Regulation of glomerular filtration rate

1- Glomerular Filtration Rate Is:

A. *The volume of filtrate produced by one kidney per min*
B. *The volume of filtrate produced by both kidneys per min*
C. *The velocity of filtrate produced by one kidney per min*
D. *The velocity of filtrate produced by both kidneys per min*

2- The average glomerular filtration rate in healthy person is:

A. *50 ml/min*
B. *95 ml/min*
C. *125 ml/min*
D. *175 ml/min*

3- Which of the following is correct:

A. *increase in net filtration pressure result in increase glomerular filtration rate*
B. *increase in net filtration pressure result in decrease glomerular filtration rate*
C. *Net filtration pressure has no effect in glomerular filtration rate*

4- Which of the following is correct:

A. *99% of glomerular filtration rate excreted*
B. *1% of glomerular filtration rate reabsorbed*
C. *1% of glomerular filtration rate excreted*
D. *50% of glomerular filtration rate reabsorbed*

5- Which of the following is correct:

A. *If the GFR is too high the tubules will reabsorb wastes that should be eliminated*
B. *If the GFR is too high Azotemia develops Will develop*
C. *If the GFR is too high there will be threat of dehydration and electrolyte depletion*
D. *If the GFR is too high Fluid will flow sluggishly through tubules*

6- The number of mechanism by which the glomerular blood pressure adjusted:

A. *Three mechanism*
B. *Two mechanism*
C. *Just one mechanism*
D. *Four mechanism*

7- The body maintains constant GFR over an ABP range of 75-160 mmHg because of which of the following mechanism:

A. *Hormonal mechanism: renin and angiotensin*
B. *Autoregulation*
C. *Sympathetic control*
D. *None of these*

8- Which of the following changes would you expect to find after administering a vasodilator drug that caused a 50% decrease in afferent arteriolar resistance and no change in arterial pressure:

E. *Decreased renal blood flow, decreased GFR, and decreased peritubular capillary hydrostatic pressure*
F. *B) Decreased renal blood flow, decreased GFR, and increased peritubular capillary hydrostatic pressure*
G. *C) Increased renal blood flow, increased GFR, and increased peritubular capillary hydrostatic pressure*
H. *D) Increased renal blood flow, increased GFR, and no change in peritubular capillary hydrostatic pressure*
I. *E) Increased renal blood flow, increased GFR, and decreased peritubular capillary hydrostatic pressure*

9- Which of the following would tend to decrease GFR by more than 10% in a normal kidney:

A. *Decrease in renal arterial pressure from 100 to 85 mm HgB) 50% decrease in afferent arteriolar resistance*
B. *50% decrease in efferent arteriolar resistance*
C. *50% increase in the glomerular capillary filtration coefficient*
D. *Decrease in plasma colloid osmotic pressure from 28 to 20 mm Hg*

10- If the average hydrostatic pressure in the glomerular capillaries is 50 mm Hg, the hydrostatic pressure in the Bowman's space is 12 mm Hg, the average colloid osmotic pressure in the glomerular capillaries is 30 mm Hg, and there is no protein in the glomerular ultrafiltrate, what is the net pressure driving glomerular filtration:

A. *8 mm Hg*
B. *32 mm Hg*

C. *48 mm Hg*
D. *60 mm Hg*
E. *92 mm Hg*

11- Which of the following changes tends to increase GFR:

A. *Increased afferent arteriolar resistance*
B. *Decreased efferent arteriolar resistance*
C. *Increased glomerular capillary filtration coefficient*
D. *Increased Bowman's capsule hydrostatic pressure*
E. *Decreased glomerular capillary hydrostatic pressure*

12- Which of the following is filtered most readily by the glomerular capillaries:

A. *Albumin in plasma*
B. *Neutral dextran with a molecular weight of 25,000*
C. *Polycationic dextran with a molecular weight of 25,000*
D. *Polyanionic dextran with a molecular weight of 25,000*
E. *Red blood cells*

13- Which of the following is correct:

F. *If the arterial pressure increase the urine output will decrease*
G. *The arterial pressure have no effect in both urine output and glomerular filtration rate*
H. *If the arterial pressure increase the glomerular filtration rate will increase*
I. *If the arterial pressure increase the glomerular filtration rate will decrease*

14- Which of the following describe Auto-regulation of GFR

A. *feedback mechanisms extrinsic to the kidney that keep the renal blood flow and GFR relatively distributed due to fluctuations in ABP*
B. *feedback mechanisms intrinsic to the kidney that keep the renal blood flow and GFR relatively distributed due to fluctuations in ABP*
C. *feedback mechanisms intrinsic to the kidney that keep the renal blood flow and GFR relatively distributed due to fluctuations in ABP.*
D. *feedback mechanisms intrinsic to the kidney that keep the renal blood flow and GFR relatively constant despite fluctuations in ABP.*

15- It is the intrinsic capability of blood vessels to constrict when blood pressure is increased:

A. *Hormonal Control of GFR*
B. *Sympathetic Control of GFR*
C. *Myogenic mechanism*
D. *Tubuloglomerular feedback mechanism*

16- Angiotensin II:

A. *constrict afferent arteriole*
B. *Cause salt and water retention*
C. *increase urine exertion*
D. *Cause thirst*
E. *Cause low concentration of urine*

17- Which is correct:

A. *renin-angiotensin mechanism induces vasoconstriction of efferent arteriole and sympathetic neurotransmitter cause constrict of afferent arterioles*
B. *renin-angiotensin mechanism induces vasoconstriction of afferent arteriole and sympathetic neurotransmitter cause constrict of efferent arterioles*
C. *renin-angiotensin mechanism induces vasodilation of afferent arteriole and sympathetic neurotransmitter cause constrict of efferent arterioles*
D. *renin-angiotensin mechanism induces vasoconstriction of efferent arteriole and sympathetic neurotransmitter cause dilation of afferent arterioles*

18- Angiotensin II:

A. *monitor salinity*
B. *secrete Renin*
C. *constrict afferent arteriole*
D. *constrict efferent arteriole*

19- Macula densa:

A. *monitor salinity*
B. *secrete Renin*
C. *constrict afferent arteriole*
D. *dilate efferent arteriole*

20- Juxtaglomerular cells:

A. *monitor salinity*
B. *secrete Renin*
C. *constrict afferent arteriole*
D. *dilate efferent arteriole*

Answers:

Q1: B

Q2: C

Q3: A

Q4: C

Q5: C

Q6: A

Q7: B

Q8: C | *A 50% reduction in afferent arteriolar resistance with no change in arterial pressure would increase renal blood flow and glomerular hydrostatic pressure, thereby increasing GFR. At the same time, the reduction in afferent arteriolar resistance would raise peritubular capillary hydrostatic pressure.*

Q9: C | *A 50% reduction in efferent arteriolar resistance would cause a large decrease in GFR, greater than 10%. A decrease in renal artery pressure from 100 to 85 mm Hg would cause only a slight decrease in GFR in a normal, autoregulating kidney. A decrease in afferent arteriole resistance, a decrease in plasma colloid osmotic pressure, or an increase in the glomerular capillary filtration coefficient would all tend to increase GFR.*

Q10: A | *The net filtration pressure at the glomerular capillaries is equal to the sum of the forces favoring filtration (glomerular capillary hydrostatic pressure) minus the forces that oppose filtration (hydrostatic pressure in Bowman's space and glomerular colloid osmotic pressure). Therefore, the net pressure driving glomerular filtration is 50 – 12 – 30 = 8 mm Hg.*

Q11: C | *The glomerular capillary filtration coefficient is the product of the hydraulic conductivity and surface area of the glomerular capillaries. Therefore, increasing the glomerular capillary filtration coefficient tends to increase GFR. Increased afferent arteriolar resistance, decreased efferent arteriolar resistance, increased Bowman's capsule hydrostatic pressure, and decreased glomerular hydrostatic pressure tend to decrease GFR.*

Q12: C | *The filterability of solutes in the plasma is inversely related to the size of the solute (molecular weight). Also, positively charged molecules are filtered more readily than are neutral molecules or negatively charged molecules of equal molecular weight. Therefore, the positively charged polycationic dextran with a molecular weight of 25,000 would be the most readily filtered substance of the choices provided. Red blood cells are not filtered at all by the glomerular capillaries under normal conditions.*

Q13: C

Q14: D

Q15: C

Q16: D

Q17: A

Q18: D

Q19: A

Q20: B