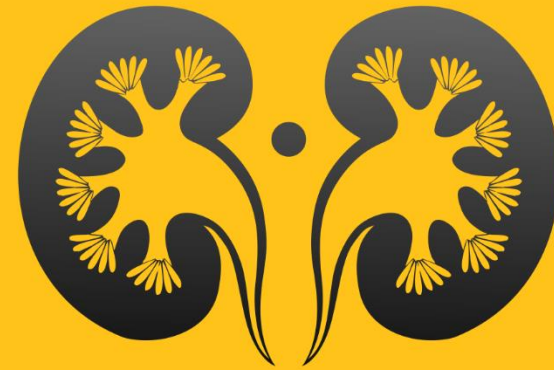


# Chronic Kidney Disease

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# Goals & Objectives

At the end of this session learner will be

- Able to define Chronic Kidney disease
- Able to learn differences between acute vs chronic kidney disease
- Able to learn about important laboratory tests
- When to refer out?

# CKD Burden

- CKD affects 26 million Americans
- Prevalence is 11-13%
- It consumes 28% of the Medicare Budget
  - This was 6.9% in 1993
  - Costs for 2013 were \$42 Billion dollars
- DM+ CKD increases mortality rate 6 fold
- CKD disproportionately affects African Americans and Hispanics

# Definition

- CKD: Criteria
- Abnormalities of kidney structure/function for > 3 months
- Either of the following for > 3 months
  - Urine ACR > 30mg/g
  - Markers of kidney damage

# AKI vs CKD- THE VERY FIRST STEP!!

<b><i>Acute Kidney Injury</i></b>	<b><i>Chronic Kidney Disorder</i></b>
Sudden loss of kidney function	Progressive kidney failure with time ( look for other markers- anemia, kidney size on US)
Reversible	Not reversible
Common Causes: Dehydration, Contrast exposure, Medications	Common Causes: DM, HTN

# Common medications to watch out for in an Acute Kidney Injury:

- NSAIDs
- PPIs
- ACE/ARBs

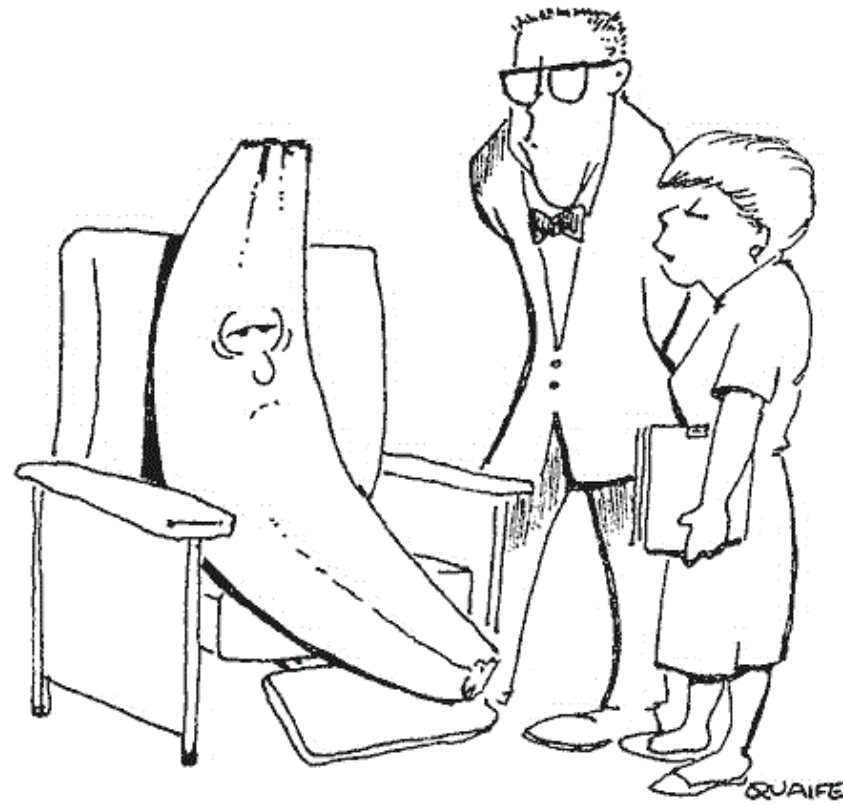
# Common medications that need to be stopped in AKI

- Metformin: is not nephrotoxic, but it increases the risk of lactic acidosis.
- Osteoporosis medications including Alendronate
- Hypertriglyceridemia medications e.g.: Fenofibrate

# Other common things to avoid in patients with AKI or CKD

- Iodinated contrast media(CT/Angiograms): AKI
- Gadolinium-based contrast(MRIs): NSF
- Sodium Phosphate/Magnesium bowel preparations: AKI, CKD





We're a little concerned  
about your potassium levels.

## Old Classification of CKD as Defined by Kidney Disease Outcomes Quality Initiative (KDOQI) Modified and Endorsed by KDIGO

Stage	Description	Classification by Severity	Classification by Treatment
1	Kidney damage with normal or increased GFR	GFR $\geq$ 90	 T if kidney transplant recipient D if dialysis
2	Kidney damage with mild decrease in GFR	GFR of 60-89	
3	Moderate decrease in GFR	GFR of 30-59	
4	Severe decrease in GFR	GFR of 15-29	
5	Kidney failure	GFR $<$ 15	

Note: GFR is given in mL/min/1.73 m<sup>2</sup>

# CKD Risk Factors:

- DM
- HTN
- Family history of kidney failure
- Cardiovascular disease
- HIV Infection
- Immunological disease( Auto-immunity is not a disease process in El Paso, IT IS AN EPIDEMIC!)
- Frequent NSAID use

# Evaluation of Patients with CKD

- Blood pressure
- Serum creatinine
  - Use a GFR estimating equation or clearance measurement; don't rely on serum creatinine concentration alone
  - Be attentive to changes in creatinine over time--even in "normal" range
- Urinalysis
  - Urine sediment
  - Spot urine for protein/creatinine or albumin/creatinine ratio
- Albuminuria/Proteinuria
- Electrolytes, blood glucose, CBC

# Evaluation of Patients with CKD contd..

- Depending on stage: albumin, phosphate, calcium, iPTH
- Renal imaging
- Depending on above lab findings pt may or may not need
  - Light chain assay, serum or urine protein electrophoresis (SPEP, UPEP)
  - ANCA/ANA/C3/C4 etc.
  - HIV, HCV, HBV tests
  - Complements, other serologies—limited role unless specific reason

# Key issues in managing CKD:

- Ensuring etiology is correct
- Implementing appropriate therapy
- Monitoring the patient
- Screening for CKD complications

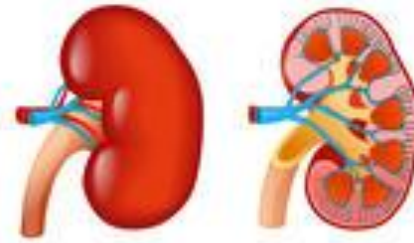
# CKD Complications:

- Cardiovascular disease
- HTN
- Anemia of CKD
- Mineral Bone disease
- Hyperkalemia
- Metabolic Acidosis

# Basic Metabolic Panel

	Your Value	Units	Normal Range
Glucose	84	mg/dL	65-99
BUN	15	mg/dL	8-27
Creatinine, Serum	1	mg/dL	0.76-1.27
eGFR	93	mL/min/1.73	>59
BUN/ Cr ratio	20		10-22
Sodium, Serum	140	mmol/L	134-144
Potassium, Serum	4.1	mmol/L	3.5-5.2
Chloride	102	mmol/L	97-109
Carbon Dioxide, Total	20	mmol/L	18-29
Calcium, Serum	9.2	mg/dL	8.6-10.2





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**“Your kidney stone test came back.  
You didn't pass.”**

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Saving Hearts!!**

# Summary:

- IS THIS AKI OR IS THIS CKD???
- Try to obtain historical creatinine levels
- IF AKI initiate work up stat or get help!
- Stage CKD with eGFR and albuminuria and consider cause
- IF CKD make sure all complication parameters are being monitored and dealt with
- Control BP ( ACE OR ARB )
- Manage DM
- Avoid nephrotoxins

# References:

- <https://www.kidney.org/professionals/physicians/pcp>
- <https://www.pinterest.com/pin/344455071481439875/>
- [https://www.pinterest.com/gaia\\_software/kidney-comics/](https://www.pinterest.com/gaia_software/kidney-comics/)
- <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd>



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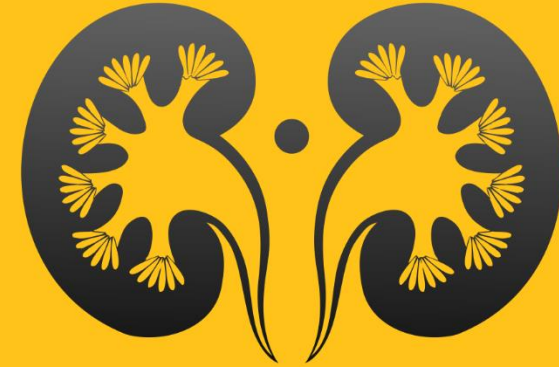
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Thank You!!

Questions?

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