

## Information for Vets – Disease Comparisons

### Diagnosing: RD; PLN & PLE & Addison's Disease

These diseases can be difficult to diagnose and can be confused with each other. Here are some of the similarities and differences.

	<b>RD</b>	<b>PLN</b>	<b>PLE</b>	<b>Addison's</b>
<b>Age of Onset</b>	<1-3years	Mean ~ 6 years	Mean ~ 4.5 years	Young (in general)
<b>Sex Predilection</b>	None noted	Female: male=1.6	Female: male=1.7	Female (in general)
<b>Polyuria/Polydipsia</b>	Yes	Only25% had PU/PD	No, unless on steroids	Yes
<b>Vomiting/Diarrhoea</b>	Yes	Yes	Yes	Yes
<b>Ascites/Edema</b>	No	Possibly	Possibly	No
<b>Azotemia</b>	Yes	Eventually	No	Possibly (pre-renal)
<b>Kidney Size</b>	Small	May be normal	Normal	Normal
<b>Hypoalbuminemia</b>	No	Yes	Yes	Possibly (melena)
<b>Hypoglobulinemia</b>	No	No	Yes	Possibly (melena)
<b>Hypercholesterolemia</b>	No	Yes	Hypocoolesterolemia	No
<b>Low Na/K ratio</b>	Not noted	Rarely (~10%)	Rarely (~10%)	Yes
<b>Urine Specific Gravity</b>	Isosthenuria	Mean 1.023	Mean 1.033	Low (medullary washout)
<b>Proteinuria</b>	None or mild	Yes	No	No
<b>Histopathology</b> <b>K = kidney</b> <b>I = intestine</b>	Foetal Glomeruli, Foetal mesenchyme (K)	Glomerulonephritis, Glomerulosclerosis (K)	IBD, lymphangiectasia, lymphangitis (I)	No

Source 1999 ACVIM PROCEEDINGS Soft Coated Wheaten Terrier PLE-PLN;  
Meryl P. Littman VMD DACVIM, Philadelphia PA

### Other important lab findings:

<b>RD</b>	<b>PLE</b>	<b>PLN<sup>1</sup></b>	<b>Addison's<sup>2</sup></b>
<ul style="list-style-type: none"> <li>Elevated Creatinine</li> <li>Elevated BUN</li> </ul>	<ul style="list-style-type: none"> <li>Eosinophilia</li> <li>Lymphopenia</li> <li>Low total protein</li> </ul>	<ul style="list-style-type: none"> <li>Elevated Serum Creatinine</li> <li>Elevated BUN</li> <li>Elevated Urine Protein Creatinine Ratio*</li> </ul> <p><i>*very important!</i></p>	<ul style="list-style-type: none"> <li>Elevated Serum Creatinine</li> <li>Elevated BUN</li> </ul>

*Diagnosis of PLE/PLN, RD, or Addison's is dependent on evaluating everything; test results, clinical signs and symptoms.*

<sup>1</sup>**PLE and PLN** are difficult to diagnose. The initial stages of the disease may be mistaken for liver, glandular or other enteric or kidney diseases. Wheatens with PLE and/or PLN may have serious thromboembolic events (such as pulmonary embolism) before symptoms or renal failure start, even before there is increased serum creatinine or BUN.

<sup>2</sup>The clinical signs of **Addison's Disease** are often non-specific and can mimic those of multiple other medical disorders.

<b>RD</b>	<b>PLE</b>	<b>PLN<sup>1</sup></b>	<b>Addison's<sup>2</sup></b>
<ul style="list-style-type: none"> <li>• Increased water consumption</li> <li>• Increased urination (dilute urine)</li> <li>• "Poor doer"</li> <li>• Decreased appetite</li> <li>• Vomiting</li> <li>• Possibly prone to urinary tract infection</li> </ul>	<ul style="list-style-type: none"> <li>• Vomiting</li> <li>• Diarrhoea</li> <li>• Weight loss</li> <li>• Ascites</li> <li>• Edema</li> <li>• Plural effusion</li> </ul>	<ul style="list-style-type: none"> <li>• Listlessness/depression</li> <li>• Decreased appetite, vomiting, weight loss</li> <li>• Ascites, edema, pleural effusion</li> <li>• Increased water consumption</li> <li>• Increased urination (less common)</li> <li>• Thromboembolic phenomena and hypertension (less common)</li> </ul>	<ul style="list-style-type: none"> <li>• Listlessness/depression</li> <li>• Decreased appetite, vomiting, weight loss</li> <li>• Inability to handle stress</li> <li>• Sudden collapse</li> <li>• Slow heart rate</li> </ul>

Wheatens who exhibit signs of kidney failure need to have careful diagnosis made, as RD and PLN can be mistaken for each other in the later stages of the disease process. The following chart assists with this comparison.

## Differences between RD and PLN

Renal Dysplasia (RD)	Protein Losing Nephropathy (PLN)
Usually referred to as Juvenile Renal Dysplasia. Dogs <i>generally</i> die between the ages of 6 weeks to 3 years.	Dogs tend to show their illness at 5-7 years old, but onset can be both earlier and later than this.
Dogs drink large amounts of water. Their Urine Specific Gravity (USG) is often low and the urine is dilute.	Dogs may not have these symptoms and can usually concentrate their urine until they reach end stage renal failure.
Dogs tend to lose little protein in the urine and the serum albumin stays normal.	Dogs lose large quantities of protein in the urine and their serum albumin drops. They also have a high protein/creatinine ratio.
Dogs eventually have high serum creatinine and Urea (BUN). Dogs <b>do not</b> have low albumin and high cholesterol.	Dogs eventually have high serum creatinine and Urea (BUN). Dogs have low albumin readings and high cholesterol.
Dogs are born with small, malformed kidneys.	Usually have normal sized kidneys until later stages of the disease.
In the renal cortex are microscopic cystic lesions, decreased and immature foetal glomeruli and cystic glomeruli.	Dogs show glomeruli changes, such as glomerulonephritis and/or glomerulosclerosis. They do not have many foetal glomeruli
Dogs are not usually predisposed to effusions and thromboembolism (clots).	Dogs can throw clots, in the lung, heart, brain, portal vein or distal aorta (saddle).

# Comparison Chart of Hereditary Diseases

There are four hereditary diseases known to affect the breed.

DISEASE	SYMPTOMS	LABORATORY ABNORMALITIES OFTEN ASSOCIATED WITH THIS DISEASE
<b>Renal Dysplasia (RD)</b>		
Renal dysplasia is a congenital or neonatal disease which causes maldevelopment of the kidneys in utero, or early in life.	Increased water consumption Increased urination (dilute urine) Poor doer, decreased appetite Vomiting Possibly prone to urinary tract infection.	Low urine specific gravity Elevated creatinine and BUN Small kidneys Small, hyperechoic kidneys with or without cysts seen via abdominal ultrasound
<b>Protein Losing Enteropathy (PLE)</b>		
PLE is usually caused by inflammatory bowel disease or lymphangitis/lymphangiectasia. In affected Wheatens there is a stimulation of the immune system in the bowel wall	Vomiting Diarrhoea Weight loss Ascites, oedema, pleural effusion	Note that not all of the laboratory abnormalities are seen in every case. The most important are indicated by an asterisk. Hypoalbuminemia* Hypoglobulinemia* Eosinophilia Hypocholesterolemia Lymphopenia
<b>Protein Losing Nephropathy (PLN)</b>		
PLN is difficult to diagnose. The initial stages of the disease may be mistaken for liver, glandular or other enteric or kidney diseases. Wheatens with PLN may have serious thromboembolic events before renal failure starts, even before there is increased serum creatinine or BUN. An abnormality of the glomeruli usually causes PLN	Listlessness/depression Decreased appetite, vomiting, weight loss Ascites, oedema, pleural effusion Increased water consumption, increased urination (less common) Thromboembolic phenomena and hypertension (less common)	Note that not all of the laboratory abnormalities are seen in every case. The most important are indicated by an asterisk. Hypoalbuminemia* Elevated serum creatinine, BUN (later) Hypercholesterolemia Elevated MA (Microalbuminuria) Elevated urine protein/creatinine ratio*
<b>Addison's Disease</b>		
Addison's disease (Hypoadrenocorticism) is the insufficient production and secretion of hormones (glucocorticoids, mineralocorticoids) by the adrenal gland cortex. The clinical signs are often non-specific and can mimic those of multiple other medical disorders	Listlessness/depression. Decreased appetite, vomiting, diarrhoea, weight loss. Inability to handle stress Sudden collapse Slow heart rate	Decrease in Na/K ratio (Sodium/potassium ratio) Abnormal ACTH stimulation test Elevated serum creatinine, BUN Sometimes, low urine specific gravity
Further information on all of these diseases can also be found in the 'Health Matters' section at: <a href="http://www.wheatenhealthinitiative.com">www.wheatenhealthinitiative.com</a> and the health section of the SCWT Club of America's Web Site: <a href="http://www.scwtca.org">www.scwtca.org</a>		<b>WHEATEN HEALTH INITIATIVE</b>