

are numerous and include infection, neoplasia (tumors), cysts, nephrolithiasis (kidney stones), injury from toxin exposure (anti-freeze, aspirin, acetaminophen, ibuprofen), as well as a number of inflammatory diseases (glomerulonephritis, systemic lupus). Successful management of these diseases depends in part on the ability to measure the extent of disease before and after treatment.

While blood tests and urinalyses can measure the total renal function (e.g. the function of both kidneys combined), they do not allow us to measure the function of an individual kidney. In some circumstances the ability to measure individual kidney function is of dramatic importance. These circumstances usually involve an anticipated nephrotomy (surgically cutting into a kidney, i.e. to remove a stone) or nephrectomy (the surgical removal of a kidney, i.e. to remove a tumor). Under normal circumstances all animals have enough extra kidney function to survive with only 1 kidney. Unfortunately this is not always the case in patients with renal disease. Quantitative renal scintigraphy is a valuable tool to assess the renal function that will remain following these types of surgical procedures. The knowledge of how each individual kidney is functioning can dramatically affect the plans to surgically remove a kidney stone or remove an entire kidney damaged by infection or tumor.

Quantitative renal scintigraphy requires no sedation or anesthesia and can be performed on an outpatient basis (no overnight hospitalization is required). Transportation to and from your local veterinarian's hospital can also be arranged to facilitate optimal patient management and convenience.

## Advanced Veterinary Medical Imaging has 2 convenient locations.

### West Los Angeles

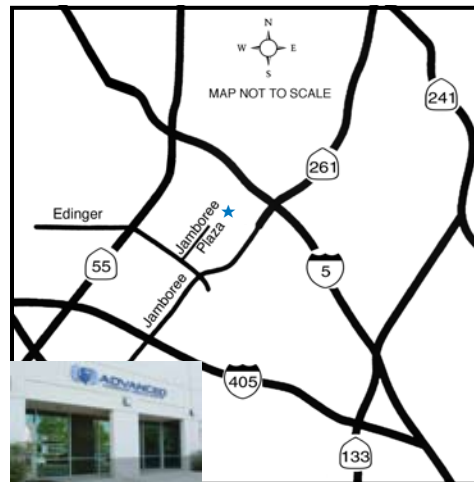
Located near the corner of Pico and Sepulveda, conveniently accessible from the 405 and 10 freeways.



2340 Sepulveda Blvd., Los Angeles, CA 90064  
Tel: 310-477-4453

### Orange County

Located in the Jamboree Plaza business park across from the Metrolink Parking lot.



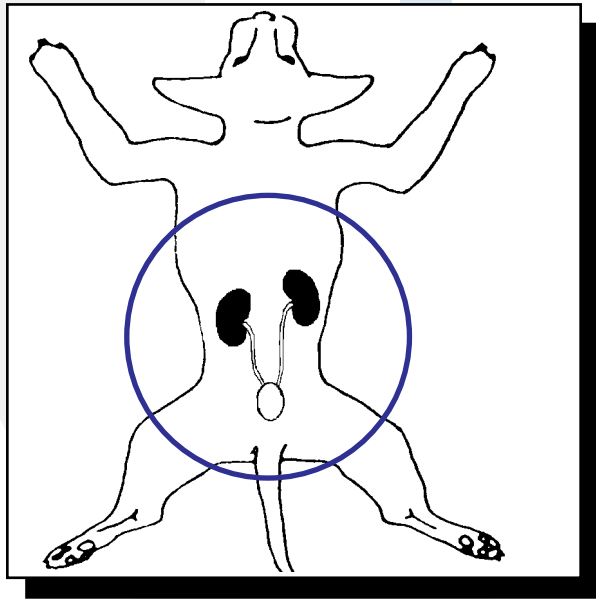
3047 Edinger Ave., Tustin, CA 92780  
Tel: 949-559-7289



# Renal Scintigraphy Update

**Renal Scintigraphy** is a valuable tool in the evaluation of kidney (e.g. renal) function that has been used extensively in human medicine for over a decade and has recently become available for use in veterinary medicine. Renal scintigraphy utilizes a technology called nuclear medicine.

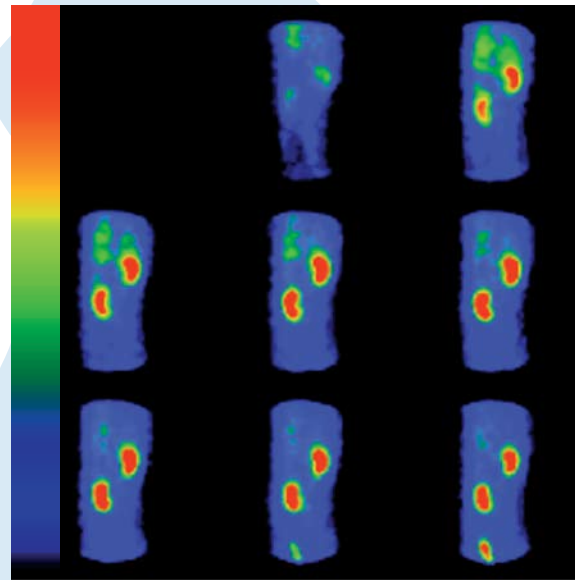
Nuclear medicine is a branch of diagnostic radiology that provides unique physiological information about disease processes. The practice of nuclear medicine involves the administration of radionuclides (radioactive isotopes), usually attached (or tagged) to drugs that travel to a specific organ within the body. Because these radionuclides emit gamma radiation (X-rays) we can image them using a specialized machine called a gamma camera. The location and rela-



**Figure 1.** Schematic drawing of the normal location of the kidneys and urinary bladder. The blue circle represents the gamma camera's view.

tive amount of radionuclide within an organ can tell us about the organ's function.

With renal scintigraphy, the relative amount of the radionuclide extracted from the blood by a kidney is proportional to that kidney's function, also called its glomerular filtration rate (GFR). Both anatomic and functional

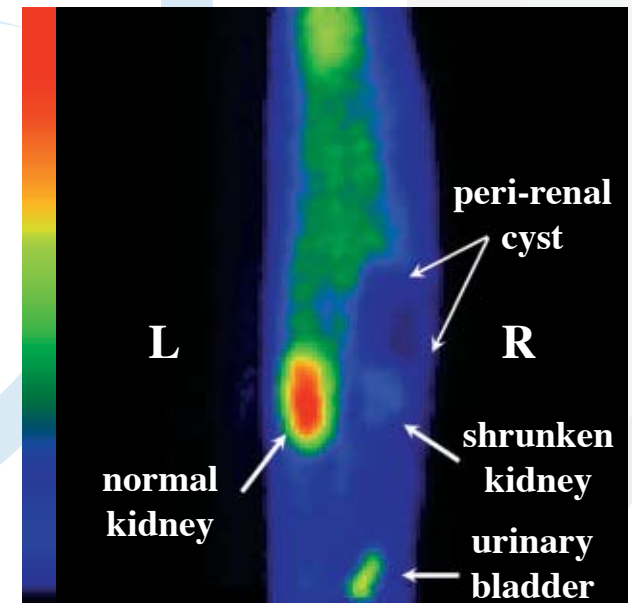


**Figure 2.** A series of dynamic images demonstrating the rapid uptake of the radionuclide by normal kidneys (red) in this dog. By measuring the amount of radionuclide uptake into each kidney, the exact kidney function (GFR) can be calculated. Also note the radionuclide in the urinary bladder in the last 2 images.

information can be obtained using renal scintigraphy. Other imaging techniques like diagnostic radiology and ultrasound are superior for determining the structural or anatomic details of the kidney but neither technique measures kidney function.

Quantitative renal scintigraphy is unique in its ability to rapidly and noninvasively measure individual and total kidney function (GFR) in the awake animal. The protocol for quantitative renal scintigraphy requires that the patient lie on its side for less than 10 minutes during which time the radionuclide is injected and images of the kidneys are acquired by a gamma camera and stored in a nuclear medicine computer for later analysis. By measuring the amount of radionuclide taken up into each individual kidney the computer can determine the kidney's glomerular filtration rate (GFR).

Renal (kidney) disease is one of the most common illnesses affecting veterinary patients. The types of diseases that can affect the kidneys



**Figure 3.** Composite image of a cat showing the uptake of the radionuclide into the normal left kidney. The small, poorly functional right kidney is also visualized within a large peri-renal cyst.