

Urine Protein Creatinine Ratios

What is a urine protein:creatinine ratio?

"...determines if the loss poses a health risk for the pet."

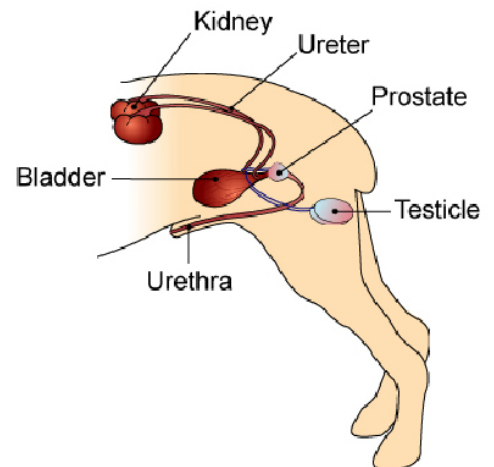
The urine protein:creatinine ratio is a simple test that measures how much protein is being lost through the kidneys, and determines if the loss poses a health risk for the pet. The test involves measuring the amount of protein and creatinine in a urine sample, and mathematically dividing the protein value by the creatinine value.

What is creatinine and why is it used in this test?

Creatinine is a by-product of muscle metabolism. Creatinine is excreted in urine at an approximately constant rate, which means it can be used as a standard for comparison for other substances that are also excreted in the urine.

Is protein loss through the kidney always significant?

Losing a small amount of protein through the kidneys may not be important if the kidneys are otherwise working well and producing concentrated urine. However, if kidney function is compromised and the kidneys are producing dilute urine, then even small amounts of urinary protein loss may be abnormal and should be investigated. Substantial protein loss through the kidneys is a concern because it means the kidneys are not working properly. It is also worrisome because the body is losing protein, which is a precious substance needed for long-term health and well being.



Does all urinary protein come from the kidneys?

No. Protein can be present in urine if there is inflammation or bleeding anywhere in the urinary system. Protein that comes from inflammation or bleeding is not as worrisome, because the urinary protein loss will stop once the underlying problem is treated or corrected.

Can any urine sample be used to measure protein:creatinine ratio?



No. The protein:creatinine ratio should be performed only on urine that is free of blood and inflammatory cells. A complete urinalysis and sediment evaluation (see handout "Urinalysis") should be completed to determine if the sample is suitable for the protein: creatinine ratio test. The presence of blood and inflammation in urine may give a falsely high result for the protein:creatinine ratio, suggesting there is kidney disease when none is actually present.

How is the Protein:Creatinine ratio interpreted?

The protein:creatinine ratio must be interpreted in the context of the Blood Urea Nitrogen (BUN), which is a substance found in blood that reflects the health of the kidney (see Biochemistry Profile).

An elevated BUN signals there is a problem with kidney function. In this situation a protein:creatinine ratio greater than 0.4 in a cat and 0.5 in a dog indicates there is medically significant protein loss through the kidneys.

If the BUN is within normal limits, indicating the kidneys are healthy, a protein:creatinine ratio up to 2.0 in both cats and dogs is acceptable. Values above 2.0, indicates there is medically significant protein loss through the kidneys, even if the BUN is within normal limits.

Does an elevated Protein:Creatinine ratio explain the underlying problem?

No. The protein:creatinine ratio only helps to establish the fact that a problem exists. Further testing is usually required and may involve serial measurement of protein:creatinine ratio to prove the protein loss is persistent, and ultrasound of the kidney to non-invasively examine the kidney structure, or possibly a kidney biopsy to assess the kidney tissue directly. Once a complete diagnosis is made, plans can be made to manage the disease as effectively as possible.

*This client information sheet is based on material written by: Kristiina Ruotsalo, DVM, DVSc, Dip ACVP & Margo S. Tant BSc, DVM, DVSc
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