

**Directions: Questions (1-25) Circle the one best answer**

1. A 60-year-old woman presents to your office for evaluation of urinary incontinence. She gets an intense urge to urinate and leakage occurs on the way to the toilet. Before voiding, coughing in the standing position causes leakage. The post void residual urine is 50 ml. The pelvic examination reveals a small cystocele.

Based upon the above information, you will now recommend:

- (A) Surgery to correct cystocele
- (B) Start oxybutunin
- (C) Start phenylpropanolamine
- (D) Teach the patient pelvic muscle exercises and bladder training techniques

2. A 64-year-old woman consults you for insomnia. She keeps lying in bed for several hours before falling asleep. She is not on any medications and denies any problem with anxiety or depression.

The appropriate management may include all of the following except:

- (A) Instruct her to go to bed only when sleepy and get out of bed when unable to sleep for 20 minutes.
- (B) Try to wake up and sleep at the same time every day and advise her not to watch TV or do reading in bed.
- (C) Short term trial of Zolpidem
- (D) Start her on daily diphenhydramine at bedtime.

3. A 38-year-old female presents to the emergency room with severe left flank pain radiating to the left groin of 2-hour duration. The urine shows 2+ blood and flat plate of abdomen shows a small left ureteric stone. She has history of Crohn's disease and had a small bowel resection 5 years ago. She denies any bowel symptoms at this time.

The most likely cause of her renal stone disease is :

- (A) Hypercalciuria
- (B) Hypocitrauria
- (C) Hyperoxaluria secondary to increase oxalate absorption from GI tract
- (D) Hypomagnesiuria

4. A 30-year-old male consults you because of recurrent attacks of sinusitis and pneumonia for the last one year. He has been hospitalized with pneumococcal pneumonia three times in the last one year. The blood tests reveal normal Hb, HCT, WBC and platelet count. The lymphocytic profile shows normal T and B-lymphocytes. The levels of IgG, IgM and IgG are markedly reduced. The serum albumin is normal.

Based upon the above information, the most likely diagnosis is :

- (A) Malabsorption syndrome
- (B) Multiple myeloma
- (C) Bruton X-linked hypogammaglobulinemia
- (D) Common variable immunodeficiency

C 5.

A 35-year-old chronic alcoholic is brought to the emergency room in confused and disoriented state and in acute respiratory distress. The examination shows a BP 90/70, pulse rate 110/min., rales in both lung fields. The chest x-ray shows a pulmonary edema pattern. The EKG shows sinus tachycardia and no ischemic changes. The laboratory studies reveal glucose 90 mg/dL, BUN 56 mg/dL, Na 138 meq/L, K 5.0 meq/L, HCO<sub>3</sub> 10 meq/L, Cl 98 meq/L. The serum osmolality is 340 mosm/Kg. The urine shows 10-20 RBC'S/hpf, 3-5 WBC'S/hpf and many envelope shaped crystals. The blood gases show PO<sub>2</sub> 70 mm/Hg, PCO<sub>2</sub> 22 mm/Hg and pH 7.1

Based upon the above information, the most likely diagnosis is:

- (A) Methanol intoxication
- (B) Lactic acidosis secondary to hypotension
- (C) Ethylene glycol intoxication
- (D) Acute tubular necrosis secondary to sepsis

C 6.

A 22-year-old male consults you because of recurrent attacks of swelling of lips, face and eyelids of few years duration. These attacks at times are associated with crampy abdominal pain. The attacks do not respond to antihistamine or prednisone but resolve spontaneously in 2-3 days. Few other members of his family have similar complaints.

Best way to confirm his diagnosis is:

- (A) Serum CH50
- (B) Serum C3 level
- (C) Serum C4, C2, C1 inhibitor antigenic and functional, C1q
- (D) Serum C2 level

D 7.

A 40-year-old nurse while assisting in a Code in the emergency room complaints of generalized pruritus and few minutes later develops a diffuse urticarial rash and swelling of lips and tongue. She is immediately given S/C epinephrine and IV diphenhydramine with good response.

The best way to confirm the cause of her symptoms is :

- (A) Skin prick testing with latex proteins
- (B) Serum C3, C4 and CH50 level
- (C) ANA
- (D) Testing for Latex specific IGE by RAST

B 8.

A 44-year-old male patient consults you because of recurrent headaches. He is taking no medications at this time. The physical examination shows BP 180/100 and no focal neurological findings. The fundoscopic examination shows no hemorrhages, exudates or pappiledema. The laboratory studies reveal Na 138 meq/L, K 2.8 meq/L, HCO<sub>3</sub> 32 meq/L, Cl 100 meq/L. The renin level after 2 hours of upright posture are very low and the aldosterone levels after salt loading are markedly elevated. Based upon this information, the most likely diagnosis is :

- (A) Renovascular hypertension
- (B) Primary hyperaldosteronism
- (C) Bartter's syndrome
- (D) Low renin essential hypertension

B

9.

A 70-year-old male patient consults you because of weakness. He was recently admitted to the hospital with enterococcal endocarditis and treated with IV ampicillin & gentamicin for 6 weeks. He was discharged 2 weeks ago and had a normal BUN/Cr at discharge. The laboratory studies reveal BUN 60 mg/dL, Cr 5.0 mg/dL, K 3.1 meq/L, Mg .8 mg/dL ( nl: 2-3 mg/dL ), Calcium 7.2. The urine analysis shows few RBC's and WBC's but no casts or protein. The serum complement levels are normal

Based upon the above information, the most likely diagnosis is :

- (A) Glomerulonephritis secondary to endocarditis
- (B) Gentamicin toxicity
- (C) Interstitial nephritis due to ampicillin
- (D) Renal damage due to hypomagnesemia

C

10.

A 60-year-old female is admitted with suspected acute diverticulitis and started on IV clindamycin and gentamicin. The BUN/Cr on admission are normal. A CT scan with oral And IV contrast confirms the diagnosis of acute diverticulitis involving the sigmoid colon. The next day patient develops oliguria and laboratory studies show BUN 35 mg/dl, Cr 2.0/dL, fractional excretion of Na < 1. The urine analysis is normal.

Based upon the above information, the most likely diagnosis is :

- (A) Clindamycin induced nephrotoxicity
- (B) Gentamicin induced nephrotoxicity
- (C) Radio-contrast induced nephrotoxicity
- (D) Renal damage secondary to intra-abdominal sepsis

C

11.

You are asked to evaluate a 52-year-old man with history of low back pain, weakness and exertional dyspnea of few months duration. Physical examination reveals ++ pallor and tenderness over lumbar spine.

Laboratory studies:

CBC..... Hb 7.4 g/dL, Hct 24%, Sed. rate 85 mm/h

Bun/Cr.....50/4.0

Glucose.....100 mg/dL

Electrolytes..... Na 136 meq/L, K 3.1 meq/L, Cl 116 meq/ L, HCO<sub>3</sub> 19 meq/L

Calcium.....11.9 mg/dL

Urine.....++ glucose, trace protein, pH 3.8, 24-hour urine protein 3.2 gm

Based upon the above information, the most likely diagnosis is :

- (A) Metastatic bone disease
- (B) Multiple myeloma with distal renal tubular acidosis (Type 1)
- (C) Multiple myeloma with proximal renal tubular acidosis (Type 2)
- (D) Hyperparathyroidism

- B
12. A 45-year-old woman is hospitalized because of high fever with chills and right costovertebral angle tenderness. She is started on ampicillin & gentamicin after obtaining urine and blood cultures. Laboratory studies reveal a WBC count of 14000 /uL, normal BUN/Cr and urine analysis shows many gram negative bacteria and WBC's. She becomes afebrile in 24 hours and cultures of blood and urine are positive for E. coli. Ten days after admission she spikes a temperature of 102 F. Physical examination reveals a faint macular rash on the trunk and legs. Repeat laboratory studies reveal Hb 12.5 g/dL, WBC 11500/ uL ( PMN's 65%, Lymphocytes 14%, Eosinophils 12%), BUN 70 mg/dL, Cr 3.4 mg/dL and urine analysis shows 1+ protein, 15-20 WBC's/ hpf, 10-20 RBC's/ hpf and many granular and WBC's casts → *interstitial nephritis*  
Based upon the above information, the most likely diagnosis at this point is :
- (A) Acute tubular necrosis secondary to gentamicin
  - (B) Tubulo-interstitial nephritis secondary to ampicillin
  - (C) Acute glomerulonephritis
  - (D) Renal failure secondary to sepsis
- C
13. A 20-year-old woman presents with fever and sore throat. Physical examination reveals evidence of pharyngitis and tonsillitis. Urine analysis shows 3+ protein and no RBC's, WBC's or casts. A throat culture is done and she is started on oral penicillin.  
The most appropriate next procedure to evaluate her proteinuria should be:
- (A) 24 hour urine for protein
  - (B) Urine protein electrophoresis
  - (C) Retest protein excretion after her acute febrile illness has resolved
  - (D) Renal biopsy
- D
14. A 62-year-old man presents because of increasing exertional dyspnea of few weeks duration. He has a history of hypertension and CHF for the last 2 years. His present medications include furosemide, digoxin and nifedipine. Physical examination reveals BP 150/90, pulse 76/minute, 1+ edema of both legs, elevated JVP, positive S3 gallop and rales in both lung bases. Laboratory studies show a BUN of 24 mg/dL and Cr of 1.1 mg/dL. He is started on enalapril 5 mg daily and other medications are continued. Seven days later he reports improvement in symptoms and repeat blood tests reveal BUN of 75 mg/ dL and Cr of 2.1 mg/dL. Urine analysis is normal  
The most likely cause of acute renal failure in this patient is :
- (A) Acute interstitial nephritis induced by enalapril
  - (B) Acute tubular necrosis
  - (C) Atheroembolic renal disease
  - (D) Functional prerenal azotemia induced by enalapril

15.

A 66-year-old woman presents to the emergency room because of weakness, nausea and vomiting of few days duration. She denies any significant past medical illness. Physical examination is normal.

Laboratory studies:

BUN/Cr..... 80/ 2.5

Urine..... trace protein, 3-5 WBC's /hpf, no casts, Na 5 meq /L  
osmolality 670/mosm/Kg, fractional excretion of Na <1

The most likely cause of acute renal failure in this patient is :

- (A) Interstitial nephritis
- (B) Acute tubular necrosis
- (C) Pre renal azotemia
- (D) Chronic glomerulonephritis

16.

A 74-year-old woman with long standing history of atherosclerotic vascular disease is brought to the emergency room because of nausea, vomiting, abdominal pain and weakness. Seven days ago, she underwent an angiogram for evaluation of abdominal aortic aneurysm, which revealed a 6x7 cm aneurysm below the renal artery. Physical examination reveals bluish discoloration of toes, livido reticularis of both feet and diffuse abdominal tenderness

Laboratory studies:

BUN/Cr. 60/4.6, Amylase 500 U/L (nl: 60-180 U/L), CBC& Electrolytes...normal

The best procedure to confirm the diagnosis is:

- (A) A CT scan of the kidneys
- (B) Exploratory laprotomy
- (C) Biopsy of the lower extremity lesion
- (D) Renal biopsy

17.

A 39-year-old woman is brought to the emergency room with one-day history of mental confusion and disorientation. Ten minutes after arrival to the ER she develops a grand mal seizure, which is controlled by intravenous diazepam.

Laboratory studies:

Electrolytes ..... Na 112 meq/L, K 4.1 meq/L, Cl 88meq/L, HCO<sub>3</sub> 22 meq/L

BUN..... 8 mg/dL

Plasma osmolality.... 230 mosmol/kg H<sub>2</sub>O

Urine..... Na 10 meq/L, Osmolality 50 mosmol/Kg H<sub>2</sub>O

Urine out put..... 2 liters in first 3 hours

Based upon the above information, the most likely diagnosis is :

- (A) Addison's disease
- (B) Syndrome of inappropriate antidiuretic hormone secretion
- (C) Psychogenic polydypsia
- (D) Salt losing nephritis

B

18.

A 70-year-old woman consults you because of increasing edema of legs and puffiness of face for the last few weeks. She has a history of hypertension, osteoarthritis and cardiac arrhythmia and has been on procainamide, propranolol and naproxen. Physical examination shows a BP 146/86, 1 + periorbital edema, 3 + pitting edema of both feet and legs and normal heart and lung examination.

Laboratory studies:

BUN/Cr.....85/ 6.0 mg/dL

Electrolytes.....Na 136 meq/L, K 4.6 meq/L, Cl 96 meq/L, HCO<sub>3</sub> 24 meq/L

Proteins.....Total protein 6.1 mg/dL, albumin 2.5 mg/dL

ANA.....Positive at a titer of 1: 60 with a diffuse pattern

Urine.....4 + protein, 20-30 WBC's/ hpf, 1-2 RBC's/hpf, many granular casts and few oval fat bodies, Urine protein to creatinine ratio 5.6

↓ interstitial nephritis

Based upon the above information, the most likely diagnosis is :

- (A) Procainamide induced lupus nephritis
- (B) Naproxen induced interstitial nephritis and nephrotic syndrome
- (C) Amyloidosis
- (D) Membranous nephropathy

D

19.

A 22-year-old woman is brought to emergency room in confused and disoriented state. Few minutes after arrival to the emergency room, she develops a grand mal seizure. There is no history of any trauma. Initial laboratory studies show BUN 30 mg/dL, Cr 4.5 mg/dL, phosphorus 8.5 mg/dL ( nl: 3-4.5 mg/dL ), uric acid 13.5 mg/dL ( nl : 2.5-8.0 mg/dL), Calcium 6.2 mg/dL, K 5.8 mg/dL. A lumbar puncture is performed and the examination of spinal fluid is normal.

Based upon the above information, the most likely diagnosis is:

- (A) Rapidly progressive glomerulonephritis
- (B) Tumor lysis syndrome
- (C) Multiple myeloma
- (D) Cocaine induced rhabdomyolysis and renal failure

C

20.

A 42-year-old female consults you because of an episode of hemoptysis. She also has history of recurrent attacks of otitis media and sinusitis in the last one year. Chest x-ray is normal. Laboratory studies reveal BUN of 62 mg/dL and Cr of 6.2. Urine analysis show 1+ protein, 2+ blood, 20-30 RBC's/hpf and many RBC's casts. ANA is negative. The complement studies are normal and anti neutrophilic cytoplasmic antibodies are positive (ANCA)

Based upon the above information, the most likely diagnosis is:

- (A) Goodpasture's syndrome
- (B) Polyarteritis nodosa
- (C) Wegener's granulomatosis
- (D) Lupus nephritis

B 21

A 26-year-old female consults you because of 2 week history of cough, hemoptysis, dyspnea and dark-colored urine. Chest x-ray shows hilar infiltrates in both lungs. Urine analysis shows 50-100 RBC's /hpf and many RBC's casts. ANA is negative and complement studies are normal.

Renal biopsy in this patient will most likely show

- (A) Granulomatous necrotizing vasculitis
- (B) Linear deposits of IGG by immuno-fluorescence
- (C) Granular sub-endothelial deposits of IGG and C3
- (D) IGA deposits in the mesangium

De - Good pasture's

B 22

A 15-year-old boy consults you because of recurrent attacks of cola color urine after vigorous exercise. Urine analysis reveal 2+ protein, 50-100 RBC's/hpf with many dysmorphic RBC's and RBC's casts. Serum BUN, Cr, electrolytes and CBC are normal

Renal biopsy in this patient will most likely show:

- (A) Sub-epithelial deposits of IGG & C3
- (B) IGA, C3 & IGG deposits in the mesangium
- (C) Normal renal biopsy
- (D) Granular deposits of IGG & C3

B 23

A 24-year-old man presents with history of peripheral edema, periorbital swelling and dark color urine of few days duration. Two weeks ago, he developed left leg cellulitis, which was treated with oral penicillin. Physical examination reveals BP 170/100, 3+ pedal edema and periorbital swelling.

Laboratory studies:

BUN.....50 mg/dL

Cr.....4.6mg/dL

CBC, electrolytes.....Normal

Urine.....3+ protein, 3+ blood, many RBC's & RBC's casts

ANA.....negative

Serum antistreptolysin O.....positive

Serum anti-deoxyribonuclease B... positive

Complement Studies..... C3 low. CH50 low. C4 normal

Based upon the above information, the most likely diagnosis is :

- (A) Acute lupus nephritis
- (B) Acute postsreptococcal glomerulonephritis
- (C) Berger's disease
- (D) Polyarteritis nodosa

D 24. A 29-year old man consults you because of recurrent muscle cramps, muscle weakness and polyuria of 1-year duration. Physical examination shows BP 110/80, pulse 76/min. and normal heart & lung examination. Laboratory studies: BUN 16mg/dL, Cr 1.0 mg/dL, Glucose 100mg/dL  
Electrolytes..... Na 140 meq/L, K 2.6 meq/L, Cl 95 meq/L, HCO<sub>3</sub> 32 meq/L  
Urine..... Na 50 meq/L, K 60 meq/L, Cl 40 meq/L  
Renin levels...elevated, Aldosterone...elevated  
Based upon the above information, the most likely diagnosis is  
(A) Renin producing tumor of kidney  
(B) Primary hyperaldosteronism  
(C) Ectopic ACTH production  
(D) Bartter's syndrome

A 25. A 66-year-old woman is brought to the hospital with marked mental confusion. Physical examination reveals a BP of 130/80, pulse 78/min and mental obtundation without any focal neurological signs. She has been taking hydrochlorothiazide 25 mg/d for the last 3 weeks. Laboratory studies BUN 5mg/dL, Cr 6 mg/dL, Na 112 meq/L, K 3.0 meq/L, Cl 84 meq/L, HCO<sub>3</sub> 24 meq/L, Serum osmolality...232 mosm/Kg,  
Urine...Na 46 meq/L, osmolality 300 mosm/Kg  
Based upon the above information, the most likely diagnosis is :  
(A) Hyponatremia secondary to hydrochlorothiazide  
(B) Psychogenic polydypsia  
(C) SIADH caused by underlying malignancy  
(D) Diabetes insipidus

**Directions: Items 26-40 are true and false questions. Mark T for statements that are true and F for statements that are false**

26-29 The drugs, which may cause nephrotic syndrome, include

- T (26) Gold
- T (27) Penicillamine
- T (28) Captopril
- T (29) NSAIDS

30-32 The true statements about HIV nephropathy include

- T (30) It leads to severe proteinuria and rapidly progressive renal failure
- T (31) Biopsy shows focal and segmental glomerulosclerosis
- T (32) It is more common in intravenous drug users and blacks

33-36 The true statements about renal tubular acidosis include

- T (33) Urine pH remains > 5.5 in distal RTA in spite of severe systemic acidosis
- T (34) Multiple myeloma may cause proximal RTA
- T (35) Hyperkalemia is a feature of type IV RTA
- F (36) Renal stones and nephrocalcinosis is more common in proximal RTA

37-40 The true statements regarding use of various diuretics include

- T (37) Thiazides are useful in treatment of idiopathic hypercalciuria
- T (38) Furosemide is useful in treatment of hypercalcemia
- T (39) Thiazides are useful in treatment of nephrogenic diabetes insipidus
- F (40) Furosemide may lead to development of SIADH



## Answers to Nephrology Questions

- |     |   |     |   |
|-----|---|-----|---|
| 1.  | D | 26. | T |
| 2.  | D | 27. | T |
| 3.  | C | 28. | T |
| 4.  | D | 29. | T |
| 5.  | C | 30. | T |
| 6.  | C | 31. | T |
| 7.  | D | 32. | T |
| 8.  | B | 33. | T |
| 9.  | B | 34. | T |
| 10. | C | 35. | T |
| 11. | C | 36. | F |
| 12. | B | 37. | T |
| 13. | C | 38. | T |
| 14. | D | 39. | T |
| 15. | C | 40. | F |
| 16. | C |     |   |
| 17. | C |     |   |
| 18. | B |     |   |
| 19. | D |     |   |
| 20. | C |     |   |
| 21. | B |     |   |
| 22. | B |     |   |
| 23. | B |     |   |
| 24. | D |     |   |
| 25. | A |     |   |