Interventional radiology (IR) involves the use of contemporary imaging techniques such as fluoroscopy and ultrasonography to selectively access vessels and other structures in order to deliver different materials for therapeutic reasons.

**EXAMPLES OF COMMONLY PERFORMED PROCEDURES**

**Tracheal Stenting**
Tracheal collapse is a progressive, degenerative disease of the cartilage rings in which hypocellularity and decreased glycosaminoglycan and calcium content leads to dynamic tracheal collapse during respiration. Many of these animals are palliated with medications including anti-inflammatories, cough suppressants, sedatives/tranquilizers, and bronchodilators. Candidates for surgical therapy are those that have failed initial conservative medical management. Clinical improvement rates in 75%-90% of animals treated with self-expanding, intra-luminal stainless steel stents have been reported. Immediate complications were mostly minor although there was a peri-operative mortality rate of approximately 10%. Late complications included stent shortening, excessive granulation tissue, progressive tracheal collapse, and stent fracture.

**Congenital Intrahepatic Portosystemic Shunts**
Portosystemic shunts (PSSs) are anomalous vascular communications between the portal venous and systemic circulations that result in a clinical syndrome with various neurological, biochemical, and hematological consequences. Numerous techniques have been described for intrahepatic PSS attenuation, ranging from careful liver dissection around the shunting vessel to more technically demanding and complicated procedures involving temporary vascular hepatic inflow occlusion for intravascular repair (References available from the author). The goal of IR techniques for intrahepatic PSSs is to reduce the unacceptably high, peri-operative mortality rates associated with traditional open surgical techniques and hopefully improve the outcome for these cases. We have performed over 60 percutaneous transvenous coil embolizations (PTCE) with a vena caval stent and thrombogenic coils placed within the shunt. Peri-operative complications were minor and peri-operative mortalities were comparatively low.

**Percutaneous Transarterial Embolization and Chemoembolization (TACE)**
Bland arterial embolization entails selective, catheter-directed delivery of particulate material in order to control hemorrhage, occlude vascular malformations, or reduce tumor growth. Chemoembolization involves selective intra-arterial chemotherapy delivery in conjunction with subsequent particle embolization. Various tumors may respond to chemoembolization as well.

**Palliative Stenting for Benign or Malignant Obstructions**
Veterinary patients can present with advanced stages of malignancy in which traditional therapies such as surgery, chemotherapy, or radiation therapy are either associated with excessive morbidity, cost, or poor outcome. IR techniques involving the placement of intra-luminal stents to
palliate similar malignant obstructions in humans have been described (see urethral stent figure). The author has performed a number of palliative stenting procedures in the urinary tract, and upper and lower gastrointestinal tracts to relieve luminal obstructions due to neoplasia in animals as small as a ferret. These IR techniques were rapid, safe, and effective, and complications were minor and uncommon.14

Endourology
Similar techniques are currently being employed to manage ureteral obstructions secondary to stones (see ureteral stent figure to right), strictures, or malignancies. These procedures can be performed surgically or with minimal invasiveness (percutaneously or via cystoscopy) to reduce morbidity and improve outcomes in certain patients.

REFERENCES

