

Evaluation of adult with kidney disease:

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- Many patients with CKD progress to ESRD and need RRT
- Even more die of non-renal causes , esp. premature CVS events
- Early diagnosis of CKD important to prevent progression of kidney disease but even more so to prevent CVS complications

Definitions:

- KDOQI guidelines classify CKD into 5 stages using eGFR from MDRD:

Stages of chronic kidney disease			
Stage	Description of kidney damage with:	GFR mL/min 1.73 m ²	% US population*
1	Normal GFR but some evidence of kidney damage e.g., abnormal urinalysis or histological changes	> 90	3.3
2	Mild chronic kidney failure	60–89	3.0
3	Moderate chronic kidney failure	30–59	4.3
4	Severe chronic kidney failure	15–29	0.2
5	ESRD when RRT has to be considered	< 15 on dialysis	0.2

*Percentage of US population at each stage according to NHANES III

Criteria for Definition of Chronic Kidney Disease

Kidney damage for ≥ 3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR, that can lead to decreased GFR, manifest by either:

- Pathologic abnormalities
- Markers of kidney damage, including abnormalities in the composition of blood or urine, or abnormalities in imaging tests
- GFR < 60 ml/min/1.73 m² for ≥ 3 months, with or without kidney damage

Clinical presentation:

- Early diagnosis of CKD with algorithm based disease management plan may slow rate of decline of kidney function and reduce CVS events
- Many patients with CKD are known to health care system because they receive treatment for diabetes, hypertension or CVS disease

Clinical presentation:

- Patients can present as:
 1. CKD recognised on abnormal creatinine or eGFR in context of known cause of kidney disease like diabetes
 2. Acute-on-chronic renal failure as unexpected illness, when it becomes apparent that patient had underlying CKD prior to presentation
 3. Late, as uremic emergency, requiring urgent management

Causes of acute-on-chronic renal failure

Dehydration

Drugs

Disease relapse

Disease acceleration

Infection

Obstruction

Hypercalcemia

Hypertension

Heart failure

Interstitial nephritis

Causes of chronic renal failure

Common causes in all registries of patients with ESRD (see Fig. 66.3)

Diabetic nephropathy
Glomerulonephritis
Interstitial nephritis (including pyelonephritis)
Hypertension/vascular disease
Hereditary/congenital disease
Neoplasms

Less common causes

Group	Causes
Metabolic	cystinosis oxalosis nephrocalcinosis cystinuria hyperuricemia
Vascular	ischemic renal disease ^a scleroderma hemolytic uremic syndrome postpartum renal failure
Dysproteinemias	amyloid myeloma cryoglobulinemia light chain deposition disease (LCDD)
Hereditary	Alport syndrome Fabry disease tuberous sclerosis sickle cell disease
Vasculitis	Wegener's granulomatosis microscopic polyangiitis polyarteritis nodosa lupus
Malignancy	renal cell carcinoma lymphoma
Structural	cystic kidney disease other than adult-onset cystic disease; congenital and acquired abnormalities of the urinary tract, e.g., associated with spina bifida, spinal cord injury

^aIncreasingly common but not separately identified in most registries.

Evaluation of patient with suspected CKD:

- Detection of eGFR in patient with previous normal renal function/or unknown function requires a history and examination with attention to blood pressure and urinalysis to assess if acute or chronic.
- Ultrasound of kidneys showing small kidneys suggest chronic disease.
- Proteinuria indicates high risk of progression and CVS disease
- Urine culture and evaluation for haematuria important
- Blood pressure recording and evaluation of complications of CKD: dyslipidaemia, anaemia, CKD-BMD.

Important aspects of history:

- DRUG and TOXIN history
- Allergies
- Family history
- Previous and recent infections
- Recurrent urinary tract infections
- Kidney stones
- Obstetric history
- History of bleeding/thrombosis
- Travel history
- Comprehensive systemic enquiry covering all systems is essential

Potentially treatable causes of chronic renal failure

Renal diseases susceptible to specific therapy that may delay or prevent ESRD

Immune-mediated

Systemic lupus

Systemic vasculitis

Membranous nephropathy

Deposition diseases

Myeloma

Amyloid

Hyperuricemia

Vascular

Accelerated hypertension

Ischemic renal disease

Infective

Tuberculosis

When to refer to nephrologist:

Suggested Criteria for Referral of Patients with Chronic Kidney Disease to a Nephrologist

New Diagnosis	Stage 3	Stage 4
eGFR <30 ml/min/per 1.73 m ²	eGFR falling by >4 ml/min per year	eGFR <20 ml/min per 1.73 m ²
Hemoglobin <11g/dl	eGFR < 50 ml/min in patient younger than 50 years	eGFR falling by >4 ml/min per year
K ⁺ >6 mmol/l	Hemoglobin < 11 g/dl	Hemoglobin <11 g/dl
Ca <2.1 mmol/l	K ⁺ >6 mmol/l	K ⁺ >6 mmol/l
Pi >1.5 mmol/l	Ca <2.1 mmol/l	Ca <2.1 mmol/l
PTH >3× upper limit normal	Pi >1.5 mmol/l	Pi >1.5 mmol/l
Hematuria		PTH >3× upper limit normal
Urine ACR >30 mg/mmol		
Suspected renovascular disease		

