“buyer beware” market. Millions of dollars are wasted annually on pet supplements that are inappropriate, however, there are effective supplements available that are backed by scientific studies.

Dr. Rebecca Remillard, a board-certified veterinary nutritionist at Angell, is available for Nutritional Counseling by appointment. For more information or to refer a client, please call Eleanor Cousino, Referral Coordinator at 617 522-5011 or visit www.mspca.org/nutrition.
Patient Bullet is a one-year-old neutered male Rhodesian Ridgeback.

Presenting Complaint Approximately one month prior to coming to Angell, Bullet’s owner had discovered him gnawing on the computer surge protector when he bit down and was electrocuted. His concerned owner ran toward him and the stunned dog covered and shook. He seemed otherwise uninjured according to the owner and she decided not to have him examined.

In the immediate aftermath of this traumatic event, Bullet became extremely reactive to his owner’s approach. He ran away and hid in a closet or under the bed, sometimes dribbling urine as he fled from her. After several weeks, she brought him to Angell.

Bullet appeared to be anxious and hypervigilant in the waiting area and huddled close to his owner’s feet. The owner was able to demonstrate good leash control and appropriate application of obedience commands when asked to walk her dog through the waiting area.

An in-depth review of the history revealed that Bullet ate two daily meals and enjoyed long walks and play dates with other compatible canine playmates everyday. His owner had owned two large dogs prior to Bullet and was an experienced and reliable handler.

Diagnosis Because of her rapid approach toward the dog at the moment he received a strong electric jolt from the cable he had bitten, she had become a conditioned stimulus of his phobic response.

In true Pavlovian conditioning, the unconditioned stimulus (pain and panic from electrocution) triggered the unconditioned response (physiological reactions such as elevated heart rate, respiratory rate, adrenaline, cortisol and psychological response of avoidance reaction). The owner’s advance (conditioned stimulus) was coincident to the dog’s trauma and this association created a conditioned and very negative response to his owner. Bullet had unfortunately developed a phobia of his owner.

Treatment Bullet survived a traumatic event but emerged with a post-traumatic behavior problem. Anxiety should be considered a form of pain, and with that in mind, deserves attention and intervention. Relief of anxiety is no less important than pain management.

The goals of treatment were two-fold. First, Bullet’s anxiety level needed to be controlled and chemical intervention would provide the fastest, most reliable relief. Second, the relationship between owner and pet companion needed to be reset back to normal; psychoactive medication, combined with basic behavior modification, were advised.

A CBC, serum biochemistry and urinalysis were clinically insignificant. Physical examination was unremarkable.

The effects of electrocution are not always obvious and Bullet’s owner was advised to bring him in as an emergency should his destructive behavior continue to be directed onto cables and wires. It was recommended that Bullet be offered rawhide strips, sticks and batons (avoiding knotted or bulky shapes) coated with peanut butter several times over the course of the day and evening. Chewing is an anxiety-releasing mechanism in dogs. The owner was to sit on the floor so that she would appear less intimidating and invite her dog to approach her for a food reward.

The benzodiazepine alprazolam (0.1 mg/kg q12h) was chosen to control Bullet’s anxiety. This group of drugs has an orexigenic effect that can be used as an advantage in desensitizing and counterconditioning programs. For Bullet, the appetite-boosting effect combined with the anxiolytic effect helped him to overcome his phobia. His motivation to acquire the food reward exceeded the fear of approaching his owner.

After one week on psychoactive medication, Bullet’s owner was able to sit on a chair or sofa when she invited him to enjoy his rawhide. By the end of the second week, he was able to approach her when she stood. By the end of the fourth week, Bullet remained in a down and stay position and welcomed her approach as she gave him a treat.

Alprazolam therapy was continued for an additional month to avoid any chance of regression and gradually withdrawn in the last week of treatment. Bullet showed no fear of his owner during this time and alprazolam was discontinued. Bullet’s owner also ensured that all electric wiring in her home was concealed behind furniture, under rugs or in commercially-available cable covers.

Follow Up Bullet is continuing to enjoy and respond well to his rawhide chews. Both Bullet and his owner are once again enjoying each other’s company.

For More Information A behavior problem, whether acute or longstanding in nature, can have a serious impact on the animal and owner’s quality of life and their future together. It is always important to ask about the existence of any behavior problems during routine examinations. In addition, a client’s report of pet misbehavior at any time should prompt a referral to a board-certified veterinary behaviorist for a meaningful diagnosis and appropriate treatment plan.

For more information, please visit www.mspca.org/behavior.

To refer a client to the Behavior Service at Angell, please call Eleanor Cousino at 617 522-5011.
tumors have a larger proportion of proliferating cells, so the smaller the tumor, the better the response to chemotherapy.

**What are the common side effects of chemotherapy?** Toxicty from chemotherapy most commonly occurs in normal tissues that are renewing and rapidly dividing, i.e. gastrointestinal tract, bone marrow and continuously growing hair.

Gastrointestinal toxicity most commonly occurs secondary to direct damage to intestinal epithelial cells. Typical signs include inappetence, nausea, vomiting and/or diarrhea beginning three to five days after treatment. Usually, these side effects are minimal and self-limiting. Occasionally, supportive care is required.

Myelosuppression occurs secondary to damage to the rapidly dividing bone marrow stem cells. Cells with the shortest circulating life span are most susceptible. Thus, myelosuppression most often manifests as neutropenia since the half-life of a circulating neutrophil is less than one day. Platelets circulate for approximately 10 days and are the second most susceptible line. Usually, patients with mild to moderate myelosuppression are clinically normal, if there are no secondary infections. An ill patient on chemotherapy should be seen on an emergency basis.

If any of the aforementioned side effects are severe, dose reductions are considered. These reductions are not taken lightly, as dose intensity is extremely important for anti-tumor response. Therefore, dose reductions are considered only after symptomatic treatments to abrogate adverse effects of chemotherapy have been attempted.

Other drug-specific effects such as cardiotoxicity from doxorubicin, sterile cystitis from cyclophosphamide and hepatitis from CCNU may necessitate discontinuation of the drug.

**Which bloodwork parameters should I monitor? What should I do about abnormally low blood counts?** A CBC should be performed at intervals at which neutropenia is expected to be most pronounced. This usually falls at weekly intervals between treatments that are given more than one week apart (doxorubicin is given every two to three weeks; CCNU is given every three weeks in the dog). A CBC is also performed just prior to each chemotherapy administration. If the neutrophil count is less than 1500/µL, treatment should be delayed until it is above this limit. If the neutrophil count falls below 1000/µL and the patient is febrile, prophylactic broad-spectrum oral antibiotics should be started. If febrile, the patient should be treated with IV fluids and antibiotics, as this is consistent with sepsis and an oncologic emergency.

**What history and physical exam findings should I be concerned about?** Chemotherapy side effects that are prolonged, severe or are diminishing the patient’s quality of life should be addressed as soon as possible.

Consequences of severe GI effects are dehydration, nutritional deficiency and treatment delay. Judicious use of anti-emetics (serotonin 5-HT3 receptor antagonists, Cerenia, metoclopramide) and anti-diarrheals (metronidazole, tylosin) is indicated. Hospitalization for rehydration and other supportive care may be indicated.

If a myelosuppressed animal is ill or pyretic, immediate attention with emergency examination, hospitalization and parenteral administration of broad-spectrum antibiotics, IV fluid support and other supportive care (parenteral anti-emetics and anti-diarrheals), are indicated. Thoracic radiographs should be considered in a febrile neutropenic patient to rule out aspiration pneumonia especially if there is concurrent vomiting.

**What are the goals of chemotherapy?** The goals of using chemotherapy in our veterinary patients are to control cancer and prolong survival while above all maintaining a good quality of life. While we expect the side effects to be minimal and predominantly self-limiting, there are instances when they can be severe and even life-threatening. Early detection and immediate intervention can minimize progression to a life-threatening state.

**For more information or to refer a client to the Oncology Service at Angell, please call Gary Vanasse at 617 541-5136, email oncology@mspca.org or visit www.mspca.org/oncology.**
Angell Animal Medical Center Referral Guide

Cardiology Service
Referral Liaison: Robin Grammer
Referral Line: 617 541-5038  Referral Fax: 617 989-1653
Email: cardiology@mspca.org  Web site: www.mspca.org/cardiology

Dermatology Service
Referral Liaison: Rebecca Stlaske
Referral Line: 617 524-5733  Referral Fax: 617 989-1613
Email: dermatology@mspca.org  Web site: www.mspca.org/dermatology

Neurology Service
Referral Liaison: Natasha Bureau
Referral Line: 617 541-5140  Referral Fax: 617 989-1666
Email: neurology@mspca.org  Web site: www.mspca.org/neurology

Oncology Service
Referral Liaison: Gary Vanasse
Referral Line: 617 541-5136  Referral Fax: 617 541-5130
Email: oncology@mspca.org  Web site: www.mspca.org/oncology

Pain Medicine Service
Referral Liaison: Natasha Bureau
Referral Line: 617-541-5140  Referral Fax: 617-989-1666
Email: painmedicine@mspca.org  Web site: www.mspca.org/painmedicine

For all other referrals, please continue to call Eleanor Cousino, Angell Referral Coordinator at 617 522-5011.