

Maddie's[®] Shelter Medicine Program at the University of Florida

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We propose a comprehensive shelter medicine program that will focus on four central strategies: (1) shelter evaluation and extension services, including shelter assessments and provision of disease control consultation to enhance the welfare of the animals and the efficiency of the programs in achieving their life-saving goals, (2) training of shelter medicine professionals and general practitioners to fill the current shortage of skilled providers, (3) training of veterinary students in the problems of homeless animals, the animal sheltering system, shelter medicine, and opportunities for careers in the field, and (4) development of new knowledge to solve existing and emerging threats to successful sheltering programs.

Background

Nationally, there is a shortage of veterinarians adequately trained in the clinical, managerial, and legal issues of shelter medicine. Similarly, there is a shortage of veterinarians skilled in high-quality high-volume spay-neuter, considered to be an essential component of reducing the number of unwanted pets. Accompanying this shortfall is a lack of highly trained veterinary technicians who can facilitate and lead programs that benefit sheltered animals. In addition to the lack of highly skilled professionals in this growing field is a lack of basic knowledge about the best methods for controlling infections, reducing the number of unwanted pets, identifying and preventing cruelty, enhancing adoption success and pet retention, and enriching the lives of sheltered animals.

This is a transitional time for the animal welfare field as growing demand for animal-friendly solutions is challenging traditional sheltering paradigms. There is an international desire to shift from a reactive animal control model in which massive numbers of animals are processed through shelters with an overall high euthanasia rate to one in which proactive preventive measures reduce shelter admissions with individualized programs tailored to different types of animals to result in higher save rates.

Attempts to make this change have revealed large gaps in fundamental knowledge regarding the needs of sheltered populations and a shortage of skilled professionals required to implement change. Two recent examples of attempts to reduce shelter euthanasia illustrate dichotomous results. A large American shelter instituted a "No Kill" policy in the absence of methods to balance intakes and departures. The result was severe overcrowding which eventually led to a high shelter death rate (10%) due to infectious diseases and neglect and a high euthanasia rate of >50%. Perhaps more disturbing was the evolution of staff opinion to embrace the deteriorating situation and the inability to either recognize animal suffering or to create effective remediation plans. In a contrasting example, a UK cat sheltering system adopted out 60,000 cats from a series of shelters in 2005 while experiencing only 1.0% deaths in the shelter and 3.8% euthanasias, even though approximately half of the cats were housed in the shelters for more than four weeks. Sheltered cats are notoriously susceptible to upper respiratory infections and panleukopenia virus, yet this large-scale "No Kill" sheltering system in the UK experienced a very high save rate. Clearly, these two

shelters applied different strategies to assure similar goals and had strikingly different results. *Although the commitment to embrace a “No Kill” philosophy in animal sheltering is gaining ground, the currently available tools to achieve it are inadequate.*

Since 2002, Alachua County in Florida has been actively engaged in embracing the “No-Kill” philosophy. The Maddie's[®] Pet Rescue Project has partnered with Maddie's[®] Spay/Neuter Project to end the killing of healthy and treatable shelter dogs and cats countywide. The College of Veterinary Medicine at the University of Florida initiated a limited shelter medicine program in 2003 with partial funding provided by Merial Animal Health and Alachua County Animal Services. This program employs a full-time veterinarian for teaching veterinary students principles of shelter medicine via elective clinical clerkships. In this clerkship veterinary students provide health examinations, spay/neuter surgeries, and medical treatments for dogs and cats housed in the Alachua County Animal Services shelter facility and for the five adoption guarantee groups in Maddie's[®] Pet Rescue Project. Recently, the shelter medicine students have begun weekly visits to the local shelter for homeless and low-income people to provide free care for their pets.

The University of Florida is uniquely positioned to become a center of excellence in shelter medicine in the southeastern United States because of its diverse faculty expertise, location in a region with a large number of animal shelters and rescue groups, and a highly supportive administrative structure. Our current framework upon which to structure a comprehensive shelter medicine program includes:

- Maddie's[®] Pet Rescue Project with five adoption-guarantee groups and one open admission municipal shelter
- Maddie's[®] Spay/Neuter Project
- Elective clinical clerkship in shelter medicine
- Alachua County Veterinary Medical Association
- Expertise in infectious diseases
- Expertise in disaster medicine
- Expertise in high-quality high-volume sterilization
- Expertise in animal behavior
- Expertise in animal nutrition
- Expertise in grief counseling and compassion fatigue
- Well-established feral cat trap-neuter-return program
- School of Public Health
- Maples Center for Forensic Medicine
- School of Building Construction and Design
- Network of five certified veterinary technician schools in Florida
- Relationship with the North American Veterinary Conference

Overview of Proposed Activities of Maddie's[®] Shelter Medicine Program at the University of Florida

(1) Shelter Assessment and Disease Control Extension Services for Shelters

Shelter Health Assessment Services

- Just as a physical examination includes an evaluation of all body systems in the context of the animal's history and the owner's goals and expectations, a complete shelter health assessment should include information about the shelter's mission and specific goals for the assessment. The goal of the evaluation should be to improve the shelter's ability to achieve their overall mission as well as improving shelter animal health and well being. In this context, systems to be evaluated would potentially include:
 - Statistical analysis and tracking
 - Population management
 - Isolation and segregation
 - Intake process
 - Parasite control
 - Vaccination
 - Veterinary services
 - On-site veterinary services vs. dependency on community clinics
 - Adequacy of hours/services
 - Standard surgical practices
 - Disease recognition and diagnosis
 - Treatment for common diseases
 - Nutrition/feeding
 - Euthanasia (process and procedure)
 - Kennel cleaning
 - Cleaning other areas (common areas, vehicles, dishes, etc.)
 - Cat and dog housing
 - Cat and dog enrichment/stress management
 - Behavior evaluation
- Some shelters may require a very focused analysis based on solving a specific challenge or responding to a particular opportunity, from controlling an outbreak of ringworm to developing new housing for cats. Shelters may specifically request assistance with facility design as they plan for a new or expanded structure. Some shelters may request a full shelter health evaluation encompassing all of the above areas. Sometimes this happens in response to external or internal criticism, or following a disaster or some kind, but increasingly this is also requested in response to a major opportunity for change (e.g. a shelter has funding opportunity and would like to spend it to best effect) or “prophylactically” to ensure best policies and practices. Formal shelter health consultations are a powerful tool to change the outcome for literally thousands of animals that pass through the shelters benefitting from this service. In addition, much is learned from each consultation: shelter staff and management learn from our report and recommendations; veterinary students and residents learn about shelter operations and needs; and we at the shelter medicine program learn with each consultation how to make

this service more effective. A focus of our shelter medicine program will include shelter health assessments. The scope of these assessments may vary and may include:

- Review of written protocols or shelter design plans
- Self-assessment for shelters via a web-based tool
- Extensive site visit and observations

Disease Diagnostic, Control, and Prevention Services

- Contagious infectious diseases are the most significant threat to the welfare of shelter populations and have a direct impact on the numbers of animals euthanized or adopted. Transmission of infections is an inherent and persistent risk in shelters. Vulnerability to infection is enhanced by high population density, admission of animals with unknown exposure to infectious agents, lack of protective immunity, stress, debilitation, concurrent parasitism, facility deficiencies in housing space and ventilation, and improper infection control procedures. Continual problems with infectious diseases in shelters result in animal suffering, increased euthanasia, decreased or delayed adoptions, low staff morale, financial stress, and compromised relations with the public and community veterinarians.
- The temperate climate in the southeastern United States favors year-round endemicity of common infectious diseases as well as the emergence of diseases that are uncommon in other regions of the country. Many regional shelters not only battle disease in a few animals on continual basis, but may also be devastated by outbreaks involving large numbers of animals accompanied by high morbidity and mortality. The causes of endemic disease or infectious disease outbreaks are rarely determined due to budget constraints and lack of expertise in proper procedures for diagnostic testing. Consequently, intervention and prevention strategies are hampered by speculation on causes in lieu of accurate diagnosis. Frequently, the persistence of the problem leads shelters to accept a diseased population as the “norm” for which there is no realistic solution or enter into cycles of depopulation and repopulation with new animals.
- The need for disease detection and management services in the regional shelter community is underscored by recent, highly publicized disease outbreaks involving thousands of dogs in several shelters throughout Florida and other states, many of which elected to depopulate as a means for control. Since disease problems have a major impact on shelter animal health and welfare, we believe that a cornerstone of a comprehensive shelter medicine program is the provision of disease diagnostic, control, and prevention services to sheltering facilities focusing on the southeastern United States. The fundamentals of this infectious disease management service include:
 - Diagnostic testing to identify infectious agents
 - Formulation of control/eradication strategies appropriate for the agent identified
 - Formulation of prevention strategies to minimize recurrence
 - Outcome assessment by surveillance and adoption/euthanasia statistics, using the Maddie’s Fund monthly reporting system based on the Asilomar Accords when possible.
 - Provision of disease prevention resources for shelter managers and veterinarians

- Continuing education delivered by website, webinars, seminars, conferences, and workshops

(2) Advanced Training of Shelter Medicine Professionals

- Residency Program for Shelter Medicine Specialists (to start in the second year of the project)
 - There is a critical shortage of specialists in shelter medicine and an urgent unmet need for consultants to help shelters develop effective medical programs that keep animals healthy and facilitate their placement into homes. To meet this need, shelter medicine residents will receive intensive training in epidemiology, infectious diseases, internal medicine, surgery, facilities management, data management, disaster medicine, behavior, environmental enrichment, and forensics. The residency training period is three years.
 - Residents will be dual-enrolled in a Masters of Public Health or Master of Science program and will be qualified for board certification by the American College of Veterinary Preventive Medicine or the American Board of Veterinary Practitioners pending availability of a new separate board certification process in shelter medicine.
 - We will train three residents at a time, adding one new resident a year starting in the second year of the Maddie's[®] Shelter Medicine Program. This will assure that there is always a first-, second-, and third-year resident in the training program and will provide a critical mass for a robust learning environment. Residents will participate in journal clubs, seminar series, national on-line shelter rounds, and phone or email consultations with shelters. In addition, each resident is expected to visit at least 50 different shelters during the three-year program. A high priority will be placed on assuring visits to a variety of different sheltering models, including open admission, adoption-guarantee, private nonprofit, municipal, rural, urban, successful, and struggling shelters. A core component of the training program will be to participate in detailed on-site shelter consultations alongside shelter medicine faculty. In the third year of the program, residents will complete these consultations independently with faculty supervision available upon request.
 - Each resident is expected to complete and publish a research project on a topic of current importance to shelter medicine. In addition, a second publication, such as a case study, is required.
 - If a suitable candidate for a residency position cannot be recruited, the position may be temporarily replaced with a one-year internship in shelter medicine. If no house officer trainees are available for a period of time, the program will contract with a part-time shelter veterinarian to assist with shelter consultations. The goal for a fully staffed shelter medicine residency over the six-year funding period is three residents who have completed their training program, one resident who has completed two years of the program, and one resident who has completed one year of the program. Since this is a new program and there is not yet board

certification available in the specialty of shelter medicine, it is possible that it will not be feasible to recruit the full complement of residents expected. Maddie's[®] Shelter Medicine Program at the University of Florida will be considered successful if a total of three residents are recruited into the program over the five-year resident funding period.

- Training Program for Shelter Specialty Technicians
 - The unique skill set required for effective veterinary technician deployment in shelters has yet to be formally addressed. Technician training schools focus on the care of one animal at a time, frequently under the direct supervision of a veterinarian. Shelter technicians often have hundreds of animals under their care and frequently work without veterinary supervision. Skilled shelter technicians can play a key role in keeping their shelters healthy by vigilant surveillance, development of effective infection control procedures, enriching the shelter environment, and supervising lay staff. Our shelter medicine program will include a continuing education track for shelter technicians that may be delivered via conferences at the veterinary school or regional centers, lectures or courses at technician training schools, or distance learning opportunities. This program is expected to both enhance the capability of shelter technicians as well as to reduce burn-out and improve recruitment to shelter positions.

- Training Program in Veterinary Disaster Medicine
 - The state of Florida has an excellent disaster response team (State Agricultural Response Team, SART) in place, and many first responders are members of the veterinary faculty and staff. The University of Florida Veterinary Emergency Treatment Service (UF VETS) is a state-supported resource for SART and part of the college's commitment to providing care for animals displaced by natural and man-made disasters. Our current role is to provide assessment of animal care infrastructure in the early hours following a disaster, to provide logistical support as requested by disaster managers, to oversee and provide medical assistance to animals temporarily housed in shelters, and to help shelters and veterinary clinics resume operations following a disaster so that they can take over the care of homeless and injured animals. Under Maddie's[®] Shelter Medicine Program at the University of Florida, we will expand this role to provide training in disaster medicine to veterinary students, shelter medicine residents, veterinarians, technicians, and shelter workers via a series of courses, laboratories, and field exercises:
 - Veterinary Disaster Response course
 - Disaster Shelter Manager seminars
 - Annual Field Exercise Training event

- Training Program in Veterinary Forensic Medicine
 - Shelters are the primary agencies that encounter animal cruelty. Shelter veterinarians are the professionals most likely to be asked to render expert opinions regarding suspected cruelty cases, and their involvement is critical to a

successful outcome. The veterinarian and shelter staff are often the first ones to recognize signs of abuse on intake examinations, and the investigations are usually conducted by officers of the shelter or local law enforcement, depending on the jurisdiction. The role of the veterinarian is critical with cruelty investigations, and includes documentation of physical findings of abuse, collection of evidence, provision of treatment, working with the prosecutor on case strategy, and eventually testifying in court. They have an additional role at the crime scene. All crime scene findings must be interpreted in the context of the behavior of the victim. Veterinarians and veterinary technicians/assistants are far more qualified to examine animal victims than investigators of human victims to interpret crime scenes. The veterinary professional should be at the scene or otherwise assist investigators with their crime scene analysis. The core issue for animal cruelty investigations is training and education. The historical lack of investigation and prosecution of animal cruelty cases is primarily due to lack of recognition, lack of knowledge of investigation procedures, and lack of knowledge of available professional resources and expertise.

- We propose to provide training for veterinary students, shelter medicine residents, shelter veterinarians and veterinary technicians, and animal cruelty investigators with a series of intensive workshops and an elective course for veterinary students. We will take advantage of unique regional resources that provide expertise in animal forensic investigations, including the University of Florida's Maples Center for Forensic Medicine and Dr. Melinda Merck's veterinary forensic consultation service.
- Effective crime-scene investigation of animal victims is hindered by the lack of veterinary-specific scientific data to assist in the interpretation of evidence. In addition to providing training programs for forensic investigations, we will engage in research to enhance the science of animal cruelty investigations.

(3) Veterinary Student Training

- Providing extensive training programs in shelter medicine to veterinary students serves several purposes. First, graduate veterinarians with strong skills in companion animal group health and sterilization needed by shelters are in critically short supply. Second, students exposed to the sheltering system who witness the problems of animal homelessness first-hand will graduate with a clear understanding of the urgency of the problem and how they are positioned as veterinary professionals to provide key leadership to benefit shelters. Thus, even those students who do not elect to pursue a career in shelter medicine are likely to be supportive of those who do or to help in smaller ways through their own private practices. We propose to develop a curriculum that reaches all students in their core (required) course work and provides advanced training opportunities for those with an interest in shelter medicine.
- Proposed New Veterinary Student Curriculum
 - Lectures in core (required) courses
 - Shelter medicine elective course

- Veterinary forensics elective course
- Disaster medicine elective course
- Shelter behavior medicine elective course
- Continuation of the existing shelter medicine elective clerkship. This clerkship focuses on concepts pertaining to animal sheltering, companion animal group health, spay/neuter surgical techniques, and visits to the local animal control facility and local adoption guarantee groups
- New advanced shelter medicine elective clinical clerkship for a limited number of exceptional students with a special interest in shelter medicine. This clerkship will focus on additional aspects of shelter medicine that include an increased emphasis on infection control, group health, and high volume surgical spay/neuter techniques. Students will accompany faculty and residents on shelter consultation visits to a variety of different types of shelters and participate in diagnostic sample collection, facility review, and written shelter evaluations. If approved, it may also be possible to accept students from other veterinary colleges into this clerkship in order to expand the reach of this opportunity to schools that do not offer similar shelter medicine training for their students.
- Externship at High Quality High-Volume Spay-Neuter programs
- Maddie's[®] Shelter Medicine Externship stipends for exceptional students to visit leading adoption-guarantee shelters in the U.S.

(4) Development and Dissemination of New Knowledge to Enhance the Well-Being of Sheltered Animals

- Maddie's[®] Shelter Medicine Program at the University of Florida will have a substantial research component.
 - Practical research projects aimed at providing data to inform and validate our recommendations are an essential component of a comprehensive shelter program. Our projects will focus on issues of particular importance in the southeastern United States. In this region, infectious diseases currently appear to be the most significant threat to the well-being of sheltered animals. In many cases, the source material for our scientific publications is likely to originate in the shelters where we are performing diagnostic and consultative services. We believe that by sharing our findings with the entire sheltering community we can have a much greater impact than by individual consultations alone. University of Florida researchers have established expertise in infectious disease, population medicine, epidemiology, anesthesia and surgery, and feral cat populations. These research projects will be conducted *in vitro* or in the shelter environment where the studied animals benefit from the interventions. No research that is harmful to animals will be conducted under this program. We will develop research opportunities for veterinary students, residents, and junior faculty under the supervision of seasoned investigators. This will help expand the capacity to develop sound solutions for critical issues in shelter medicine. *This program will become a national leader in shelter-based research and will ultimately provide evidence-based recommendations for shelter medicine.*
 - Funding mechanisms for shelter medicine research projects include:

- Maddie's Fund stipend for summer research by veterinary students (included in this proposal)
 - Merck-Merial Veterinary Scholars Research Training Grant
 - Intramural grant competitions for faculty, residents, and students
 - Extramural grant competitions for faculty and residents
 - Separate research proposal to Maddie's Fund
- Development of a Shelter Medicine Website
 - The website for Maddie's[®] Shelter Medicine Program at the University of Florida will provide helpful information to the shelter community both locally and throughout the United States. We will develop freely available protocols, case studies of successful and failed shelter interventions, updates on disease outbreaks, and self-assessment tools for shelters to use. We envision that a number of the lectures and training programs offered at the University of Florida can be developed into distance learning opportunities that can be used to enhance shelter medicine internationally.
- Shelter Medicine Symposia
 - There will be an annual conference hosted by the University of Florida, College of Veterinary Medicine. This conference will be of particular interest to animal shelter managers, animal control officers, shelter veterinarians and veterinary technicians, and will cover a number of topics related to animal sheltering.
 - These annual conferences will also enable us to develop more networking within the shelter community, and the topics of discussion will be driven by issues of importance to the participants. Elements of the conference may be captured into continuing education programs available on the website for wider distribution.
- Continuing Education Seminars
 - Both residents and faculty are expected to make presentations on topics of shelter medicine at regional, national, and international veterinary continuing education meetings. In addition, they are expected to make themselves available for participation in shelter medicine programs at other institutions.
- Directory of Shelters and Rescue/Adoption Groups in the Southeastern United States.
 - It is our goal for Maddie's[®] Shelter Medicine Program at the University of Florida to serve as a valuable resource for the southeastern United States. To be effective, we must be able to contact regional shelters and rescue/adoption groups with news updates and notice of opportunities to participate in research studies, training courses, and shelter evaluations.
 - Currently, there are no complete directories of shelters and rescue/adoption groups available for the southeastern United States. Therefore, an early task is to compile an up-to-date list of sheltering facilities and rescue/adoption foster networks. We have acquired mailing and contact lists from the Humane Society of the United States, the American Society for the Prevention of Cruelty to Animals,

and the National Animal Control Association. Each list has approximately 1,000 to 2000 listings for agencies in the Southeast region encompassed by Florida, Mississippi, Alabama, and Georgia. We also plan to access on-line directories operated by Petfinder[®] and the Florida Animal Control Association. The lists will be compiled into a single document and then refined to consolidate agencies with multiple listings. Once a single list is compiled, each agency will be individually contacted to determine its current address and contact information as well as to establish whether the agency has a bricks-and-mortar facility for housing animals or if it is a foster network. The College of Veterinary Medicine has allocated \$10,000 to pay three undergraduate students to complete the directory.

(5) Collaboration with Other Shelter Medicine Programs

- The specialty of shelter medicine is very young and the pool of experts available to expand knowledge, perform consultations, and train more experts is quite small. At this time, less than half of veterinary schools have any emphasis on shelter medicine training at all. Of those schools that do engage in shelter medicine training, specific topics of expertise are quite variable depending on the location. As such, we believe it is important to develop strong collaborations among the existing programs to share expertise, training opportunities, and resources. Not only does this increase the breadth of expertise across collaborating programs, it also provides an opportunity for some degree of standardization, increasing the potential for the leaders in the field to speak with a unified voice and to avoid inadvertent conflicting messages. We have already begun discussions with program directors at other institutions, including Cornell, UC Davis, Pennsylvania, Mississippi, and Iowa regarding collaboration in the following areas:
 - Standardization of shelter medicine residency requirements and development of a board specialty in shelter medicine
 - Creation of a single national collaborative shelter health web portal containing disease control information and shelter self-assessment tools
 - Sharing of distance learning materials across programs
 - Development of training centers for residents and interns to gain skills not available at their home institution
 - National web-based or teleconference shelter medicine journal club
 - Faculty and resident exchanges to provide lectures and other training opportunities where none currently exist

(6) Naming Opportunities, Recognition Plan, and Institutional Commitment to the Program

- The program will be named Maddie's[®] Shelter Medicine Program at the University of Florida for as long as the program is sponsored by Maddie's Fund.
- Each of the positions funded by the program will be named for Maddie's Fund:
 - Maddie's[®] Professor of Shelter Medicine
 - Maddie's[®] Clinical Assistant Professor of Shelter Medicine
 - Maddie's[®] Shelter Medicine Resident

- Maddie's[®] Shelter Medicine Program Coordinator
- All course materials provided to students and other participants in training programs will acknowledge the support of Maddie's[®] Shelter Medicine Program at the University of Florida and will feature both the Maddie's Fund logo and the University of Florida logo.
- All reports and presentations by faculty and residents will acknowledge the support of Maddie's[®] Shelter Medicine Program at the University of Florida and will feature both the Maddie's Fund logo and the University of Florida logo.
- The College will host website space. The program website will prominently feature the sponsorship of Maddie's Fund, the Maddie's Fund logo, and the story of Maddie.
- All publications will describe author affiliations as Maddie's[®] Shelter Medicine Program at the University of Florida in place of an academic department.
- A Maddie's[®] Shelter Medicine Program at the University of Florida banner will be displayed at shelter medicine field exercises and public events.
- An effort will be made to secure press coverage for important events and discoveries made by the program. These media opportunities will include a description of Maddie's Fund's role in the project.
- The College of Veterinary Medicine will make several investments in Maddie's[®] Shelter Medicine Program at the University of Florida. Alternative funding has been secured from Merial for the third faculty member, Dr. Natalie Isaza, who teaches the shelter medicine elective clerkship and who will coordinate the new shelter medicine didactic course. Although this is currently a full-time position, funding is renewed annually and is not permanently secure. Efforts are underway to acquire endowment funds to permanently support the position. However, at the present time, it is not possible to guarantee this as a permanent full-time position. Approximately 0.1 FTE for the Director of Medical/Health Administration, Mr. John Haven, will be released for managing the disaster medicine courses and training exercises, and CVM disaster responses. The College has provided funds to develop an up-to-date shelter directory for the southeastern United States. The College will also provide a full-time biological scientist to assist with shelter medicine research projects. The College will provide a minimum of 800 square feet of modern laboratory space equipped with a biosafety cabinet, chemical hood, centrifuges, refrigeration, computers, PCR equipment, and other basic laboratory equipment. Office space with telephone and Internet access will be provided for the faculty, program coordinator, and residents.

(7) Funding Plan

- Maddie's Fund will provide three years of funding at the initiation of the program. It is understood that if the program meets its objectives as outlined in this proposal, then the second three-year allotment of funding would be awarded and the program would continue as described. However, there will also be an opportunity at the end of the first three years to revise the plan for the second half of the program to better meet current needs and opportunities that have developed since the start of the program, as long as both Maddie's Fund and the University of Florida agree to the changes.

(8) Personnel

- The following positions are proposed for funding by Maddie's[®] Shelter Medicine Program at the University of Florida, the University of Florida, or other sources as described. Although we have proposed named individuals to fill some of the positions, it is possible that personal situations or new opportunities could arise in which alternate appointments could be made to the named positions.
 - Maddie's[®] Professor of Shelter Medicine (Julie Levy, DVM, PhD, DACVIM). Program director duties include written annual reports and verbal quarterly reports to Maddie's Fund, research coordinator, residency supervisor, shelter consultations, personnel supervisor, and course instructor. Dr. Levy will be assigned 1.0 FTE to the shelter medicine program (job classification: Professor, funded by the Maddie's Fund).
 - Maddie's[®] Clinical Assistant Professor of Shelter Medicine (Cynda Crawford, DVM, PhD). Duties include direction of the shelter disease diagnosis, control, and prevention program, development of shelter health assessment tools, course instructor, resident training, research, and course coordinator for the disaster medicine course. Dr. Crawford will be assigned 1.0 FTE to the shelter medicine program (job classification: Clinical Assistant Professor, funded by Maddie's fund).
 - Merial[®] Clinical Assistant Professor of Shelter Medicine (Natalie Isaza, DVM). Duties include veterinary student clinical teaching, course instruction, and course coordinator for the shelter medicine course. Dr. Isaza is assigned 1.0 FTE to the shelter medicine elective clerkship, but her salary is contributed by the College (job classification: Clinical Assistant Professor, funded by the College).
 - Shelter Medicine Research Technician (Sylvia Tucker, BS). Duties include participation in data collection, development of standard operating procedures, sample archives, maintaining records, fiscal administration, coordination of shelter research, supervision of temporary student research assistants, and compilation of data for completed projects. Ms. Tucker is assigned 1.0 FTE to the program (job classification: Biological Scientist grade 24, funded by the College).
 - Maddie's[®] Shelter Medicine Program Coordinator (TBA). Duties include fiscal administration, personnel and equipment management, coordination of shelter outreach programs, maintenance of website, organization of continuing education programs, primary public contact for the program. The program coordinator will be assigned 1.0 FTE to the program (job classification: Administrative Services Coordinator grade 4, funded by Maddie's Fund).
 - Maddie's[®] Shelter Medicine Residents (TBA). Duties include veterinary student instruction, participation in related clinical clerkships outside of shelter medicine, participation in shelter outreach and consultations, completion and publication of at least one shelter medicine related research project and a second paper such as a case report, and completion of the Master of Public Health or Masters of Science

degree by the final year of the program. The residents will be assigned 1.0 FTE to the combined residency/masters program (funded by Maddie's Fund).

- Forensic Medicine Instructor (Melinda Merck, DVM). Duties include development of curriculum for veterinary students, veterinarians, crime scene investigators, and law enforcement personnel, including didactic lectures, laboratories, short courses, and distance learning methods. Dr. Merck's salary is paid by the American Society for the Prevention of Cruelty to Animals. Dr. Merck lives in Georgia and will commute to Florida to teach as an adjunct faculty member. Dr. Merck will be assigned 0.1 FTE to the disaster medicine training program (job classification: affiliated clinical assistant professor of forensic medicine, funded by the ASPCA)
- Disaster Medicine Instructor (Mr. John Haven). Duties include development of curriculum for veterinary students, technicians, veterinarians, and shelter personnel, including didactic lectures, laboratories, short courses, and distance learning methods. Mr. Haven's salary is paid by the College. Mr. Haven will be assigned 0.1 FTE to disaster medicine training program (job classification: Director of Medical/Health Administration, funded by the College).

APPENDIX CONTENTS

1. Detail of Disease Diagnostic, Control, and Prevention Services for Shelters
2. Ten New Lectures in Shelter Medicine for the Core (Required) Veterinary Student Curriculum
3. Four New Elective Courses for Veterinary Students
4. Detail of Disaster Medicine Training
5. Detail of Veterinary Forensic Medicine Training
6. Budget

Disease Diagnostic, Control, and Prevention Services for Shelters To be Initiated in the First Year

- Diagnostic testing
 - Rapid identification of disease agents leads to early targeted intervention, resulting in decreased number of affected animals, less euthanasia, and less disruption of adoption programs.
 - Site visits to shelters experiencing increased frequency of disease are essential for evaluation of the animals and facility and collection of proper samples for diagnostic testing. The investigation teams will include Dr. Crawford, shelter medicine residents, and veterinary students on the shelter medicine clinical rotation. Dr. Crawford will supervise the assessments and sample collection by first- and second-year residents and students. Residents in the third year of training will lead their own teams, thereby expanding coverage of Florida and other states in the Southeast region.
 - Samples will be collected to test for bacterial and viral respiratory pathogens, infectious causes of vomiting/diarrhea, parasitic diseases, communicable skin diseases, and other causes of unexplained morbidity and mortality.
 - Testing of collected samples will be provided by Dr. Crawford's laboratory, the diagnostic laboratory and pathology services at the University of Florida College of Veterinary Medicine, national reference laboratories, and laboratories with specialized expertise.
 - Diagnostic expertise
 - In the past two years, Dr. Crawford has visited sixteen shelters in Florida with disease outbreaks in their dog populations. In February 2008 alone, she traveled to five shelters for assessment and diagnosis of infectious disease outbreaks. Diagnostic testing identified infections by well-known pathogens such as canine distemper virus, adenovirus, and parainfluenza virus, as well as infections due to new pathogens, including canine influenza virus, respiratory coronavirus, and *Streptococcus equi zooepidemicus* bacteria. Rapid identification of the pathogens provided essential information for management decisions by shelter directors and veterinarians. Dr. Crawford is recognized for her expertise in diagnosis of respiratory infections and experience with novel pathogens that impact shelter populations.
 - Dr. Levy is an internationally-recognized expert in feline infectious diseases, including those thought to commonly affect cats in shelters. She has also been instrumental in development and validation of commercially available in-clinic diagnostic kits frequently utilized by shelters.
- Formulation of control/eradication strategies based on diagnosis

- Determining the diagnosis allows for targeted control/eradication strategies that increase the success rate of intervention.
- Under supervision by Drs. Crawford and Levy, residents and veterinary students will formulate intervention strategies based on the transmission characteristics of the pathogen, the incubation and shedding times for the pathogen, whether the disease is treatable, the number and location of sick or exposed animals, the number and location of unexposed animals, space to separate exposed and unexposed populations in the facility, and availability of local adoption partners or other sheltering facilities to provide additional space for temporary relocation. The residents and students will also assist with implementation on site.
- Intervention experience
 - Drs. Crawford and Levy collaborated with a team of experts from the UC-Davis shelter medicine program in the formulation and implementation of strategies for successful eradication of canine distemper infection from the Alachua County Animal Services facility and local adoption partners in 2007. Maddie's Fund provided support for the University of Florida to determine appropriate management of the dog population to break the cycle of disease transmission within the shelter.
 - Dr. Crawford has provided management strategies for canine influenza outbreaks in several Florida shelters as well as shelters across the U.S. since 2005. She first discovered and reported the canine influenza virus in kennel racing greyhounds and subsequently in sheltered dogs and is considered the world's expert in canine influenza in shelters.
 - Most recently, Dr. Crawford diagnosed an outbreak of *Streptococcus equi zooepidemicus* bacterial infection in dogs in the largest shelter facility in Florida. This outbreak caused the acute death of sixteen dogs in three days. The shelter veterinarian was advised by other parties to depopulate all dogs and cats in the shelter to stop the outbreak. Dr. Crawford suggested location of all exposed animals in one area, creation of a separate clean space for new animals, division of the staff into teams specific for the exposed and unexposed animals, and treating all the animals with prophylactic antibiotics. This strategy proved effective since no more dogs developed infection and depopulation was avoided.
 - Dr. Crawford has also recently documented the association of canine respiratory coronavirus with disease outbreaks in dogs in four Florida shelters. While this relatively new respiratory pathogen is known to affect kennel dogs in the U.K., this is the first evidence for its involvement in respiratory disease outbreaks in dog populations in the U.S.
 - Dr. Levy has served as a consultant for intervention of several feline infectious diseases in shelters, including panleukopenia, viral respiratory infections, and retroviral infections.

- Formulation of prevention strategies to minimize recurrence
 - The ultimate goal of shelter medicine is prevention of disease recurrence, not reliance on continual disease interventions.
 - Under supervision by Drs. Crawford and Levy, residents and veterinary students will formulate prevention strategies based on vaccination, directed animal movement from intake wards to adoption wards, cleaning/disinfection protocols, establishment of an isolation area for sick animals, separation of puppies and kittens from adults, and decreasing population density by increasing movement of animals out of the facility in a timely manner.
 - Identification of risk factors predisposing to infectious disease outbreaks is a vital component of prevention strategies. Residents and veterinary students will learn to recognize these risk factors during their on-site evaluations of shelters and translate them into their prevention strategies.
 - Experience in risk factor assessment
 - With funding provided by Maddie's Fund, Drs. Crawford and Levy recently assessed the risk for re-introduction of canine distemper into the Alachua County Animal Services facility following the intervention phase. They collected blood samples from more than 500 dogs at intake and determined that nearly 60% of these dogs did not have protective levels of immunity to distemper virus. This suggests that if the virus was re-introduced into the shelter by an infected dog, more than half the dog population would be vulnerable to infection, leading to another distemper outbreak and increased euthanasia.
 - Dr. Crawford has published and presented information at local and national conferences on the risk of canine influenza in shelters and identified some of the factors predisposing to an outbreak.
- Outcome assessment by disease surveillance and adoption/euthanasia statistics
 - The success of a prevention strategy can be measured by subsequent data collection and analysis. The goal is to increase adoption and decrease the euthanasia rate due to disease. A healthy population is an adoptable population.
 - Residents and students will design a surveillance program to serve as one measure of outcome. Surveillance strategies include education of shelter staff on close observation of all animals at intake and frequent observation thereafter for clinical signs of disease, rapid reporting of suspected cases, proper collection of clinical samples from suspect cases for diagnostic testing (passive surveillance), and a regular schedule of sample collection from randomly selected dogs for pathogen screening (active surveillance).
 - Another measure of outcome will be analysis of shelter statistics following implementation of prevention strategies, including number of admissions, number

of sick animals, number of animals euthanized due to disease, number of adoptions or transfers to adoption groups, average daily population census, and length of stay in shelter.

- Provision of disease prevention resources for shelter managers, veterinarians, and veterinary technicians
 - Residents will create and update a virtual library on the freely available shelter medicine website that provides resources on disease detection, management, and prevention for shelter managers, staff, and veterinarians.
 - Drs. Crawford and Levy and the residents will be available for disease-related consultations by telephone and email.
- Continuing education
 - Presentations at local, state, and national meetings on shelter medicine
 - Annual shelter medicine seminar at the University of Florida College of Veterinary Medicine or other centrally located sites in Florida
 - Hosting of and participation in local, regional, and national webinars and workshops

Ten New Lectures in Shelter Medicine for the Core (Required) Veterinary Student Curriculum

To be Phased into the Curriculum over Four Years

The addition of the following lectures in established courses will be submitted to the faculty for adoption into the veterinary core curriculum. The UF CVM is currently performing a curriculum review, and it is likely that substantial reorganization of the curriculum, including addition and deletion of some current courses, will result over the next two years. Thus, it is not possible at this time to assure inclusion of these suggested lectures in the required curriculum. Our goal is to integrate at least four of the following ten lectures in the core curriculum within four years. Suggested instructors for each lecture are listed.

Freshman Fall

- VEM 5001 Career Opportunities in Veterinary Medicine
Shelter Medicine: Dr. Sara Pizano and Dr. Kelly Ann Rada, Miami-Dade Animal Care and Control; or Dr. Gloria Livadas and Dr. Fran Chuilli, Palm Beach Animal Care and Control; or Dr. Isabelle Roese and Dr. Lisa Centonze, Hillsborough County Animal Services
- VEM 5008 Veterinary Professional Development
The veterinarian's role in animal welfare: Dr. Phil Bushby, Mississippi State University
- VEM 5110 Animal Systems One
Vaccination in the high-risk environment: Dr. Cynda Crawford

Freshman Spring

- VEM 5041 Professional Ethics in Veterinary Medicine
The duty of veterinarians in cruelty cases: Dr. Lila Miller or Dr. Melinda Merck, ASPCA
- VEM 5191 Introduction to Veterinary Behavior
Environmental enrichment of dogs and cats in sheltering facilities: Dr. Gary Patronek, Animal Rescue League in Boston; or Dr. Brenda Griffin, Cornell University
Temperament assessment in shelters: Dr. Brenda Griffin, Cornell University

Sophomore Fall

- VEM 5278 Theriogenology
The ideal age for neutering: Dr. Julie Levy
- VEM 5141 Veterinary Microbiology
Infection control in shelters and clinics: Dr. Cynda Crawford

Sophomore Spring

- VEM 5503 Veterinary Epidemiology
Companion animal disease outbreak management: Dr. Cynda Crawford
Pet homelessness, zoonotic diseases, and public health: Dr. Julie Levy

Four New Elective Courses for Veterinary Students To be Phased into the Curriculum over Two Years

We have identified four elective course topics that would constitute enhancements to veterinary student instruction in the field of shelter medicine. Our goal would be to introduce two of the courses during the first one to two years of Maddie's[®] Shelter Medicine Program at the University of Florida. A third and possibly a fourth course may be introduced within the first four years of the program. Additional advanced courses may be developed based on response to the introductory shelter medicine courses.

- Shelter Medicine
- Introduction to Veterinary Disaster Response
- Veterinary Forensic Medicine
- Shelter Behavior Medicine

The first three courses would be conducted in traditional lecture and laboratory formats at the UF CVM. At the present time, there is no instructor available to teach Shelter Behavior Medicine at the University of Florida. We have arranged for our residents to travel to Cornell University for an intensive two- to three-week course in shelter behavior medicine taught by Dr. Brenda Griffin, Maddie's[®] Shelter Medicine Clinician. Dr. Terry Curtis, a board-certified specialist in companion animal behavior, is associated with the UF CVM as a Clinical Behaviorist. She teaches the existing veterinary behavior course and performs behavior consultations as an independent consultant. Dr. Curtis has expressed interest in developing a Shelter Behavior Medicine course at the UF CVM and may submit a supplemental application to Maddie's Fund in that case. If a Shelter Behavior Medicine course at UF cannot be arranged locally, we plan to work with Dr. Brenda Griffin to create a distance learning opportunity for our students and residents. As there is much uncertainty about the potential availability of such a course, we cannot commit to developing it within the time frame of Maddie's[®] Shelter Medicine Program at the University of Florida.

Course outlines for the four proposed courses are attached. These outlines are intended to convey conceptual material. Actual course content, lecture titles, and lecture hours may be altered during the course approval process.

Department	Small Animal Clinical Sciences
Name of Course	Veterinary Forensic Medicine
University Course Number	VEM 5XXX
Catalog Description	Exposure to the application of veterinary forensics in crimes involving animals, including recognition of abuse, crime scene investigation, and interacting with the legal community. Course Coordinator - Dr. M. Merck Grading System – Letter Grade
Semester Credit Hours	1 credit
Instructional Units; Lectures	14
Instructional Units; Discuss	2
Instructional Units; Labs	0
Midterm, Final Exams	1
Total Contact Hours	17

Course Outline

IU No.	Instructional Topic	Instruction Format
1	Animal Cruelty	Lecture
2	Crime Scene Investigation, Chain of Custody, and CSI: The Animal	Lecture
3	Recognition of Non-Accidental Causes of Injury and False Cases of Animal Cruelty	Lecture
4	Identifying and Interpreting Bruising and Abrasion Patterns and Sexual Assault	Lecture
5	Gunshot Wounds	Lecture
6	Weapons, Blood Loss Calculation, and Drowning	Lecture
7	Asphyxiation and Smoke Inhalation	Lecture
8	Burn Wounds and Blunt Force Trauma	Lecture
9	Poisoning and Dog Fighting	Lecture
10	Neglect and Collectors	Lecture
11	Laboratory Testing and Time of Death	Lecture
12	The Forensic Examination Report and the Burden of Proof	Lecture
13	Working with Law Enforcement, Prosecutors, and the Media	Lecture
14	Expert Witness Testimony	Lecture
15	Case Examples	Discussion
16	Mock Trial	Discussion
17	Final Examination	Exam

Course Objectives

This course will teach the student the many roles of the veterinarian regarding the investigation of crimes involving animals including crime scene investigation. The course will introduce the student to medico-legal death investigation and the application of forensic science to abuse cases. The student will learn how to work with investigators, prosecutors, and how to provide courtroom testimony.

Department	Small Animal Clinical Sciences
Name of Course	Introduction to Veterinary Disaster Response
University Course Number	VEM 5XXX
Catalog Description	Exposure to the basic principles of State Agriculture Response Team (SART) concepts, the Incident Command System (ICS), the National Incident Management System (NIMS), and hazardous materials (HAZMAT) awareness. Meets the FEMA minimum responder credential requirements for participation in disaster responses. Course Coordinator - Dr. C. Crawford Grading System – Pass/Fail
Semester Credit Hours	1 credit
Instructional Units; Lectures	15
Instructional Units; Discuss	0
Instructional Units; Labs	1
Midterm, Final Exams	3
Total Contact Hours	19

Course Outline

IU No.	Instructional Topic	Instruction Format
1	Common Principles – Impact of Disasters on Veterinarians and Their Communities	Lecture
2	SART – State Agricultural Response Teams – State Response	Lecture
3	ICS 100 - Incident Command System Overview	On-line lecture
4	ICS 100 – ICS Features and Principles	On-line lecture
5	ICS 100 – ICS Organization Part 1	On-line lecture
6	ICS 100 - Exam	On-line exam
7	IS 700 – National Incident Management System – Part 1	On-line lecture
8	IS 700 – National Incident Management System – Part 2	On-line lecture
9	IS 700 – Examination	On-line exam
10	ICS 200 – ICS Organization Part 2	On-line lecture
11	ICS 200 – ICS Leadership and Management	On-line lecture
12	ICS 200 – ICS Delegation of Authority and Management by Objectives	On-line lecture
13	ICS 200 – ICS Functional Areas & Positions	On-line lecture
14	ICS 200 – ICS Briefings	On-line lecture
15	ICS 200 – ICS Organizational Flexibility	On-line lecture
16	ICS 200 – ICS Transfer of Command	On-line lecture
17	ICS 200 – Examination	On-line exam
18	HAZMAT – Introduction to Hazardous Materials	Lecture
19	HAZMAT – Hazardous Materials Equipment and Vehicle Use	Lab

Course Objectives

This course aims to introduce students to the basics of responding to disasters as a veterinary responder, and to build a base for further development in responder training. This course will be a prerequisite for additional in-depth disaster response courses. The course includes an overview of the individual veterinary clinic or shelter facility, the county, and the state level response issues and the roles each play, and how they relate to SART. The course includes an introduction to the National Incident Management System, seeks to develop a basic understanding of the Incident Command System, and to create a basic awareness of HAZMAT issues regarding disaster response. The overall objective is to make the student compliant with the FEMA (Federal Emergency Management Agency) minimum responder credential requirements. The student will accomplish these objectives with three hours of on-site lecture, one on-site laboratory, and three on-line courses completed via the FEMA website. A passing grade in the course requires passage of three on-line exams and attendance at all the on-site lectures and the laboratory.

Department	Small Animal Clinical Sciences
Name of Course	Shelter Behavior Medicine
University Course Number	VEM 5XXX
Catalog Description	Exposure to the concepts of behavioral health care of shelter animals. Students will gain valuable hands-on experience with animal handling, training, behavioral assessments, environmental enrichment, stress reduction, and methods of increasing adoptions. Course Coordinator - Dr. Brenda Griffin Grading System – Letter Grade
Semester Credit Hours	1 credit
Instructional Units; Lectures	21
Instructional Units; Discuss	0
Instructional Units; Labs	4
Midterm, Final Exams	1
Total Contact Hours	26

Course Outline

IU No.	Instructional Topic	Instruction Format
1	Relinquishment	Lecture
2	Intake & Adoption	Lecture
3	Dogs Learn and Can Cats Be Trained?	Lecture
4	Pryor's 8 Ways to Change Behavior	Lecture
5	Shelter Cat Training	Lab
6	Cleveland's Understanding the Use of Corrections	Lecture
7	Housebreaking and Crate Training	Lecture
8	Clicker Training	Lecture
9	Shelter dog training: obedience and agility	Lab
10	The Culture Clash	Lecture
11	Management of Stress in Housed Cats	Lecture
12	Enrichment for Shelter Animals	Lecture
13	Reading Dog Body Language	Lecture
14	Temperament Testing Shelter Dogs	Lecture
15	Temperament Testing Research Results	Lecture
16	Shelter Issues	Lecture
17	Feline Behavior Assessments	Lecture
18	Aggression in Dogs	Lecture
19	Canine and Feline Temperament Testing	Lab
20	Chemical Restraint	Lecture
21	Abnormal Behavior in the Shelter	Lecture
22	Behavior Modification in the Shelter – What is and is not feasible	Lecture
23	Solving Common Behavior Problems	Lecture
24	Reading Body Language and Safe Handling	Lab
25	Psychopharmacology	Lecture
26	Final Examination	Exam

Course Objectives

This course aims to prepare students to establish behavioral selection criteria for shelter animals (dogs and cats), develop behavioral assessment protocols, advise on adopter/animal compatibility, diagnose and treat common behavioral problems (litter box issues, separation anxiety, etc), and design preventive behavioral wellness programs for shelter animals including enrichment and socialization. Students will develop an understanding of concepts related to dog and cat learning and training, including how to apply these to teach manners to shelter dogs, how to apply these to help solve behavioral problems/training problems, and how to establish basic training classes for puppies, kittens and dogs. Students will learn to design protocols for safe animal handling, design stress management programs for shelter animals (population and individuals), and promote quality of life for shelter animals.

Department	Small Animal Clinical Sciences
Name of Course	Shelter Medicine
University Course Number	VEM 5XXX
Catalog Description	Students will learn the basics of infection control, preventive medicine, and vaccination strategies unique to the shelter environment. In addition they gain insight into animal abuse and neglect issues and the value of educating the public on spay/neuter procedures. Course Coordinator - Dr. N. Isaza Grading System - Letter grade
Semester Credit Hours	1 credit
Instructional Units; Lectures	15
Instructional Units; Discuss	0
Instructional Units; Labs	0
Midterm, Final Exams	1
Total Contact Hours	16

Course Outline

IU No.	Instructional Topic	Instruction Format
1	Overview of Animal Sheltering	Lecture
2	Components of Population Medicine	Lecture
3	Shelter Building Design	Lecture
4	Cleaning and Disinfection	Lecture
5	Disease Surveillance and Control	Lecture
6	Vaccination Strategies	Lecture
7	Behavior Assessment and Managing Stress in Shelter Animals	Lecture
8	Zoonotic Diseases and Public Health	Lecture
9	Dermatologic Diseases/Ringworm	Lecture
10	Feline Infectious Disease	Lecture
11	Feral Cats and Trap-Neuter-Return	Lecture
12	Canine Infectious Disease	Lecture
13	Shelter's Role in Disaster Response	Lecture
14	Animal Cruelty and Neglect	Lecture
15	The Veterinarian's Role in a Shelter	Lecture
16	Final Examination	Exam

Course Objectives

This course will introduce the student to several basic health and welfare concepts in the sheltering of dogs and cats. The concepts include the impact of disease outbreaks, disease detection and control, preventive strategies to minimize disease, behavior problems and reduction of stress factors contributing to behavior problems, animal cruelty and neglect, and the role of veterinarians in protecting the health and welfare of animals in shelters. This course is not intended to provide comprehensive and in-depth material on each subject, but rather to teach the student that there are many facets to Shelter Medicine.

Disaster Medicine Training To be Phased into the Program over Three Years

The College of Veterinary Medicine is uniquely positioned both geographically and operationally, to be a national center of excellence in veterinary disaster medicine.

The College is the sole veterinary school in Florida, the state with the longest coastline in the country, protruding into a bastion of tropic storms, with a huge population unable to evacuate in a timely manner due to this geography. Besides hurricanes, Florida is regularly exposed to tornados, wildfires, flooding, and an earthquake zone in the Gulf of Mexico. Florida also faces potential man-made disasters, including chemical spills, a nuclear incident at one of the reactors around the state, or a terrorist attack in one of the many tourist areas. In addition, Florida is a popular site for illegal importation of animals which could result in the introduction of foreign animal diseases. In 2007, two large animal shelters in Florida were heavily damaged in fires in which dozens of animals perished because the shelters lacked evacuation plans. In 2004, hurricanes flooded several Florida shelters resulting in drowning of animals trapped in cages after the human population was evacuated. Clearly, animal shelters need to develop disaster plans that take into account the unique features of Florida and the surrounding regions. One of our major goals will be to facilitate this type of planning.

Operationally, the College is a leader in disaster management and response in the state of Florida. The College deployed veterinary care teams to hurricanes Charlie, Frances, and Jeanne during the 2004 hurricane season, deployed a team to Hurricane Wilma in 2005, and operated a shelter for evacuated Hurricane Katrina animals at the College. During the wildfires of 2007, College response teams assisted with animal evacuation and managed several patients.

The Director of Medical/Health Administration, John Haven, represents the College on the State Agricultural Response Team (SART) steering council and advisory board. The college response team, the Veterinary Emergency Treatment Service (UF VETS), is the lead patient care component for the Florida SART. Through a collaborative relationship with the Florida Veterinary Medical Association and the Florida Division of Agriculture and Consumer Services (which is the lead agency for animal issues during disaster in the state emergency operations center), this team is capable of deploying a self-contained veterinary field hospital with up to twelve staff for several days. The role of UF VETS is to 1) assess the operational capacities of veterinary clinics and shelters in disaster-impacted areas; 2) to assist in provision of resources necessary for such facilities to become operational; 3) to partner with sheltering groups for provision of medical care to animals evacuated to temporary shelters in the impacted areas; and 4) to serve as a medical treatment facility for owned and unowned animals when community veterinary clinics and shelters are not operational. The UF VETS team equipment was purchased through grants and donations, and is staffed by volunteers from the college. As an extension of this relationship, Vet Corps, a reserve corps of veterinarians and technicians from across the state, was formed in September 2007. Vet Corps will provide a mechanism to organize, train, and deploy veterinary resources across the state using the Incident Command System. Vet Corps is managed by the College.

The College's broad and deep deployment and training capability can and should be translated into coursework to meet the needs of responders who deal with animal issues across the state and the country. The College will provide courses to a broad constituency –

veterinarians, veterinary technicians, first responders, animal control and shelter workers, and concerned lay volunteers. Examples of courses that could be developed include:

- An initial course, targeted at the veterinary student and shelter medicine residents, is the “Introduction to Veterinary Disaster Response.” This elective course seeks to prepare veterinary students and shelter medicine residents to be FEMA compliant responders, and includes instruction in ICS (Incident Command System), NIMS (National Incident Management System), Hazardous Materials Awareness, and SART (State Agricultural Response Teams). The course could potentially be offered during two to three semesters a year to students in all classes, providing flexibility with the aim of credentialing a large number of students to participate in federal disaster responses.
- An advanced disaster medicine course, targeted at veterinary students and shelter medicine residents through the College, and other groups through SART, may be developed to provide advanced ICS training, to include ICS 300 and ICS 400, which are required for personnel involved in supervising staff during a disaster response or to participate in an Incident Management Team (IMT) responding to a disaster. This course will include tabletop scenarios and exercises and a field exercise to practice response planning and implementation and problem-solving.
- The most advanced program would be the Disaster Shelter Manager Certificate program for shelter managers, shelter veterinarians, and our shelter medicine residents. This course would include the ICS, shelter management during emergencies and disasters, animal evacuation, and a field deployment exercise. A final capstone project would be the development of a local disaster preparedness and response plan for submission as their county’s PETS Act animal care and sheltering plan. The development of the plan would require that the participant engage members of the county animal response team, a sister shelter or other rescue/adoption groups which can accept evacuated animals, and the county emergency operations center. The end result would be development of a local disaster plan that is fully integrated into local and state disaster management systems and personnel who are trained and capable responders. We will work with SART to identify and to encourage participants from each county in Florida to complete their disaster plan.
- It is the intent of the UF VETS team to have at least one large field training exercise each year. These exercises would provide hands-on training and execution of concepts learned in lectures and labs. Each exercise allows students to work with SART partner agencies, develop leadership and problem solving skills, and to develop management styles under the direct supervision of experienced responders. Field exercises may include a statewide readiness deployment event, involving responders from the College, Vet Corps, State Veterinarian’s Office, Department of Public Health, Fire, Sheriff, Animal Control, USDA, and non-profit sheltering agencies. These agencies would deploy with all of their equipment in a self-contained live-in exercise for several days, simulating a natural or man-made disaster. This exercise would require live animal intake, decontamination, patient care, and sheltering. We completed the inaugural large-scale training event in March 2008, which was a simulated chemical (chlorine) spill that contaminated the animals in a local animal shelter.

Veterinary Forensic Medicine Training To be Phased into the Program over Three Years

- We propose to provide training for veterinary students, shelter medicine residents, veterinarians, veterinary technicians, and investigators with a series of intensive workshops and an elective course for veterinary students.
 - A certificate program in veterinary forensic medicine may be developed by Dr. Melinda Merck, the international authority on the topic. The program will be composed of several separate modules modeled after similar training in human forensic medicine. A certificate will be issued at the completion of all of the modules. Each module would be three to five days in length. Didactic lectures, case discussions, and wet labs dealing with subjects such as evidence collection, chain of custody, history taking, interpretation of postmortem changes, blunt and sharp force injuries, gunshot wounds, head injuries, asphyxia, drowning, toxicology, trace evidence, and DNA technology.
 - An annual continuing education symposium on forensic medicine will also be offered. Such a program sponsored by the University of Florida and the ASPCA is already planned for April 9-11, 2008 in Orlando. Topics include:
 - Veterinary Forensic Pathology and Animal Cruelty
Melinda Merck, DVM, Forensic Veterinarian
 - Veterinary Forensic Toxicology: Intentional Poisoning of Animals
Sharon Gwaltney-Brandt, Ph.D., DVM, ASPCA Poison Control Center, Urbana, IL
 - Non-Human Bone Identification
Tony Falsetti, Ph.D. CA Pound Human Identification Laboratory
 - Forensics and Fighting Animals
Sandy Christiansen, Spartanburg Humane Society
 - DNA Testing Methodology in Veterinary Forensics
Beth Wictum, UC Davis Veterinary Genetics Laboratory
 - Scope and Applications of Forensic Entomology
Jason H. Byrd, Ph.D. Forensic Entomologist
 - Bloodstain Analysis
Toby Wolson, M.S., Noslow Forensic Consultations
 - Basic Crime Scene Procedures for Veterinary Forensics
Kristie A. Shaw, Crime Laboratory Analyst
 - Case Packaging and Presentation for Veterinary Forensics
Randall Lockwood, DVM, Anti-cruelty Initiatives and Legislative Services

- Forensic Botany: Plants as Evidence
David Hall, Ph.D., Forensic Botanist
 - Forensic Odontology: Animal and Human Bitemark Analysis
Ken Corhn, DDS, Forensic Odontologist
 - Proper Collection and Preservation of Genetic Evidence
Ginger Clark, M.S. Interdisciplinary Center for Biotechnology Research
 - Clandestine Gravesite Detection: The Use of GPR
John Schultz, Ph.D., Forensic Anthropologist
 - Trauma and Medical Examination of Wildlife
Richard Stroud, Ph.D., Senior Veterinary Medical Examiner
 - Sharp Force, Blunt Force, and Gunshot Trauma to Bone
Stephen Nelson, M.D., Chief Medical Examiner
 - Sharp Force, Blunt Force, and Gunshot Trauma to Soft Tissue
Stephen Nelson, M.D., Chief Medical Examiner
 - Future Trends in Veterinary Forensics
Melinda Merck, DVM, Forensic Veterinarian
- Veterinary Forensic Medicine Research
 - There is a need for validation of crime scene investigation techniques for animal victims. Most investigative techniques are extrapolated from those used for human victims, and there is growing evidence that these are not always appropriate. We propose to conduct research on several important forensic topics. Examples of areas that require research include:
 - Forensic entomology is the most accurate method to determine time of death or time of injury. Recent findings suggest that there is a difference in insect behavior with cat and dog cadavers compared with those of humans. This research would document insect behavior with animal cadavers using animals that were previously euthanized at shelters. The forensic entomologists at the University of Florida will collaborate on this research.
 - Blunt force injury to live animals is very difficult to document unless there is visible bruising (which is rare) or fractures. One method of determining tissue injury and inflammation is using a FLIR Camera which measures skin temperature differences. This camera is already being used in the veterinary community to determine areas of injury and lameness in horses and dogs. This would be a new application for animals. Research is needed to document the usefulness of this method for determining hidden evidence of abuse. This would involve using the camera to examine known victims of trauma through the veterinary teaching hospital and emergency hospitals such as victims of motor vehicle accidents. This documentation is critical for

thermography to become accepted in court as a recognized diagnostic imaging test.

**Maddie's Shelter Medicine Program at the University of Florida
Objectives for Years 1-3**

	Year 1	Year 2	Year 3
Staff recruitment	Recruit Program Coordinator		
Shelter medicine residency	Plan and receive program approval	Admit 1st resident	Admit 2nd resident
Website	Launch program website		
Shelter medicine symposium	Host annual symposium	Host annual symposium and develop distance CE	Host annual symposium and provide distance CE
Disaster medicine symposium		Host annual symposium	Host annual symposium and develop distance CE
Disaster medicine field exercise		Host annual exercise	Host annual exercise
Forensic medicine symposium		Host annual symposium	Host annual symposium and develop distance CE
Shelter technician continuing education	Present seminar	Present at least 2 seminars	Present at least 2 seminars and develop distance CE
Veterinary student shelter medicine elective courses	Submit for approval Introduction to Veterinary Disaster Response and Veterinary Forensic Medicine	Submit for approval Advanced Disaster Medicine	Submit for approval Shelter Behavior Medicine
	Teach Shelter Medicine and Introduction to Veterinary Disaster Response	Teach Shelter Medicine, Introduction to Veterinary Disaster Response, and Veterinary Forensic Medicine	Teach Advanced Disaster Medicine, Shelter Medicine, Introduction to Veterinary Disaster Response, and Veterinary Forensic Medicine
Veterinary student required shelter medicine lectures	Submit for approval 3 new lectures	Submit for approval 3 new lectures	Submit for approval 3 new lectures
	Teach at least 1 lecture	Teach at least 2 lectures	Teach at least 3 lectures
Advanced shelter clerkship	Submit clerkship for approval	Begin clerkship	Continue clerkship
Shelter medicine externships	Implement externship program	Continue externship program	Continue externship program
Shelter medicine summer student research	Enroll at least 1 student researcher	Enroll at least 2 student researchers	Enroll at least 2 student researchers
Shelter Health Assessment Service	Initiate program	Continue program	Continue program and develop web-based self-assessment tools
Disease Diagnostic, Control, and Prevention Service	Initiate program	Continue program	Continue program
Directory of Shelters and Rescue Groups in the Southeast	Complete directory		
National/International veterinary CE	Present shelter medicine lectures in at least 2 meetings	Present shelter medicine lectures in at least 3 meetings	Present shelter medicine lectures in at least 4 meetings