Diabetes and the Kidney

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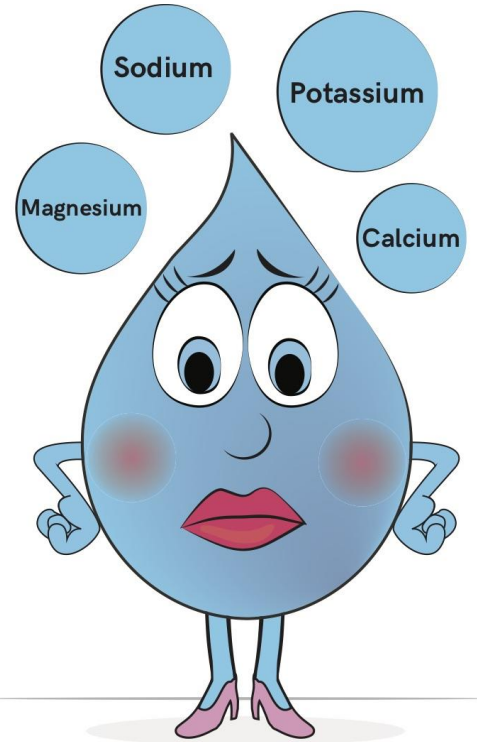
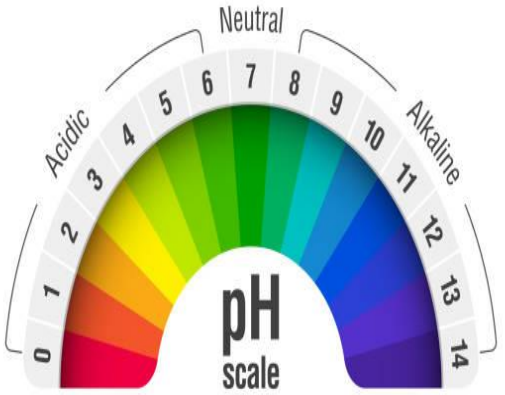
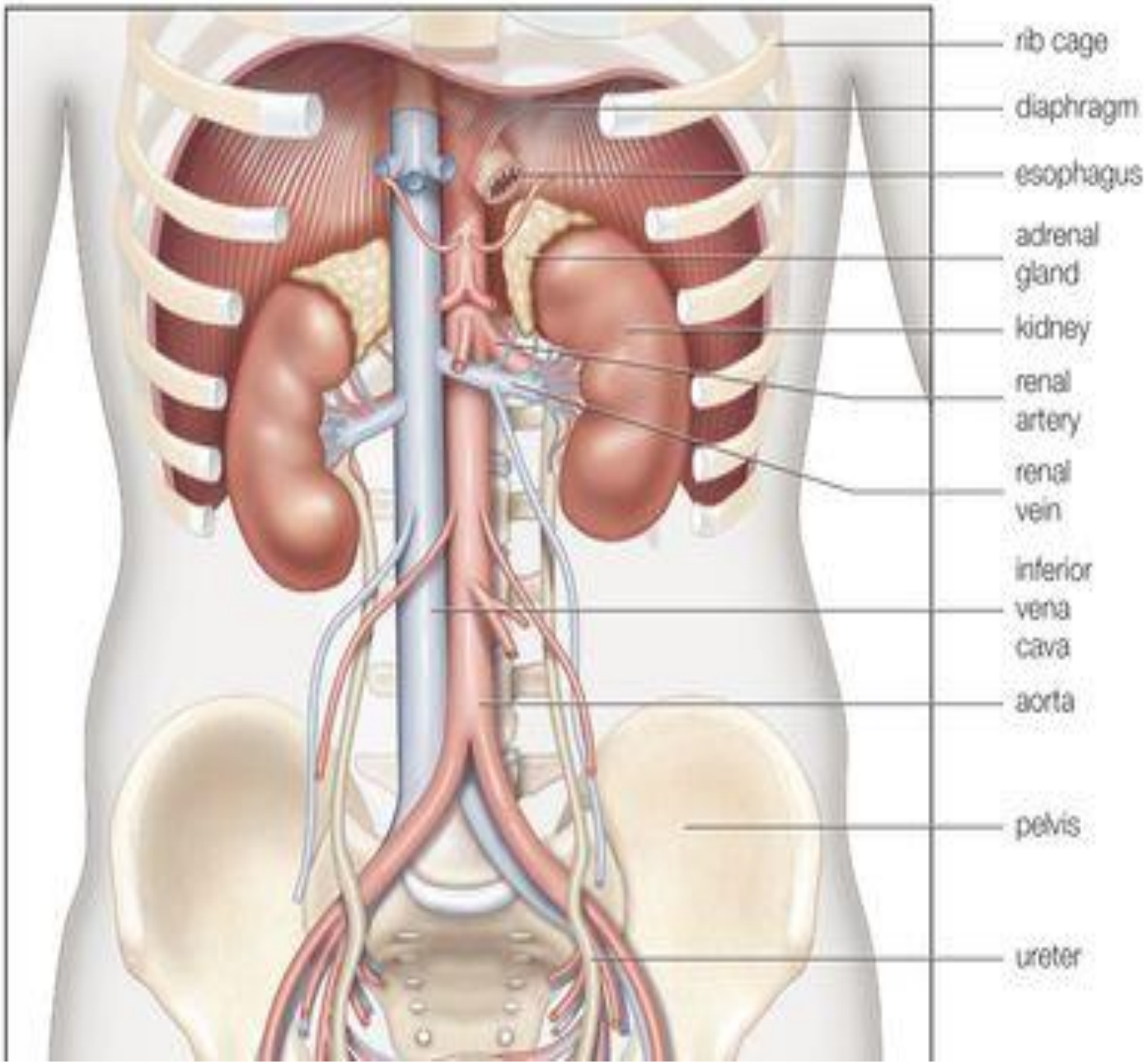
Plan of Session

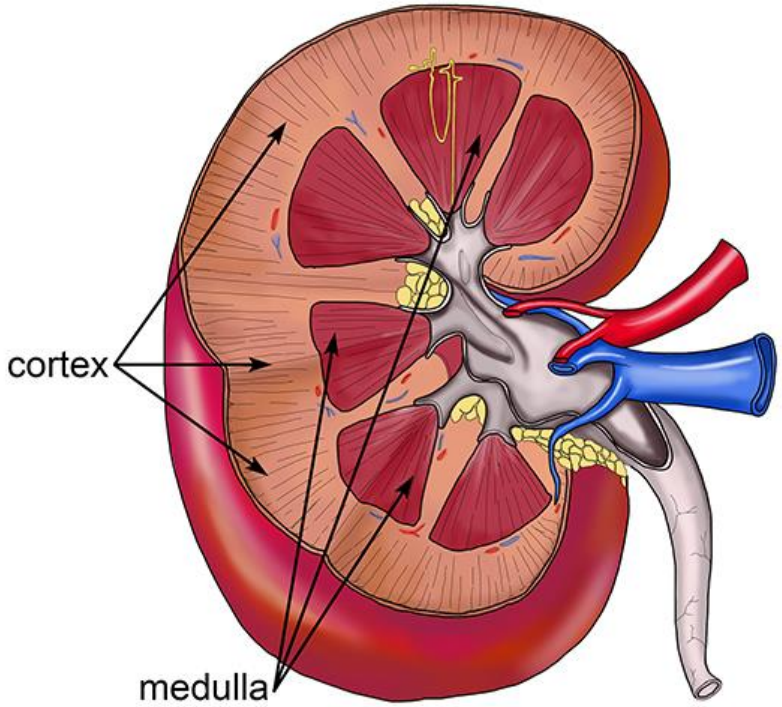
- What do kidneys do for us?
- What is GFR and CKD?
- What is microalbuminuria & proteinuria?
- What causes kidney problems in diabetes?
- How to treat kidney problems in diabetes?

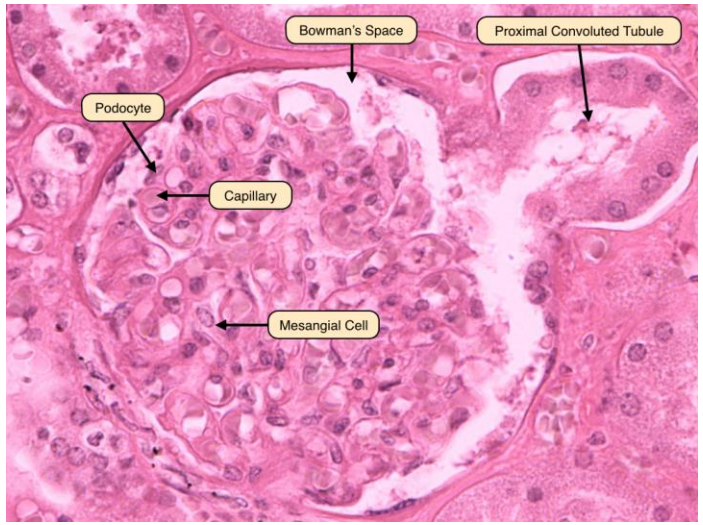


What have the kidneys ever done for us

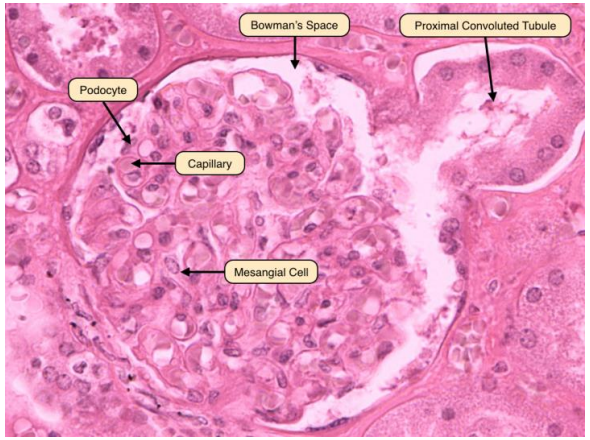



rib cage
diaphragm
esophagus
adrenal gland
kidney
renal artery
renal vein
inferior vena cava
aorta
pelvis
ureter

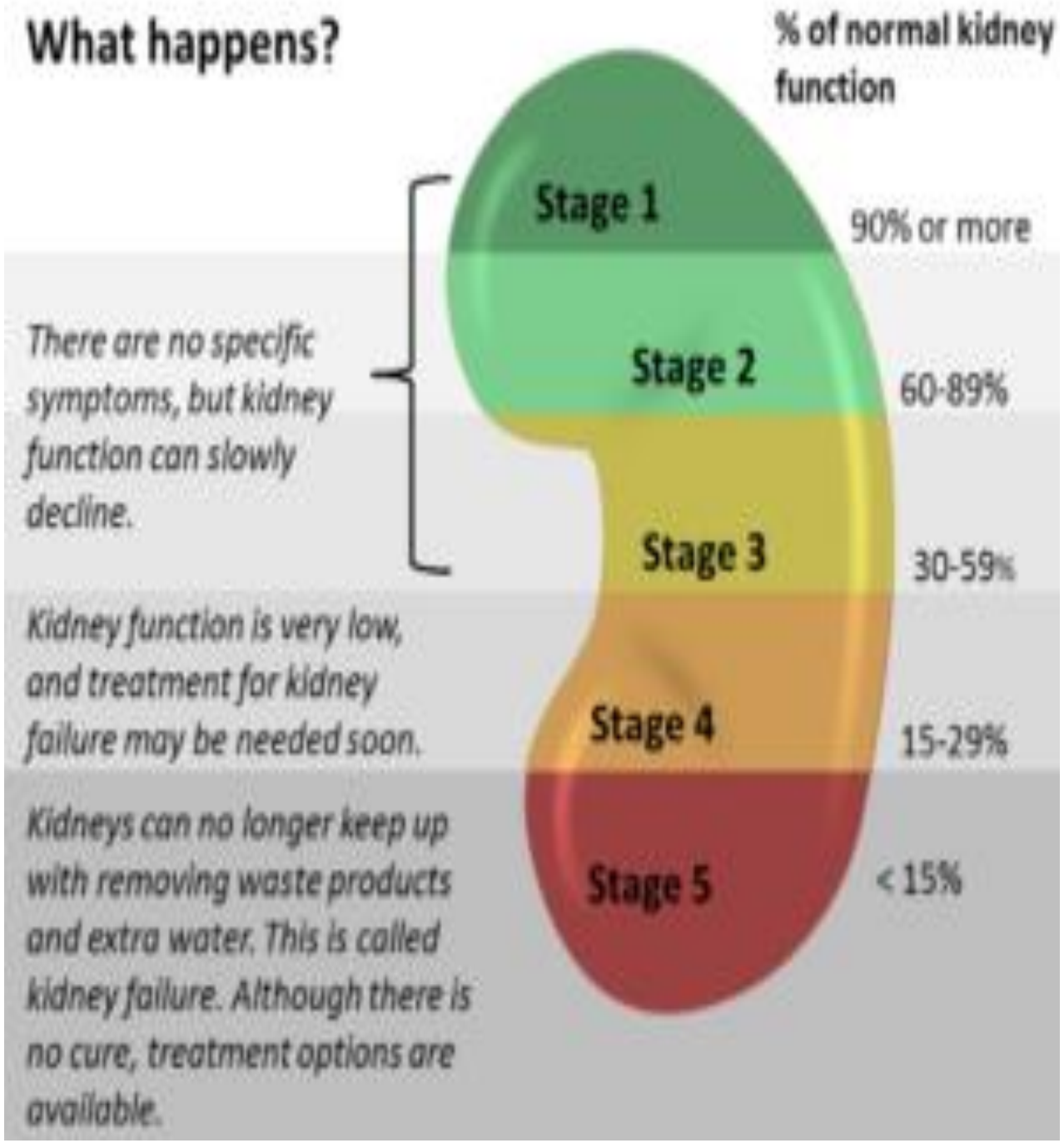

cortex
medulla


Bowman's Space
Proximal Convoluted Tubule
Podocyte
Capillary
Mesangial Cell

eGFR = 186.3 x (**Creatinine**/88.4) $^{-1.154}$ x **age** $^{-0.203}$ x (0.742 if female) x (1.21 if black)



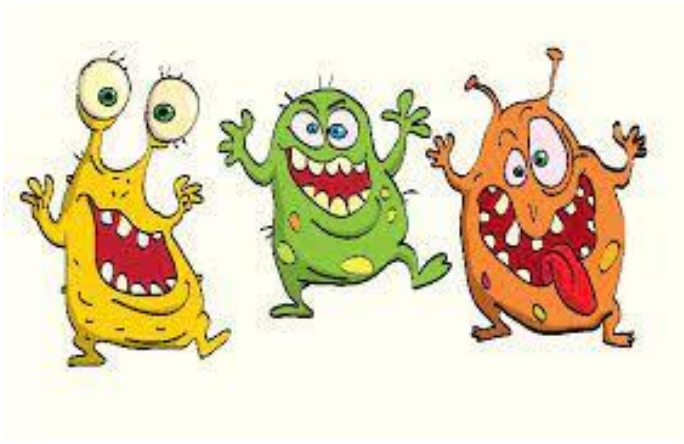
eGFR represents the percentage of your kidney function

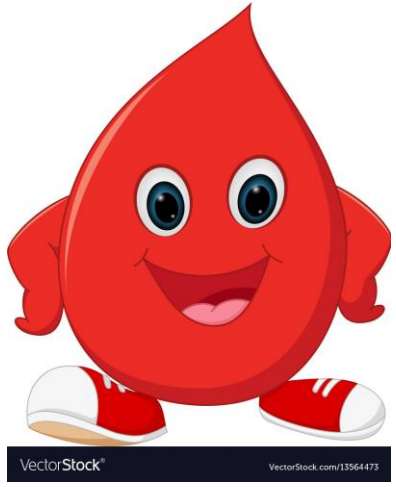


Stage 3a 45 – 59%

Stage 3b 16 – 44%

Microalbuminuria & Proteinuria

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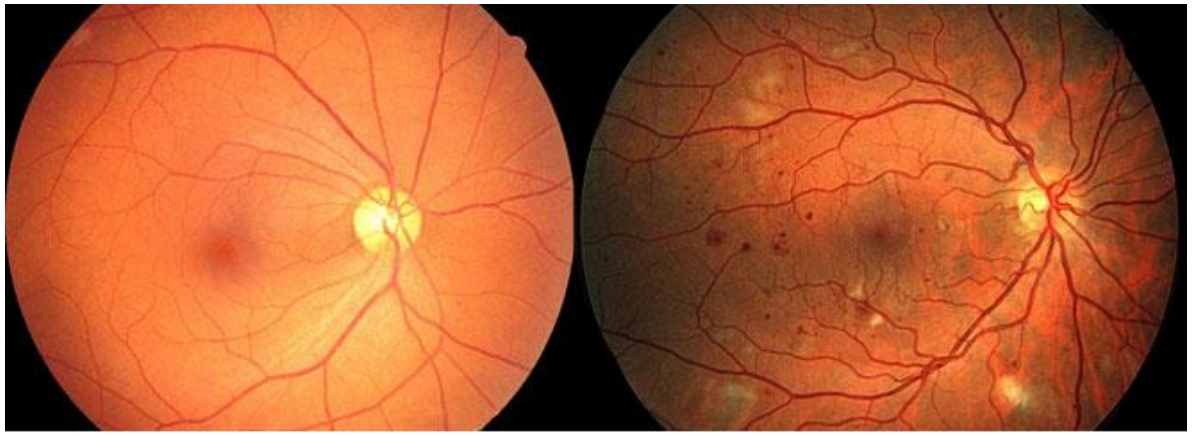
Prognosis of CKD by GFR and Albuminuria Categories

GFR categories (ml/min/1.73 m²) Description and range				Albuminuria categories Description and range		
				A1	**A2**	**A3**
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30 mg/mmol
	G1	Normal or high	≥90			
	G2	Mildly decreased	60-90			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.
KDIGO 2012

Risk Factors for Diabetic Kidney Disease

Prolonged Poor Diabetes / BP Control



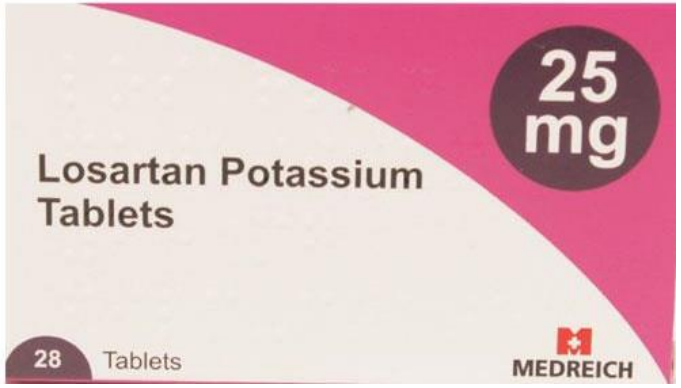
Normal Retina

Diabetic Retinopathy

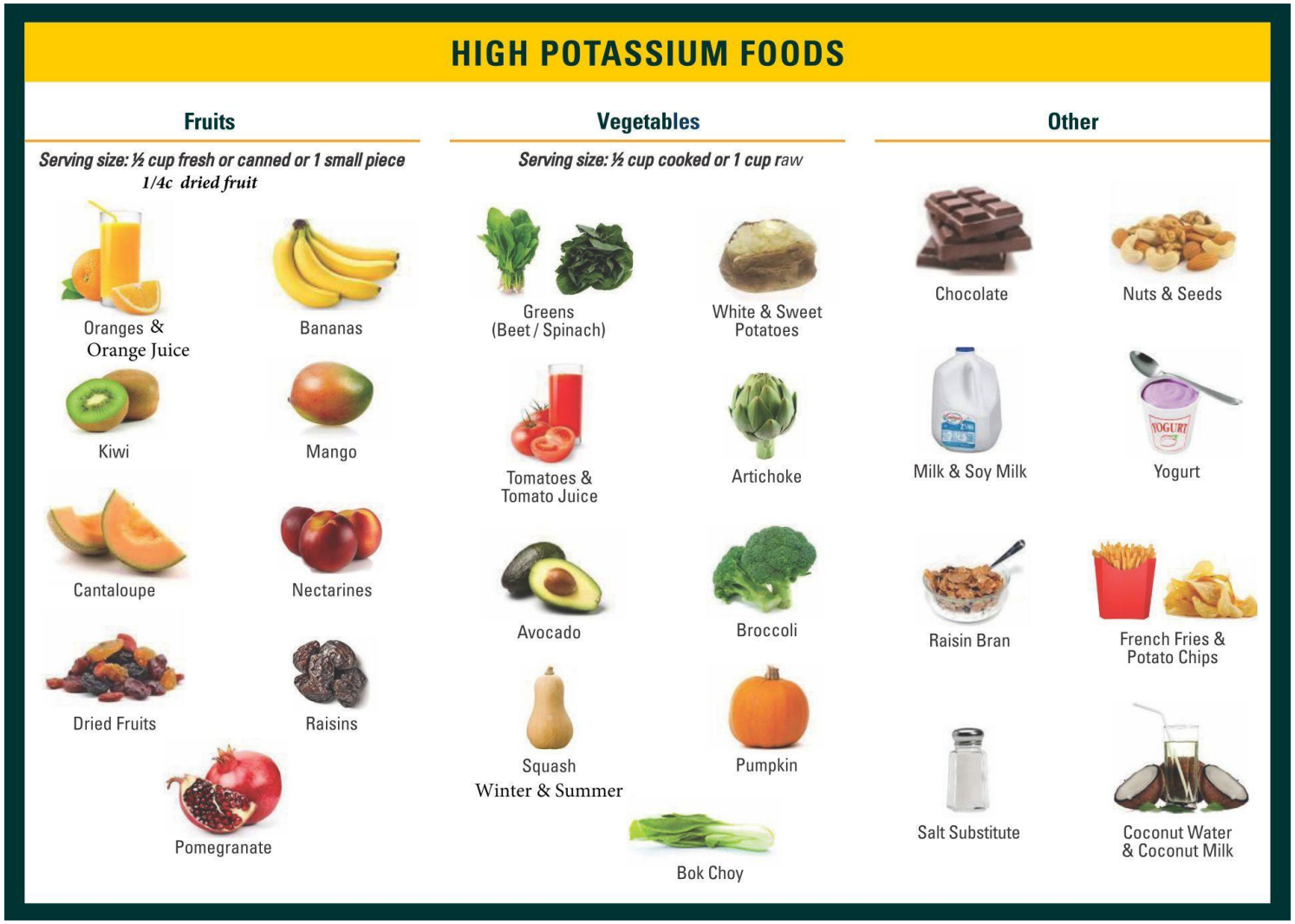
Family History
Male
SE Asian / Black Race

Treatments for Diabetic Kidney Disease

CKD 3b or lower



Major Changes in Diet may be required

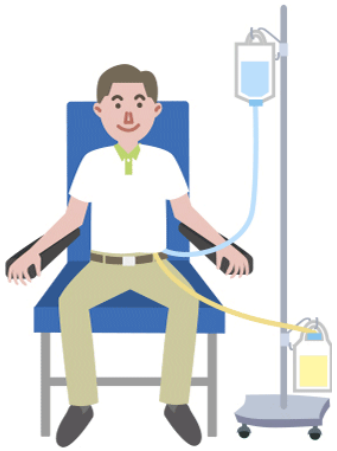


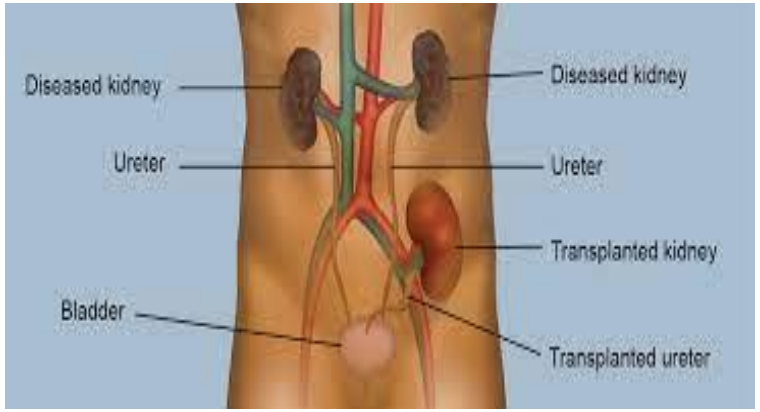
Additional Clinics with Nephrologist

Optimisation of existing kidney function

Hemodialysis

Peritoneal dialysis





Summary

- CKD is a natural part of ageing
- Do annual urine microalbumin test
- Good control of diabetes and blood pressure slows CKD progression
- The majority of people with CKD do not require a nephrologist