



**Todos Santos, Guatemala  
Interim Report  
Implementation Phase 1  
January 2009**

Submitted by:

Dr. Enid Stiles, Co-ordinator: Canine and Feline Programs

Dr. Kate Kuzminski, Head Field Veterinarian

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Veterinarians without Borders/ Vétérinaires sans Frontières - Canada

#110-100 Stone Road West, Guelph, Ontario, Canada, N1G 5L3

Tel: 519-823-2324, Fax: 519-837-3209

Email: [info@vwb-vsfc.ca](mailto:info@vwb-vsfc.ca)

## TODOS SANTOS IMPLEMENTATION PHASE 1: INTERIM REPORT

### 1. Project Background

**1.1 Primary phase:** Todos Santos is a community in the Cuchumatanes mountain region of northwestern Guatemala. VWB/VSF has been asked to assist the community in managing their canine population. Many people living within this community are fearful of the un-owned dogs that roam the streets. Tourism is affected as people are unable to walk the streets freely at night for fear of these dogs. Rabies and other diseases of zoonotic importance are endemic throughout Guatemala. Dogs serve as vectors of these diseases and dog over-population can threaten the health of human residents via zoonotic disease transmission, physical attacks and limitations of activities via fear and intimidation.

The local people of Todos Santos have a great appreciation for dogs, especially as guard dogs, and most have dogs of their own. These owned dogs are also roaming the streets and will breed with the un-owned dogs causing a significant surplus of dog population. Past and present methods for controlling the dog population consist of mass culling campaigns using strychnine and occasionally individuals in the town will take it upon themselves to lay “dog poison”. Unfortunately, even non-target owned dogs are killed with these campaigns. A preliminary reconnaissance and stakeholder analysis was undertaken approximately 1 year ago in Todos Santos by VWB-VSF members. This preliminary work included meetings with local government officials and the public, the veterinary college, public health officials and veterinary practitioners in the region (note: there are no veterinary services within 2 hours of this community).

*Photos: top: Todos Santos, Guatemala, 2009; bottom: woman and dog, Todos Santos. Photos by: Dominique Laplante*

**1.2 The secondary phase** of the VWB-VSF project took place in May 2008 at which time a team, including veterinary epidemiologist, Dr Andria Jones, from the Ontario Veterinary College, and her masters student, Dr Andrew Pulczer, visited the village to perform household surveys and to devise a methodology estimating and characterizing the dog



population. They concluded that there are approximately 270 owned males and 109 owned female dogs in this community, almost of all of which are free-roaming, and an additional 70 un-owned free roaming dogs. The household survey included questions with respect to interest in sterilization. Strong community support for sterilizing the dog population was evident, although surgical methods appeared less appealing to the villagers. Although the data analysis is not complete at this time, from initial examination it appears that people were more likely to participate in chemical castration than surgical castration.

## 2. Implementation phase I

**2.1 The Team:** In the summer of 2008, a core committee was formed to develop the implementation phase. This team consisted of:

- Dr Enid Stiles, VWB/VSF Canada Coordinator of Canine and Feline Programs
- Dr Kate Kuzminski, lead veterinarian
- Dr Andrew Pulczer, lead researcher
- Marjolaine Perrault, lead animal health technician.

The initial priorities of this committee were to identify goals, appropriate fund and budget, collaborate with Guatemalan agencies and government, and develop protocols for the implementation project itself. A request for assistance was placed to all VWB/VSF Canada members as there was a need for 1 more veterinarian and 3 more animal health technicians in order to obtain the proposed goals of the implementation phase. Interviews were performed and Dr Dominique Laplante and technicians Josee Greenacre, Ana Montejo and Carlos Hortiguela were selected based on Spanish skills and experience. The team was fortunate to have the added assistance of animal health technician, Donna Nach, who covered her own costs and volunteered her time to assist the team.

At the end of November, Dr Kuzminski and Dr Pulczer attended a training session on the use of EsterilSol in Mexico under the direction of Dr Esquivel, Chief Academic Advisor for Latin America, ArkSciences. *Please refer to **Appendix I** for more details on this chemical sterilant and the training information.*

VWB/VSF Canada was able to import the EsterilSol™ product into Guatemala with the assistance of Dr Carlos Esquivel and ArkSciences. Dr Esquivel kindly provided appropriate documentation to allow the product to pass, explaining that it was not for resale and was only to be used as a veterinary product on canine species. The EsterilSol was delivered to Dr. Contreras' clinic in Huehuetenango, where the team was able to

retrieve it upon their arrival in Guatemala. Duty was paid and reimbursed to Dr. Contreras upon delivery.

**2.2 Pre-implementation education and surveys:** During the month of December 2008 and the first week of January, 2009 a mass educational campaign was launched. Media forums included radio, local news, and council meetings. Posters were placed in all communities (**Appendix II**) in highly visible areas and at community centers and offices. All owners were given detailed information with respect to the procedure, product, possible complications, etc and were asked to sign a waiver form. Household surveys in all the communities was undertaken in December by Andres Carrillo, a tri-lingual interviewer hired previously in the secondary phase of the project in 2008. This survey can be reviewed in **Appendix III**. As per this census, the total number of owned dogs in Todos Santos (all 12 villages) was 352 with 70.5% (248) of these dogs being male dogs over the age of 3 months. 25 of these male dogs were previously castrated (from the local butcher – technique unknown). In total, there were 223 male owned intact dogs over the age of 3 months as per the household census. More specific details on the December household census are available upon request.

### **2.3 Implementation:**

*Please refer to Appendix IV for information on the specific schedule of Implementation Phase I.*

#### **2.3.1 Clinic Protocols**

**Fasting:** All dogs receiving an EsterilSol™ injection were fasted for a minimum of 12 hours. Instructions were written on the posters and given in the radio announcements to ensure no food was given past 8 pm the night before.

**Sedation:** All dogs were sedated prior to receiving the EsterilSol™ injection. There were two main sedation protocols:

1. Morphine/Acepromazine IM: morphine 0.5 mg/kg, acepromazine 0.03 mg/kg
2. Zoletil IM: 3 mg/kg, which is half of the published dose of 7-10 mg/kg for an IM injection.

Dosing was adjusted on a case by case basis depending on the health status of each individual patient. Animals over 7 years of age received an 80% dose. Generally speaking, the sedation protocols worked well. A few dogs needed to have their acepromazine dose “topped” up, and some had a longer recovery than expected. The Zoletil sedation was used the initial day, and there was more vomiting seen in dogs than expected. It was difficult to determine if this was secondary to the morphine injection, not being fasted or the EsterilSol™ injection. The timing of the morphine injection was

modified and it was given as the patient was about to go home. This appeared to reduce the incidence of the vomiting. The protocol was then switched to the acepromazine/morphine sedation the following day and there were less incidences of post-injection vomiting. It is likely that the morphine caused the vomiting, and not the Zoletil or the EsterilSol™.

One of the main goals of this phase of the project was to reduce the post-injection complications associated with EsterilSol™. In the Galapagos, Levy et al. experienced a 3.9% complication rate, in which 4/103 dogs sterilized with the zinc gluconate had necrotizing reactions at the injection site. In order to reduce any irritation, inflammation or pain associated with the procedure both an NSAID and an opioid were administered to all patients. Rimadyl® was used initially, but due to miscalculation of dog numbers, there was not enough of the drug and this NSAID had to be substituted with injectable ketoprofen. Injectable Rimadyl® is not available in Guatemala and future NSAID use should include those products accessible to Guatemalan veterinarians. Injectable ketoprofen proved to be a much more economic option however the use of this medication will be reviewed as it has potentially increased bleeding tendencies which would be problematic for surgical procedures.

### **2.3.2 Patient summary**

#### **Male dogs:**

Total number of male owned dogs presented for examination: **216**  
(216/262= **82%** of the total number of owned male dogs in Todos Santos were examined)

Total number of **INTACT** male owned dogs presented for examination: **204**

Total number of male dogs injected with EsterilSol™: **126**

Of the 89 male owned dogs that were not injected with EsterilSol™:

36 were too young or their testicles were too small;

10 were either cryptorchid or had scrotal pathology;

14 were geriatric or otherwise poor anesthetic risk;

12 were already castrated;

17 did not want the procedure done to their dogs (*mostly because people were using them for breeding studs*)

***EsterilSol™ eligible owned male dogs presented to field clinics which agreed and received chemical castration: 91.7%***

***1 male un-owned dog received EsterilSol™ injections (please see below in section 2.3.6 Stray Dog Capture)***

## **Female dogs:**

**72 female dogs also presented for examination and vaccination.**

**12 female dogs were surgically sterilized (ovario-hysterectomy) (section 2.3.5 Surgical Sterilization)**

**Note: the surgical sterilization was not offered to all the clients as there was not sufficient capacity for this procedure at this time.**

### ***Vaccination:***

***203 of the male and 59 female owned dogs that presented were vaccinated with Rabies vaccine. These vaccines were provided from the government.***

### **2.3.3 Post-operative care:**

**At home instructions and care:** All clients went home with post-injection (EsterilSol™) instructions that included preventing their dogs from wandering for 7 days, keeping them indoors the first night, ensuring there was no redness/swelling of the scrotum, keeping their dogs from laying on cold surfaces. Clients were asked to call the team emergency number if their dog was not eating, having difficulty urinating or defecating, was lethargic or if they had any concerns at all. The initial 3 days the team received a few calls from concerned owners and made house visits for each patient. The majority, by far, were concerns that their dog was not eating or was lethargic. It became immediately clear that at-home instructions were not clear enough. The dogs were being left outside or on cool surfaces and were suffering from issues of thermoregulation and hypovolemia. The team proceeded to emphasize that patients needed to be kept inside (in the kitchen) following their procedure (for warmth) and that they should offer palatable foods to ensure the dogs had interest in eating. Some of the clients were feeding their dogs the typical corn tortillas which were being refused, however when the team offered the dogs chicken and rice, the dogs were very happy to eat. With these renewed instructions, the team received very few calls after procedure.

The owners of all dogs sterilized with EsterilSol™ were called 72 hours after the procedure to evaluate for post-injection complications. They were asked:

1. How is your dog?
2. Is he walking/moving normally?
3. Is he sitting/sleeping normally?
4. Is he licking/chewing at his scrotum?

5. Does he seem painful?
6. Are the testicles red or inflamed?
7. Do you have any concerns?

A number of owners were concerned with the lethargy and decreased appetite seen in their dogs. One or two felt their dogs were painful. The team did house visits to follow-up with any client concerns. The majority of animals who were inappetent with their owners, quickly ate the food the team brought (papas fritas, chicken etc), which emphasized the need to offer extra tasty food following the sedation/procedure. A couple patients were outside, were very cold and slightly hypovolemic. These patients improved significantly with IV fluids, warm bedding and the offering of chicken soup.

**Injection site complications:** There were two patients that had complications associated with their scrotum. One was slightly more dry/scaly than normal and one had a necrotic draining tract approximately 2 inches cranial to the scrotum. The first patient was treated with oral Rimadyl® for two days and a topical antibiotic/steroid cream applied twice a day for 3 days. This scrotum was checked daily for 3 days and it healed normally. A scrotal ablation was performed on the second patient with no known post-op complications. The veterinary and technician responsible for this particular dogs EsterilSol™ injection, did not note any specific issues with the procedure or physical issues with this dog.

**Identification:** All sterilized dogs were identified with a tattooed 'E' on the inside of the left ear. This protocol was chosen based on Saving Animals Across Borders who tattooed the letter 'N' on the inside of the left ear, as they were using the product (produced as Neutersol®). At this time, ArkSciences has no identification protocol. This procedure is useful for owned animals but cannot be identified from a distance. The Tsunami Animal-People Alliance in Sri Lanka have tried tattooing and collars and are now back to ear notching as a means of easily identifying sterilized animals from a distance. A butane cautery unit from Nasco Canada, which is truly a dehorner can be used to quickly ear notch and minimize bleeding. The unit costs approximately \$130 Canadian plus butane refills. We were able to borrow both a tattoo plier and a cautery dehorner for this trip.

#### **2.3.4 Clinic challenges:**

The team faced a number of obstacles on this first implementation trip, logistics and weather being the most challenging. Finding appropriate sites to hold the field clinics was difficult. Because of the area covered and the terrain, it made it impossible to hold everything in a



central location because the dogs would then have to walk significant distances in very steep terrain while still experiencing the effects of anesthetics. Some of the communities had a community room, which worked well, but the smaller ones had no communal space and the team was forced to hold clinics outdoors. This was fine, except on rainy days, which made for very difficult clinics. *Photo: Dr. Kate Kuzminski and girl, Todos Santos, 2009; Photo by: Dominique Laplante.*

One of the biggest challenges of this initial implementation phase was patient thermoregulation. On sunny days, temperatures were adequate to be able to hold clinics outside and thermoregulation was much easier to maintain. In all of the buildings used it was quite cool and towards the end of the day (around 4-5pm), it became quite a challenge to maintain reasonable body temperatures of the sedated patients. The team had purchased a butane burner and could boil water on-site with which they filled hot water bottles or warm fluid bottles up as external heat sources. The team also brought plastic wrap which was used as a cover sheet for patients in recovery.

### **2.3.5 Surgical Sterilization:**

While the initial goal of the implementation phase was to capture and sterilize all un-owned dogs (chemical for males and surgical for females), stray (un-owned) dog capture proved too difficult. As a contingency plan, the team offered sterilization to a handful of owned female dogs. 12 female dogs received surgical ovario-hysterectomies. It was a good opportunity to experience surgical sterilization in the Todos Santos field conditions. All dogs had IV catheters placed and were on IV fluids for the procedure. The anesthetic protocol was a multimodal combination in which the Zoletil® was reconstituted with Dormitor®, ketamine and butorphanol (see Appendix V). Propofol® was used as needed. This protocol has been successfully used in RAVS field clinics where IV anesthesia was the only option.

Thermoregulation, homeostasis and appropriate lighting were the main clinic challenges. Clinic temperatures were cool, and maintaining appropriate body temperatures for our anesthetized patients was challenging. Hot water bottles, warmed fluids, and plastic wraps were used to reduce heat loss. At that time of year (January), there is a very small window in which the temperatures are adequate to perform surgery. As Todos Santos sits in the valley between two mountains, the sun does not reach over the peak and shine on all parts of the village until 10-11 am. By 3 pm, the sun is setting over the other mountain range, again leaving the buildings in shade. This can mean a significant drop in room temperature. It was not unusual to be able to see your breath by 4-5 pm, which made surgical recoveries at that time very difficult. This also made it that much more crucial that animals be housed indoors for the night.



Excessive bleeding/oozing was common, providing an experience quite different from that in Canada. It also proved to be a challenge for Dr Contreras, as the prudent use of ligatures to ensure hemostasis was questionable. It may be prudent to have vitamin k on hand for return visits.

While challenging, this experience will better prepare VWB/VSF for the future obstacles of these field conditions and enable us to surgically sterilize larger numbers of female dogs upon return visits.

It was exceptionally difficult to get the Mayor to provide the team with an appropriate room close to this central area where most of the stray dogs roam, in which to establish a surgical suite. Now that the Mayor and community have witnessed the clinics and understand what our requirements are, they have assured VWB/VSF that they will provide us with a properly located and lit room upon our return. I believe that part of the difficulty with the municipality cooperating in the provision of rooms had to do with their perception of the dogs as being “dirty”. Once they saw that the team left the rooms much cleaner than they were to begin with, they seemed much more supportive.

### ***2.3.6 Stray Dog Capture:***

Unfortunately, the attempts to capture the stray dogs failed miserably. There were significantly fewer stray dogs in comparison to the counts made in May of 2008 (70 estimated at this time) however we are awaiting final tabulation of the estimates for January 2009). A likely reason for this reduction was that there had been recent and continuing culling campaigns of these dogs. In order to ensure community confidence as well as team and dog safety, the team needed to ensure the stray dogs were secured in a humane and safe manner. This was exceptionally difficult given the steep terrain, aggressive nature of the dogs, number of people in El Centro, and numerous places where dogs can escape/hide. The stray dog population is mainly focused around the market in El Centro. The terrain and lay-out of this area makes it exceptionally difficult to capture these dogs. Butterfly-type nets could work, however human crowd control remains an issue. Local residents are very curious about the catching of the dogs, and were a definite obstacle to safe capture and handling. Assistance from the municipal police in crowd control would potentially make things easier for future campaigns. Oral sedation provided in food or traps and butterfly nets as supported/used by WSPA and the Tsunami Animal-People Alliance are options to consider. Dart guns are an option, but given the number of places dogs can escape/hide to, their safety is questionable in this environment.

The stress the 2 dogs that were captured suffered on recovery was significant and the team opted to discontinue the capture and sterilization of the stray dogs because of



these welfare issues. Improved recovery conditions and monitoring (short term) for these animals are a priority for future stray campaigns.

### **2.3.7 Fecal Project:**

As zoonotic risk and the overall wellness of the community and their dogs was an important portion of the VWB/VSF project in Todos Santos, canine endoparasitic research was performed. The team was able to borrow a microscope and a centrifuge from the Ministry of Agriculture in Chiantla. Fecal samples were taken from sedated animals by means of rectal palpation. At this time we are awaiting final tabulation of these results.

This fecal analysis was very time-consuming and it was difficult to run fecals at the end of a long-tiring day. This initial survey was successful in identifying the fact that the prevalence of intestinal parasites in the dog population is significant, some of which have zoonotic potential. This could be the basis for a future work on reducing human health risk in this community.

## **3. Post-implementation Phase I**

### **3.1 Monitoring and evaluation:**

**March 2009:** Thorough investigation of possible post-injection site reactions and other possible problems with the procedure is extremely important to this project. The local Peace Corps volunteer has been identified as a contact person for community participants to contact if they are having problems or concerns with their dogs. A post-implementation survey and census is being completed in the week of 16-20 of March, 2009 (Appendix VI). Marjolaine Perrault will be returning to the community at this time to:

1. Continue discussions and partnerships with the mayor and administration.
  - Discuss the project, their concerns and future plans (see below).
  - Explore collaboration with the municipality and support for program.
2. Review the census and survey results
3. Visit clients with problematic or specific issues outlined in these surveys and examine dogs if necessary.
4. Discuss more thoroughly the behavior component of the survey with these clients
5. Meet with Dr Figueroa of Rescate Animale – a well-supported McKee technique trained veterinarian in Quezaltenango province and discuss future partnership for local sustainability of the sterilization program.

6. Train Andres (local hired person) to use the internet, so that future surveys can be transmitted electronically.

7. Round table discussion with a small group of local people to investigate: What represents wealth in Todos Santos, what is the typical salary at the municipality, and how do they think this project could be sustained without external assistance.

**May 2009:** A third dog population estimate and household survey will be conducted in May of 2009. A veterinary student, Taya Forde, and Kate Kuzminski will return to Todos Santos to perform a complete household survey as well as another dog population estimate (using mark-recapture protocol previously used with this population). Continued discussions with the municipality will be undertaken once again. Tabulation and comparative studies will be performed to evaluate the impact of the implementation phase 1 on the overall dog population.

### 3.2 Future Plans

During the last week in Todos Santos, Marjo Perrault and Kate Kuzminski met with the Mayor. It became clear that he realized he had been less than supportive of our efforts while we were working in his community. He was impressed with the number of dogs we sterilized and assured us that next time he would ensure we had more assistance. Providing us with adequate rooms for clinics/surgery, transportation for our supplies, a cambieneta (megaphone on a truck) are all simple things the municipality can do to make this an easier project. The Mayor provided a letter to us requesting that we come back to assist him in developing a responsible pet ownership program for his community as well as working on the dump/slaughterhouse and market issues that encourage a strong village carrying capacity for stray dogs.

**Building local capacity** in this project is of utmost importance. It will ensure that one day this project can be taken over by Guatemalan veterinarians and local team members as well as the municipality. The Peace Corp representative may be able to help us initially in a facilitating role, but VWB/VSF needs to identify key players in the community who are willing and able to ensure longevity of this project. A Dog Working Group could be a viable option as long as the membership of this group was not solely election-based, as it would change with each election (every 3-4 years). *Photo: Woman and girl waiting in line for the canine clinic. Todos Santos, 2009. Photo by: Dominique Laplante.*



If deemed appropriate, it would be prudent to have McKee trained veterinarians doing the surgical procedures in Todos Santos and perhaps trained to use EsterilSol™ safely in



order to encourage future involvement of Guatemalan veterinarians. Involving other veterinarians such as from Rescate and the University must be explored further.

**Carrying capacity of the dog population:** The project and community need to more fully address the issue of carrying capacity, as it is unlikely that a sterilization campaign and responsible pet ownership program will suffice at reducing the numbers of stray dogs. Waste management is a key factor in this carrying capacity. The dogs have ample resources as the local dump as well as the slaughter facility where offal is left for the dogs to eat. Not only is this contributing to the dog population, it is also potentially causing a public health risk. In the fall (September/October), VWB/VSF plans on facilitating a participatory workshop with all stakeholders in Todos Santos. Specialists to be invited to participate include: WSPA, McKee, Environmental engineers and waste management experts, Biofuel expert, and Ecohealth specialists. It is the goal of this workshop that the local stakeholders will identify themselves and propose a solution to the multi-disciplinary issues surrounding the dog population problem of Todos Santos.

Implementation Phase 2: VWB/VSF is proposing a return in November of 2009 for a second sterilization and vaccination campaign. At this time, all dogs not sterilized that are safe candidates for sterilization will be sterilized. Improved procedure for capturing and restraining the stray dogs will be attempted with an objective to sterilize ALL stray and owned dogs.

## APPENDIX I

### *Chemical Sterilization of Male Dogs*

#### EsterilSol™ - Zinc Gluconate

EsterilSol™ is a sterile injectable aqueous solution containing 0.2 M zinc gluconate neutralized to pH 7 with 0.2 M L-arginine (13.1mg zinc per ml). Once injected into a testicle, the zinc causes atrophy of the seminiferous tubules, rete testis and epididymis of male dogs (by about 77%) resulting in permanent, irreversible, non-surgical sterilization. Testosterone production will be decreased by 41-52%. At this time, ArkSciences is not making any product claims in regard to decreased testosterone-driven behaviours or prostatic disease. This product is labeled for male dogs 3 months of age and older and for testicles more than 10 mm and less than 27 mm wide. In addition to size contraindications, the use of EsterilSol™ is not recommended for cryptorchids, testicles with disease or malformation or in patients with pre-existing scrotal irritation or dermatitis.

A caliper is provided to ensure the testicles are the appropriate size. Most dogs will fall into this size category (<10mm but >27mm). Dosing is based on testicle size and ranges from 0.2 ml to 1.0 ml EsterilSol™ per testicle. The maximum dose is 1 ml, so if the testicle is larger than 27 mm, it is unlikely that complete sterilization will be achieved. It is available in 2 ml single use vials or 20 ml multi-use vials. The 20 ml vial currently costs \$60 USD (Oct 2008) for NGO's and depending on the size of the testicles will sterilize 10-20 dogs. Shelf life is 2 years and no refrigeration is required. The approximate cost of the product itself, to chemically neuter a dog is between \$3 - \$6USD / dog using the 20ml vials.

Light sedation is suggested in order to prevent animal movement and appropriate administration technique. According to Dr. Carlos Esquivel, Chief Academic Advisor for Latin America, ArkSciences, the injection should not be rushed but should take approximately 3-4 minutes to give.

In EsterilSol™ field studies, local reactions including testicular swelling, pain, biting/licking at the scrotum, preputial swelling and irritation, dermatitis, ulceration, infection, dryness and bruising of the scrotum were noted. The product apparently produces no adverse systemic effects. In Dr. Esquivel's opinion, initial post-injection complications were largely due to poor injection technique. Ensuring that 3 needles are used per patient, appropriate volumes and technique are maintained and that pre-existing dermatitis issues are treated before injection should reduce the incidence of

post-op complications significantly. Post injection pain is the most common complication (6.3% within 2 days of injection initially however Dr. Esquivel believes it is much lower at this time). Vomiting within 1 minute and 4 hours after injection is also a documented complication outlined in the EsterilSol™ marketing material. Dr. Esquivel believes this complication is more likely due to animals not being fasted prior to sedation as well as the use of drugs such as xylazine which can encourage vomiting. Post-op swelling appears to be a minor issue as per ArkSciences and Dr Esquivel.

In November of 2008, lead veterinarian, Dr Kate Kuzminski and team veterinarian, Dr Andrew Pulczer, attended a 2 day training session in Mexico under the supervision of Dr Esquivel. This training session was an extremely important step in pre-implementation and allowed for both veterinarians to feel confident in the use and possible problems when using EsterilSol™.

As a promotional tool, Ark Sciences has partnered with Mexican boxer Julio Cesar Chavez to promote chemical sterilization of male dogs in Mexico. In regions and countries where there is significant cultural reluctance for surgical castration, promotional activities such as this are critical.

*Photo: Dr Esquivel and Dr Kuzminski with the rest of the training team, Mexico, 2008.*



## **ADMINISTERING ESTERILSOL Technique Protocol**

Patients must be fasted for 12 hours. A full physical examination must be performed to ensure a clinically, healthy patient. The testicles must be examined/palpated prior to sedation. Check for symmetry, normal consistency and absence of fibrosis and pain. If abnormalities exist, this patient is not a good candidate for EsterilSol™. DO NOT use if: generalized abrasions, pyoderma/dermatitis, fibrosis or asymmetry, cryptorchid. If there is a small local abrasive area that can be avoided during the injection then patient is still good candidate. If dermatitis/pyoderma, treat with antibiotics and revisit dog once cleared up for the injection.

Using the EsterilSol™ calipers, measure the testicle width prior to sedation to ensure they are greater or equal to 10 mm or less than or equal to 27 mm. If patient is healthy and testicles are normal, weigh the dog and administer the appropriate sedation. (Our



options include: Zoletil, ace/morphine, propofol, Domitor. Include an opioid in the pre-med). If possible, administer the NSAID SQ at this time.

Once sedated, place the dog on his back and use the calipers to confirm the testicle diameter. If the diameter reads between 2 measurements on the caliper, round up to the next dose. Be precise in your dose calculations. Using gauze square, clean the testicles with a mild chlorhexadine solution. Rinse and dry well. Do not use iodine or alcohol to clean. Do not clip or pluck testicles.

Pull up the appropriate volume of EsterilSol™ for the right testicle into a 1cc syringe. Ensure there are no air bubbles in the syringe. Remove the syringe/needle from the vial and replace the needle with a clean, new 25-28g needle. Place syringe with new needle onto the table.

Repeat the procedure for the left testicle. Place on the table to the left of the other table. Always place the syringe with the EsterilSol™ for the right testicle on the right of the syringe prepared for the left testicle. This will ensure there is no confusion regarding which syringe is intended for which testicle. Gently grasp the right testicle with your left hand. Push the testicle forward and upward in the scrotum so the scrotal skin is taut against the testicle. Do not squeeze too firmly. Palpate the caput of the epididymis. Holding the syringe like a dart, and parallel to the abdominal wall, steadily introduce the needle into the centre of the testicle, just to the side of the caput. Take care to avoid the epididymis. Ultimately the needle should be seated into the centre of the testicle. DO NOT aspirate the syringe as this will cause contraction of the seminiferous tubules and will increase the risk of product seepage out of the parenchyma. Gently depress the plunger to administer the EsterilSol™. It is VERY important to be slow and steady during this injection process. Take a full 10-12 seconds to complete your injection. A rapid injection may again cause contraction of the seminiferous tubules which may lead to product seepage. Ensure the plunger is depressed fully. Wait a few seconds and then rapidly remove the syringe by pulling straight out. Ensure no EsterilSol™ has touched the scrotal surface during the removal of the syringe. If it has, gently rinse off with water and pat dry.

Repeat the process for the left testicle. Do not massage or manipulate the testicles after the procedure. Both an opioid and an NSAID should be administered for analgesia. Place the dog on a towel and keep warm during recovery. Once able to walk, the dog can go home.

Follow-up: Most complications occur within 12-72 hours. At 72 hours we will check in with the owners to see how their dog is doing. Need to ask about appetite, movement, urination/defecation, licking/chewing at scrotum, any redness, any concerns, seems painful??

## APPENDIX II



### CAMPAÑA DE ESTERILIZACIÓN DE PERROS (MACHOS) VACUNACIÓN Y TRATAMIENTO CONTRA LOS PARASITOS (MACHOS Y HEMBRAS)



EN COLABORACION CON LA MUNICIPALIDAD DE TODOS SANTOS,  
VETERINARIOS SIN FRONTERAS-Canadá ESTARA TRABAJANDO EN  
LAS SIGUIENTES COMUNIDADES

**¡ATENCIÓN! SU PERRO NO PUEDE COMER DESPUÉS DE LAS 10 DE LA  
NOCHE ANTES DEL DIA DE LA ESTERILIZACIÓN**

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PARA CUALQUIER PREGUNTA LLAMÉ AL TELEFONO

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## APPENDIX III

### Todos Santos – Cuestionario del HOGAR

1. Fecha: Enero \_\_\_\_\_ del 2009
2. Nombre de la Comunidad: \_\_\_\_\_
3. Nombre de la persona entrevistada: \_\_\_\_\_
4. ¿Su hogar actualmente es dueña de algún perro? Seleccione una: \_\_\_\_ Si \_\_\_\_ No

**Si la respuesta NO, vaya a la el extremo.**

5. ¿De cuántos perros es dueña su hogar ahora? \_\_\_\_\_
6. Por favor infórmenos acerca de su perro(s) o perra(s):

Número del Perro(a)	1	2	3	4
¿Nombre del perro(a)?				
¿Sexo del perro(a)? (masculino o femenino)				
¿Edad actual del perro(a)? (Seleccione una): ■ Cachorro (menor de 3 meses) ■ Joven a adulto (igual o mas de 3 meses)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
¿Cuándo es su perro(a) recluido en su propiedad? (Seleccione una): ■ Nunca recluido / libre de vagar ■ Durante el día solamente ■ Durante la noche solamente ■ Siempre (día y noche)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
¿Collar identificación? (si o no)				
¿Vacunado para la Rabia durante pasado 3 años? (si o no)				

¿Parasite sustantivo durante pasado año? (si o no)				
¿Castrado(a)? (si o no)				

Número del Perro(a)	5	6	7	8
¿Nombre del perro(a)?				
¿Sexo del perro(a)? (masculino o femenino)				
¿Edad actual del perro(a)? (Seleccione una): <ul style="list-style-type: none"> <li>▪ Cachorro (menor de 3 meses)</li> <li>▪ Joven a adulto (igual o mas de 3 meses)</li> </ul>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
¿Cuándo es su perro(a) recluido en su propiedad? (Seleccione una): <ul style="list-style-type: none"> <li>▪ Nunca recluido / libre de vagar</li> <li>▪ Durante el dia solamente</li> <li>▪ Durante la noche solamente</li> <li>▪ Siempre (dia y noche)</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
¿Collar identificación? (si o no)				
¿Vacunado para la Rabia durante pasado 3 años? (si o no)				
¿Parasite sustantivo durante pasado año? (si o no)				
¿Castrado(a)? (si o no)				
Número del Perro(a)	9	10	11	12
¿Nombre del perro(a)?				
¿Sexo del perro(a)? (masculino o femenino)				
¿Edad actual del perro(a)? (Seleccione una): <ul style="list-style-type: none"> <li>▪ Cachorro (menor de 3 meses)</li> <li>▪ Joven a adulto (igual o mas de 3 meses)</li> </ul>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
¿Cuándo es su perro(a) recluido en su propiedad? (Seleccione una): <ul style="list-style-type: none"> <li>▪ Nunca recluido / libre de vagar</li> <li>▪ Durante el dia solamente</li> <li>▪ Durante la noche solamente</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

▪ Siempre (día y noche)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
¿Collar identificación? (si o no)				
¿Vacunado para la Rabia durante pasado 3 años? (si o no)				
¿Parasite sustantivo durante pasado año? (si o no)				
¿Castrado(a)? (si o no)				

## APPENDIX IV

### TODOS SANTOS SCHEDULE

**KK: Kate Kuzminski – lead veterinarian**

**MP: Marjolaine Perrault – lead animal health technician**

**AP: Andrew Pulczer – lead researcher**

Jan 5-9: KK, MP, AP arrive in Todos Santos. Get rooms/arrangements finalized for clinics. Attend meetings. Put signs up in each community to tell what day/time/place of clinics.

Jan 10: Final preparations/market day/rest of team arrives  
(Dr Laplante, J. Greenacre, A. Montejo, C. Horteiga, D. Nash)

Jan 11: Team meeting/arrange supplies for clinics.

Jan 12: Los Mendoza

Jan 13: Finish Los Mendoza/El Centro

Jan 14: Che Cruz

Jan 15: Los Pablos AM

Chinquipic PM

Follow-up with Jan 12 patients/House Calls

Jan 16 : Market day

Follow-up with Jan 13 patients/House Calls

Jan 17: Los Jiminez

Los Mateus/Los Perez

Follow-up with Jan 14 patients/House Calls

Jan 18: Tuj Cuc



Angle

Follow-up with Jan 15 patients/House Calls

Jan 19: Los Ruinas AM

Set-up for spays PM

Dog Count by AP

Jan 20: Spays/House Calls

Follow-up with Jan 17 patients

Dog Count by AP

Jan 21: Spays/House Calls

Follow-up with Jan 18 patients

Dog Count by AP

Jan 22: Team Members left

House-Calls

Follow-up with Jan 19 patients

Dog Count by AP

Jan 23: Final Wrap-up/Pack Up

Follow-up with any questionable cases/Dog Count by AP

KK, MP, AP departed Todos Santos late Sat night.

## APPENDIX V

### ANESTHETIC PROTOCOLS

Premed Options (source [www.vasg.org](http://www.vasg.org)) :

Morphine/Ace - SQ or IM

- a. Morphine 0.5 mg/kg
- b. Acepromazine 0.03 mg/kg

Morphine/Domitor - IM (epaxials)

- a. Morphine 0.5 mg/kg
- b. Domitor 0.002-0.02 mg/kg

Acepromazine/Butorphanol – IM

- a. Acepromazine 0.03 mg/kg
- b. Butorphanol 0.2mg/kg

Injectable premed/induction/maintenance (for spays/strays, source RAVS)

Reconstitute Telazol with

2 ml Domitor

2 ml Ketamine

1 ml Butorphanol or Buprenorphine

Dogs – 0.1 ml/(4.5 kg) IM or IV

Cats – 0.05 – 0.08 ml/cat IM only (can reverse half the domitor if needed)

Induction/Maintenance (source [www.vasg.org](http://www.vasg.org)) :

- a. Propofol 3 - 4 mg/kg IV initially, then boluses of ¼ - 1/3 of the original induction dose as needed for maintenance

Analgesia Options: Rimadyl injectable/oral, Ketoprofen injectable, morphine

## APPENDIX VI

### Todos Santos – Encuesta de casa

7. Fecha: Enero \_\_\_\_\_ del 2009  
 8. Nombre de la Comunidad: \_\_\_\_\_  
 9. Nombre de la persona entrevistada: \_\_\_\_\_  
 10. ¿Su casa es actualmente dueña de algún perro? Seleccione una: \_\_\_\_ Si \_\_\_\_ No

**Si la respuesta NO, go to question 5 otherwise complete the following table.**

Cantidad de Perro(a)	1	2	3	4	5	6
¿Nombre del perro(a)?						
¿Sexo del perro(a)? (masculino o femenino)						
¿Edad actual del perro(a)?						
¿Cuándo es su perro(a) recluso en su propiedad? (Seleccione una):						
▪ Nunca recluso / libre de vagar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Durante el día solamente	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Durante la noche solamente	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Siempre (día y noche)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
¿Tiene el perro un collar de identificación? (si o no)						
¿A estado vacunado contra la rabia en los pasado año? (si o no) IF YES - when						
By whom did your dog receive a rabies vaccination?						
¿A recibido tratamiento contra los parásitos en los pasado año? (si o no)						
¿Castrado o operado? (si o no)						

11. ¿Did VWB sterilize your dog(s) in Enero 2009? Seleccione una: \_\_\_\_ Si \_\_\_\_ No

**If NO, la encuesta esta terminada.**

12. Were you happy with the dog sterilization(s)? Seleccione una: \_\_\_\_ Si \_\_\_\_ No; If not, please explain:

\_\_\_\_\_

\_\_\_\_\_

13. If this male chemical sterilization procedure was available again, would you pay for this procedure? \_\_\_\_\_ Si \_\_\_\_\_ No.

If you would pay, what is the highest amount you would be willing to pay?

\_\_\_\_\_ 30-50Q \_\_\_\_\_ 50-100Q \_\_\_\_\_ 100-150Q

11. If available, would you sterilize your female dog surgically? \_\_\_\_\_ Si \_\_\_\_\_ No

If so, what is the highest amount you would be willing to pay?

\_\_\_\_\_ 50-100Q \_\_\_\_\_ 100-150Q \_\_\_\_\_ 150-200Q

14. DOG 1. Have you seen any changes in your dog(s) behavior following sterilization??

Selecione una: \_\_\_\_\_ Si \_\_\_\_\_ No; **If no, go to question 8.** If yes then:

Does you dog roam (leave your area): \_\_\_\_\_ Less \_\_\_\_\_ More \_\_\_\_\_ As before

Aggressive towards other dogs: \_\_\_\_\_ Less \_\_\_\_\_ More \_\_\_\_\_ As before

Aggressive towards unknown people: Less \_\_\_\_\_ More \_\_\_\_\_ \_\_\_\_\_ As before

Aggressive towards known people: \_\_\_\_\_ Less \_\_\_\_\_ \_\_\_\_\_ More \_\_\_\_\_ As before

Has your dog(s) bitten anyone before the sterilization? \_\_\_\_\_ Si \_\_\_\_\_ No

Has your dog(s) bitten anyone since sterilized? \_\_\_\_\_ Si \_\_\_\_\_ No

If your dog has bitten since the sterilization, please explain (to whom (target), context, situation, etc):

\_\_\_\_\_

\_\_\_\_\_

15. DOG 1. Were there any medical issues following the sterilization of your dog(s) once the team left? Selecione una: \_\_\_\_\_ Si \_\_\_\_\_ No; If yes, please explain (example: swelling, pain, infection, etc):

\_\_\_\_\_

\_\_\_\_\_

16. DOG 2. Have you seen any changes in your dog(s) behavior following sterilization??

Selecione una: \_\_\_\_\_ Si \_\_\_\_\_ No; **If no, go to question 8.** If yes then:

Does you dog roam (leave your area): \_\_\_\_\_ Less \_\_\_\_\_ More \_\_\_\_\_ As before

Aggressive towards other dogs: \_\_\_\_\_ Less \_\_\_\_\_ More \_\_\_\_\_ As before

Aggressive towards unknown people: Less \_\_\_\_\_ More \_\_\_\_\_ \_\_\_\_\_ As before

Aggressive towards known people: \_\_\_\_\_ Less \_\_\_\_\_ \_\_\_\_\_ More \_\_\_\_\_ As before

Has your dog(s) bitten anyone before the sterilization? \_\_\_\_\_ Si \_\_\_\_\_ No

Has your dog(s) bitten anyone since sterilized? \_\_\_\_\_ Si \_\_\_\_\_ No

If your dog has bitten since the sterilization, please explain (to whom (target), context, situation, etc):

\_\_\_\_\_

\_\_\_\_\_

17. DOG 2. Were there any medical issues following the sterilization of your dog(s) once the team left? Selecione una: \_\_\_\_\_ Si \_\_\_\_\_ No; If yes, please explain (example: swelling, pain, infection, etc):

\_\_\_\_\_

\_\_\_\_\_

General



Other comments:

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