ProHeart® 6 (moxidectin):
The Value of the Second Dose*

Introduction
ProHeart 6, an injectable prescription parasiticide, is the only U.S. Food and Drug Administration (FDA)-approved injectable heartworm disease preventative that protects dogs for six months against heartworm disease caused by *Dirofilaria immitis*; it also treats preexisting infections with common hookworms (*Ancylostoma caninum* and *Uncinaria stenocephala*).

ProHeart 6 is the only heartworm disease preventative that ensures six months of continuous protection in a single dose and can only be administered by veterinarians and staff.

A 2015 study analyzed a total of 1,626 veterinary invoices for 918 dogs receiving an appropriately timed second dose of ProHeart 6 (within 5–7 months of an initial dose). The study found that beyond ensuring year-round compliance with a heartworm disease prevention regimen, the second dose offers additional benefits for the patient, the pet owner and the practice (Figure 1).

**Figure 1 — Benefits of the ProHeart 6 Second Dose**

For the Patient
- Year-round protection
- Early detection of disease

For the Pet Owner
- Convenient peace of mind

For the Veterinary Practice
- Veterinarian-controlled compliance
- Healthier practice

About the study
This study enrolled 18 veterinary practices from eight states. All practices supplied invoices for 2009–2014. The 1,626 invoices analyzed in the study all met the criteria for a ProHeart 6 second dose (i.e., one given 5–7 months after the initial dose). The invoices also included anonymous data about health observations, patient health status, medical issues addressed, products or services the client purchased during the visit and any charges associated with the visit. All patients met the label requirements for ProHeart 6 administration; no exclusion criteria were applied for patient age, breed, size or gender.
Key findings
Medical issues addressed
As a direct consequence of being brought in for physical exams at the time of the ProHeart 6 second dose, 21.7% of patients (353/1,626) had at least one medical issue addressed at the time of the second dose. Of those 353 patients, 315 (89%) had a new medical condition diagnosed. The newly identified issues spanned a wide range of acute, chronic and other conditions. Table 1 shows the breakdown of medical issues identified at the time of the ProHeart 6 second-dose visit.

Additional services and products obtained
The ProHeart 6 second-dose visit also saw 78.9% of clients (1,283/1,626) obtaining other products, services or both. Tables 2 and 3 show these additional services and products, as well as the mean charge for each item. Vaccinations were the most common additional services (23.3% of invoices, mean charge $36.33), and pet supplies were the most common additional products (10.8% of invoices, mean charge $23.77). Of the additional services obtained, dental care accounted for the highest mean service charge ($188.14); for additional products, the highest mean product charge was generated by flea/tick control ($58.59).

Revenue generated
The average total revenue associated with the ProHeart 6 second-dose visit was $121.13. The ProHeart 6 acquisition cost was calculated as $12.32, the average cost to veterinary practices for a ProHeart 6 dose for a 35-lb dog. Table 4 shows the average invoice charges for a ProHeart 6 second-dose visit. Of the $121.13 average total revenue, the ProHeart 6 dose itself was only $45.96 on average. The remaining $75.17 took the form of additional services/products and exam/other fees. Moreover, those pet owners who were charged an exam fee (average $28.80) were significantly (P<.0001) more likely to purchase additional products or services at that visit to the veterinary practice.
**Added value of the second dose**

Owner compliance is a known issue in heartworm disease preventative regimens. Because ProHeart 6 can only be administered by veterinarians and veterinary staff certified to do so, it removes the obstacle that comes with monthly, home-administered preventatives. And because an appropriately timed second dose of ProHeart 6 comes 5–7 months after the first dose, it provides an opportunity for the regular six-month physical exams that are part of many wellness programs.

**For the patient**, the ProHeart 6 second dose ensures an uninterrupted 12 months’ protection against heartworm disease. Added value also takes the form of the possibility for earlier detection and treatment of various conditions.

**For the pet owner**, in addition to the convenience of year-round compliance without needing to administer a heartworm disease preventative at home, the second dose provides the ease of obtaining additional products and services at the same time. Pet owners also benefit from knowing a dog’s health is being monitored with twice-yearly physical exams.

**For the veterinary practice**, the second-dose visit creates more opportunities to practice best medicine, from observing a dog’s health every six months through physical exams to working within the framework of wellness programs. The veterinary-administered medication also helps keep the veterinary practice—and the practice’s pharmacy—at the center of the dog’s care. Moreover, regular physical exams improve the overall health of the veterinary practice.

**IMPORTANT SAFETY INFORMATION**

PROHEART 6 should be used in healthy dogs. Do not administer to sick, debilitated, underweight dogs or dogs that have a history of weight loss. Prior to administration, PROHEART 6 certified veterinarians should continue to assess patient health through a medical history, physical examination and if deemed appropriate, diagnostic testing. Continue to use caution when administering PROHEART 6 concurrently with vaccinations. Adverse events, including anaphylaxis, have been reported following the concomitant use of PROHEART 6 and vaccines. In some cases, anaphylactic reactions have resulted in death. Use with caution in dogs with pre-existing or uncontrolled allergic disease (food allergy, atopy or flea allergy dermatitis). Dogs receiving PROHEART 6 should be tested for existing heartworms as per the product label. In people, avoid PROHEART 6 contact with eyes. If contact with the eyes occurs, rinse thoroughly with water for 15 minutes and seek medical attention immediately. PROHEART 6 is available only to veterinarians through a restricted distribution program. Only certified veterinarians and staff can administer it. See full Prescribing Information on the following page.

*All data are from Lavan R, Login, JA. How a PROHEART® 6 (moxidectin) repeat dose improves compliance, product and service utilization, and patient health. Zoetis Inc., 2015.*

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ProHeart® 6 (moxidectin)

Sustained Release Injectable for Dogs

**DESCRIPTION**

ProHeart® 6 (moxidectin) Sustained Release Injectable consists of two separate vials: One vial contains 10% moxidectin sterile microspheres and the second vial contains a specifically formulated sterile vehicle for constellation with the microspheres. No other diluent shall be used. A clear or translucent appearance of the vehicle is normal. Each mL of constituted drug product contains 3.4 mg moxidectin, 3.1% glycerin triacetate, 1.4% hydroxypropyl methylcellulose, 0.87% sodium chloride, 0.17% methylparaben, 0.02% propylparaben and 0.001% butylated hydroxytoluene. Hydrochloric acid is used to adjust pH.

**PHARMACOLOGY**

Moxidectin is a semi-synthetic methamidine derivative of nemadectin which is a fermentation product of Streptomycetes cyaneogriseus subspecies noncyanogenus. Moxidectin is a pentacyclic 16-membered lactone macrolide. Moxidectin has activity resulting in paralysis and death of affected parasites. The stage of the canine heartworm affected at the time of treatment will be the dose used. The dose of 0.17 mg/kg body weight is the basal stage. The larval and adult stages of the canine heartworms, Ancylostoma caninum and Uncinaria stenocephala are susceptible.

**INDICATIONS**

Following injection with ProHeart® 6, peak moxidectin blood levels will be observed approximately 7-14 days after treatment. At the end of the six month dosing interval, residual drug concentrations are negligible. Accordingly, little or no drug accumulation is expected to occur with repeated administrations.

**WARNINGS**

In a laboratory effectiveness study, dogs with 4- and 6-month-old heartworm infections experienced vomiting, lethargy and anorexia. In all cases, the dogs recovered fully. In clinical studies, two geriatric dogs with a history of weight loss after the initial ProHeart® 6 injection died within a month of the second injection. A third dog who was overweight for its age and breed and who had a history of periodontal problems experienced lethargy following the initial injection of ProHeart® 6. The dog never recovered and died 3 months later (see WARNINGS).

**CONTRAINDICATIONS**

ProHeart® 6 is contraindicated in animals previously found to be hypersensitive to this drug.

**HUMAN WARNINGS**

Not for human use. Keep this and all drugs out of the reach of children. May be slightly irritating to the eyes. May cause slight irritation to the upper respiratory tract if inhaled. May be harmful if swallowed. If contact with the eyes occurs, rinse thoroughly with water for 15 minutes and seek medical attention immediately. If accidental ingestion occurs, contact a Poison Control Center or a physician immediately. The Safety Data Sheet (SDS) contains more detailed occupational safety information.

**WARNINGS**

ProHeart® 6 should be administered with caution in dogs with pre-existing allergic disease, including food allergy, atopy, and flea allergy dermatitis. In some cases, anaphylactic reactions have resulted in liver disease and death. Anaphylactic and anaphylactoid reactions should be treated immediately with the same measures used to treat hypersensitivity reactions to vaccines and other injectable products.

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