



Investigating a Noninvasive, At-home Diagnostic Technique for Gastrointestinal Disorders *Pedro L Boscan, DVM, PhD, Colorado State University*

Result: Novel wireless sensor capsule helps researchers study gastrointestinal disorders in dogs

Gastrointestinal disorders, such as vomiting, diarrhea, and weight loss, often are associated with a change in the motility – the rate of movement of food through the stomach and intestines. In human medicine, a novel, noninvasive, wireless sensor capsule called the SmartPill® was developed to measure gastrointestinal motility in people. The device monitors and records data on a small portable receiver as the capsule passes through the GI tract. Data collected includes gastric pH (stomach acid level), gastric emptying (the speed with which food empties from the stomach and enters the small intestine), and total GI transit time (how long it takes for food to travel through the entire digestive tract).

Motility disorders in dogs and cats are difficult to diagnose and treat. Morris Animal Foundation–funded researchers at Colorado State University addressed this problem by evaluating SmartPill® technology and its ability to diagnose GI transit disorders in healthy dogs for baseline data. As GI function is influenced by stress levels, researchers measured GI transit times of dogs using this technology in both a nonstressful home environment and more stressful veterinary hospital environment.

Data analysis revealed that hospitalization induces a delay in gastric emptying in most dogs. Delayed gastric emptying has been linked to several problems, including altered oral drug absorption and a predisposition to bloat. However, no changes in gastric acidity were observed during hospitalization. This suggests further evaluation of the prophylactic use of antacids drugs to prevent hospital stress-related gastric ulceration in dogs.

While researchers were able to successfully apply a human motility technique to veterinary medicine and collect important GI mobility data, final analysis of the SmartPill® technology showed wide data variability among dogs. This variability suggests that the SmartPill® may not be an effective diagnostic tool for clinical settings. Cost-to-benefit ratio also precludes its use in most veterinary clinics. Another problem noted by the researchers was that some small dogs have difficulty passing the SmartPill® beyond the stomach, making this technology ineffective for evaluating motility in small pure- and mixed-breeds.

The motility baseline data collected from this study in healthy dogs will be incorporated into the research team's next project focusing on large-breed dogs predisposed to developing gastric dilation volvulus syndrome or bloat. (D10CA-016)