

IRIS involvement in standardization issues regarding estimation of glomerular filtration rate (GFR)

IRIS has been discussing methods for estimation of GFR in the context of standardization of methods. Both in human medicine and small animal medicine, is estimation of GFR considered the most accurate measure available for assessment of renal function. GFR is estimated by measurement of clearance of a filtration marker, which is a drug that is freely filtered in glomeruli, without significant tubular reabsorption or excretion. GFR will be reduced before abnormal increases in serum urea and creatinine occur. Estimation of GFR can be of great value for research and in clinical practice, but traditional methods have been too cumbersome to come into widespread use outside research institutions. Renal clearance of inulin has been regarded as the “gold standard” method, but validation of simpler methods, without urine sampling (plasma clearance) or with a reduced number of samples, are being evaluated.

While important papers in the field have been published the last decade, there are also several issues that need further clarification before universal recommendations can be given.

Specifically, these are addressed by

- studying the quality of the marker relative to the presumptions made during the pharmacokinetic modeling of the excretion data
- defining situations where plasma clearance estimates may be unreliable
- evaluating how to optimally index the measured clearance values to body size
- establishing valid reference ranges in healthy dogs (age-matched and breed specific, where appropriate)
- studying which GFR values are commonly observed in disease conditions where confusion may arise as to whether the animal has a secondary effect of the disease, or a concurrent separate renal problem (i. E. Cushing’s disease and other endocrine conditions)

IRIS board members have been working with various methods, such as plasma clearance of iohexol, exogenous creatinine and 99mTc DTPA, as well as renal uptake (scintigraphy) of 99mTc DTPA and renal clearance of inulin and creatinine. A number of veterinary schools around the world have access to one of these methods. The 99mTc DTPA methods are probably the most widely available today, due to the increasing number of nuclear medicine units in veterinary teaching hospitals. Their main drawback is the need to work with radioactivity.

Work is underway to study simplified methods that could be available for practitioners. Two large scale projects on plasma clearance of iohexol, inulin and creatinine are currently going on, involving IRIS board members and veterinary teaching hospitals in 4 countries. The issues specified above are addressed. Methodology in the two projects is currently being integrated, aiming at making results and reference values interchangeable between the studies.

IRIS board members are willing to cooperate with practitioners on a case-to-case basis at this point in time, but would like to see more results from ongoing studies before providing universal recommendations regarding the use of these methods in routine clinical practice.