By Adam Hollingworth

Renal

KD01 [Mar96] [Apr01] Renal blood flow is dependent on:

A. Juxtaglomerular apparatus
B. [Na^+] at macula densa
C. Afferent vasodilatation
D. Arterial pressure
E. Efferent vasoconstriction
rest = autoregulatory systems

Factors (not) affecting ?renal blood flow/GFR:

A. Sympathetic nervous system
B. Sodium flow past macula densa
C. Afferent arteriolar vasodilatation
D. Arterial pressure
E. Efferent arteriolar vasoconstriction
(Similar Q: see KD18)

KD01b [Jul97] Renal blood flow:

A. Is 600-650ml/min per kidney
B. Is directly measured by infusing PAH
C. Is increased by sympathetic tone

KD01c [Jul98] [Feb04] Renal blood flow:

A. Greater per unit mass than cerebral blood flow
B. Is greater in the medulla compared to the cortex
C. Is closely related to tubular sodium reabsorption
D. Only sympathetically mediated
E. Some noradrenergic endings on JG complex and tubules
F. Parasympathetic via hypogastric plexus

KD02 [Mar96] [Feb12] Which has the greatest renal clearance?

A. PAH
B. Glucose
C. Urea

D. Water
E. Inulin

KD03 [Mar97] [Jul99] [Apr01] The ascending limb of the Loop of Henle is:

A. Impermeable to Na+
B. Involved in active transport of K+ into the lumen
C. Involved in active transport of Cl- out of lumen
D. Involved in active transport of Na+ into lumen
E. Hypotonic at the top
F. ?None of the above ?Actively transports water

KD04 [d] [Jul98] [Feb00] Regarding glucose handling in the kidney

A. Reuptake is passive
B. Tm is the same for all nephrons
C. D-glucose more rapidly absorbed than L-glucose
D. Reabsorption is inversely proportional to lipid solubility

KD05 [Jul97] Water filtration by the kidney:

A. Is 180 l/hr
B. Is 125 ml/min
C. Up to 90% is reabsorbed
D. Most drugs have MW less than 600 and are freely filtered
E. ?

KD07 [Mar98] ?Secretion/?absorption of urea takes place in:

A. Proximal convoluted tubule
B. Distal convoluted tubule
C. ?
D. ?

KD08 [Jul98] Glomerular capillary permeability is:

A. Less than in ordinary capillaries
B. 50 times more than skeletal muscle capillaries

C. ?

D. ?

KD09 [Mar99] Which ONE of the following is not involved in the regulation of glomerular filtration rate (GFR)?

A. Juxtaglomerular apparatus

B. Arterial pressure ? ie between 90-220mg autoreg possible.

C. Efferent arteriolar tone

D. Na content in distal tubule (macula densa at end of tck ALH)

E. Afferent arteriolar tone

(Similar Q: KD14)

KD10 [Jul98] [Jul01] With regard to glomerular filtration:

A. Autoregulation maintains flow

B. ?Afferent arteriole driving force

C. Is equal for cationic & anionic molecules

D. All cross if ?>/?< 8 nm in diameter

Jul 2001 version:

The permeability of glomerular capillaries:

A. Equals that of other capillaries

B. Is much less than that of other capillaries

C. Is equal for cationic and anionic molecules of equal size

D. Approaches 100% for neutral molecules of 8mm diameter

E. Is about 50 times as great as that of a skeletal muscle capillary

(This was MCQ No. 18 on the Jul 01 paper)

KD11 [Mar99] [Feb06] Kidney:

A. Maximum urine osmolality of 1200 mOsm/l - apparently 1200-1400

B. Min urine osmolality 100mosmol/Kg

C. Minimum osmolality = 20mOsmol/kg =30

D. ?

E. ?

KD12 [Jul99] [Feb00] [Mar03] Significant tubular reabsorption occurs with:

A. Phosphate

B. Creatinine

C. Urea

D. Sulphate

E. All of the above

KD13 - Deleted - same Q as ED26

KD14 [Feb00] [Apr01] Increased GFR is caused by

A. Increased cardiac output

B. Afferent arteriolar vasoconstriction

C. Efferent arteriolar vasodilatation

D. Increased chloride delivery to the macula densa

[[Apr 2001 version: Which of the following is involved in the regulation of glomerular filtration rate (GFR)?

A. Juxtaglomerular apparatus

B. Afferent arteriolar tone

C. Efferent arteriolar tone

D. Chloride transport at the macula densa

E. All of the above

KD15 [Jul00] The formula for GFR is:

A. GFR = Kf (HPG - HPB + OPG - OPB)

B. GFR = Kf (HPG - HPB - OPG + OPB) OBG not normally included as is norm 0. Lacks brackets otherwise should be (HPG - HPB) - (OPG - OPB)

C. GFR = Kf (HPG + HPB - OPG + OPB)

D. GFR = Kf (HPG + HPB - OPG - OPB)

E. GFR = Kf (HPG - HPB - OPG - OPB)

(Comment: HP is hydrostatic pressure, OP is oncotic pressure, G is glomerulus, B is Bowman's capsule)

KD16 [Jul00] [Jul01] The effect of PTH on the kidney is to:

A. Increase Ca excretion and increase phosphate excretion

B. Increase Ca excretion and decrease phosphate excretion

C. Decrease Ca excretion and increase phosphate excretion

D. Decrease Ca excretion and decrease phosphate excretion

E. None of the above

KD17 [Jul00] Water handling by kidney (% reabsorption)

A. 93%

B. 94%

C. 99%

D. 99.4%

E. 99.9%

KD18 [Jul00] [Feb04] Resistance to renal blood flow is chiefly determined by:

A. Renal artery

B. Afferent & efferent arterioles

C. Interlobular & arcuate arteries

D. Peritubular capillaries

E. ?

(see also KD01)

KD19 [Jul00] Tubuloglomerular feedback:

A. Increased solute delivery to macula densa causes decreased GFR.

B. ?

C. ?

(see also the more complete KD23 which may be the same Q as this one)

KD20 [Apr01] [Feb04] For renal clearance of a substance to exceed Inulin,

A. Increase in GFR

B. Must be secreted by either the proximal or distal tubules

C. Must have a lower molecular weight than Inulin

Alt version: If a substance is cleared by the kidney at a rate greater than inulin, it must be:

A. Freely filtered

B. Actively secreted

C. ?

D. Actively reabsorbed

E. ?

Alt version: If a substance is found in the urine at a HIGHER concentration than inulin, then

A. It must be filtered more

B. It is secreted into the lumen

C. ?

D. There is less reabsorption in the ?DCT

KD21 [Apr01] Water excretion by the kidney is due to:

A Osmosis

B. Active transport into the lumen

C. Passive secretion in the collecting tubules

D. Solvent drag

E. Facilitated diffusion

F. Paracellular movement

(Comment: “bulk flow” or “filtration” were not choices)

KD22 [Apr01] [Jul01] Angiotensin II causes:

A. Increases proximal tubular reabsorption of Na & H2O & increases secretion of K+

B. Increases distal tubular reabsorption of Na & H2O & decreases secretion of K+

C. Decreases distal tubular reabsorption of Na & H2O

D. Increases excretion of Na & H2O

KD23 [Jul01] [Feb04] Glomerulotubular balance:

A Involves afferent arteriole feedback loop

B Involves efferent arteriole feedback loop

C Juxtaglomerular complex

D Ability to increase tubular absorption in response to an increase in filtered load

E None of the above

F. Tubular resorption is matched to GFR

(Q41 on Jul 01 paper)

KD24 [Jul01] Kidneys produce:

A. Erythropoietin

B. ADH

C. Angiotensin II

D. ANP

E. Cholecalciferol

KD25 [Jul01] Renal nerve sympathetic stimulation

A. Causes increased sodium reabsorption from the PCT

B. Inhibits renin release

C. Increased GFR

D. ?

E. ?

KD26 [Jul01] Water reabsorption by the kidney:

A. 90% in proximal tubule

B. 60% in distal tubule

C. By active transport

D. ?

E. ?

none are correct

KD27 [Jul01] Glomerular filtration rate (GFR):

A. Is independent of the size of the capillary bed

B. Depends only on the hydrostatic and osmotic pressure differences across the capillary

C. Is determined by the same forces governing filtration across all other capillaries

D. Depends only on the permeability of the capillary

E. Requires active transport

KD28 [Mar02] [Mar03] Pressure diuresis:

A. Due to decreased reabsorption of Na+ & water in peritubular capillaries

B. Regulated by macula densa

C. Increase ADH

D. Increase angiotensin

E. Control by JGA

- Isotonic incr circulating volume->
1. incr Glomerular capillary pressure ->incr GFR (minor effect),and
2. incr hydrostatic pressure of peri-tubular capillary thus incr renal interstitial pressure and decr Na resorption
- The macula densa regulates tubuloglomerular feedback via sensing ?Na &/or Cl in tubule (mediated by PG's or Adenosine depending on which text you read to act on JG cells)
- Increased circulating volume causing pressure diuresis will actually decrease activation of RAS and reduce ADH secretion (via RAS & direct baroceptor reflexes)
- JGA controls RAS and is in fact controlled (negatively) by pressure diuresis

KD29 [Mar02] [Jul02] [Mar03] [Jul03] [Feb04] What is the minimum amount of urine required to excrete 600mOsm

A. 100ml

B. 500ml

C. 1 litre

D. 2 litre

E. 4 litre

KD30 [Mar02] [Jul02] Increase in GFR occurs with

A. Increased sympathetic stimulation

B. Decreased renal blood flow

C. Hypoproteinaemia

D. Ureteric obstruction

E. None of the above

KD31 [Mar02] [Feb04] Filtration fraction measured as inulin clearance/ PAH clearance

A. ?

B. ?

KD31b [Mar03] [Jul03] [Feb04] Regarding renal clearance:

A. Inulin clearance measures renal blood flow

B. Creatine clearance correlates with GFR

C. Filtration fraction measured as inulin clearance/ PAH clearance

D. ?

(Comment: "option B was creatine & NOT creatinine!")

KD32 [Mar03] Regarding urea:

A. Urea is formed from …ornithineOrnithine participates in urea cycle, and urea is produced from arginine when arginine breaks down into ornithine and urea. (Ornithine is like oxaceloacetate and is regenerated during the cycle)

B. 10% is reabsorbed by kidney - 50%

C. ?

KD33 [Mar03] [Jul03] The clearance (or 'renal regulation') of which ONE of the following is NOT regulated by a hormone:

A. Sodium

B. Potassium

C. Calcium

D. Phosphate

E. Sulphate

KD34 [Mar03] [Jul03] Biggest contribution to urine concentration by:

A. Na+ absorption in thick ascending limb

B. Passive diffusion of urea in collecting ducts

C. Chloride absorption in distal convoluted tubule

July 03 comment: "There were 2 questions on factors contributing to the hypertonic medullary

interstitium and permeability of the loop of Henle next to one another, to which I am sure I have the options incorrect, but they were something like:

A. Sodium transport into the ascending limb of LOH

B. Active sodium transport into the vasa recta

C. Passive reabsorption of urea in collecting duct

D. Water reabsorption in thin ascending limb of LOH

E. Sodium reabsorption by the thin ascending limb of LOH "

Alternate July 2003 version

High osmolarity of renal medullary interstitium is due to:

A. secretion of H2O into ascending loop of Henle

B. diffusion of H2O into ascending loop of Henle

C. active transport of Na from vasa recta

D. passive reabsorption of urea from collecting duct ?is it passive

E. Cl absorption in distal tubule

KD35 [Feb06] The amount of H^+ filtered by the kidney per day:

A. 3.6 mmol

B. 36 nmol

C. 0.68 mmol

D. 6.8 mmol???

E. 68 mmol

KD36 [Feb06] Regarding water reabsorption in the collecting tubules:

A. depends on aldosterone levels

B. collecting tubules able to reabsorb 60-70% of water

C. depends on renin levels

D. loops of henle are ONLY located in the renal medulla (may be from another question)

E. ?

KD37 [Feb06] Regarding the Loop of Henle:

A. active transport of na into tubules

B. active transport of cl out of tubules

C. active transport of k into tubules

D. permeable to water

E. *something else wrong*

KD38 [Jul10]] Creatinine/urea is not used for the measurement of GFR because:

A. It is not readily filtered

B. It is secreted in the ascending loop of Henle

C. It is reabsorbed in the proximal tubule

D. ?

E. ?