi CA. *Capire i disegni infantili*. Torino: Centro Scientifico Editore, 2000.
19. Bradley MM, Lang PJ. Measuring emotion: the self-assessment manikin and the semantic differential. *J Behav Ther Exp Psychiatry* 1994;25:49-59.
20. Bouchard F, Landry M, Belles-Isles M, Gagnon J. A magical dream: a pilot project in animal-assisted therapy in pediatric oncology. *Can Oncol Nurs J* 2004;14:14-7.
21. Gagnon J, Bouchard F, Landry M, Belles-Isles M, Fortier M, Fillion L. Implementing a hospital-based animal therapy program for children with cancer: a descriptive study. *Can Oncol Nurs J* 2004;1:210-22.

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