INTRODUCTION

Prevention of physical and emotional disease is increasingly recognized as a more efficient, cost effective, and humane approach to animal care. The benefits may be even greater in the typical field clinic setting where geographical, cultural, and economic factors impede access to veterinary care. With this in mind, the core goal of any wellness and preventive medicine care program is to protect animal welfare and ensure a high quality of life through the prevention and mitigation of disease.

OPERATIONAL CONSIDERATIONS

Ensuring organized and efficient clinic operations will allow for the care of more animals per unit of time at reduced cost. An organized clinic is perhaps the best way to demonstrate to the clients and community that their animals are valued and respected. Standard operating procedures should be established, written and accessible, and staff members should be trained in their execution.

Medical Records

The medical record should allow for the collection of pertinent historical information which will vary based on the clinic. The reason for presentation, length of ownership, dietary history, lifestyle, exposure to other animals, and existing or historical medical conditions may all be useful information to record. At a minimum, known administration of any treatments or medications and existing clinical signs of illness should be documented for each patient. Medical records should contain a complete, accurate, and legible account of all procedures, diagnostic test results, treatments, prescriptions dispensed, and any instructions and recommendations provided to the caretaker. In the case of anesthetic and/or surgical procedures, medical records should also include the caretaker’s acknowledgement of procedural risks in their native language along with all the details of the anesthetic and surgical procedure. Particularly for temporary field clinics, the caretaker should be provided a copy of the medical record along with information about how to handle questions or complications after the clinic’s closure.

Animal Identification

A method of individual animal ID ensures that patients move through the clinic efficiently and minimizes the chance of errors in treatment administration. The system used should assign each animal a unique alphanumeric identifier that will be recorded on the individual animal themselves, all patient records, treatments administered, and treatments dispensed. When identifying the animals themselves, a variety of methods may be considered including the use of temporary collars and tags, disposable ID bands, masking tape on the forehead of the animal, ID microchips, or simply writing the ID number directly on the animal in semi-permanent marker. Best practices include training staff to instinctively match an animal’s ID number with that on its medical record and that recorded on any medications intended for administration prior to beginning a procedure or dispensing a medication.

Physical Examination

The physical examination is the foundation of both preventive and diagnostic medicine. In the field, practitioners must often rely on the physical examination as the primary, if not the only, source of diagnostic information. While examination by a veterinarian is ideal, in most settings basic physical examination procedures can be performed by trained lay persons.
A minimum preventive health assessment should include the following: animal description; actual or estimated age; sex and sterilization status; species and predominant breed or breed type; resting heart rate, respiratory rate and body temperature; general attitude and mental state; hydration status; body weight and/or body condition assessment; pain assessment; and evaluation for common signs of infectious (e.g., discharge from mucous membranes, coughing, sneezing, vomiting, diarrhea) and non-infectious (e.g., hair loss, wounds, abnormal growths) disease. Additional assessment of animals presenting for anesthetic and/or surgical procedures is warranted including auscultation for severe abnormalities of the heart and lungs, assessment of hemodynamic status (e.g., mucous membrane color, capillary refill time, pulse quality), and evaluation of the intended surgical site for abnormalities that may alter the procedure or impede healing (e.g., lactation, severe pyoderma).

PROTECTING PHYSICAL HEALTH

Vaccination
Vaccination is the cornerstone of protecting physical health and preventing disease. An understanding of vaccine products, their pros and cons, and their administration, storage, and handling is critical to ensuring that vaccination actually leads to immunization. Vaccine products are generally categorized as either “infectious” (including modified-live virus) or “non-infectious” in nature. Whenever possible, modified-live virus vaccines should be used in the field due to their rapid onset of immunity, ability to overcome maternal antibody interference, role in passive immunization of the population, and ability to induce immunity after a single administration. When choosing specific vaccine products and protocols for a field clinic, consider the following: product efficacy, product formulation, ease of handling and administration, target population, vaccination program design, and immunization goals. See Appendices for Sample Vaccination Protocols for Dogs and Cats.

Vaccines are sensitive to both extreme temperatures and fluctuations in temperature and they should be stored under refrigeration. In many field clinics, refrigeration may not be possible. In such cases, vaccines should be maintained in coolers with ice packs. Similarly, many clinics and spay-neuter programs will prepare vaccines in the morning and set them aside for later use, carry them in vehicles, or store them on counter-tops in convenient locations. These practices also jeopardize viability of the vaccines and should be avoided. Many types of sterile vaccine diluents are product-specific and should not be interchanged or substituted with another product or solution. Once a vaccine has been reconstituted it should be administered within 30 minutes and protected from temperature extremes. Multiple vaccine products should never be mixed with one another and doses of vaccine should never be split between animals. Although challenging in the field clinic setting, these handling guidelines are essential to assure vaccination products remain effective. In their absence, resources will be wasted, the community remains at risk for disease outbreaks, and program credibility is undermined.

Vaccine products should be administered via the route indicated by the manufacturer. Using an incorrect route can result in inactivation of the vaccine, clinical disease in the animal, or severe organ damage. As a general rule, non-infectious vaccines must be administered either subcutaneously or intramuscularly, whereas infectious vaccines may be labeled for intranasal, intraoral, subcutaneous, transdermal, or intramuscular administration. Cleaning the skin with an alcohol swab prior to injection is neither recommended nor necessary. Using a standard site for administration of vaccinations is best practice and, in the event of an adverse reaction, will provide a clue as to which product may have caused the reaction. Most commonly, the following sites are used: right foreleg - canine distemper-
parvovirus and feline upper respiratory-panleukopenia; right hindleg - rabies or combination products containing rabies; left hindleg - feline leukemia virus or combination products containing feline leukemia. Products should be given as far down the leg (below the elbow or stifle) as is feasible. When dealing with a fractious or fearful animal, the interscapular region is also acceptable.

**Parasite prevention**

In addition to causing disease in animals, many parasites and parasite-vectored pathogens can also affect humans. The chosen parasite treatment protocol should prioritize the treatment of infestations that are common in the particular geographic region of operation as well as those that represent significant risk of zoonosis. Fecal examination (e.g., fecal flotation, direct fecal smears) is recommended when the distribution of parasites at a given clinic site is unknown, when animals present with clinical signs consistent with gastrointestinal parasite infestation (e.g., vomiting, diarrhea), or when there is lack of response to previous anthelmintic administration. In the absence of such diagnostics, a broad spectrum anthelmintic with efficacy against the most common and most pathogenic parasites should be administered empirically. The author generally recommends the empirical administration of pyrantel pamoate (10 mg/kg), fenbendazole (50 mg/kg), or ivermectin (0.2 mg/kg) in both dogs and cats. Off-label use of products formulated for large animals may be cost effective; pre-established dosing charts are recommended to prevent accidental overdosage.

Ectoparasiticides effective against fleas and ticks should also be administered to preserve quality of life and prevent transmission of vector-borne disease to both animals and humans. A wide variety of commercially available topical combination products are available, some of which are effective against both internal and external parasites. These may seem cost prohibitive for many field clinics, however, their broad spectrum of activity and, in many cases, the ability to purchase in bulk and distribute individual doses off-label may translate into overall cost savings. Their use is particularly desirable and effective in field clinics where the opportunity for repeat dosing, exact weight determination, and administration of oral medications may not be possible.

Field clinics or other facilities that may be housing animals long term should have a plan for environmental control of fleas and ticks. Areas surrounding the housing facility should be kept free from yard waste, grass, weeds, brush, and any points of access for wildlife to enter animal housing areas should be secured. Environmental acaricides (e.g., synthetic pyrethroids) can be applied around housing structures and within cracks and crevices in floors, walls, and ceilings. At least two treatments per year (in spring and fall) are required to eliminate all life stages; heavy infestations may require more frequent application and care should be taken to avoid direct animal contact with such products.

**Diagnostic testing**

Although it is an expected component of preventive veterinary care in the developed world, the utility of diagnostic testing in the field clinic must be considered in light of the population of animals and caretakers being served, resource availability, and the program’s overall mission. The following questions should be considered:

- Does the program have enough resources (financial, staffing, equipment, time) for testing?
- Does the prevalence of the disease in question in the region justify diagnostic screening?
- What tests are available, will they be feasible to conduct, and will they produce accurate results?
- Will the results of the screening test alter the therapeutic plan for the individual patient?
Will the results of the screening test impact human health?
Will the results of the screening test alter the operation of current or future clinics?
Does the cost of conducting the screening test impact other clinic services or the clinic’s effectiveness as a whole in pursuing their primary mission?
Does conducting diagnostic testing fall within the clinic’s operational mission?

Testing for diseases that are common, highly infectious, potentially fatal, or zoonotic should be prioritized. These commonly include: canine heartworm disease, feline leukemia virus, feline immunodeficiency virus, and dermatophytosis.

**SPAY-NEUTER**

Although the benefits of spay-neuter to the individual animal are well-established, surgical sterilization is not an expected or desired component of responsible pet ownership in many parts of the world. It is important for practitioners to carefully consider whether or not it is appropriate to include elective sterilization as part of a field clinic’s preventive care program. If spay-neuter services are provided, both the risks and benefits to the individual animal should be discussed with the caretaker and the program should consider whether or not surgical services can be provided with adequate anesthesia and analgesia, maintenance of aseptic technique, and with provisions for post-procedural care.

**HUSBANDRY**

A comprehensive wellness and preventive care assessment should also include evaluation of the husbandry provided by the caretaker. It is not uncommon for field clinic practitioners to encounter disease processes due to inadequate nutrition; unsanitary living environments; and lack of appropriate grooming, breed, or age-specific care. Type and formulation of food offered, frequency and amount of administration, animal acceptance of diet, and alternate sources of caloric intake should all be assessed. Access to and availability of clean drinking water should be ensured. Animals and populations that are fed imbalanced homemade diets, diets formulated for different species, or are primarily sustained via scavenging should be assessed with particular attention to common forms of malnutrition. Claw trimming and coat maintenance to prevent matting, urine and fecal scalding, secondary infection, and parasitic infestation should be performed and demonstrated to caretakers when necessary. Breed-specific care may include discussion of concepts such as environmental thermoregulation for brachycephalic animals, establishing an ear cleaning regimen for flop-eared breeds, and skin care for breeds with redundant skin or those prone to sunburn. Specific needs for neonatal or pediatric animals as well as geriatric animals may also be discussed.

**CONCLUSION**

Facing severe infectious disease threats, treatment of diseases that have progressed due to lack of care, and the simple logistics of creating a clinic environment in an inhospitable environment, it is easy to place wellness and preventive care low on the list of priorities. However, by ensuring that things such as vaccination, parasite prevention, and basic husbandry are always prioritized, the veterinary profession can lead by example. Prevention truly is the best medicine and will ensure the highest quality of life – in both the short and long term – for both the people and animals we serve.
## APPENDIX A: SAMPLE VACCINATION PROTOCOLS FOR DOGS

### Vaccination Protocol for Shelter-Housed Dogs

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Initial Vaccination</th>
<th>Revaccination Interval</th>
</tr>
</thead>
</table>
| **Modified Live Virus**  
Canine distemper virus +  
Canine adenovirus-2 +  
Canine parvovirus +/-  
Canine parainfluenza virus | Puppies: 4 weeks of age  
Adults: On admission | Repeat every 2 weeks until 20 weeks of age  
Repeat in 2 weeks if possible |
| **Modified Live Virus**  
Intranasal *Bordetella bronchiseptica* +  
Canine parainfluenza virus | Puppies: 3 weeks of age  
Adults: On admission | Repeat once in 2 weeks if less than 6 weeks of age  
Repeat in 6 months |
| **Inactivated**  
Rabies virus | Puppies: 12 weeks of age*  
Adults: On admission or prior to release | Repeat in 1 year  
Repeat in 1 year |

### Vaccination Protocol for Privately-Owned Dogs

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Initial Vaccination</th>
<th>Revaccination Interval</th>
</tr>
</thead>
</table>
| **Modified Live Virus**  
Canine distemper virus +  
Canine adenovirus-2 +  
Canine parvovirus +/-  
Canine parainfluenza virus | Puppies: 6 weeks of age  
Adults: On initial presentation | Repeat every 4 weeks until 16 weeks of age, in 1 year, and every 3 years thereafter  
Repeat in 1 year, then every 3 years thereafter |
| **Modified Live Virus**  
Intranasal *Bordetella bronchiseptica* +  
Canine parainfluenza virus | Puppies: 4 weeks of age  
Adults: On initial presentation | Repeat annually  
Repeat annually |
| **Inactivated**  
Rabies virus | Puppies: 12 weeks of age  
Adults: On initial presentation | Repeat in 1 year  
Repeat in 1 year, then every 1 or 3 years depending on product used |

*Note: “Puppies” are considered to be <16 weeks of age; adults are considered to be >16 weeks of age.*

*If animals are only available for vaccination on occasion at less than 12 weeks of age (e.g., trap-neuter-return programs), vaccination as early as 8 weeks is recommended. Such vaccination may not be legally recognized in some localities, though it is likely to provide some level of protection against disease.
APPENDIX B: SAMPLE VACCINATION PROTOCOLS FOR DOGS

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Initial Vaccination</th>
<th>Revaccination Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modified Live Virus</strong></td>
<td>Kittens 4 weeks of age</td>
<td>Repeat every 2 weeks until 20 weeks of age</td>
</tr>
<tr>
<td>Feline viral rhinotracheitis +</td>
<td>Adults On admission</td>
<td>Repeat in 2 weeks if possible</td>
</tr>
<tr>
<td>Feline calicivirus +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feline panleukopenia virus</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inactivated or Recombinant</strong></td>
<td>Kittens 8 weeks of age</td>
<td>Repeat in 2 weeks</td>
</tr>
<tr>
<td>Feline leukemia virus</td>
<td>Adults On admission if</td>
<td>Repeat in 1 year if group-housed</td>
</tr>
<tr>
<td></td>
<td>group-housed</td>
<td></td>
</tr>
<tr>
<td><strong>Inactivated</strong></td>
<td>Kittens 12 weeks of age*</td>
<td>Repeat in 1 year</td>
</tr>
<tr>
<td>Rabies virus</td>
<td>Adults On admission or</td>
<td>Repeat in 1 year</td>
</tr>
<tr>
<td></td>
<td>prior to release</td>
<td></td>
</tr>
</tbody>
</table>

Note: “Kittens” are considered to be <16 weeks of age; adults are considered to be >16 weeks of age.

*If animals are only available for vaccination on occasion at less than 12 weeks of age (e.g., trap-neuter-return programs), vaccination as early as 8 weeks is recommended. Such vaccination may not be legally recognized in some localities, though it is likely to provide some level of protection against disease.