Non volatile acid [organic : Keto â, lactic â
inorganic – from Prot. metab ex. Sulfuric â, Hydrochloric â

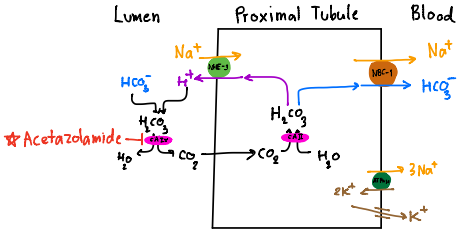
☆Renal fail : มี Non volatile â ในร่างกาย ⇒ Wide Gap Metabolic acidosis

Net acid excretion (Titrable â : PO_4^-, UA, Cr)

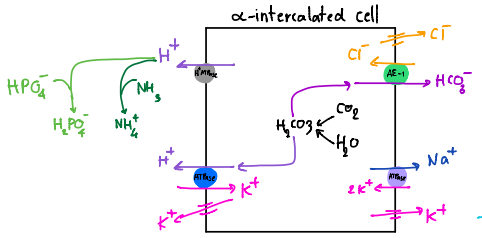
Renal NAE = NH_4^+ + TA − HCO_3^-
60% 40% 0%

Glutamate → HCO_3^- → Na/HCO_3^- Symport → interstitial
Glutamate → NH_4^+ → Na/NH_4^+ antiport → Lumen → NH_4^+ flow → Reabsorb → NH_3 → Secrete + H^+ = NH_4

in cell @ PCT — loop — TAL — CD
NaK2Cl
distal
Type 1 RTA (dRTA)
intercalated cell



☆ Proximal Renal Tubular acidosis
(Type 2 RTA, pRTA)
impaired HCO_3^- Reabsorption



☆ Distal Renal Tubular acidosis
(Type 1 RTA, dRTA)
impaired H^+ secretion

Hypoxemia
Shock
Type A
Lactic acidosis
Type B
B_1 def
lymphoma
fail
NRTI
metformin

Anion Gap = Unmeasured anion − Unmeasured cat
Anion Gap = $Na^+ - HCO_3^- - Cl^-$

Metab acidosis due to Acid accum : High AG Metab acidosis
- Lactic/Ketoacidosis
- Poisoning : MeOH, EthOH
- Rhabdomyolysis

Metab acidosis due to HCO_3^- loss : Normal AG Metab acidosis
- Diarrhea
- RTA
- Acid ingestion

Glomerular filtration Barrier
- Fenestrated endothelium
- Trilaminar GBM
- Podocyte
  - Heparan Sulfate ⇒ Polyanion : −ve charge : ป้องกันไม่ให้ Prot. ผ่าน
  - Collagen type IV → α-5 chain mutation : ☆ Alport syndrome [Hereditary nephritis]
  - Slit diaphragm : Nephrin — mutation → ☆ Familial FSGS
    - Cut off @ 70,000 Da

linear IgG stain ← ☆ Anti-GBS dz @α-3 of non Collagenous + = Goodpastuer Syndrome

☆ MCD

Alport syndrome
- Lamellation
- Basket-weaving
- ?deft
- ocular abnormalities

☆ Nephrotic syndrome — Mutate

Proteinuria ☆ Tx ACEI, ARB, Diltiazem
Normal Urinary Protein < 150 mg/d [Secreated Protein : Tamm-Horsfall Prot]
Normal Urinary albumin < 30 mg/d
Microalbuminuri : 30-300 mg/d
Macroalbuminuria > 300 mg/d

☆ Albuminuria = Earliest marker of Nephrotic syndrome
☆ Persistant Proteinuria cause progressive renal damage & CKD

Ps.: Dipstick detect only Albumin → ตรวจ Dipstick ได้ผลบวก เมื่อตรวจเจอว่า Protein เยอะใน 24-hr urine

Types of Proteinuria
- Transient = ↑Glomerular Pressure ex fever, Heavy exercise, Seizure, ♀
- Overflow = ↑(Abnormal) Protein ex Multiple myeloma (light chain), Hb-uria, Myob-uria
- Glomerular = Broken infiltration barrier ex Glomerular dz
- Tubular = @ PCT ดูดกลับ small Prot. ไม่ได้ ex Tubulointerstitial dz (1-2 g/day)
- Postrenal (IgA, IgG) ex UTI,