



## KRONİK BÖBREK YETMEZLİĞİ

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## Kronik Böbrek Yetmezliđi Chronic Renal Failure (CRF)

- Böbrek dokusu zayıf bir rejenerasyon gücüne sahip olduğundan, nefronlar yıkımlandıklarında yenilenemezler.
- Renal yetersizlik nefronlar %70 veya daha fazla oranda harabiyete uğradığında ortaya çıkar.
- Polidipsi,
- Poliüri
- Kusma,
- Anoreksi,
- Diyare,
- Ağırılık kaybı
- Hipoalbuminemi gibi farklı belirtiler gelişir.

# Evreleme

<https://www.iris-kidney.com/>

- Evreleme başlangıçta
- Açlık kan kreatininin
- Açlık kan SDMA konsantrasyonuna göre
- Hidratlı, stabil bir hastada en az iki kez bakılmasına dayanır.
- Daha sonra
- Proteinüri ve
- Kan basıncına göre alt evrelemeden geçirilir.

# Step 1: Diagnose CKD

**Clinical signs and physical examination findings worsen with increasing severity of kidney disease**

## Clinical presentation

Consider age, sex, breed predispositions, and relevant historical information, including medication history, toxin/toxicant exposure, and diet.

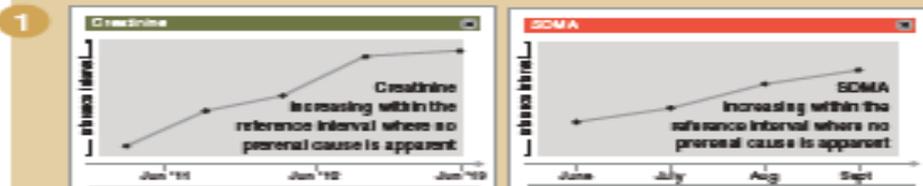
Can be subclinical in early stage CKD. Signs may include polyuria, polydipsia, weight loss, decreased appetite, lethargy, dehydration, vomiting, and bad breath.

## Physical examination findings

Can be normal in early stage CKD. Findings may include palpable kidney abnormalities, evidence of weight loss, dehydration, pale mucous membranes, uremic ulcers, evidence of hypertension, i.e., retinal hemorrhages/detachment.

### To diagnose Stage 1 and early Stage 2 CKD

One or more of these diagnostic findings:

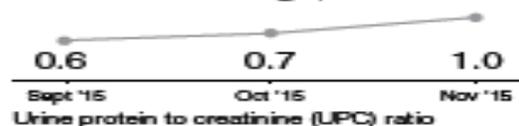


2 Persistent increased SDMA\* > 14 µg/dL

3 Abnormal kidney imaging



4 Persistent renal proteinuria  
UPC > 0.5 in dogs; UPC > 0.4 in cats



OR

### To diagnose more advanced CKD (late Stage 2–4)

Both of these diagnostic findings:

Increased creatinine and SDMA concentrations

Creatinine

SDMA

Results of both tests should be interpreted in light of patient's hydration status.

plus

Urine specific gravity < 1.030

Urine specific gravity < 1.035\*

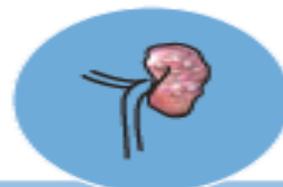
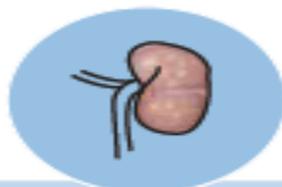


1.030	Canine	1.008
1.035	Feline	1.008

See [www.iris-kidney.com](http://www.iris-kidney.com) for more detailed staging, therapeutic, and management guidelines.

\*Note that some cats can produce hypersthenuric urine in the face of renal azotemia.

## Step 2: Stage CKD



		Stage 1 No azotemia (Normal creatinine)	Stage 2 Mild azotemia (Normal or mildly elevated creatinine)	Stage 3 Moderate azotemia	Stage 4 Severe azotemia
<b>Creatinine in mg/dL</b>	Canine	Less than 1.4 (125 μmol/L)	1.4–2.8 (125–250 μmol/L)	2.9–5.0 (251–440 μmol/L)	Greater than 5.0 (440 μmol/L)
	Feline	Less than 1.6 (140 μmol/L)	1.6–2.8 (140–250 μmol/L)	2.9–5.0 (251–440 μmol/L)	Greater than 5.0 (440 μmol/L)
<b>SDMA* in μg/dL</b>	Canine	Less than 18	18–35	36–54	Greater than 54
	Feline	Less than 18	18–25	26–38	Greater than 38
<b>UPC ratio</b>	Canine	Nonproteinuric <0.2    Borderline proteinuric 0.2–0.5    Proteinuric >0.5			
	Feline	Nonproteinuric <0.2    Borderline proteinuric 0.2–0.4    Proteinuric >0.4			
<b>Systolic blood pressure in mm Hg</b>	Normotensive <140    Prehypertensive 140–159				
	Hypertensive 160–179    Severely hypertensive ≥180				

**Note:** In the case of staging discrepancy between creatinine and SDMA, consider patient muscle mass and retesting both in 2–4 weeks. If values are persistently discordant, consider assigning the patient to the higher stage.

\*SDMA = IDEXX SDMA\* Test

See [www.iris-kidney.com](http://www.iris-kidney.com) for more detailed staging, therapeutic, and management guidelines.

## Step 3: Treat CKD



### Stage 1

#### Treatment recommendations

Use nephrotoxic drugs with caution

Correct prerenal and postrenal abnormalities

Fresh water available at all times

Monitor trends in creatinine and SDMA to document stability or progression

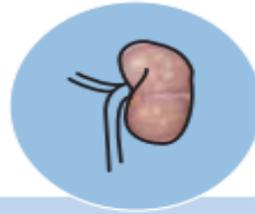
Investigate for and treat underlying disease and/or complications

Treat hypertension if systolic blood pressure persistently >160 or evidence of end-organ damage

Treat persistent proteinuria with renal therapeutic diet and medication (UPC >0.5 in dogs; UPC >0.4 in cats)

Keep phosphorus <4.6 mg/dL (<1.5 mmol/L)

If required, use renal therapeutic diet plus phosphate binder



### Stage 2

Same as Stage 1

Renal therapeutic diet

Treat hypokalemia in cats

Treat inappetence and nausea if present



### Stage 3

Same as Stage 2

Keep phosphorus <5.0 mg/dL (<1.6 mmol/L)

Treat metabolic acidosis

Consider treatment of anemia

Treat vomiting, inappetence, and nausea

Increased enteral or subcutaneous fluids may be required to maintain hydration



### Stage 4

Same as Stage 3

Keep phosphorus <6.0 mg/dL (<1.9 mmol/L)

Consider feeding tube for nutritional and hydration support and ease of medicating

# Evreleme

<https://www.iris-kidney.com/>

Evreleme başlangıçta Açlık kan kreatininin Açlık kan SDMA (Simetrik Dimetil Arjinin) konsantrasyonuna göre

Hidratlı, stabil bir hastada en az iki kez bakılmasına dayanır.

Daha sonra Proteinüri ve Kan basıncına göre alt evreleme yapılır

	Evre 1 Azotemi yok (normal kreatinin)	Evre 2 Hafif azotemi (Normal veya hafif yüksek kreatinin)	Evre 3 Orta düzeyde azotemi	Evre 4 Şiddetli azotemi
<b>Kreatinin mg/dL (stabil kreatinin düzeyine göre evre)</b>				
Köpek	1,4'ten (125 µmol/L) az	1,4–2,8 (125–250 µmol/L)	2,9 -5.0 (251-440) µmol/L az	5,0'dan (440 µmol/L) yüksek
Kedi	1,6'dan az (140 µmol/L)	1,6–2,8 (140–250 µmol/L)	1,6'dan az (140 µmol/L)	5,0'dan (440 µmol/L) yüksek
<b>SDMA (µg/dL) (stabil SDMA'ya dayalı aşama)</b>				
Köpek	<18	18–35	36–54	>54
Kedi	<18	18–25	26–38	>38

**TABLE 2** Substages of CKD: Classified by Urine Protein/Creatinine Ratio (UPC)

CLASSIFICATION OF UPC	UPC RATIO	
	CATS	DOGS
Non-proteinuric	< 0.2	< 0.2
Borderline proteinuric	0.2-0.4	0.2-0.5
Proteinuric	> 0.4	> 0.5

**TABLE 3** Substages of CKD: Classified by Systemic Blood Pressure & Risk of Target Organ Damage

CLASSIFICATION OF BLOOD PRESSURE	SYSTOLIC BLOOD PRESSURE (MM HG)	RISK OF TARGET ORGAN DAMAGE
Normotensive	< 150	Minimal
Borderline hypertensive	150-159	Low
Hypertensive	160-179	Moderate
Severe hypertension	≥ 180	Severe

# Kronik B6brek Yetmezliđi

- Klinik tablo Őekillendiđinde hastalık ilerlemiŐ ve artık b6brek fonksiyonları b6y6k oranda iŐlevini yitirme noktasına gelmiŐtir.
- CRF en sık karŐılaŐılan b6brek hastalıđıdır.
- **Prognoz**
- Hastanın yaŐı
- Hastalıđın s6uresi
- Beslenme koŐullarına g6re deđiŐir.
- Eđer erken tanı koyulmazsa hastalıđın tedavisi ok daha g6 olmaktadır.

- Renal yetersizlikte, protein metabolizmasının normal ürünleri böbrek tarafından etkili bir biçimde uzaklaştırılmaz
- **Azotemi** kusma, diyare ve arasıra konvulsiyonlar oluşturacak etkilerde bulunur.
- İdrarla amino asit kaybedildiğinden protein gereksinimi yükselir.
- Böbreklerden suda eriyen vitaminler kaybedilir
- **Kalsiyum kaybı**  **Fosfor tutulumu** 
- **Kalsiyum : fosfor oranı 1.5:1' den 1:4'e değişir.**