# Relation of Survival Time and Urinary Protein Excretion in Cats with Renal Failure and/or Hypertension.

ACVIM 2003

**HM Syme,** J Elliott. Royal Veterinary College, London, UK.

Proteinuria is related to survival time in humans with renal failure. The aim of this study was to investigate the relationship of proteinuria to survival time in cats with variable renal function, and with or without systemic hypertension.

Cats were included in the study if they were considered normal (by physical examination, plasma chemistry and USG >1.035; n=24) or if they had chronic renal failure (CRF, plasma creatinine>1.9 mg/dl, USG <1.035) and/or hypertension (systolic blood pressure [SBP] consistently >175 mm Hg using a Doppler method). Hyperthyroid cats were excluded from the study. Total protein and albumin were measured in feline urine samples and indexed to urine creatinine concentrations to yield urine protein-to-creatinine (UPC) and albumin-to-creatinine (UAC) ratios respectively. Albumin quantification was by a species-specific ELISA method. UPC and UAC values were log transformed for statistical analysis. Survival analysis (time to death due to any cause) was performed by Cox's regression. Cases were censored if they were alive at the conclusion of the study or lost to follow up (LTFU). Potential predictive variables that were investigated were SBP, age, plasma creatinine concentration and either log UPC or log UAC (in separate models due to co-linearity of the variables). Median survival times (for the mean of the covariates) were calculated for cats that had normal or increased UPC (as determined from the normal group).

Time until death was 331 ± 321 days (n=55) and length of follow-up for cats that were censored was 580 ± 373 days (alive n=48, LTFU n=14). SBP was not predictive of survival and so was excluded from the final analyses. Age (p=0.007 and p=0.027, for log UPC and log UAC model respectively), plasma creatinine concentration (p<0.001 in both models) and both log UPC (p<0.001) and log UAC (p<0.001) were inversely associated with survival. Median survival times for cats with UPC greater or less than 0.43 were 281 and 766 days, respectively (covariate mean for creatinine 2.6 mg/dl and age 13.2 years).

Proteinuria predicts reduced survival times in cats with CRF. Further studies are now warranted to determine whether interventions that decrease proteinuria, such as treatment with ACE-inhibitors, will improve survival of cats with renal failure.