



Pre-Vet Activities

*My Summer at the San Jose Animal Care Center and more...
Shannon Smith '15*

This summer I was able to have two very different but equally awesome animal experiences. For the majority of the summer, I helped out at the San Jose Animal Care Center in their shelter clinic. At first I thought I would just be observing the spay and neuter surgeries, but Dr. Tyson had me jump right in! At first I was just restraining the cats, dogs, and sometimes rabbits for the vet techs and clipping their nails. Soon, though, I was able to prep them for surgery and give them microchips and Rabies vaccines post-op. There was never a dull moment at the clinic, from necropsies to enucleations (eye removal) to a tail amputation. One of the highlights was getting to go with the vet to the Ringling Bros circus inspection to make sure their elephants, tigers, horses, and poodles were fit.



When I wasn't at the shelter clinic, I was training the two bobcats at the Palo Alto Junior Museum & Zoo. They can do 'sit,' 'down,' give me both paws, put their paws up so I can see their belly, and we're now trying to get them to open their mouths on command. Overall, a fabulous summer mix of animal care and to perform animal enrichment!



My Summer in Taiwan

Julia Tsai '16

Take a rabies outbreak, a few typhoons, ECGs and heart x-rays, and surgeries packed into two months in an entirely different culture and part of the world, and you might begin to see what my summer in Taiwan was like. This past summer, I interned at two veterinary clinics in Taiwan, a general animal hospital and a clinic specialized in cardiology. At these clinics, I came across diseases such as leptospirosis and heart conditions such as PDA (patent ductus arteriosus) and mitral regurgitation, a term with which I came to be very familiar during our client consultations. In the mornings, I helped to restrain animals during blood draws or examinations, shadowing a veterinarian as he worked with clients and their pets. Also, since in Taiwan blood and urine samples are tested directly in the clinic, I saw quite a few blood test results and slides of fecal matter or skin. I remember looking at a microscope slide of the mites responsible for demodectic mange on a young female French bulldog. The poor owners had had no idea what was causing such a terrible skin rash on their puppy until they took her to the vet. In addition to working with clients, the veterinarian Dr. Yang also worked with animal rescue organizations such as Animals Taiwan, providing free care and service to rescued stray animals.

In some cases, it was a lost dog suffering from malnutrition in need of an IV, but I will never forget the day when a dog came in with a plastic red band encased around his neck by skin that had grown around it. We could only guess what had happened to the dog; maybe, as a puppy, his owners had placed the "collar" around his neck, but when the dog ran away and grew bigger, the collar slowly embedded itself into his neck. Despite our speculations, I am happy to say he was alert and active the next morning after his surgery. The picture of the black puppy in the wheelchair was another rescue that had lost his hind legs after being run over by a truck, and I was given the task of training him to use his wheelchair and he has been hobbling around the office and greeting visitors with his signature nose bump ever since.





Julia Tsai—continued

At the cardiology clinic, I shadowed a veterinarian as he met with clients for heart consultations that required ECGs, ultrasounds, and x-rays. I helped restrain dogs and cats while listening in on his diagnosis. I learned more about the anatomy and physiology of the heart and lungs than I ever could have imagined. Dr. Hung showed me the different x-rays of an enlarged heart compared to a normal heart and taught me how to identify areas of the heart and blood flow using the ultrasound. Since we were dealing with older patients except in the cases of PDA, most of the diagnoses were valve disease. For the majority of patients, Dr. Hung could only prescribe medication or a more stress-free environment, but he would always tell me after his consultations that dogs could be sent to Japan, where a renowned open heart surgeon could repair a torn mitral valve. The cost and risks of going to Japan were extremely high, but a successful trip could return the heart to a healthy state. I was able to see the effects of this surgery when one of his clients returned from Japan with a white Maltese whose ultrasound results after the surgery were completely clear of any mitral regurgitation. The difference between his before and after heart x-rays was amazing.

There was so much that I learned this past summer that I could go on endlessly talking about all the cases I saw. Interning in Taiwan was an amazing experience; every day, I stayed late just to keep learning from the other veterinarians and went home in awe of the work they did and the hours they put into their devotion to animals. I learned so much about veterinary care, but I also noticed how cultural differences within a country can impact the approach of veterinarians in helping their clients. Experiencing veterinary care still within the setting of a private clinic but in an entirely different cultural context really showed me the variability of being a veterinarian.



The Nebraska Humane Society- Summer Animal Medical Internship Linnea Tracy '15

The Nebraska Humane Society, located in Omaha, Nebraska, is the fifth oldest humane society in the United States. Founded in 1875, it is today a large and successful nonprofit, which treats, cares for, and adopts out thousands of animals a year. At any one time, hundreds of animals call the NHS home. When I walked in to the lobby on my first day as an Animal Medical intern this past summer, the spacious, well kempt lobby was certainly not in keeping with the typical mental image of a 'dog pound,' and that is because the NHS is so much more. Over the course of the summer, I learned to call the NHS home- the huge kennel rooms, cacophonous with barking, the front desk, alive with chatter and always a dog or two sitting at someone's feet, the catteries, full of mewling and the ping of cat toys being batted to and fro, but most of all the Animal Medical Department, shiny white, full of intelligent conversation, caring thoughts and hands, and animals in need. What the NHS does is more than just enforce animal control- it embodies its slogan "Join the Humane Race," and to this the Animal Medical Department is crucial. The NHS employs a team of veterinarians, veterinary technicians, and a couple veterinary assistants who care for, keep tabs on, and are personally acquainted with each animal (dogs, cats, exotics, farm animals) in the facility, seven days a week. As an intern, I had the opportunity to experience the full spectrum of ups and downs in shelter veterinary work. Each day was rewarding, beginning with surgery bright and early in the morning (lasting up to six hours, with up to sixty animals needing to be spayed, neutered, have wounds repaired, tumors removed, and other conditions attended to under anesthesia), and lasting until the evening when all rounds were completed, check-ups finished, blood, urine, and feces analyzed, paperwork typed and posted, and animals sent to foster care for recovery. I saw cases of compassion and love stem from pasts of neglect and fear, learned to understand the mercy behind difficult decisions such as euthana-

A puppy sleeps in the recovery area after being spayed.





Linnea Tracy '15— continued

sia, began to read animal behavior on a much deeper level, and I couldn't have spent my summer in a better place. I was mentored and taught by some of the most passionate, intelligent, and down-to-earth people in the field of shelter medicine, and had the opportunity to truly assist and gain practical experience, rather than just observing. I learned difficult lessons, put in long hours, had fun, and gained a new family. The Nebraska Humane Society's internship program may be brand new, but it is already top of the line, and, knowing the organization, I'm sure it will only improve from here.



Lily—
A Chihuahua puppy that came to us with both front legs badly fractured and healing improperly. She was sent to an orthopedic specialist who reset her legs using external fixtures and a bone graft. After months of foster care and charming everyone she met, she stopped fearing people and is now looking for her forever home.



Kittens come in all shapes and patterns—some even have moustaches!



My Summer at CEVET Amalia Saladrigas '16

This summer I worked for nine weeks at CEVET (Centro de Especialistas Veterinarios) in Puerto Rico. An ophthalmologist and a surgeon share the facilities and I shadowed the surgeon, Dr. Carlos Mongil, two days a week for the first five weeks, and three days a week for the last four. I mostly cleaned cages, walked dogs, held down and weighed patients, and ran around offering a pair of helpful hands wherever they were needed at the moment, but since Dr. Mongil is one of the only two veterinary surgeons in Puerto Rico, I also got to watch a lot of different surgeries.

On a regular day, the volunteers (mostly pre-vets, vet students, or students doing externships), one or two at a time, would welcome the client and the patient into



Amalia Saladrigas '16 – continued

an examination room and ask some routine questions, figure out what the general problem or the symptoms were and when they had started, and then report to the doctor. Then, the doctor would go in, examine the patient, ask more technical questions, and advice whatever course of action or treatment he deemed appropriate. In the afternoons he would operate on cases that were urgent (usually fractures and dogs that had swallowed things they shouldn't have), or surgeries that he scheduled previously for that day.

The most common cases were ruptured CCL's (cranial cruciate ligaments) and injuries that required FHO's (femoral head osteotomy), but we also got to see Dr. Mongil pull out shoelaces from a dog's intestines, stabilize an atlanto-axial luxation, and perform open heart surgery to fix a PDA, a congenital heart defect. He is an extremely meticulous and very talented surgeon. From learning to connect very general symptoms to specific problems, to learning the basics of pre and post-op handling of patients, I got a lot out of the experience. Work hours varied from maybe seven hours a day to twelve, but it was definitely worth it.

My Summer at Palo Alto Animal Services

Adrienne Thom '16

Over this past summer I continued my work at Palo Alto Animal Services that I had been doing throughout the year. Under the direction of Dr. Yoffee, the head veterinarian there, I helped prep the animals for spays and neuters as well as administer vaccines and microchips. I worked mostly with dogs, cats (including feral cats), and bunnies. Although most of the surgeries were spays and neuters, I also got to observe a leg amputation as well as an eye removal, both of which were much longer and more complex than the usual spay/neuter. Since those types of surgeries are longer, the animals under anesthesia loose a lot more heat than with shorter surgeries leading to a major problem of keeping the animals warm while they are under.



Adrienne Thom '16 - continued

In addition to the work at the clinic, I worked with Dr. Heller and Dr. Grahn at Stanford in their research on maintaining body temperature in animals, specifically small animals under anesthesia. Dr. Heller engineered a set of heating paw pads for animals that circulate warm liquid through the pad and can be attached to the feet of animals during surgery. I helped collect preliminary data at Adobe Hospital, observing many surgeries with the heating pads both on and off. Most of the surgeries were dentistry but there were some more intricate ones I was able to observe such as a torn ACL repair.



My Summer at the Oakland Zoo and more... Nicole Gilmore '15

Over the summer, I had an internship at the Oakland Zoo. I worked with giraffes, eland, Egyptian geese, and vultures. I worked alongside the keepers, and my main tasks were things like cleaning the exhibit and preparing food. I also got to help with some of training (operant conditioning) and learn the theory behind it. The animals are trained so medical procedures can be done more easily, and training is done through positive reinforcement with food.

Interns also had weekly classes where we learned different aspects of zoo and animal management. We also got “behind the scenes” tours of different parts of the zoo – my favorite was our visit to the vet hospital where we got to observe a vet implant a microchip into a fruit bat.



Nicole Gilmore—continued

When I was not at the zoo, I volunteered with a local small animal vet. I did a lot of cleaning, but also held animals during exams and drew up vaccines. I got to observe all the exams and procedures, like ultrasounds and teeth cleanings. I particularly enjoyed watching surgical procedures, such as spays and mass removals.

It was a very fun and informative summer, as I got to see different aspects of the animal care world, and work with some very different species.



My Summer in Belize and South Africa Kateline Lin '16

This summer I went to Belize, where I took a large animal veterinary course and a wildlife veterinary course through a program known as Institute for Sustainable International Studies (ISIS). The ISIS courses can be accepted for college credit at some schools and are also good for vet students who want to gain in-field experience. Veterinary regulations in Belize are much less strict than in the US, so we got to do things that most students wouldn't get to do until later in vet school. We had a



Suturing a dog



Kateline Lin '16 continued

few in-class lectures learning about diseases common in livestock and zoonotic diseases, but otherwise, we were out on various farms working with animals. We did general physical exams on all the animals, gave cattle and horses injections, examined a horse that had gotten a snake bite, examined a horse that had fallen out a truck during transportation and had to be euthanized, palpated cows, necropsied cattle which had died from blackleg disease, etc. The most exciting part was assisting the vet as he did castrations for pigs, horses, and cattle. After a few times, he



Castrating a pig

actually let us do the whole thing ourselves, under his supervision. In addition to large animals, we also worked with small animals. At one point, we even worked with police drug and firearm dogs! After first practicing suturing on store-bought chicken breasts, the vet let us stitch up the cats and dogs after the spay/neutering. One weekend, we set

up a free clinic day for the town so that people could bring their pets over for a physical checkup, vitamin B and deworming injections, and spay/neutering.

The wildlife veterinary course was less hands-on and more lecture-orientated, but nonetheless cool. We got to practice with tranquilizer blow darts, perform necropsies on birds, do wing wraps on injured birds, learn to take and analyze x-ray images of iguanas, dogs, turtles, monkeys, etc.



We also went to the Belize Agricultural Health office where we learned all about parasitology and how to do McMaster tests and blood smears.

I spent the second half of my summer in South Africa doing wildlife conservation volunteer work. I definitely saw a lot of animals, but there wasn't a big veterinary component. Still, I got to see a wildlife vet in action, darting a brown hyena to remove its radio collar and then monitoring it carefully as the anesthetizing effects wore off .



Working with Wildlife *Rachel Berkowitz '16*

Over this past summer, I worked as a veterinary assistant at a specialized cats-only vet clinic. I learned basic veterinary technician skills, from running diagnostic tests to assisting with surgery and managing client accounts and phone calls. The clinic was small, so every staff member was trained in nearly every aspect of its operation. This environment allowed me to learn far more than in a larger scale clinical setting. The veterinarian encouraged us to look at medical histories and current symptoms and attempt to come up with a diagnosis for the cats ourselves before she examined the patient. She would then confirm a correct guess or explain the reasons for an incorrect one. Her approach to teaching helped me learn a great deal about diseases common in cats and the sometimes odd and unexpected differences in their medical care and treatment when compared to other domestic small animals. I regularly assisted with surgeries and got to observe everything from routine spays and neuters to eye enucleations, a tail amputation, emergency dog attack surgeries, thyroid gland removals, and even removal of a piece of fishing line wrapped around a cat's tongue and passing all the way through its large intestine. I also learned a great deal about how a small business such as this is operated, and how to manage client and financial accounts. While my focus is more on wildlife veterinary medicine, working at the cat clinic this summer was a valuable experience that will undoubtedly help me later down the road.



Ash Sundaram (a SUPVC affiliate member)

I work as veterinary technician with Dr. Van Sant at For the Birds, an avian practice in San Jose. We primarily see psittacines though, at times, we also see wild life (raptors, crows, pigeons, passerines), game birds (pheasants, peacocks) and poultry (chickens, ducks).



Ash Sundaram –continued

Birds, unlike dogs and cats, are not domesticated. They are still wild since they are separated from their wild ancestors by only one or two generations. They have very specific requirements, both for their management at home as well as for their medical care. Hence, we place a lot of importance to the holistic wellbeing of the birds. As part of this philosophy, we educate clients on the right nutritional, environmental and medical requirements to keep their birds healthy and happy. Some of the pathologic conditions we usually encounter and treat birds for include avian gastric yeast (*macrorhabdus ornithogaster*), aspergillosis, bacteriosis, virosis, protozoanosis, helminthosis, neoplasias, hyperlipidemia, hypovitaminosis A, hypocalcemia and physical trauma like fractures. However, hormonal stress conditions are among the most difficult to deal with since, apart from medical intervention, they often need a lot of changes to the environment.

Hormonal stress includes physiological stress caused by circulating reproductive hormones (estrogen in females and testosterone in males) which leads to pathologic conditions such as overproduction of eggs, dystocia, oviductal prolapse, peritonitis associated with ectopic eggs, metabolic bone disease, feather plucking and self-mutilation. The most common medical treatment is an IM injection of Lupron (GnRH agonist). One of the drawbacks of Lupron is that it is effective only for a few weeks and hence, it could be expensive. Earlier this year, I got an opportunity to work with Dr. Van Sant on a paper exploring the use of Deslorelin implants instead of Lupron to alleviate hormonal stress in birds. We presented the paper at the Association of Avian Veterinarians (AAV) 2013 conference. Deslorelin implants slowly release GnRH agonist over a prolonged period of time and cause a down regulation of receptors on anterior pituitary, which eventually leads to hypogonadism and decrease in sex hormones.

This returns the birds to the resting phase of the reproductive cycle. A distinct advantage of the Deslorelin implant over the traditional use of Lupron is that the duration of the implant avoids rebound and recurrence and encourages compliance. Over time, this becomes a more cost effective approach.

In addition to the medical intervention, all owners are also advised of species-specific patterns of breeding and the recommended environmental changes that would help



Ash Sundaram –continued

ensure recovery. These changes include regulating photoperiod by restoring a regular 12-hour day, 12-hour night cycle, not allowing cavity seeking, and having owners discontinue stroking to discourage reproductive behavior. Working at For the Birds has been an enriching experience as I continue to learn new things every week. It has informed my decision to specialize in avian medicine and focus on both clinical practice and clinical research.





Contact from Alumni

Clare Sherman (Stanford '12) currently at Cornell Veterinary School emailed me:

Things are great out here in Ithaca--it's absolutely beautiful, and I'm secretly excited about getting a "real winter" for once (might regret saying that come January...). Cornell's curriculum is very impressive so far--we began with a 10-week anatomy course that goes by body region (thorax, head and neck, abdomen, pelvis and then limbs). I've been loving the classes--our weeks are planned so that everything builds upon the same material (small-group case studies, lectures, gross anatomy labs, histology labs, radiology labs, and hands-on clinical sessions with cats, dogs, rabbits, horses, pigs, sheep, cows). Having taken many of the comp med courses as a Stanford pre-vet I've felt extremely well prepared. Definitely highlight how crucial it is that all of your pre-vets take or audit your comparative anatomy course!!!!!! I still look up your lectures as I'm studying! The same goes for the other courses too--I've already drawn on material from each of them, and we're not done with the first course! “

Justin Krumm (Stanford '12) called me in September to let me know everything was going great so far in his first year at U Penn College of Veterinary Medicine.

Alexandra Hicks-Nelson (Stanford '12) texted me in late August to tell me how happy she was in her first year at Tufts Veterinary School. She also commented on how helpful all the Comparative Medicine classes she took are in providing solid background for her current classes.

Wendy Kalkus (Stanford '11) sat with me for a while at the football game at Alumni Wk end (Go Card!! We beat UCLA that game!!). Wendy is in her 2nd year at UC Davis College of Veterinary medicine and loves it!