

Biochemical/Laboratory Findings in Clinical Units and Conditions

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Abetaglobulinemia

↓ * beta globulins, proteins

Abetalipoproteinemia

↑ * acanthocytes

↓ Apo A-I, *Apo B, *beta-LPs, Bil, ESR, Hb, HCT, HDL-C, cholesterol, chylomicrons, LDL-C, LPs, PL, TAG, * vitamin - (A, E), VLDL-C

■ Stool ↑ * fat

Ablatio of Placenta

↓ RBC, fibrinogen, Hb, HCT

Abortion

incomplete abortion

↑ ALT, WBC

missed abortion

↑ WBC

↓ hCG

septic abortion

↑ CRP, bacteria (culture), elastase (PMN), ESR, PCT, PT, WBC

↓ WBC

■ Urine ↓ volume

spontaneous abortion

↑ AFP, APLA, WBC

↓ fibrinogen, hCG

threatened abortion (imminens)

↑ AFP, ALP, anti-HCV, euglobulin lysis time, * ESR, * hCG, hPL, WBC, progesterone

↓ AAP, fibrinogen, estriol, hCG, hPL, progesterone

■ Urine ↓ estriol, hCG, pregnanediol

■ Amniotic Fluid ↑ AFP

Abruptio of Placenta

↑ ESR, WBC

↓ RBC, fibrinogen, Hb, HCT

Abscess

↑ ALT, Bil, Bil conjugated, Bil unconjugated, CRP, ESR, WBC, * neopterin, neu, * PCT, * PMN-elastase, SAA

↓ albumin, RBC, Hb, HCT, PLT

appendix abscess

↑ ESR, WBC

↓ albumin

Brodie's abscess

↑ ESR, WBC

cerebral abscess

↑ ALT, ESR, WBC

■ **Cerebrospinal Fluid** ↑ **bacteria** (+ culture), **proteins**, RBC, G, cholesterol, CHS, LA, LD, WBC, lym, macrophages, neu, pleocytosis, PMN, pressure

↓ G, chloride

- cerebral epidural abscess

■ **Cerebrospinal Fluid** ↑ **bacteria** (+ culture), **proteins**, WBC, lym, neu, pressure

Douglas' space abscess

↑ ESR, WBC

intra-peritoneal abscess

↑ ESR, WBC

■ **Peritoneal Fluid** ↑ **bacteria** (+ culture), **proteins**, WBC

kidney abscess

↑ ESR, WBC

↓ WBC

■ **Urine** ↑ **albumin**, * **bacteria** (+ culture), **proteins**, RBC, Hb, pus

↓ volume

liver abscess

↑ AFP, * ALP, ALP (WBC), ALT, AMS, APTT, AST, * Bil, conjugated Bil, unconjugated Bil, CEA, ceruloplasmin, ESR, * globulins, GMT, granulocytes, Hb (free), ICD, LD, LAP, WBC, neu, 5-nucleotidase, OCT, PT

↓ * albumin, AMS, RBC, G, Hb, HCT, CHS, PLT

■ **Urine** ↓ sulfate

■ **Pleural Fluid** ↓ WBC

- amebic liver abscess

↑ ALP, ALT, AST, Bil, ESR, GMT, LAP, 5-NT, WBC

↓ albumin, Hb, HCT, microcytes

lung abscess

↑ ADH, bacteria (early) (culture), ESR, uric acid, WBC, neopterin (TB, HIV), neu

↓ albumin, RBC, Hb, HCT

■ **Sputum** ↑ * **bacteria** (+ culture), * **pus**, blood, * **volume**, viscosity

■ **Urine** ↑ **albumin**, proteins

■ **Pleural Fluid** ↑ adenosine deaminase, proteins, eos, RBC, LA, LD, WBC, mucopolysaccharides, neu, TM - (CEA), PMN

↓ G, pH

■ **Bronchoalveolar Lavage Fluid** ↑ **bacteria** (+ culture), PMN

myocardial abscess

↑ CRP, ESR, WBC

■ **Pericardial Fluid** ↑ WBC

■ **Pleural Fluid** ↑ WBC

omentum abscess

↑ ESR, WBC

↓ albumin

pancreatic abscess

↑ ALP, ALT, AMS, ESR, WBC

↓ albumin

- *Urine* ↑ AMS
- *Peritoneal Fluid* ↑ proteins, WBC
- pelvic abscess
 - ↑ ESR, WBC
 - ↓ albumin
- periappendical abscess
 - ↑ ESR, WBC
 - ↓ albumin
 - *Urine* ↑ pus
 - *Peritoneal Fluid* ↑ bacteria (+ culture), proteins, WBC
- perinephric abscess
 - ↑ bacteria (culture), ESR, PMN, WBC
- peritonsillar abscess
 - ↑ ESR, WBC
- prostatic abscess
 - ↑ ESR, WBC
 - *Urine* ↑ bacteria (+ culture), RBC, pus, WBC
- spinal epidural abscess
 - *Cerebrospinal Fluid* ↑ proteins, WBC, lym, pressure
 - ↓ pressure
- tubo-ovarian abscess
 - ↑ ESR, WBC
 - ↓ albumin
- Abuse, Androgen
 - ↑ LDL-C, PLT aggregation, PLT, RBC
 - ↓ FSH, HDL-C, LH, testosterone
 - *Urine* ↑ androgens
- Achlorhydria
 - ↑ gastrin
 - ↓ Fe, pepsinogen, secretin, vitamin - (B₁₂)
 - *Gastric Fluid* ↓ pepsin
- Acidosis
 - ↑ AB, acetoacetate, acetone, epinephrine, ALT, ammonia, AMS (S), AST, BHBA, proteins, CK, ESR, G, glucagone, Hb, HTC, K, catecholamines, ketones, creatinine, uric acid, lactate, LD, WBC, MAC, Mg, neu, norepinephrine, plasma volume, osmolality, pyruvate, FFA, urea
 - ↓ AB, AST, BE, 2,3-DPG, GPD (RBC), HCO₃⁻, chloride, K, lym, Mg, Na, pCO₂, pH, TBG
 - *Urine* ↑ acetone, ammonia, AMS, Ca, DALA, G, chloride, K, catecholamines, ketones, creatinine, Na, volume, osmolality, P
 - ↓ Mg, pH, urea
- diabetic ketoacidosis
 - ↑ * acetoacetate, * acetone, * anion gap, epinephrine, ALT, ammonia, AMS, AST, BHBA, proteins, CK, CK-MB, ESR, * G, glucagon, GD, Hb, HCT, chloride, ICD, K, catecholamines, * ketones, cortisol, * creatinine, uric acid, * LA, LD, lipids, WBC, * MAC, MD, Mg, Na, neu, norepinephrine, * osmolality, * P, PRL, pyruvate, GH, SD, TAG, triiodothyronine resin uptake, FFA, urea
 - ↓ albumin, AST, BE, Ca²⁺, CO₂, eos, G6PD (RBC), HCO₃⁻, CHS, chloride, K, creatine (false), lym, Mg, Na, P, * pCO₂, * pH, T₃

- **Urine** ↑ acetone, ammonia, AMS, proteins, DALA, G, chloride, K, catecholamines, * ketones, creatinine, Mb, Na, volume, specific gravity
- ↓ Mg, pH
- **Synovial Fluid** ↑ crystals – (urate)
- **Saliva** ↑ GMT
- hyperkalemic metabolic acidosis**
- ↑ BHBA, chloride, K, LA
- ↓ AB, BE, HCO_3^- , chloride, pCO_2 , pH
- lactic acidosis**
- ↑ acetone, ALT, AMS, anion gap, AST, BHBA, G, K, ketobodies, * LA, uric acid, LD, WBC, * MAC, P, pyruvate
- ↓ BE, G, * HCO_3^- , chloride, * pH, pO_2 , urea
- **Urine** ↑ alanine, G, ketones
- **Synovial Fluid** ↑ crystals – (urate)
- metabolic acidosis**
- ↑ anion gap, AST, BHBA, Ca, CO_2 , chloride, cholesterol, K, ketobodies, LA, LD, P, uric acid, WBC
- ↓ AB, * BE, 2,3-DPG (RBC), * HCO_3^- , chloride, WBC, Mg, pCO_2 , * pH
- **Urine** ↑ Ca, K
- ↓ AB, BE, pH
- **compensated metabolic acidosis**
- ↑ BHBA, chloride, K, LA
- ↓ HCO_3^- , chloride, pCO_2
- renal tubular acidosis**
- **distal renal tubular acidosis (type 1)**
- ↑ ALP, * chloride, * MAC, PTH
- ↓ albumin, * HCO_3^- , * K, carbonic anhydrase, P, pH, vitamin D3
- **Urine** ↑ proteins, Ca, G, HCO_3^- , K, crystals – (* Ca-phosphate), uric acid, WBC, Na, volume, * P, * pH
- ↓ citrate, pH
- **proximal renal tubular acidosis (type 2)**
- ↑ aldosterone, anion gap, * chloride, K, * MAC
- ↓ albumin, aldosterone, Ca, * HCO_3^- , * K, carbonic anhydrase, uric acid, Mg, Na, osmolality, P, * pH
- **Urine** ↑ amino acids, ammonia, Ca, * G, * HCO_3^- , K, crystals – (Ca-phosphate), uric acid, lysozyme, Na, volume, * P, * pH
- ↓ specific gravity, pH
- **renal tubular acidosis (type 4)**
- ↑ ALP, chloride, K, MAC
- **Urine** ↑ Na
- ↓ ammonium, pH
- respiratory acidosis**
- **acute respiratory acidosis**
- ↑ Ca, HCO_3^- , K, P, pCO_2
- ↓ AB, BE, chloride, O_2 , pH
- **chronic respiratory acidosis**
- ↑ Ca, HCO_3^- , K, pCO_2
- ↓ chloride, pH
- **compensated respiratory acidosis**
- ↑ AB, BE, Ca, HCO_3^- , K, pCO_2

Aciduria**L-glyceric aciduria**

- *Urine* ↑ * L-glyceric acid, oxalic acid

hereditary orotic aciduria

- ↑ **aldolase, anisocytes, basophilic stippling, Bil, unconjugated Bil, homocysteine, RBC Howell-Jolly bodies, macrocytes, megalocytes**

- ↓ **Hb, HCT, RTC, WBC**

- *Urine* ↑ * orotic acid

Acrodermatitis Enteropatica

- ↑ **Ni**

- ↓ **Zn**

Acromegaly

- ↑ **ALP, Ca, CK, CK-MB, FSH, * G, * GH-RH, glucagon, cholesterol, * ILGF-I, IGFBP-3, * insulin, IRI, K, ketobodies, creatine, creatinine, acetoacetic acid, uric acid, LH (early), Na, osteocalcin, P, PRL, * GH, somatomedin C, T₃, T₄, triiodothyronine resin uptake, urea, FFA, VLDL-C**

- ↓ * **estradiol, * FSH, IGFBP-1, cortisol, LD, neu, * SHBG, T₄, TBG, TSH, * testosterone, uric acid, Zn**

- *Urine* ↑ **Ca, G, GFR, hydroxyproline – (total, free), ketones, 17-KGS, 17-ketosteroids, 17-OHCS, creatine, creatinine**

- ↓ **17-KS, FSH, specific gravity**

- *Cerebrospinal Fluid* ↑ **proteins**

- *Synovial Fluid* ↑ **WBC, pyrophosphate, viscosity**

Adnexitis

- ↑ **ESR, WBC, neu**

Afibrinogenemia

- ↑ **PLT aggregation, APTT, BT, clotting time, PT, TT**

- ↓ * **fibrinogen, ESR**

Agammaglobulinemia (linked to X-chromosome)

- ↑ **T-lym**

- ↓ **proteins, * B-lym, factor XIII, * gamma globulins, * IgA, IgE, * IgG, * IgM, lym**

- *Synovial Fluid* ↑ **WBC, PMN**

- ↓ **viscosity**

Agensis**ovarian agensis**

- ↑ **FSH**

- *Urine* ↑ **FSH**

- ↓ **estrogens**

renal agensis

- ↓ **volume**

testicular agensis

- ↑ **FSH**

- *Urine* ↑ **FSH**

Agranulocytosis

- ↑ **ESR, lym (relat), mono (relat)**

- ↓ * **granulocytes, * WBC, neu**

Alcoholism

- ↑ **acetone, AFP, ALP, ALT, AMS, anion gap, Apo – (A-I, A-II, B), APTT, * AST, mAST, Bil, BHBA, Ca, carbohydrate-deficient transferrin, Cd, CEA, CK, CK-MB, Cu, estradiol, estrogens, ferritin, PL, FSH, * GMT,**

HDL-C, haptoglobin, HbA_{1c}, hexosaminidase B, * **cholesterol**, **chylomicrons**, **IgA**, **ketones**, * **uric acid**, **cortisol**, **LA**, **LAP**, **LD**, **LH**, **lipase**, **MAC**, * **macrocytes**, * **MCV**, **Ni**, **OCT**, **osmolality**, **P**, **Pb**, **PT**, **PTH**, **PL**, **sideroblasts**, **spherocytes**, **GH**, * **TAG**, **tropomyosin**, **5-OH tryptophan**, **VDRL (false)**, **VLDL-C**, **FFA**, **Zn**

↓ **albumin**, **aldosterone**, **ALT**, **AMS**, **AST (later)**, **delta-aminolevulinic dehydratase**, **Ca**, **CK**, **Cr**, **G**, **G tolerance**, **HDL-C**, **K**, **WBC**, **lipoprotein lipase**, **Mg**, **Mn**, **Na**, **P**, **pCO₂**, **pH**, **porphyrins**, **PRL**, **PT**, **T4**, **testosterone**, **PLT**, **urea**, **vitamin - (A, B₆, B₁₂, C, folate, niacin, riboflavin, thiamine)**, **Zn**

■ **Urine** ↑ **AMS**, **FSH**, **ketones**, **coproporphyrin III**, **creatine**, **lipids**, **DALA**, **uric acid**, **Mb**, **Mg**, **Zn**

↓ **Ca**, * **uric acid**, **niacin**

■ **Cerebrospinal Fluid** ↑ **lym**, **mono**, **pressure**

■ **Amniotic Fluid** ↑ **FSH**

■ **Synovial Fluid** ↑ **crystals - (urate)**

Alkalosis

↑ **AB**, **BE**, **HCO₃⁻**, **Na**, **pCO₂**, **pH**, **urea**

↓ **AB**, **BE**, **Ca**, **ESR**, **HCO₃⁻**, **chloride**, **K**, **Na**, **P**, **pCO₂**, **PTH**

■ **Urine** ↑ **K**, **Na**, **pH**

↓ **ammonia**, **Ca**, **chloride**, **pH**

metabolic alkalosis

↑ **AB**, **BE**, **CO₂**, **HCO₃⁻**, **Na**, **pCO₂**, **pH**, **urea**

↓ **Ca**, **Ca₂₊**, **chloride**, **K**, **Na**, **P**, **PTH**

■ **Urine** ↑ **AB**, **K**, **pH**

↓ **ammonia**, **BE**, **Ca**, **chloride**, **pH**

- chronic metabolic alkalosis

↑ **HCO₃⁻**, **pCO₂**, **pH**

respiratory alkalosis

↑ **chloride**, **K**, **P**, **pH**

↓ **Ca**, **HCO₃⁻** (chronic stage), **K**, **pCO₂** (acute stage)

■ **Urine** ↑ **pH**

■ **Cerebrospinal Fluid** ↑ **LA**

- compensated respiratory alkalosis

↓ **AB**, **BE**, **Ca**, **HCO₃⁻**, **pCO₂**

Alkaptonuria

↑ * **homogentisic acid**, **uric acid**

■ **Urine** ↑ * **homogentisic acid**

↓ **pH**

Allergy

↑ **ASLO**, **bas**, * **C3 complement**, **CIC**, * **eos**, **eosinophil cationic protein**, **fibrinogen**, **fibronectin**, **ESR**, **haptoglobin**, **IgA**, * **IgE**, * **IgE specific Ab**, **IgG**, **alpha-1 proteinase inhibitor**, **cryoglobulins**, **WBC**, **neu**, **pCO₂**, **PMN**, **RAC**, **RAL**, **RF**, **T-lym**

↓ **albumin**, **bas**, **RBC**, **HCT**, **IgA**, **complement - (C2, C3, C4)**, **WBC**, **neu**, **pO₂**, **PLT**, **transferrin**

■ **Urine** ↑ **proteins**, **RBC**, **Hb**, **pentoses**, **casts - (RBC)**

■ **Bronchoalveolar Lavage Fluid** ↑ **eos**, **IgG**, **IgM**, **lym**, **neu**, **T-lym**

■ **Pleural Fluid** ↑ **eos**, **lym**, **neu**

↓ **alveolar macrophages**

■ **Sputum** ↑ **eos**, **lym**, **neu**, **PMN**, **viscosity**

↓ **alveolar macrophages**

Alopecia Areata

- *Synovial Fluid* ↑ eos, WBC, PMN

- *Gastric Fluid* ↑ pH
- ↓ HCl

Alveolitis

allergic exogenous alveolitis

- ↑ * **Ab against *Thermoactinomyces candidus***, * **Ab against *Thermomonospora viridis***, ANA, anti-DNA, aspergillus precipitins, CIC, Eo, ESR, IgA, IgE specific, IgG, WBC, pCO₂, PMN, RF, T-lym (CD8)

- ↓ ACE, pO₂, PLT

- *Bronchoalveolar Lavage Fluid* ↑ eos, IgG, IgM, lym, mastocytes, neu, PMN, T-lym (CD4, CD8)

- ↓ macrophages

- *Pleural Fluid* ↑ eos, lym, neu

- ↓ alveolar macrophages

- *Sputum* ↑ eos, lym, neu

- ↓ alveolar macrophages

fibrosing cryptogenic alveolitis

- ↑ ACE, ANA, * CIC, EPO, RBC, ESR, * **gamma globulins**, * **IgA**, * **IgG** (IgG₁, IgG₃), IgM, * **cryoglobulins**, WBC, pCO₂, RF, T-lym

- ↓ proteins, lipase, macrophages, pO₂, FFA

- *Bronchoalveolar Lavage Fluid* ↑ alveolar macrophages, D-dimers, eos, histamine, IgG (IgG₁, IgG₃), IL-8, IGF, collagenase, LTb₄, lym, neu, PDGF-B, PMN, TNF-alpha, transforming growth factor beta, free oxygen radicals, mucin-like high-molecular glycoprotein

- ↓ macrophages, FFA

- *Pleural Fluid* ↑ LD, neu

- ↓ alveolar macrophages, pH

- *Sputum* ↑ blood, neu

- ↓ alveolar macrophages

Amenorrhea

primary amenorrhea

- ↑ beta-carotene, DHEAS, estradiol, * FSH, LH, PRL

- ↓ estradiol, progesterone

- *Urine* ↓ pregnanediol

secondary amenorrhea

- ↑ PRL, DHEAS

- ↓ FSH, T₃, T₄, TSH

Aminoacidemia

isovaleric aminoacidemia

- ↑ ammonia, glycine, MAC

- ↓ G

- *Urine* ↑ ketones

methylmalonic aminoacidemia

- ↑ ammonia, glycine, isoleucine, MAC, * **methylmalonic acid**

- ↓ G

- *Urine* ↑ glycine, ketones, * **methylmalonic acid**

- *Cerebrospinal Fluid* ↑ methylmalonic acid

propionic aminoacidemia

- ↑ ammonia, glycine, MAC, ketones, isoleucine

- ↓ biotin, G, gamma globulins, neu, PLT

- *Urine* ↑ glycine, ketones, methylcitrate, propionate

Aminoaciduria

beta-aminoisobutyric acid aminoaciduria

- *Urine* ↑ * beta-aminoisobutyric acid

argininosuccinic acid aminoaciduria

- ↑ ALP, ALT, ammonia, AST, citrulline, * argininosuccinic acid

↓ arginine

- *Urine* ↑ * argininosuccinic acid, orotic acid

- *Cerebrospinal Fluid* ↑ citrulline, argininosuccinic acid

dibasic aminoaciduria

- *Urine* ↑ arginine, lysine, ornithine

dicarboxylic aminoaciduria

- *Urine* ↑ aspartic acid, glutamic acid

generalized aminoaciduria

- *Urine* ↑ arginine, glutamine, glycine, histidine, homocystine, isoleucine, leucine, valine

glutamic acid aminoaciduria

- ↑ Bil, * glutamic acid

↓ RBC, Hb, HCT

- *Urine* ↑ glutamic acid

glutaric acid aminoaciduria

- ↑ glutaric acid, MAC

- *Urine* ↑ glutaric acid

isovaleric aminoaciduria

- ↑ ammonia, glycine, isovalerylglycine, isovaleric acid, MAC

↓ gamma globulins, K, neu, PLT

- *Urine* ↑ isovalerylglycine, isovaleric acid

methylmalonic aminoaciduria

- ↑ ammonia, glycine, isoleucine, ketones, acetoacetic acid, methylmalonic acid, MAC

↓ RBC, G, gamma globulins, Hb, HCT, neu, PLT

- *Urine* ↑ cystathionine, glycine, ketones, methylmalonic acid

- *Amniotic Fluid* ↑ methylcitric acid, methylmalonic acid

propionic aminoaciduria

- ↑ ammonia, glycine

↓ biotin, gamma globulins, neu, PLT

- *Urine* ↑ glycine, methylcitrate, propionate

Amyloidosis, Primary

- ↑ ACE, ALP, AST, beta globulins, * Bence Jones protein (lambda light chains, kappa light chains), proteins, Bil, conjugated Bil, B₂M, BT, ESR, gamma globulins, haptoglobin, K, complement - (C₃), creatinine, uric acid, WBC, lipids, paraproteins, PT, PLT, * SAA, urea, viscosity

↓ albumin, proteins, RBC, factor X, fibrinogen, * gamma globulins, Hb, HCT, IgG, IgM, folate, PT

- *Urine* ↑ * Bence Jones protein (lambda light chains), * proteins, RBC, volume, casts - (epithelial, RBC, granular, hyaline, waxy)

↓ creatinine, specific gravity, volume

- *Stool* ↑ blood, fat

- *Synovial Fluid* ↑ volume, WBC, viscosity

Analbuminemia

- ↑ alpha-2-globulins, beta globulins, CCK-PZ, gamma globulins
- ↓ * **albumin, proteins**

Anastomosis, Portocaval

- ↑ ammonia, Fe

Anemia

- ↑ ACP, aldolase, anisocytes, anulocytes, AST, bas, RBC stippling, Bil, conjugated Bil, unconjugated Bil, ceruloplasmin, Cu, BT, delta Bil, clotting time (Lee-White), 2,3-DPG, echinocytes, elliptocytes, **EPO**, Fe, ferritin, **ESR** (severe), gastrin, glutathione peroxidase, haptoglobin, HbA_{1c}, HbA₂, HbF, HbS, Heinz bodies (RBC), RBC Howell-Jolly bodies, cold agglutinins, **chloride**, cholesterol, ICD, IgA, IgG, calcitonin, catalase, sickle cells, cryoglobulins, uric acid, LA, LD, WBC, lipids, MAC, macrocytes, MCHC, MCV, MD, megalocytes, microcytes, mono, plasma volume, RBC osmotic fragility, RBC osmotic resistance, ovalocytes, plasmocytes, poikilocytes, porphyrins, **clot retraction**, RTC, transferrin satur., spherocytes, schistocytes, siderocytes, somatostatin, target cells, TIBC, PLT, transferrin, urea, Zn
- ↓ albumin, **ALP**, proteins, Bil, ceruloplasmin, Co, Cu, eos, **EPO**, **RBC**, estriol, factor - (II, V, VII, IX, XI, XIII), Fe, ferritin, **ESR**, glutathione peroxidase, haptoglobin, **Hb**, HbA₂, HbA_{1c}, HbF, HDL-C, hemopexin, **HCT**, cholesterol, **CHS**, catalase, complement - (C₃, C₄), creatinine, uric acid, LA, LCAT, LDL-C, WBC, lipids, lym, MCH, MCHC, MCV, mono, MPV, Neu, NBB, RBC osmotic fragility, RBC osmotic resistance, pO₂, PRA, pyruvate kinase, RTC, transferrin satur., secretin, TAG, TIBC, T-lym, PLT, transferrin, vitamin - (B₁, B₆, B₁₂, C, folic acid), Zn
 - **Urine** ↑ proteins, RBC, haptoglobin, Hb, hemosiderin, catalase, ketones, coproporphyrin I, blood, methylmalonic acid, uric acid, volume, porphyrins, UBG, urobilin, uropepsin, casts - (RBC)
 - ↓ estriol, FSH, creatinine, uric acid, volume
 - **Stool** ↑ porphyrins, SBG, UBG
 - **Gastric Fluid** ↑ pH
 - ↓ HCl, intrinsic factor, MAO, volume, pepsin, pH

anemia in chronic diseases

- ↑ AAT, anisocytes, ceruloplasmin, CRP, * **ferritin**, fibrinogen, **ESR**, gamma globulins, haptoglobin, HbF, IL-1, C₃-complement, WBC, macrocytes, **microcytes**, orosomucoid, poikilocytes, RDW, TNF, **free RBC protoporphyrin**, zinc protoporphyrin
- ↓ **EPO**, **RBC**, * **Fe**, * **Hb**, HDL-C, **HCT**, LDL-C, MCH, MCHC, MCV, **RTC**, **transferrin satur.**, * **TIBC**, **transferrin**
- **Urine** ↑ RBC, Hb

- anemia in chronic liver diseases

- ↑ * **macrocytes**, MCV, **RTC**, target cells, stomatocytes, WBC
- ↓ **Hb**, **HCT**, MCHC

- anemia in chronic renal diseases

- ↑ MAC, P, 2,3-DPG (RBC)
- ↓ **EPO**, Fe, folic acid, **Hb**, **HCT**

aplastic anemia (hypoproliferative)

- ↑ ALP, Bil, CCK-PZ, ceruloplasmin, Cu, BT, 2,3-DPG (RBC), EPO, Fe, * ferritin, haptoglobin, HbF, HLA – (DPw3), capillary fragility, LAP (WBC), LD, lym, macrocytes, MCV (RBC), plasmocytes, protoporphyrin (RBC), sTfR, transferrin satur., TIBC, transferrin
- ↓ eos, Bil, RBC, factor II, Hb, HCT, WBC, lym, mono, MPV, * neu, * RTC, TIBC, * PLT, T-lym, transferrin receptor, vitamin – (B₁₂)
- Urine ↑ EPO
- Stool ↓ UBG

autoimmune anemia

- ↑ ADA, cold agglutinins, cryoglobulins
- ↓ RBC, Hb, HCT, complement – (C₁, CH₅₀), RBC osmotic resistance

– autoimmune hemolytic anemia

- ↑ ACP, ADA, adenylate kinase (RBC), aldolase, ALT, anti-RBC, antimicrobial Ab, antithyroglobulin Ab, antithyroidal Ab, AST, baso, Bil, * unconjugated Bil, conjugated Bil, delta Bil, Ca, 2,3-DPG (RBC), ferritin, ESR, haptoglobin, Hb (free), * cold agglutinins, complement – (C₃, C₄), creatinine, * cryoglobulins, IgG, uric acid, LD, LD – (1, 2), WBC, MCV, MD, methemalbumin, microspherocytes, mono, neu, osmotic fragility (RBC), P, RDW, spherocytes, RTC, PLT, urea
- ↓ RBC, * haptoglobin, Hb, HbA_{1c}, GHb, HCT, folate, complement – (C₁, C_{1r}, C_{1s}, C₂, C₃, C₄, CH₅₀), WBC, neu, * RBC osmotic resistance, RTC, PLT
- Urine ↑ coproporphyrin, iron, Hb, UBG
- ↓ volume
- Stool ↑ porphyrins, SBG, UBG

dyserythropoietic anemia

- ↓ Hb, HCT, PLT

fetal anemia

- Amniotic Fluid ↑ volume, rT₃

hemolytic anemia

– acute hemolytic anemia

- ↑ ACP, ACHE (RBC), ADA, aldolase, AST, Bil, conjugated Bil, unconjugated Bil, delta Bil, * ferritin, cryoglobulins, uric acid, LD, LD – (1, 2), MCV, MD, PLT, * sTfR, urea
- ↓ HCT
- Urine ↑ haptoglobin, Hb, hemosiderin, UBG
- Stool ↑ porphyrins, UBG

– chronic hemolytic anemia

- ↑ aldolase, ANA, ALT, AST, bas, RBC stippling, Bil, * unconjugated Bil, delta Bil, elliptocytes, * Fe, * ferritin, HbF, RBC Heinz bodies, RBC Howell–Jolly bodies, cold agglutinins, IgA, IgG, * nucleated RBC, sickle cells, cryoglobulins, uric acid, lipids, LD, LD – (1, 2), WBC, macrocytes, MCV, MD, porphyrins, protoporphyrin, pyknotocytes, RTC, transferrin satur., * transferrin receptor, schistocytes, siderocytes, stomocytes, * TIBC, PLT, urea
- ↓ Apo B, RBC, Fe, haptoglobin, Hb, GHb, hemopexin, HDL-C, HCT, cholesterol, LCAT, LDL-C, PLT, RTC, transferrin satur., TIBC, PLT, vitamin – (E, folate), transferrin
- Urine ↑ hemosiderin, Hb, UBG
- Stool ↑ porphyrins, SBG, UBG
- Synovial Fluid ↑ crystals – (urate)

– **familial nonspherocytic hemolytic anemia**

- ↑ ACP, ANA, **RBC basophilic stippling**, Bil, unconjugated Bil, elliptocytes, **RBC Heinz bodies**, **RBC Howell–Jolly bodies**, LD, MCV, MD, RBC osmotic fragility, porphyrins, pyknocytes, RTC, stomacytes, urea
- ↓ RBC, G6PD (RBC), Hb, HCT, RBC osmotic resistance, **pyruvate kinase**, **PLT**

■ **Urine** ↑ UBG

– **microangiopathic hemolytic anemia**

- ↑ ALT, ANA, Hb, * **helmet cells**, LD, * **microspherocytes**, poikilocytes, pyknocytes, * **schistocytes**, stomacytes
- ↓ RBC, Fe, **haptoglobin**, Hb, HCT, PLT

■ **Urine** ↑ Fe, Hb, hemosiderin

hereditary anemia

– **hereditary elliptocytic anemia**

- ↑ Bil, unconjugated Bil, * **elliptocytes**, HbF, lym, **RBC osmotic fragility**, RTC
- ↓ Hb, HCT, RBC osmotic resistance

– **hereditary spherocytic anemia**

- ↑ aldolase, ALT, ACHE (RBC), AST, **anisocytes**, baso, Bil, **unconjugated Bil**, Ca (RBC), Fe, HbF, Heinz bodies, uric acid, LD, **WBC**, lym, MCH, MCHC, MCV, microcytes, * **microspherocytes**, P, plasmocytes, **poikilocytes**, **RBC Howell–Jolly bodies**, * **RBC osmotic fragility**, RTC, **spherocytes**, siderocytes, PLT, TIBC, viscosity
- ↓ CK, RBC, folic acid, **haptoglobin**, Hb, HCT, cholesterol, WBC, lipids, LPs, MCV, **RBC osmotic resistance**, PL, PLT, TAG

■ **Urine** ↑ Hb, coproporphyrin, N-formiminoglutamic acid, UBG

■ **Stool** ↑ UBG

hypochromic anemia (maturation disorders)

- ↑ anulocytes, HbA₂, target cells, TIBC
- ↓ Bil, RBC, Fe, Hb, HbA₂, HCT, MCHC, MCH, MCV, **transferrin satur.**

macrocytic anemia

- ↑ unconjugated Bil, gastrin, LD, * **macrocytes**, MCH, * **MCV**
- ↓ RBC, Hb, HCT, WBC, MCHC, PLT, vitamin – (B₁₂, folate)

megaloblastic anemia

- ↑ ACP, aldolase, anisocytes, APA, RBC basophilic stippling, Bil, **unconjugated Bil**, elliptocytes, eos, Fe, * **ferritin**, gastrin, G6PD (RBC), HbA₂, HbF, * **homocysteine**, RBC Howell–Jolly bodies, ICD, LA, LD, LD – (1, 2), **macrocytes**, * **MCH**, * **MCV**, MD, **megalocytes**, * **methylmalonic acid**, MPV, ovalocytes, PMN, poikilocytes, schistocytes, * RDW, transferrin receptor, * **sTfR**
- ↓ Fe, RBC, haptoglobin, Hb, HCT, cholesterol, WBC, MPV, neu, RTC, PLT, vitamin – (B₁₂, * B₁₂, folate)

■ **Urine** ↑ hemosiderin, methylmalonic acid

■ **Gastric Fluid** ↓ HCl, intrinsic factor, pepsin

myelophthisic anemia

- ↑ nucleated RBC, RBC basophilic stippling, RTC
- ↓ RBC, Hb, HCT, WBC, PLT

normochromic anemia

- ↑ creatinine
- ↓ HCT, Fe, TIBC

pernicious anemia

- ↑ **AMA, ANA, anisocytes, APA, antimicrobial Ab, antithyroglobulin Ab, antithyroidal Ab, Bil, unconjugated Bil, stippled RBC, eos, Fe, ferritin, gastrin, G6PD (RBC), HbF, HLA - (DR₂, DR₅), homocysteine, RBC Howell-Jolly bodies, nucleated RBC, calcitonin, methylmalonic acid, LD, LD - (1,2), WBC, macrocytes, MCH, MCHC, MCV, megaloblasts, neu, poikilocytes, * anti-intrinsic factor Ab, transferrin satur. (untreated), schistocytes, siderocytes, TIBC, transcobalamin II, transketolase, UBBC, * antiparietal cell Ab**
- ↓ **Al, ALP, Bil, RBC, factor - (II, XIII), Hb, HCT, cholesterol, CHS, lipids, uric acid, WBC, neu, pepsinogen, PL, PRA, RTC, transferrin satur. (early treatment), secretin, TIBC, transferrin, PLT, vitamin - (B₁₂, folate), Zn**
- **Urine** ↑ hemosiderin, catalase, **coproporphyrin I, methylmalonic acid, uric acid, taurine, UBG, uropepsin**
- **Stool** ↑ fat, UBG
- **Gastric Fluid** ↑ pH
- ↓ *** HCl, intrinsic factor, MAO, volume, pepsin**
- **Sputum** ↑ blood

posthemorrhagic anemia

- ↑ **WBC (2-5 hrs after), neu, * RTC (1-2 days after, peak 4-7 day), PLT (2-6 hrs after), * transferrin, * sTfR, * transferrin satur.**
- ↓ **albumin, proteins, * ferritin, clotting time, RBC (later), Hb (3-72 hrs after), HCT (3-72 hrs after), transferrin satur.**

sickle-cell anemia

- ↑ **ACHE (RBC), ALP (crisis), ALT, Bil, unconjugated Bil, drepanocytes, elliptocytes, ESR, Fe, glycated Hb, HbA₂, HbF, * HbS, RBC Howell-Jolly bodies, hPL, CHS, nucleated RBC, * sickle cells, uric acid, LD, LD - (1, 2), WBC, MCV, MD, neu, RBC osmotic resistance, osmolality, P, poikilocytes, RTC, siderocytes, * target cells, PLT, urea, viscosity**
- ↓ **albumin, ALP (WBC), RBC, factor B, factor XIII, FSH, ESR, glutathione peroxidase (RBC), haptoglobin, Hb, GHb, HCT, MCV, RBC osmotic fragility, PL, TIBC, transferrin, Zn**
- **Urine** ↑ **proteins, RBC, Hb, hemosiderin, blood, uric acid, volume, casts - (RBC)**
- ↓ **FSH**
- **Stool** ↑ UBG
- **Synovial Fluid** ↑ **WBC, mono, RBC, viscosity, volume**

sideroblastic anemia

- ↑ **anisocytes, elliptocytes, Fe, ferritin, HbF, hemosiderin, macrocytes, MCH, MCV, microcytes, mono, poikilocytes, RDW, RTC, transferrin satur., sideroblasts, siderocytes, stippled RBC, target cells, PLT, free protoporphyrin (RBC), zinc protoporphyrin**
- ↓ **ALP (WBC), RBC, Fe, Hb, HbA₂, HCT, folate, WBC, MCH, MCHC, MCV, neu, osmotic fragility (RBC), RTC, TIBC, PLT, free protoporphyrin (RBC), transferrin, vitamin - (B₆), volume (RBC)**

sideropenic anemia

- ↑ *** anisocytes, anulocytes, APA, * elliptocytes, EPO, GHb, * microcytes, RBC osmotic resistance, PMN, poikilocytes, porphyrins, * RDW, target cells, * TIBC, PLT, * transferrin, transferrin receptor, free protoporphyrin (RBC), zinc protoporphyrin**

- ↓ * RBC, * Fe, * ferritin, glutathione peroxidase (RBC), * Hb, HbA₂, HCT, catalase (RBC), WBC, * MCHC, * MCH, * MCV, neu, RBC osmotic fragility, RTC, * transferrin satur., TIBC, * PLT

thalassemia

- alpha thalassemia

- ↑ anisocytes, Fe, ferritin, glutathione peroxidase (RBC), HbF, microcytes, RBC, siderocytes, target cells
- ↓ RBC, haptoglobin, Hb, HbA₂, HbF, HbH, HCT, MCH, MCHC, MCV, RTC, TIBC, transferrin, vitamin - (folic acid, B₁₂)

- beta thalassemia major

- ↑ ADA, ACHE (RBC), ALT, * anisocytes, AST, RBC basophilic stippling, Bil, unconjugated Bil, Cu, elliptocytes, Fe, ferritin, GHb, * HbA₂, *HbF, Hb (free), RBC Heinz bodies, nucleated RBC, sickle cells, uric acid, LD, WBC, pre-beta-LP, lym, microcytes, mono, RBC osmotic resistance, * poikilocytes, protoporphyrin (RBC), RBC, RTC, transferrin satur., transferrin receptor, transferrin satur., schistocytes, spherocytes, siderocytes, PLT, target cells, TAG, TIBC
- ↓ RBC, factors - (V, VII, IX, XI), G tolerance, haptoglobin, â Hb, HbA, HbA_{1c}, HbF, hemopexin, * HCT, cholesterol, folate, WBC, lipids (+RBC), MCH, MCHC, MCV, microcytes, P, RBC osmotic fragility, pyrimidine-5 nucleotidase (RBC), RTC, TIBC, transferrin, PLT, Zn
 - Urine ↑ amino acids, proteins, hemosiderin, UBG, urobilin
 - Stool ↑ UBG
- ↓ UBG

- beta thalassemia minor

- ↑ ALT, anisocytes, RBC basophilic stippling, Bil, unconjugated Bil, Cu, Fe, ferritin, * HbA₂, HbF, RBC Heinz bodies, catalase (RBC), sickle cells, microcytes, osmotic resistance (RBC), poikilocytes, RBC, RDW, RTC, transferrin receptor, transferrin satur., schistocytes, siderocytes, target cells
- ↓ RBC, folic acid, haptoglobin, Hb, HbA, HbA₂, HCT, free protoporphyrin (RBC), cholesterol, MCH, MCHC, MCV, transferrin
 - Urine ↑ UBG
 - Stool ↑ UBG

- beta thalassemia trait

- ↑ anisocytes, Fe, HbA₂, microcytes, ovalocytes, poikilocytes, RBC, RBC basophilic stippling, RTC, target cells, transferrin satur.
- ↓ Hb, MCV, RBC osmotic fragility

vitamin B₁₂/folate deficiency anemia

- ↑ aldolase, anisocytes, anti-intrinsic factor Ab, Bil, Bil unconjugated, BT, Cu, elliptocytes, eos, Fe, * ferritin, G6PD (+RBC), HbF, * homocysteine, RBC Howell-Jolly bodies, ICD (+RBC), LD, LD5, lysozyme, macrocytes, * MCH, * MCV, MD (+RBC), megalocytes, * methylmalonic acid, poikilocytes, RDW, * sTfR, UBBC
- ↓ ACHE, ALP, * Fe, * RBC, * Hb, HCT, cholesterol, CHS, complement - (C₃), K, uric acid, WBC, neu, osmotic fragility (RBC), RTC, PLT, TIBC, vitamin - (B₆, * B₁₂, * folate)
 - Urine ↑ amino acids, N-forminio-glutamic acid, methylmalonic acid, taurine
- ↓ uric acid

Anencephaly

- ↑ AFP
- ↓ estriol
 - *Urine* ↓ estriol
 - *Amniotic Fluid* ↑ acetylcholinesterase, * AFP, volume
 - ↓ DHEAS, estriol, cortisol, GH

Anesthesia

spinal anesthesia

- *Cerebrospinal Fluid* ↑ WBC

total anesthesia

- ↑ G, HCO₃⁻, cholesterol, acetoacetic acid, ketobodies, WBC, lipids, pCO₂
- ↓ chloride, pO₂, PLT, testosterone
- *Urine* ↑ ketones
- ↓ P

Aneurysm, Dissecting Aortic

- ↑ AMS, * AST, * CK, CRP, LD, cTnI, Mb, * WBC
- ↓ RBC, Hb, HCT
- *Urine* ↑ AMS
- *Pericardial Fluid* ↑ RBC, volume

Angina, Pectoral

- ↑ ALT, Apo B-100, AST, factor IV, G, GMT, cholesterol, creatinine, LDL-C, WBC, uric acid, Mb, cTnI
- ↓ ESR

unstable pectoral angina

- ↑ ALT, * AST, CRP, GP-BB, LD, * WBC, cTnI, cTnT

Angiocardiology

- ↑ AST, CK, CK-MB

Angioedema

acquired angioedema

- ↓ C1-esterase inhibitor, complement - (C1q)

hereditary angioedema

- ↑ AAT
- ↓ * C1-esterase inhibitor, complement - (C2, C3, C4)
- *Synovial Fluid* ↑ eos

Angioplasty, Percutaneous Transluminal Coronary

- ↑ AST, CK, CRP, CK-MB, fibrinogen, GP-BB, H-FABP, cTnT, cTnI

Angiitis, Hypersensitivity

- ↑ eos
- ↓ albumin

Anovulation

- ↑ PRL
- ↓ estradiol
- *Urine* ↓ estrogens, pregnanediol

Anorexia Nervosa

- ↑ aldosterone, AMS, Apo B, * beta-carotene, BT, cholesterol, K, ILGF-I, * cortisol, creatinine, * ketobodies, acetoacetic acid, LDL-C, MAC, osmolality, PRL, SHBG, GH, rT₃, TAG, urea, vitamin - (D)
- ↓ ACE, albumin, AMS, proteins, Ca, RBC, estradiol, estrone, estrogens, FSH, ESR, G, Hb, HCT, chloride, cholesterol, IgG, IgM, IGF-I, K, creatinine, uric acid, WBC, LH, Mg, Na, norepinephrine, osteocalcin, P, pH, * T₃, T₄, testosterone, TIBC, PLT, urea, vitamin - (B₂, folate)

- **Urine** ↑ ketones, cortisol
↓ estriol, FSH, 17-KS, 17-KGS
 - **Sweat** ↑ chloride, Na
- Anoxia**
- ↑ G, catecholamines, * LA, LD, WBC, neu, pCO₂, troponin I
 - ↓ eos, * pH, * pO₂
- Aplasia**
- congenital pure RBC aplasia**
- ↑ adenosine deaminase (RBC), EPO, PLT, purine nucleoside phosphor-
ylase (RBC), transferrin satur.
 - ↓ Hb, HCT, RTC, WBC
- germinal aplasia**
- **Urine** ↑ gonadotropin
↓ 17-KS
 - **Seminal Fluid** ↓ spermatozoa
- lymphoid aplasia**
- ↓ IgA, IgG, IgM
- Apoplexy, Cerebral (stroke)**
- ↑ Ab against beta-2 GP I, ACLA, ALT Apo E-IV, BT, fibrinogen, ESR, G,
Hb, uric acid, LD, Lp(a), Na, Ni, TAG
 - ↓ cholesterol
 - **Urine** ↑ G, volume
 - **Cerebrospinal Fluid** ↑ AST, albumin CFS/serum, * proteins, * RBC,
* G, Hb, ICAM CSF/serum, IDH, * blood, * LA, LD, WBC, MBP, PG
 - ↓ G
- Appendicitis, Acute**
- ↑ AMS, * CRP, ESR, HCT, * WBC, neu, * elastase (PMN), PCT, SAA, urea
 - **Urine** ↑ AMS, RBC, Hb, WBC
 - **Peritoneal Fluid** ↑ RBC
- Argininemia**
- ↑ ammonia (after meals), * arginine
 - **Urine** ↑ arginine, cystine, ornithine
- Arrest, Cardiopulmonary**
- ↑ AST, CK, K, * LA, MAC, MAL, * mAST, * pCO₂, * pH, pyruvate, RAC,
RAL, troponin - (I, T)
 - ↓ * pH, * pO₂, * O₂ satur.
- Arteriosclerosis**
- ↑ PLT adhesiveness, Apo - (B, C-III), Apo E (2/2, 4/4 phenotypes), anti-
body against Chlamydia pneumoniae, Cd, ceruloplasmin, CO₂, CRP,
Cu, RBC, factor - (VII, VIII), fibrinogen, G, glycoprotein IIIa (PLA₁/
2), HCO₃⁻, homocysteine, cholesterol, uric acid, creatinine, LDL-C,
lipids, Lp(a), A2MG, MDA, P, pCO₂, PAI-1, PDGF, TAG, urea, volume
(RBC), Zn
 - ↓ Apo - (AI, AII), HDL-C, cholesterol, Leiden's factor, LCAT (early),
lipase, Mg, paraoxonase, prostacyclin, Se, volume (RBC)
 - Note:** gene polymorphism - (ACE D/D, angiotensinogen, Apo B XbaI,
CBS, factor Leiden, MTHFR)
 - **Urine** ↑ RBC, Hb, crystals - (urate)
 - **Cerebrospinal Fluid** ↑ proteins, LA

Arteritis

cranial arteritis

↑ * ESR

Takayasu's arteritis

↑ alpha-2-globulins, CIC, fibrinogen, ESR, gamma globulins, HLA – (Bw2, Bw52, DQ, DR4), IgA, IgG, IgM, WBC, LE cells, lym, neu

↓ albumin, Hb, HCT

■ Urine ↑ estrogens (females)

temporal arteritis (giant cell a.)

↑ AAT, ACLA, alpha-1-globulins, alpha-2-globulins, ALP, ALT, ANA, ANCA, p-ANCA, AST, CIC, CRP, ESR, haptoglobin, HLA – (B8, DR4), IgG, IgM, IL-6, WBC, mono, PLT

↓ albumin, B-lym, RBC, Hb, HCT, complement – (C3), T-lym (CD8+)

Arthritis

arthritis associated with hemochromatosis

↑ ADA, AFP, ALT, AST, Ca, Cu, D-dimers, * Fe, * ferritin, G, HLA – (A3, B7, B14), CHS, WBC, PTH, * transferrin satur., siderocytes, GH, TIBC

↓ ACTH, Cu, FSH, LH, P, PTH, GH, testosterone, * TIBC, transferrin, TSH

■ Urine ↑ Fe, G, Hb, hemosiderin, porphyrins

■ Synovial Fluid ↑ crystals – (calcium pyrophosphate), WBC, viscosity, volume

chronic arthritis

↑ ceruloplasmin, Cu, D-dimers, uric acid, mucoproteins

↓ cholesterol

■ Urine ↑ 17-KS

■ Synovial Fluid ↑ ALP

↓ aldolase, arylsulfatase, LD, N-acetylglucosaminidase, pH

fungal arthritis

■ Synovial Fluid ↑ clot formation, WBC, volume

gonorrheal arthritis

↑ WBC

■ Synovial Fluid ↑ * bacteria (+ culture), WBC, neu, volume

↓ G

hemophilic arthritis

■ Synovial Fluid ↑ volume, RBC, volume

infectious arthritis

↑ alpha-1-globulins, alpha-2-globulins, * A2MG, bacteria (culture), conjugated Bil, D-dimers, ESR, uric acid, WBC, urea

↓ complement – (CH50), transferrin satur.

■ Synovial Fluid ↑ * bacteria (+ culture), A2MG, proteins, alpha-2-globulins, clot formation, gamma globulins, LA, LD, WBC, PMN, volume

↓ albumin, G, viscosity

Lyme arthritis

↑ ALP, ALT, * Ab against *B. burgdorferi*, AST, treponemal antibodies (false), CIC, CK-MB, D-dimers, ESR, GMT, HLA – (DR2, DR4), IgG, IgM, cryoglobulins, LAP, LD, 5-NT, WBC

↓ RBC, ESR, Hb, HCT, WBC

■ Synovial Fluid ↑ C3, C4, CIC, eos, pus, WBC, PMN

↓ viscosity

psoriatic arthritis

- ↑ alpha-2-globulins, ceruloplasmin, CRP, ESR, RF, HLA – (A2, B7, B13, B16, B27, BW17, Bw38, Bw39, CW6, DR4, DR7), complement – (C3, C4), WBC, uric acid
- ↓ RBC, Hb
- **Synovial Fluid** ↑ * ALP, C3, * WBC, clot formation, volume, PMN
- ↓ G, viscosity

pyogenic arthritis

- ↑ bacteria (culture), CRP, ESR, mucoproteins, RF, WBC
- ↓ G
- **Synovial Fluid** ↑ * bacteria (+ culture), clot formation, proteins, volume, WBC

rheumatoid arthritis

- ↑ AAT, Ab against salivary duct, ACA, ACE, AGP, alpha-1-globulins, alpha-2-globulins, ALP, ALT, A2MG, AMA, ANA, ANCA, p-ANCA, anti-ss-DNA, anti-ds-DNA, antiendothelial Ab, anti-HSP 65, alpha-1-anti-chymotrypsin, antikeratine Ab, antimicrosomal Ab, anti-p 56, anti-poly (ADP-ribose), anti-RA33, anti-RNP, anti-Scl-70, anti-Ro/SSA, anti-La, Ha/SSB, antithyroglobulin Ab, antithyroidal Ab, APF, ASLO, ASMA, betaglobulins, B2M, proteins, Ca, CEA, ceruloplasmin, CIC, CRP, Cu, D-dimers, elastase, eos, ESR, ferritin, fibrinogen, phospholipase A2, gamma globulins, gastrin, glycated Hb, GMT, haptoglobin, hexosaminidase, HLA – (B27, DPw4, DQ7, DQw7, DR1, DR4, DR6, Dw4, Dw10, Dw13, Dw14, Dw15), h-sICAM-1, h-sVCAM-1, IgA, IgD, IgE, IgG, IgM, IFN-gamma, IL – (1, 6, 8), complement – (Ba, Bb, C1q, C2, C3, C4, C4d, C9), creatine, uric acid, cryoglobulins, glutamic acid, bile acids, WBC, LD, LE cells, lupus inhibitor, lym, Mn, mono, mucoproteins, 5-NT, neopterin, neu, osteocalcin, PT, anti-DNA-histone complex Ab, RANA, RF – (* IgA, * IgM), N-telopeptides, TNF-alpha, transferrin, PLT, urea, VDRL (false), viscosity
- ↓ albumin, ALP, A2MG, amino acids, arginine, AT III, beta-galactosidase, beta-2-glycoprotein I, CK, proteins, EPO, RBC, Fe, glutamine, glycoproteins, G tolerance, Hb, HCT, HDL-C, histidine, cholesterol, complement – (C1r, C1s, C2, C3, C4, CH50), LDL-C, lipids, WBC, Mb, MCV, neu, osteocalcin, pCO₂, transferrin satur., TIBC, transferrin, vitamin – (C, D), Zn
- **Urine** ↑ alanine, albumin, Cu, glutamine, glycine, hexosaminidase, hydroxyproline
- ↓ catecholamines, cysteine, glutamic acid, pyridoxine, threonine, tyrosine
- **Synovial Fluid** ↑ * aldolase, AAT, ACP, ANA, * ALP, alpha-1-antichymotrypsin, B2M, * N-acetyl-beta-D-glucosaminidase, proteins, ceruloplasmin, clot formation, Cu, eos, RBC, pus, IFN-gamma, IgM, IL – (1, 2, 6, 8), trypsin inhibitor, complement – (C3), LA, * LD, WBC, lym, lymphokines, macrophages, neu, 5-NT, PG, PMN, ragocytes, RF, TNF-alpha, beta-thromboglobulin, volume
- ↓ complement – (C3, C4), G, factor B, chylomicrons, pH, viscosity, * mucin clotting
- **Pericardial Fluid** ↑ proteins, cholesterol, gamma globulin, LD
- ↓ complement – (C4), G

- **Pleural Fluid** ↑ adenosine deaminase, **proteins**, CIC, CSF – (GM, M), eos, epithelial cells, RBC, crystals – (cholesterol), LD, WBC, **lym**, mono, mononuclear cells, neu, PMN, RF
 - ↓ C₃, C₄, G, pH, viscosity
 - **Bronchoalveolar Lavage Fluid** ↑ **lym**
 - **Gastric Fluid** ↑ pH
 - ↓ HCl
 - **Saliva** ↑ IgA, Na
- juvenile rheumatoid arthritis (Still's disease)**
- ↑ alpha globulins, ALT, ANA, **anti-ds-DNA**, **anti-ss-DNA**, **anti-RNP**, ASLO, AST, complement – (C₃, C₄), CIC, CRP, ESR, **gamma globulins**, **ferritin**, GMT, **haptoglobin**, HLA – (B₂₇, Dp_{w2}, DR₁, DR₄, DR₅, DR₈, DR_{w6}, DR_{w8}, Dw₄, Dw₁₄, Dw₅, Dw₅₂), immunoglobulins, WBC, LE cells, neu, RF, PLT
 - ↓ **albumin**, A₂MG, RBC, ESR, Fe, Hb, HCT, IgG, WBC, PLT, TIBC, vitamin – (C)
 - **Synovial Fluid** ↑ WBC, C₃, clot formation, **lym**, mono, plasmocytes, volume, PMN
 - ↓ complement – (C₃, C₄), G, viscosity
- septic arthritis**
- ↑ ESR, WBC, PMN
 - **Synovial Fluid** ↑ **proteins**, clot formation, RBC, **pus**, LA, LD, WBC, neu, PMN, **ragocytes**, volume
 - ↓ G, pH, WBC, viscosity
- syphilitic arthritis**
- ↑ WBC, **lym**
 - **Synovial Fluid** ↑ clot formation, WBC, PMN
- traumatic arthritis**
- ↑ WBC
 - **Synovial Fluid** ↑ clot formation, volume
- tuberculous arthritis**
- ↑ WBC
 - **Synovial Fluid** ↑ eos, clot formation, pus, WBC, **lym**, macrophages, neu, PMN, volume
 - ↓ G, viscosity
- uratic arthritis (gouty a.)**
- ↑ ADA, alanine, Apo E, AST, * CRP, * ESR (attack), RF, **cholesterol**, IDL-C, IgG, complement (total), **glutamic acid** (+RBC), * **uric acid**, **creatinine**, WBC (attack), neu, * TAG, **urea**
 - ↓ alpha-1-globulins, alpha-2-globulins, **glycine**, complement (total), P, **serine**
 - **Urine** ↑ alpha-aminonitrogen, albumin, **proteins**, * **urate crystals**, * **uric acid**
 - ↓ GFR, 17-KS, 17-OHCS, 17-KGS, pH, uric acid
 - **Synovial Fluid** ↑ aldolase, **proteins**, complement – (C₃, total c.), clot formation, phagocytes, pus, ragocytes, crystals – (* **monosodium urate**), uric acid, LD, * WBC, mono, neu, PMN, volume
 - ↓ G, viscosity
- viral arthritis**
- ↑ neopterin, WBC, **lym**, RF

- **Synovial Fluid** ↑ clot formation, WBC, lym, mono
↓ viscosity

Arthropathy

Charcot's arthropathy

- **Synovial Fluid** ↑ RBC, WBC, viscosity, crystals – (hydroxyapatite), volume

crystal arthropathy

- **Synovial Fluid** ↑ cholesterol, crystals – (hydroxyapatite, cholesterol, drugs, uric acid), volume, WBC, PMN
↓ G, viscosity

destructive arthropathy

- **Synovial Fluid** ↑ crystals – (hydroxyapatite)

Asbestosis

- ↑ ACA, ACE, RF, ANA, ESR, gamma globulins
- ↓ pO₂
- **Pleural Fluid** ↑ eos, RBC, WBC, lym, CD4/CD8, B-lym, LTB₄
- **Sputum** ↑ * **asbestos particles**
- **Bronchoalveolar Lavage Fluid** ↑ * **asbestos particles**

Ascites

- ↑ AMS, AMS (P), conjugated Bil, TAG (chylous)
- ↓ **albumin, proteins**
- **Urine** ↑ AMS, proteins
↓ K, pH
- **Peritoneal Fluid** ↑ ALP, AMS, bacteria (+ culture), **proteins**, GMT, HCO₃⁻, RBC, blood, K, LD, WBC, metHb, neu, P, PMN, **volume, TAG**, turbidity, color changes
↓ cholesterol, HCO₃⁻, pH

Asphyxia

- ↑ catecholamines, PLT
- **Urine** ↑ G

Asplenia

- ↑ acanthocytes

Assault, Sexual (rape)

- **Vaginal Fluid** ↑ * ACP, * spermatozoa, * spermatozoa motility

Asthma, Bronchial

- ↑ AAT, ADH, ASMA, AST, CIC, CK, Cu, 2,3-DPG, eos, **eosinophil cationic protein**, G, h-sICAM-1, Hb, HCT, HCO₃⁻, uric acid, LA, LD, LD₅, WBC, neu, * pCO₂, * pH (early stage of attack), pyruvate, MAC (later), RF, * RAC, RAL (early)
- ↓ K, HCO₃⁻, cortisol, complement – (C₄), Na, pCO₂ (early stage of attack), pH, pO₂, pH, vitamin – (B₆)
- **Urine** ↑ VMA
- **Pleural Fluid** ↑ eos
- **Sputum** ↑ **Curschmann's spirals**, eos, Charcot–Leyden crystals
- **Bronchoalveolar Lavage Fluid** ↑ IL-2
- **Sweat** ↑ chloride

allergic bronchial asthma

- ↑ ADH, CIC, eos, * **eosinophil cationic protein**, IgE, IgE specific Ab, WBC, pCO₂, pH (early stage of attack), MAC (later), RAC, RAL
- ↓ Na, pCO₂ (early stage of attack), pO₂, PLT, vitamin – (B₆)

- **Sputum** ↑ bacteria (+ culture), Curshmann's spirals, eos, histiocytes, mucus, Charcot–Leyden crystals, PMN, viscosity, color changes
- **Urine** ↑ VMA
- **Pleural Fluid** ↑ eos

Ataxia Teleangiectasia

- ↑ * AFP, ALT, ALP anti-EBV Ab, B-lym, * CEA, beta-LP, FSH, G, IgM, LH, phytanic acid, T-lym (CD8), vitamin – (E)
- ↓ IgA, IgE, IgG, beta-LP, 17-KS, lym, T-lym (CD4), vitamin – (E)

Note: mitochondrial DNA (molecular genetic analysis), decreased cellular immunity

Atelectasis, Pulmonary

- ↑ WBC
- ↓ pO₂

Atherosclerosis

- ↑ Apo A, Apo – (B, C-III), Apo E (2/2, 4/4 phenotypes), antibody against Chlamydia pneumoniae, PLT adhesiveness, ceruloplasmin, CRP, Cu, factor – (VII, VIII), fibrinogen, G, glycoprotein IIIa (PLA_{1/2}), HCO₃⁻, homocysteine, cholesterol, uric acid, creatinine, LDL-C, lipids, Lp(a), MDA, P, PF4, PAI-1, PDGF, TAG, beta-thromboglobulin, urea, Zn
- ↓ HDL-C, LCAT (early), Leiden's factor, lipase, Mg, paraoxonase, prostacyclin, vitamin – (B₁₂, folate)
- **Urine** ↑ RBC, Hb, crystals – (urate)
- **Cerebrospinal Fluid** ↑ proteins, LA

Note: gene polymorphism – (ACE D/D, angiotensinogen, Apo B XbaI, CBS, factor Leiden, MTHFR)

Atopy

- ↑ eos, IgE
- **Sweat** ↑ chloride, Na

Atransferrinemia

acquired atransferrinemia

- ↑ transferrin satur., sTfR
- ↓ Fe, TIBC, * transferrin

congenital atransferrinemia

- ↑ Fe, transferrin satur., sTfR
- ↓ * beta globulins, RBC, Fe, Hb, HCT, TIBC, * transferrin

Atresia

biliary atresia

- ↑ alpha-1-globulins, ALP, ALT, AST, Bil, conjugated Bil, unconjugated Bil, CK-BB, clotting time, CRP, elastase, fibrinogen, GMD, GMT, haptoglobin, ICD, bile acids, PT, LP-X
- ↓ factor II, vitamin – (E, B₁₂)
- **Urine** ↑ galactose, conjugated Bil, pH, pregnanediol, UBG (infection)
- **Stool** ↓ Bil, UBG

duodenal atresia

- ↑ AFP
- **Amniotic Fluid** ↑ AFP, volume

esophageal atresia

- ↑ AFP
- **Amniotic Fluid** ↑ AFP, volume

urethral atresia

- **Amniotic Fluid** ↓ volume

Atrophy, Muscular

- ↑ CK, CK-mass, Mb, * myokinase, * mitochondrial DNA
- **Urine** ↑ creatine
- ↓ creatine, creatinine

Azoospermia

- **Seminal Fluid** ↓ ACP, citrate, alpha-glucosidase, Mg, fructose, Zn

Bacteremia

- ↑ ESR, IL-6, WBC

Balanitis

- ↑ CRP, ESR, WBC
- **Urine** ↑ pus

Berylliosis

- ↑ ACE, Ca, RBC, gamma globulins, Hb, WBC, uric acid
- **Urine** ↑ * beryllium, Ca

Biopsy of Prostate

- ↑ PAP, PSA

Bladder Catheterisation

- ↑ PSA
- **Urine** ↑ RBC, Hb, WBC

Blockage, Subarachnoid Spinal

- **Cerebrospinal Fluid** ↓ pressure

Bronchiectasis

- ↑ proteins, WBC
- ↓ * AAT, * alpha-1-globulins, proteins, RBC, Hb, HCT, * immunoglobulins, pO₂
- **Sputum** ↑ bacteria (+ culture), pus, blood, volume, PMN, viscosity, color changes

Bronchiolitis

- ↑ RAC, WBC

Bronchitis

acute bronchitis

- ↑ AAT, ammonia, * CRP, eos, * fibrinogen, * ESR, LA, * WBC, * mucoproteins, Na
- ↓ AMS
- **Sputum** ↑ * bacteria (+ culture), pus, blood, volume, viscosity
- **Pleural Fluid** ↑ eos
- **Bronchoalveolar Lavage Fluid** ↑ bacteria (+ culture)

chronic bronchitis

- ↑ * ACE, * CEA, * eos, RBC, ESR, Hb, HCT, LA, * WBC, * pCO₂, RAC
- ↓ * AAT, AMS, Hb, HCT, pO₂
- **Sputum** ↑ * bacteria (+ culture), eos, blood, volume, Charcot-Leyden crystals, PMN
- **Bronchoalveolar Lavage Fluid** ↑ bacteria (+ culture)

Bronchopneumonia

- ↑ AAT, ANA, * CRP, eos, * fibrinogen, * ESR, LA, LD, * WBC, mucoproteins, neu, NSE, orosomucoid, * pCO₂, RAL
- ↓ albumin, proteins, * chloride, IgA, WBC, Na, neu, P, pO₂
- **Pleural Fluid** ↑ eos, WBC, neu
- **Sputum** ↑ bacteria (+ culture), pus, blood, WBC, volume, PMN, viscosity

- **Urine** ↑ alpha-aminonitrogen, **proteins**, ketones, creatinine, uric acid, WBC, casts – (granular, hyaline)
- ↓ chloride

Bulimia

- ↑ AMS, HCO_3^- (vomiting), ketobodies, **cortisol**, **MAC** (laxatives), **MAL** (vomiting), P, pH (vomiting)
- ↓ FSH, HCO_3^- (laxatives), **chloride**, K, LH, Na, pH (laxatives), PRL, progesterone, serotonin, T₃
- **Urine** ↑ pH

Burns

- ↑ **PLT adhesion**, AGP, albumin (early stage), **aldolase**, aldosterone, **alpha-1-globulins**, **alpha-2-globulins**, ALT, amino acids, AMS, AST, proteins (early), CK, CRP, RBC, factor – (V, VIII), **FDP**, phenylalanine, ferritin, fibrinogen (later), ESR, glucagon, glycine, **haptoglobin**, **Hb**, **HCT**, chloride, IgE, K, carboxy-Hb (inhalation), complement – (C3a, C5a), **creatinine**, LD 5, WBC, Na, neu, Ni, norepinephrine, ornithine, osmolality, RBC osmotic fragility, P, pCO_2 , pemphigus Ab, **PLT**, proline (2nd day), schistocytes, spherocytes, **urea**, **viscosity**, VLDL-C
- ↓ **albumin** (later stage), AMS, Apo B, AT III, **proteins** (later), Ca, Ca^{2+} , Cr, Cu, **eos**, **FDP**, fibrinogen (acute), G, Hb, HCT, **chloride**, cholesterol, CHS, **IgA**, **IgG**, **IgM**, isoleucine, K, complement – (C1r, C1s, C2, C3, C4, C5, C6, C7, C8, C9, CH50), LDL-C, leucine, lym, **Mg**, Mn, Na, osmolality, plasma volume, **RBC osmotic resistance**, pH, pO_2 , proline (4th day), TAG, valine (4th day), **Zn**
- **Urine** ↑ amino acids, AMS, asparagine, cystathionine, RBC, G, glycine, **Hb**, hemosiderin, hexosaminidase, total hydroxyproline, 17-KGS, leucine, WBC, lysozyme, **Mb**, 3-methylhistidine, serine, taurine, threonine, tyrosine, valine
- ↓ methionine, vitamin C
- **Sputum** ↑ casts – (mucin + fibrin + WBC + cell debris during inhalation burns)
- **Cerebrospinal Fluid** ↑ leucine
- **Synovial Fluid** ↑ crystals – (hydroxyapatite)

Bursitis

Bypass

aortocoronary bypass

- ↑ cTnT, cTnI, APTT, CK-MB (mass)
- ↓ uric acid
- **Urine** ↑ hexosaminidase

Cachexia

- ↑ acetone, alpha-1-globulins, amino acids, AMS, beta globulins, BHBA, Bil, unconjugated Bil, Ca, gamma globulins, ESR (advanced), glucagon, K, creatinine, uric acid, MAC, Na, urea
- ↓ albumin, ALP, AMS, **proteins**, Ca, C-peptide, EPO, Fe, ESR, **fibrinogen**, G, HCO_3^- , **cholesterol**, CHS, **insulin**, K, LDL-C, lipase, lym, **Mg**, osmolality, P, T₃, TAG, TBG, TIBC, urea
- **Urine** ↑ acetone, alpha-aminonitrogen, Ca, chloride, creatine, creatinine, uric acid, Na, volume, VMA
- ↓ chloride, creatinine, uric acid, 17-KS, osmolality, pH
- **Stool** ↓ UBG

Cardiomyopathy

- ↑ ALT, AST, **antimyocardial Ab**, BSP retention, CK, CK-MB, Co, creatinine, eos, ESR, RBC, LA, LD, **NT-pro-ANP**
- ↓ Ca, carnitine, Fe, Hb, HCT, lym, P, Se
- **Urine** ↓ Se
- **Pericardial Fluid** ↑ RBC, WBC
- **Ascitic Fluid** ↑ RBC, WBC

Carnosinemia

- ↑ * **carnosine**
- **Urine** ↓ * **homocarnosine**, * **carnosine**
- **Cerebrospinal Fluid** ↑ **homocarnosine**, **carnosine**

Castration

female castration

- ↑ FSH
- **Urine** ↑ FSH

male castration

- ↓ ACP
- **Urine** ↓ 17-KS

Catabolism

- ↑ ALA, BHBA, Glu, K, **ketones**, creatinine, Mg, osmolality (acute), **urea**, FFA
- ↓ G, lipids, osmolality (chronic), TAG
- **Urine** ↓ Se

Cellulitis

- ↑ D-dimers, WBC

Chloridorrhea, Congenital

- ↑ * **MAC**
- ↓ * **chloride**, * **K**
- **Stool** ↑ * **volume**, * **chloride**
- ↓ pH

Cholangiopancreatography, Endoscopic, Retrograde (ERCP)

- ↑ * **AMS**, * **lipase**, **trypsin**

Cholangitis

- ↑ ALP, ALP (isoenzymes), * **ALT**, **AST**, **AMS**, **Bil**, conjugated Bil, Bil unconjugated, eos, **ESR**, chenodeoxycholic acid, cholic acid, cholesterol, **GMT**, granulocytes, IgG, **LAP**, LD, lipase, lipids, neu, 5-NT, **TAG**, **bile acids**, **WBC**
- ↓ G, **PLT**
- **Urine** ↑ **AMS**, conjugated Bil, **UBG**
- **Stool** ↓ **UBG**

primary sclerosing cholangitis

- ↑ ALP, **ALT**, **ANA**, * **ANCA**, **ASMA**, **AST**, **Bil** (later), conjugated Bil, **ceruloplasmin**, **gamma globulins**, **GMT**, **HLA - (DR52)**, * **IgG**, **IgM**, **anti-neutrophil nuclear Ab**
- ↓ **albumin**

Cholecystitis

- ↑ alpha-1-globulins, alpha-2-globulins, ALP, ALP (isoenzymes), **ALT**, **AMS**, **AST**, **Bil**, BSP retention, **CA 19-9**, **CEA**, **ESR**, gamma globulins, **GMT**, cholesterol, **LAP**, **lipase**, neu, 5-NT, **OCT**, **WBC**
- ↓ **albumin**, **AMS**, **proteins**
- **Urine** ↑ **AMS**, conjugated Bil, **UBG**
- **Saliva** ↑ **GMT**

acute cholecystitis

- ↑ alpha-1-globulins, alpha-2-globulins, ALP, ALT, AMS, AST, Bil, conjugated Bil, unconjugated Bil, CK-MB, CRP, clotting time, elastase, fibrinogen, ESR, gamma globulins, GMD, GMT, haptoglobin, hexosaminidase, cholesterol, IgA, LAP, 5-nucleotidase, lipase, PT, TAG, WBC
- ↓ factor II, vitamin - (B₁₂)
- Urine ↑ AMS, conjugated Bil, pH, UBG
- Stool ↓ Bil, UBG

chronic cholecystitis

- ↑ alpha-1-globulins, alpha-2-globulins, ALP, ALT, AMS, AST, Bil, conjugated Bil, unconjugated Bil, CA 19-9, CEA, CRP, clotting time, elastase, fibrinogen, ESR, gamma globulins, GMT, cholesterol, lipase, WBC
- ↓ albumin, proteins

Cholecystopathy

- ↑ AMS, cholesterol, lipase

Choledocholithiasis

- ↑ * ALP, ALP (WBC), ALT, * AMS, Bil, * Bil conjugated, Bil unconjugated, ceruloplasmin, * GMT, cholesterol, chenodeoxycholic acid, cholic acid, * LAP, * WBC, lipase, lipids, * LP-X, TAG, bile acids
- Urine ↑ AMS, Bil, conjugated Bil, UBG
- Stool ↓ UBG

Cholelithiasis

- ↑ * ALP, ALT, AMS, AST, Bil, * Bil conjugated, CA 19-9, * GMT, chenodeoxycholic acid, cholic acid, cholesterol, immunoreactive trypsin, LAP, WBC, LD, * lipase, * 5-nucleotidase, somatostatin, TAG, bile acids, trypsin
- Urine ↑ conjugated Bil
- ↓ UBG
- Stool ↑ fat
- Cerebrospinal Fluid ↑ AMS

Cholestasis

- ↑ * ALP, ALP (isoenzyme, WBC), * ALT, AMA, * AMS, Apo E, AST, beta globulins (later), Bil, * Bil conjugated, Bil unconjugated, ceruloplasmin, Cu, delta Bil, Fe, ESR, * GMT, HDL-C, cholesterol, IgM, * chenodeoxycholic acid, cholic acid, * LAP, LDL-C, lipase, lipids, * LP-X, * 5-nucleotidase, PT, PL, * TAG, * bile acids
- ↓ albumin (later), Apo A-I, AT III, RBC, Fe, Hb, HDL-C, HCT, prothrombin, vitamin - (B₁₂, E)
- Urine ↑ conjugated Bil, UBG
- Sweat ↑ chloride

familial intrahepatic cholestasis

- ↑ conjugated Bil

Chondrocalcinosis

- ↑ PTH
- Synovial Fluid ↑ complement - (C₃), pus, crystals - (* calcium pyrophosphate), WBC, PMN, RBC, volume
- ↓ viscosity

Chorea Huntington's

- ↑ FFA
- ↓ alanine, amino acids, isoleucine, leucine, proline, tyrosine, valine

Chorioamnionitis

↑ CRP, elastase, WBC

Choriomeningitis, Lymphocytic

↑ * antibodies against arenavirus (IgG, IgM), lym, WBC

↓ WBC (early), PLT

■ **Cerebrospinal Fluid** ↑ * antibodies against arenavirus (IgG, IgM), proteins, lym

Chorioretinitis

↑ anti-toxocara Ab, lym, WBC

Chylothorax

↓ lym

■ **Pleural Fluid** ↑ cholesterol, blood, lipids, lym, TAG

Circulation, Extracorporeal

↑ euglobulin lysis time, complement – (C3a, C5a), LA

↓ A2MG, neu, PLT

Cirrhosis

alcoholic cirrhosis

↑ AAT, ACE, ACP, ACP (prostatic), AFP, **acanthocytes**, albumin, aldolase, * aldosterone, * ALP, ALP (isoenzymes), alpha-2-globulins, * ALT, AMA, A2MG, amino acids, * ammonia, AMS, ANA, * anti-HCV Ab, anti-HBc, Apo – (A-I, A-II, B), ASMA, * AST, * Bil, conjugated Bil, unconjugated Bil, B2M, BSP retention, CA 19-9, **carbohydrate-deficient transferrin**, CEA, * ceruloplasmin, CK, CK-MB, estrogens, factor – (VIII), FDP, Fe, ESR, G, **gamma globulins** (later), **globulins**, glucagon, GMT, HBsAg, HBcAg, HBV-DNA, HCV-RNA, cold agglutinins, **cholesterol**, * IgA, * IgG, IgM, IL-6, insulin, calcitonin, creatinine, LA, uric acid, LD, LD5, lecithin (RBC), lipase, WBC, LPs, beta-LPs, MAC+RAL, MCV, NT-pro-ANP, 5-NT, OCT, orosomucoid, osmolality, Pb, PT, PL, RAL, RE, rT3, RTC, SHBG, somatostatin, T4, * TAG, transferrin saturation, triiodothyronine resin uptake, tropomyosin, TSH, urea, bile acids

↓ albumin (later), ALT, AST, C3, Ca, CHS, carbohydrate-deficient transferrin (false), CK, Cr, RBC, Fe, G, G tolerance, haptoglobin, Hb, HCT, cholesterol, C1-INH, K, complement – (C3, C4), uric acid, WBC, Mg (+RBC), Mn, Na, osteocalcin, P, porphyrins, prealbumin, RBP, RTC, T3, PLT, TIBC, transferrin, urea, vitamin – (B, B₆, folate)

■ **Urine** ↑ aldosterone, amino acids, AMS, K, Mg, P, bile acids

↓ volume

■ **Pleural Fluid** ↑ AMS

■ **Peritoneal Fluid** ↑ WBC

↓ proteins, specific gravity

■ **Cerebrospinal Fluid** ↑ amino acids

cardiac cirrhosis

↑ ACP, AST, Bil, conjugated Bil, unconjugated Bil

hepatic cirrhosis

↑ AAT, ACE, ACP, ACP (prostatic), ADA, ADH, AFP, **acanthocytes**, aldolase, * aldosterone, * ALP, * ALT, AMA, A2MG, aminotripeptidase, * ammonia, AMS, ANA, * anti-HCV Ab, anti-HBc, Apo – (A-I, A-II, B), anti-thyroglobulin, arginase, APTT, ASAL, ASMA, * AST, ATPase, bas, beta-glucuronidase, proteins (early, compensated), * Bil, conjugated Bil, unconjugated Bil, B2M, BSP retention, BT, CA 19-9, CA

125, CEA, **carbohydrate-deficient transferrin**, * **ceruloplasmin**, CHE, CK, CK-MB, C-peptide, Cu, euglobulin lysis time, **estradiol**, **estrogens**, factor - (VIII), FDP, Fe, phosphohexoisomerase, FSH, fumarase, ESR, FTI, G, * **gamma globulins**, **gastrin**, G-6-PD, **glucagon**, glutathione reductase, glycerol, GMD, GMT, guanase, hCG, Hb (free), HBsAg, HBcAg, HBV-DNA, HCV-RNA, **hexosaminidase**, hydroxyproline, cold **agglutinins**, chloride, cholesterol, ICD, IgA, * **IgG**, IgM, IL-6, **calcitonin**, immunoreactive proinsulin, insulin, chenodeoxycholic acid, cholic acid, **uric acid**, creatinine, **cryoglobulins**, LA, LAP, LD, LD₅, LE cells, LH, WBC, lipase, **lipids**, lipoprotein lipase, lym, MAL (later), MCV, MD, Mn, Na, neu, NT-pro-ANP, **5-nucleotidase**, orosomucoid, osmolality, plasma volume, OCT, PT, PRA, PRL, RF, RTC, SD, SHBG, somatostatin, GH, T₃, rT₃, T₄, * **TAG**, TBG, transferrin satur., triiodothyronine resin uptake, tropomyosin, trypsin, PLT, TSH, tyrosine, **urea**, VIP, viscosity, vitamin - (B₁₂), vitamin B₁₂ binding capacity, **bile acid**

↓ **AAT**, * **albumin**, alpha-2-antiplasmin, A2MG, AMS, Apo AI, AT III, **proteins**, Ca, ceruloplasmin, Cu, RBC, factor - (V, IX), Fe, **fibrinogen**, G, G tolerance, haptoglobin, Hb, HDL-C, HCT, chloride, **cholesterol**, cholesterol esterase, CHS, IgG, ILGF-I, IGFBP-3, C1-INH, K, complement - (C₃, C₄), uric acid, LDL-C, WBC, Mg (+RBC), **mucoproteins**, Na (later), neu, Ni, orosomucoid, osmolality, **oxalate**, P, pentoses, plasmocytes, **prealbumin**, RBP, RTC, transferrin satur., Se, somatomedin C, T₃, T₄, TBG, **testosterone**, TIBC, transferrin, PLT, UBCC, **urea**, vitamin - (A, D, E, folate, niacin), volume (RBC), Zn

■ **Urine** ↑ alpha-aminonitrogen, aldosterone, amino acids, AMS, Bil, **conjugated Bil**, RBC, estrogens, fructose, G, K, coproporphyrin, crystals - (leucine, tyrosine), **uric acid**, bile acids, WBC, **osmolality**, PBG, **porphyrins**, reducing sugars, UBG, urobilin, casts - (granular, hyaline), Zn

↓ 17-KS, Na, niacin, volume, pH, sulfate, UBG, urea

■ **Cerebrospinal Fluid** ↑ amino acids, proteins, **glutamine**, **tryptophan**

↓ Zn

■ **Stool** ↑ blood, fat

↓ UBG

■ **Pleural Fluid** ↑ AMS, eos, LA, mononuclear cells, pH, volume, WBC

↓ A2MG, **proteins**, haptoglobin, hemopexin, LD, orosomucoid, specific gravity, WBC

■ **Peritoneal Fluid** ↑ **proteins**, chylomicrons, RBC, WBC

↓ * **proteins**, cholesterol, specific gravity, LA

■ **Saliva** ↑ GMT

posthepatic cirrhosis

↑ ALP, ALT, IgG, IgM

primary biliary cirrhosis

↑ AAT, ACE, ACP (prostatic), alpha globulins, * ALP, * ALT, * AMA, * ANA, * ANCA, anti-ds-DNA, anti-ss-DNA, **antimitochondrial Ab**, anti-Scl-70, anti-Ro/SSA, anti-La/SSB, antithyroidal Ab, ASGP-R, * ASMA, AST, **beta globulins**, * Bil, * **conjugated Bil**, unconjugated Bil, C₃, **ceruloplasmin**, * CIC, Cu, ESR, **gamma globulins** (later), * GMT, HLA - (DRB8), HDL-C (early), * **cholesterol**, IgA, IgG,

- * **IgM, cryoglobulins**, chenodeoxycholic acid, cholic acid, LDL-C, WBC, **lipids**, LP-X, MAC, MAC+RAL, 5-nucleotidase, PT, * **PL**, T₄, TAG (later), TBG, transferrin satur., VLDL-C (early), **bile acids**
 - ↓ **albumin** (later), Apo - (AI, AII, E), fibrinogen, **G**, complement - (C₃, C₄), HDL-C (later), IGFBP-3, C₁-INH, **uric acid**, **lym**, **Na**, osteocalcin, **PL**, * **prothrombin**, RBP, TAG, **testosterone**, TIBC, **transferrin**, tri-iodothyronine resin uptake, **PLT**, vitamin - (A, D, E, K)
 - **Urine** ↑ amino acids, **Bil**, **conjugated Bil**, **Cu**, **UBG**
 - ↓ **UBG**
 - **Stool** ↑ **fat**
 - ↓ **UBG**
- Citrullinemia**
- ↑ **alanine**, **ammonia**, * **citrulline**, aspartic acid, glutamine
 - ↓ arginine
 - **Urine** ↑ * **citrulline**, **glutamine**, orotic acid
 - **Cerebrospinal Fluid** ↑ * **citrulline**
- Citrullinuria**
- ↑ citrulline, glutamine, glycine, homocitrulline, hydroxyproline, aspartic acid, methionine, serine, valine
 - **Urine** ↑ alanine, arginine, * **citrulline**, cystathionine, cysteine, cystine, ethanalamine, glutamine, glycine, histidine, homocitrulline, hydroxylysine, hydroxyproline, aspartic acid, glutamic acid, lysine, ornithine, serine, threonine
- Climacterium, Precocious**
- ↑ FSH, LH
 - **Urine** ↑ FSH
- Coagulation, Disseminated Intravascular acute disseminated i. coagulation**
- ↑ **ACP**, **PLT Ab**, **APTT**, **beta-thromboglobulin**, unconjugated **Bil**, **BT**, * **D-dimers**, **platelet factor 4**, tissue factor, * **FDP**, fibrinogen, fibrinolytic activity, * **fibrinopeptide A**, cryofibrinogen, prothrombin factor 1+2, LD, WBC, MPV, neu, **PT** (acute form), **RTC**, **schistocytes**, thrombomodulin, **TT**, urea, vWF
 - ↓ **A₂MG**, alpha-2-antiplasmin, **AT III**, **RBC**, euglobulin fibrinolysis, factor B, factors - (II, V, VII, VIII, X, XIII), * **fibrinogen**, **fibrinopeptide A**, fibronectin, ESR, haptoglobin, **Hb**, **HCT**, complement - (C₃, CH₅₀), WBC, **PT** (subacute form), **plasminogen**, proaccelerin, protein C, protein S, * **PLT**
 - **Urine** ↑ **RBC**, **FDP**, **Hb**
- chronic disseminated i. coagulation**
- ↑ **D-dimers**, **FDP**, fibrinogen, fibrinolytic activity, **PT**, **TT**
 - ↓ **APTT**, fibrinogen, plasminogen, **PLT**
- Colitis**
- ↑ **Hb**, **HCT**, **G**, chloride, **Na**, neu, **pH**
 - ↓ albumin, proteins, chloride, **lym**, **Mg**, **Na**, **pH**, **pCO₂**
 - **Urine** ↓ specific gravity
- collagenous colitis**
- ↑ eos, ESR
- pseudomembranous colitis**
- ↑ **WBC**
 - ↓ albumin
 - **Stool** ↑ **blood**, * **cytotoxins**, **Hb**, **pH**, **RBC**, **WBC**

ulcerative colitis

- ↑ AAT, Ab against *Saccharomyces cerevisiae*, alpha-1-globulins, alpha-2-globulins, alpha-1-antichymotrypsin, ALP, ALP (WBC), ALT, ANA, ANCA, c-ANCA, p-ANCA, atypical-ANCA, anti-La/SSB, AST, bas, CCK-PZ, eos, phospholipase A2, ESR, GM-CSF, GMT, **haptoglobin**, hCG, HLA - (B₅, B₈, DR₂), IL - (1, 6, 8, 10), C1-INH, catecholamines, complement - (C₃, C₄), cryoglobulins, uric acid, LD, WBC, lupus inhibitor, lym, lysozyme, **mono**, motilin, neu, pH, PT, serotonin, somatostatin, TBG, TIBC, TM - (CA 19-9, CEA, M2-PK), TNF-alpha, PLT
- ↓ **albumin**, **proteins**, beta globulins, Ca, RBC, Fe, Hb, HCT, chloride, **cholesterol**, K, carotene, WBC, MCH, MCHC, MCV, Mg, Na, prealbumin, PT, PL, PLT, T₃, transferrin satur., vitamin - (B₆, B₁₂), volume (plasma), Zn
 - **Urine** ↑ Ca, catecholamines, **uric acid**
 - **Stool** ↑ RBC, **frequency**, Hb, cholesterol, **mucus**, **pus**, **blood**, pH, WBC, **volume**, **fat**
 - **Synovial Fluid** ↑ WBC, clot formation, PMN, volume
 - ↓ viscosity

Collagenosis

- ↑ AAT, alpha-1-globulins, alpha-2-globulins, AMA, ANA, ANCA, p-ANCA, anti-ss-DNA, anti-ds-DNA, ASLO, proteins, CEA, CK-MB, Cu, fibri-nogen, ESR, gamma globulins, **haptoglobin**, IgM, cryoglobulins, LD, LD- (2, 3, 4), mono, OCT, PLT
- ↓ **albumin**, **proteins**, WBC, lym, PLT
 - **Urine** ↑ **proteins**, RBC, Hb, pus, WBC, casts - (RBC)
 - ↓ uric acid
 - **Cerebrospinal Fluid** ↑ proteins, pressure
 - **Peritoneal Fluid** ↑ protein
 - **Pleural Fluid** ↑ CIC, LD
 - ↓ pH

Colonoscopy

- ↑ ACP

Coma

coma in acute insufficiency of adrenal cortex

- ↑ Ca²⁺, HCT, K, MAC
- ↓ G, chloride, MCV, Na

diabetic coma

- hypoglycemic diabetic coma

- ↑ ACTH, epinephrine, RBC, glucagon, K, creatinine, WBC, Na, neu
- ↓ G
 - **Cerebrospinal Fluid** ↓ G

- hyperglycemic ketoacidotic diabetic coma

- ↑ **acetone**, ammonia, AMS, BHBA, RBC, glucagon, G, HCT, chloride, K, catecholamines, **creatinine**, acetoacetic acid, **uric acid**, WBC, MAC, Mg, Na, neu, **osmolality**, P, urea, FFA
- ↓ Ca²⁺, HCO₃⁻, K, Na, P, pCO₂, pH
 - **Urine** ↑ **acetone**, protein, G, K, **ketones**, creatinine, **volume**
 - **Cerebrospinal Fluid** ↑ CK, G
 - ↓ pressure

– hyperosmolar non-ketoacidotic diabetic coma

↑ ALT, * G, K, WBC, Na, * osmolality, urea

↓ HCO_3^- , K, Na

■ **Urine** ↑ acetone, G, K

hepatic coma

– endogenous hepatic coma

↑ ALT, ammonia, anion gap, APTT, AST, Bil, unconjugated Bil, gamma globulins, glutamine, GMT, creatinine, LA, MAC, PT

↓ albumin, cholesterol, PT

■ **Cerebrospinal Fluid** ↑ glutamine

– exogenous hepatic coma

↑ ALT, * ammonia, APTT, anion gap, AST, Bil, glutamine, GMT, G6PD (RBC), creatinine, LA, WBC, MAL, Na, PT, vitamin – (B_{12})

↓ albumin, cholesterol, PT

■ **Cerebrospinal Fluid** ↑ glutamine

myxedematous coma

↑ ALT, epinephrine, cholesterol, * CK, CK-MB, CK-MM, catecholamines, creatine, creatinine, ESR, * cholesterol, * IDL-C, LD, * LDL-C, uric acid, WBC, pCO_2 , RAC, TAG, * TBG, TSH, urea

↓ ALP, G, RBC, Fe, * FT4, FT4 index, Hb, HCT, HDL-C, chloride, K, Na, neu, osmolality, pO_2 , SHBG, GH, T3, * T4, triiodothyronine resin uptake, TSH

pituitary coma

↓ G, cortisol, MAC, Na, pCO_2 , GH, T4, TSH

uremic coma

↑ Al, alpha-aminonitrogen, * ALP, AMS, ammonia, * B2M, BT, Ca, Ca^{2+} , CK, CK-MB, CK-BB, G, glucagon, * chloride, cholesterol, insulin, * K, calcitonin, catecholamines, cortisol, * creatinine, * uric acid, LA, LD, WBC, MAC, Mg, Na, neu, plasma volume, osmolality, P, PT, PRA, PRL, * PTH, pyruvate, GH, TAG, thrombomodulin, trypsin, cTnT, TT, PLT, * urea

↓ * albumin, AST, proteins, Ca, * Ca^{2+} , RBC, factors - (II, VII, IX, X, XIII), * Fe, G, haptoglobin, Hb, HCT, HDL-C, HCO_3^- , cholesterol, K, cortisol, glutamic acid, WBC, lym, Na, pH, PRA, T3, T4, TAG, testosterone, PLT, Zn

■ **Urine** ↑ * proteins, * RBC, G, pus, K, * blood, WBC, Na, casts – (cellular, granular, hyaline, waxy), VMA

↓ * specific gravity, Mg, * volume, oxalate, pH, Se urea, VMA

Complex, AIDS Dementia

↑ urea

■ **Cerebrospinal Fluid** ↑ B2M, proteins, IgG, p24 antigen, neopterin, WBC

↓ G

Conditions

convulsive conditions (seizure)

↑ ALT, anion gap, * AST, * CK, CK-BB, * WBC, pCO_2 , PRL

↓ eos, Mn

■ **Urine** ↑ protein

■ **Cerebrospinal Fluid** ↑ bas, LA

febrile conditions

↑ ACP, * CRP, G, creatinine, acetoacetic acid, * ESR, * uric acid, ketobodies, * WBC, Na, osmolality, pCO_2 , PCT, RAL, * urea

- ↓ albumin, beta-carotene, G, K, pCO₂, proteins, vitamin – (A, B, folic acid), Zn
- **Urine** ↑ ammonia, * proteins, * cAMP, * K, ketones, creatine, creatinine, crystals – (* urate), uric acid, * specific gravity, * P, pentoses, * UBG, urea, casts – (* granular, * hyaline)
- ↓ * chloride, volume, P, pH
- **Seminal Fluid** ↓ volume, spermatozoa count
- **Gastric Fluid** ↓ pH

hemolytic conditions

- ↑ ACP, ACHE (RBC), ADA, adenylate kinase (RBC), aldolase, ALP, ALT, ammonia, anti-RBC, antimicrosomal Ab, antithyroglobulin Ab, antithyroid Ab, AST, basophilic stippling (RBC), bas, Bil, Bil delta, unconjugated Bil, CK, elliptocytes, Fe, ferritin, ESR, gamma globulins, GMT, haptoglobin, HbF, Heinz bodies (RBC), Howell-Jolly bodies (RBC), cold agglutinins, IgA, IgG, K, calcitonin, cryoglobulins, uric acid, LD, LD – (1, 2), WBC, lipids, macrocytes, MCV, MD, methemalbumin, Mg, neu, NSE, RBC osmotic fragility, porphyrins, protoporphyrin, RTC, transferrin satur., spherocytes, RTC, schistocytes, TIBC, PLT, urea
- ↓ Apo B, ceruloplasmin, Cu, RBC, Fe, G, G6PD (RBC), haptoglobin, Hb, HbA_{1c}, HDL-C, hemopexin, HCT, cholesterol, complement – (C1, C1r, C1s, C2, C3, C4, CH50), LCAT, LDL-C, WBC, RBC osmotic resistance, pyruvate kinase, RTC, transferrin satur., TIBC, PLT, vitamin – (E, K, folic acid)
- **Urine** ↑ ALT, conjugated Bil, RBC, Hb, hCG, hemosiderin, UBG ↓ volume
- **Stool** ↑ porphyrins, SBG, UBG
- **Amniotic Fluid** ↑ anti-Rh factor, Bil, RBC, hCG, placental lactogen ↓ estriol

hemorrhagic conditions

- ↑ aldosterone, ALT, BT, catecholamines, MAC, neu, PRA, TIBC
- ↓ albumin, bas, proteins, Fe, Hb, HCT, chloride, cortisol, Na, PT, vitamin – (K)

hypercoagulable conditions

- ↑ APTT, anti-phospholipid Ab, * PLT aggregation, * beta-thromboglobulin, factor Leiden, * fibrinogen, fibrinopeptide A
- ↓ APTT, * AT III, fibrinogen, plasminogen, protein – (C, S), TT

hypoxic conditions

– acute hypoxic conditions

- ↑ ALT, K, * LA, * MAC, RAC
- ↓ pH, * pO₂

– chronic hypoxic conditions

- ↑ * AST, 2,3-DPG, * EPO, RBC, FDP, Hb, K, * LA, * LD, * MAC, pCO₂, RAC
- ↓ BE, * pH, * pO₂

immunodeficient conditions

- ↑ ASLO, bas, * B-lym, * C3 complement, * CIC, eos, fibrinogen, fibronectin, ESR, haptoglobin, * IgA, * IgE, * IgE specific Ab, IgG, * alpha-1-proteinase inhibitor, cryoglobulins, WBC, neu, pCO₂, PMN, RAC, RAL, RF, T-lym
- ↓ albumin, anti-EBV VCA IgG (false), bas, B-lym, RBC, Hb, HCT, IgA, IgD, IgG, IgM, complement – (C1q, C2, C3, C4), WBC, lym, neu, pO₂, PLT, T-lym, transferrin

- **Urine** ↑ proteins, RBC, Hb, pentoses, casts – (RBC)
- **Bronchoalveolar Lavage Fluid** ↑ eos, IgG, IgM, lym, neu, T-lym
- **Pleural Fluid** ↑ eos, lym, neu
 - ↓ alveolar macrophages
- **Sputum** ↑ eos, lym, neu, PMN, viscosity
 - ↓ alveolar macrophages
- **Synovial Fluid** ↑ eos, WBC, PMN

painful conditions

- ↑ * G, * WBC
- ↓ Na, osmolality
- **Urine** ↑ G, 5-HIAA

postarthrography conditions

- **Synovial Fluid** ↑ eos

postlabor conditions

- ↑ beta-endorphins, WBC, PLT
- ↓ PLT
- **Urine** ↑ creatine

post-myocardial infarction conditions

- ↑ AAT, AGP, alpha-1-globulins, alpha-2-globulins, ALT, antimyocardial Ab, AST, CK, CRP, fibrinogen, ESR, HBD, catecholamines, uric acid, LD, LD – (1, 2), WBC, L-myosin, prothrombin fragment 1.2, troponin I, troponin T
- **Pleural Fluid** ↑ neu

postsurgery conditions

- ↑ * AAT, ADH, PLT adhesion, * epinephrine, * aldosterone, alpha-1-globulins, ALP (WBC), ALT, unconjugated Bil, * CEA, CK-MM, * CRP, euglobulin lysis time (after 48 hrs), elastase, factor VIII, FDP, * fibrinogen, * ESR, plasminogen activator inhibitor, * K, catecholamines, cortisol, LA, WBC, mucoproteins, * neu, norepinephrine, PCT, PRL, taurine, TPA, PLT, urea
- ↓ albumin, arginine, proteins, Ca²⁺, Cr, euglobulin lysis time (first 48 hrs), factor XIII, G, cholesterol, CHS, Mn, Na, ornithine, osmolality, proline, PTH, vitamin C (WBC), Zn
- **Urine** ↑ AMS, hexosaminidase, catecholamines, osmolality, urea, Zn
- ↓ Na

posttransfusion conditions

- ↑ antiplatelet Ab, Bil, neu
- ↓ haptoglobin, Hb, HCT, methemalbumin, PLT
- **Urine** ↑ Hb, casts – (Hb)

prelabor hemorrhagic conditions

- ↑ BT, euglobulin lysis time

psychic conditions

– acute psychosis

- ↑ ADH, aldolase, CK, FT4, cortisol, T3, T4, TSH

– anxious psychic conditions

- ↑ epinephrine, CHS, FDP, norepinephrine, * serotonin, * FFA
- ↓ oxytocin, pCO₂
- **Urine** ↑ PABA, VMA

– depressive psychic conditions

- ↓ norepinephrine, serotonin, taurine
- **Urine** ↑ catecholamines

- ↓ cAMP, 5-HIAA
- **Cerebrospinal Fluid** ↑ CRH
- manic psychic conditions
 - ↑ * norepinephrine
 - ↓ 5-OH-tryptamine (serotonin)
 - **Urine** ↑ * cAMP
- septic conditions
 - ↑ epinephrine, alanine, alpha-1-globulins, ALP, ALP (WBC), ALT, ASLO, AST, anti-PLT, beta globulins, proteins, Bil, conjugated Bil, CK, CRP, Cu, cystine, D-dimers, elastase, FDP, phenylalanine, fibrinogen, phospholipase A₂, ESR, G, globulins, glucagon, glycine, IFN-gamma, IgA, IgD, IgG, IgM, IL - (1-beta, 6), insulin, plasminogen activator inhibitor, catecholamines, ketobodies, complement - (C₃a, C₄a, C₅a), creatinine, uric acid, LA, lactoferrin, LD, WBC, lym, MAC, methionine, mono, neu, NSE, 5-NT, osmolality, PAF, PCT, PGE₂, pH, phenylalanine, PMN, PT, RAL, TAG, taurine, TT, tryptophan, tyrosine, urea
 - ↓ alanine, albumin, aldosterone, A₂MG, Apo - (AI, B), arginine, AT III, Ca, Ca²⁺, CBG, RBC, factor - (II, XII), Fe, fibrinogen, G, G tolerance, gamma globulins, G6PD (RBC), Hb, HCT, HCO₃⁻, cholesterol, CHS, IgA, IgG, IgM, complement - (C₃, C₄, total), WBC (advanced), lipids, lym, Mg, neu, P, pCO₂, pO₂, protein C, protein S, PLT, RTC, TBG, TIBC, Zn
 - **Urine** ↑ proteins, RBC, G, Hb, 17-KGS, 17-OHCS, catecholamines, Mb, metanephrines, casts (RBC), VMA
 - ↓ volume, osmolality
 - **Cerebrospinal Fluid** ↑ proteins, glutamine
 - **Synovial Fluid** ↑ proteins, RBC, pus, LA, WBC, neu, PMN
 - ↓ G, viscosity
- Constipation
 - ↑ Ca, sulfhemoglobin
 - **Urine** ↑ UBG
- Contusion, Myocardial
 - ↑ * CK-MB, * troponin I
- Cor Pulmonale
 - ↑ ALT, ammonia, BNP, eos, RBC, ESR, Hb, HCT, LA, WBC, pCO₂, RAC
 - ↓ albumin, pO₂, satur. O₂
- Cretinism
 - ↑ cholesterol, TSH
 - ↓ ALP, FT₄, iodine, T₄
 - **Urine** ↓ 17-KGS, 17-KS
- Crisis, Acute Adrenocortical
 - ↑ cortisol, eos, K, lym
 - ↓ G, cortisol, Na
- Cryofibrinogenemia
 - ↑ AAT, A₂M, fibrinogen, haptoglobin
- Cryoglobulinemia
 - ↑ ANA, CIC, IgG, * IgM, * cryoglobulins, paraproteins, RF, urea, * viscosity
 - ↓ albumin, IgM, complement - (C₁, C₁q, C₁r, C₂, C₃, C₄, CH₅₀)
 - **Urine** ↑ proteins, RBC, Hb

	<ul style="list-style-type: none"> ↓ volume ■ Synovial Fluid ↑ crystals – (cryoglobulin)
Cryptorchism	<ul style="list-style-type: none"> ↑ FSH ↓ testosterone ■ Seminal Fluid ↓ volume, spermatozoa count
Cycle, Anovulatory	<ul style="list-style-type: none"> ↑ PRL ↓ estradiol ■ Urine ↓ pregnanediol
Cyst	
ovarian cyst	<ul style="list-style-type: none"> ↑ AMS, CA 27-29, CA 125, hCG, WBC, progesterone, testosterone ■ Urine ↓ FSH
pancreatic cyst	<ul style="list-style-type: none"> ↑ AMS, AMS (P), elastase, lipase ↓ elastase ■ Urine ↑ AMS ■ Peritoneal Fluid ↑ AMS
renal cyst	<ul style="list-style-type: none"> ↑ AFP, RBC, Na ■ Urine ↑ proteins, RBC, Hb
Cystathioninuria	<ul style="list-style-type: none"> ↑ * cystathionine ↓ RBC, Hb, PLT ■ Urine ↑ cystathionine ■ Cerebrospinal Fluid ↑ cystathionine
Cystinosis	<ul style="list-style-type: none"> ↑ ALP, chloride, * cystine, ESR, K, creatinine, MAC, P, urea ↓ Ca, CO₂, Hb, HCT, K, uric acid, P, pCO₂, pH, PLT ■ Urine ↑ alanine, albumin, amino acids, ammonia, arginine, asparaginase, cystathionine, * cystine, phenylalanine, RBC, G, globulins, glycine, histidine, hydroxyproline, isoleucine, K, glutamic acid, uric acid, leucine, lysine, methionine, ornithine, proline, proteins, pyruvate, volume, P, pH, serine, threonine, tryptophan, tyrosine, valine, casts – (granular c.) ↓ GFR ■ Stool ↑ P
Cystinuria	<ul style="list-style-type: none"> ■ Urine ↑ * arginine, Ca, cystathionine, cysteine, * cystine, cystine crystals, glycine, histidine, hydroxylysine, * lysine, methionine, * ornithine ↓ pH
Cystitis	<ul style="list-style-type: none"> ↑ alpha-1-globulins, gamma globulins, WBC, neu ■ Urine ↑ bacteria (+ culture), eos, RBC, Hb, pus, WBC, nitrites ↓ volume
Cystoscopy	<ul style="list-style-type: none"> ↑ PSA, chromogranin A
Death, Fetal	<ul style="list-style-type: none"> ↑ FDP, euglobulin lysis time, plasmin, plasminogen ↓ CBG, progesterone

- *Urine* ↓ estriol, pregnanediol
- *Amniotic Fluid* ↑ AFP

Defect

neural tube defect

- *Amniotic Fluid* ↑ AFP

tubular renal defect

- ↑ K, creatinine, MAC, urea
- ↓ uric acid
- *Urine* ↑ amino acids, proteins, G, uric acid, Na, P
- ↓ GFR, osmolality, pH

Defibrillation

- ↑ AST, CK, CK-MB

Deficiency

adenine phosphoribosyltransferase deficiency

- *Urine* ↑ adenine, 8-hydroxyadenine, 2,8-dihydroxyadenine

adenosine deaminase deficiency

- *Urine* ↑ adenosine, deoxyadenosine

alpha-1-antitrypsin deficiency

- ↑ A₂MG, ALT, AST, conjugated Bil, GMT
- ↓ * AAT, alpha-1-globulins, complement - (C₄)

L-carnitine deficiency

- ↑ ammonia, uric acid
- ↓ G, * L-carnitine
- *Urine* ↑ Mb

cholesterol desmolase deficiency

- ↑ K, PRA
- ↓ * aldosterone, * androgens, * cortisol, DHEA, 17-OH progesterone, Na, * testosterone
- *Urine* ↓ * aldosterone, 17-KS, * 17-OHCS, pregnanetriol

coagulation factor II deficiency

- ↑ APTT, BT, coagulation time, PT
- ↓ * factor II, vitamin - (K)
- Note: molecular genetics

coagulation factor V deficiency

- ↑ APTT, coagulation time, PT
- ↓ * factor V
- Note: molecular genetics (Leiden's factor)

coagulation factor VII deficiency

- ↑ coagulation time, PT
- ↓ * factor VII

coagulation factor X deficiency

- ↑ APTT, coagulation time, PT, TGT
- ↓ * factor X

coagulation factor XI deficiency

- ↑ APTT, BT, coagulation time, PT, TGT
- ↓ * factor XI

coagulation factor XII deficiency

- ↑ APTT, coagulation time, PT, TGT
- ↓ * factor XII

cobalamin deficiency causing neuropsychiatric disorders

- ↑ * homocysteine, * methylmalonic acid

copper deficiency

- ↑ cholesterol, uric acid
- ↓ * ceruloplasmin, * Cu, RBC, Hb, HCT, WBC, neu

17-OH dehydrogenase deficiency

- ↑ androstenedione
- ↓ testosterone

18-OH dehydrogenase deficiency

- ↑ 17-OHCS, PRA
- ↓ aldosterone
- Urine ↑ 17-OHCS

disaccharidase deficiency

- ↑ LA
- ↓ lym, pH

2,3-DPG deficiency

- ↑ RBC
- ↓ * 2,3-DPG

C1-esterase inhibitor deficiency

- ↓ * C1-INH, complement – (C2, C4, CH100)

folate deficiency

- ↑ aldolase, anisocytes, Bil, Bil unconjugated, BT, Cu, Fe, G6PD (+RBC), HbF, homocysteine, ICD (+RBC), LD, LD5, lysozyme, macrocytes, MCH, MCV, MD, ovalocytes, RBC Howell–Jolly bodies, UBBC
- ↓ ACHE (RBC), ALP, RBC, Hb, HCT, * Fe, cholesterol, CHS, complement – (C3), K, WBC, neu, osmotic fragility (RBC), RTC, PLT, TIBC, uric acid, vitamin – (B₁₂, * folate)
- Urine ↑ amino acids, N-forminio-glutamic acid, taurine
- ↓ uric acid

fructose-1,6-diphosphatase deficiency

- ↑ uric acid, lipids
- ↓ F-1,6DP, G
- Urine ↑ ketones

deficiency of glucose-6-phosphate dehydrogenase in RBC

- ↑ unconjugated Bil, glutathione peroxidase (RBC), glutathione reductase (RBC), Heinz bodies (RBC), nucleated RBC, uric acid, lipids, WBC, poikilocytes, RTC, spherocytes
- ↓ G, * G6PD (RBC), glutathione (RBC), haptoglobin, Hb, HCT, WBC
- Urine ↑ ketones
- Sweat ↑ chloride

glucuronyl transferase deficiency

- ↑ unconjugated Bil

glycogen-synthase deficiency

- ↓ G
- Urine ↑ alanine

growth hormone deficiency

- ↓ ACTH, ALP, G, * GH, P, * PRL, TSH

hexokinase deficiency (RBC)

- ↑ unconjugated Bil

21-hydroxylase deficiency

- ↑ ACTH, * androgens, * androstenedione, * DHEA, K, MAC, * 17-OH progesterone, * pregnanetriol, PRA, * progesterone, * testosterone
- ↓ * aldosterone, cortisol, corticosterone, Na, 11-deoxycorticosterone

- *Urine* ↑ aldosterone, androsterone, DHEA, DHEAS, * 17-KS, 17-OHCS, * pregnanetriol, free cortisol, Na, chloride
- ↓ aldosterone, 17-OHCS
- 17-alpha-hydroxylase deficiency**
 - ↑ ACTH, * 11-deoxycorticosterone, * 18-OH corticosterone, Na, progesterone
 - ↓ * aldosterone, deoxycortisol, DHEA, HCT, * 17-OH progesterone, K, cortisol, * PRA, * testosterone
 - *Urine* ↓ aldosterone, * 17-KS, * 17-OHCS, pregnanetriol
- 11-beta-hydroxylase deficiency**
 - ↑ ACTH, androgens, androstenedione, * 11-deoxycorticosterone, * 11-deoxycortisol, DHEA, cortisol, * 17-OH progesterone, testosterone
 - ↓ aldosterone, HCT, K, cortisol, corticosterone, PRA
 - *Urine* ↑ androsterone, DHEA, DHEAS, 17-KS, 17-OHCS, pregnanetriol, tetrahydro-deoxycorticosterone, tetrahydro-deoxycortisol, free cortisol
 - ↓ aldosterone
- 3-beta-hydroxysteroid dehydrogenase deficiency**
 - ↑ DHEA, DHEAS, 17-OH progesterone, 17-OH pregnenolone, * pregnenolone, PRA, testosterone
 - ↓ * aldosterone, * androstenedione, * cortisol
 - *Urine* ↑ 17-KS
 - ↓ aldosterone, 17-OHCS, pregnanetriol
- 17-beta-hydroxysteroid dehydrogenase deficiency**
 - ↑ pregnanetriol, 17-OH progesterone
 - *Urine* ↑ 17-KS, pregnanetriol
- IgA deficiency**
 - ↑ anti-IgA Ab, HLA - (DR3), IgG, IgD, IgE, IgM
 - ↓ * IgA
- iodine deficiency**
 - ↑ TSH
 - ↓ * iodine, T₄
 - *Urine* ↓ iodine
- lactase deficiency**
 - ↓ lactase
 - *Urine* ↑ lactose
- lecithin-cholesterol acyltransferase deficiency**
 - ↑ cholesterol, target cells, TAG
 - ↓ Apo A-I, Hb, HCT, HDL-C, * LCAT, PL, RBC
 - *Urine* ↑ proteins
- lipoprotein lipase deficiency**
 - ↑ chylomicrons, TAG
 - ↓ * LP lipase
- ornithine carbamoyltransferase deficiency**
 - ↑ ammonia, orotic acid
 - ↓ citrulline
 - *Urine* ↑ orotic acid
- phosphorylase deficiency**
 - ↓ G
 - *Urine* ↑ ketones, Mb

potassium deficiency

- ↑ G
- ↓ proteins, chloride, K
- **Urine** ↓ specific gravity

purine-nucleoside phosphorylase deficiency

- ↓ uric acid
- **Urine** ↑ inosine, deoxyinosine, guanosine, deoxyguanosine, uric acid

pyruvate kinase deficiency in RBC

- ↑ acanthocytes, 2,3-DPG, unconjugated Bil, echinocytes, Fe, **macrocytes**, RBC osmotic fragility, poikilocytes, RTC
- ↓ Hb, HCT, RBC osmotic resistance, * **pyruvate kinase** (RBC)

thyroxine-binding globulin deficiency

- ↓ T₃, T₄, * **TBG**

xanthine oxidase deficiency

- ↑ **hypoxanthine, xanthine**
- ↓ * **uric acid**
- **Urine** ↑ **hypoxanthine, xanthine**
- ↓ uric acid

Dehydration

- ↑ **ADH, albumin, * proteins, Ca, * RBC, * Hb, * HCT, chloride, K, creatinine, uric acid, Mg, * Na, * osmolality, P, urea, WBC**
- ↓ **ESR, HCO₃⁻, Na, plasma volume, osmolality**
- **Urine** ↑ **chloride, creatinine clearance, K, * specific gravity, * Na, casts – (granular, hyaline)**
- ↓ **K, Mg, volume, pH, urea**
- **Cerebrospinal Fluid** ↑ **proteins, ketones**
- ↓ **pressure**

hypertonic dehydration

- ↑ **proteins, G, Hb, Na, osmolality, urea, MAC**
- ↓ **Ca**
- **Urine** ↑ **specific gravity**

hypotonic dehydration

- ↑ **proteins, RBC, Hb, HCT, chloride, MAC, urea**
- ↓ **HCO₃⁻, Na, chloride, osmolality**
- **Urine** ↑ **chloride, K, ketones, specific gravity, Na, pH, casts – (granular, hyaline)**
- ↓ **K, urea**

isotonic dehydration

- ↑ **proteins, RBC, Hb, HCT, MAC, urea**
- ↓ **HCO₃⁻**
- **Urine** ↑ **chloride, K, ketones, specific gravity, casts – (granular, hyaline)**
- ↓ **K, urea**

Delirium Tremens

- ↑ **aldolase, ALT, CK, catecholamines, LD**
- ↓ **K, vitamin – (B₁, folic acid, B₁₂)**

Dementia

dialysis dementia

- ↑ **Al, ALP, urea**
- **Cerebrospinal Fluid** ↑ **WBC**

senile dementia

- ↑ **urea**

- ↓ vitamin – (B₁₂)
 - **Cerebrospinal Fluid** ↑ WBC
- Demyelination**
- ↑ E selectin
 - **Cerebrospinal Fluid** ↑ CK, enolase
- Dermatitis**
- ↑ antiendomysial Ab, antireticulin Ab, CIC, eos, HLA – (B8, DQw2, DR3, Dw3, Dw5), IgE, WBC, lym, neu
 - ↓ albumin, proteins, Fe, CHS, vitamin – (B₂, B₁₂, folic acid)
- allergic dermatitis (contact d., photoallergic d.)**
- ↑ CIC, IgE, lym
- exfoliative dermatitis**
- ↑ eos, lym, B2M
 - ↓ * albumin, proteins, * Fe, folic acid, CHS
- herpes dermatitis**
- ↑ antiendomysial Ab, antireticulin Ab, eos, HLA – (B8, DQw2, DR3, Dw3, Dw5), WBC, lym
 - ↓ albumin, folate
- seborrheic dermatitis**
- ↓ Se, Zn, vitamin – (B₂, B₁₂)
- Dermatomyositis**
- ↑ ACA, ACE, aldolase, alpha-2-globulins, ALT, ANA, anti-ds-DNA, anti-aminoacyl-tRNA synthetase Ab – (anti-EJ, anti-OJ, anti-PL-7, anti-PL-12), anti-histidyl-tRNA synthetase Ab, * anti-Jo-1, anti-Jo-2, anti-cardiolipin Ab, anti-Ku Ab, anti-Mi-2 Ab, anti-RNP, anti-Scl 70, anti-SRP, anti-Ro/SSA, anti-La, Ha/SSB, * antisynthetase Ab, ASMA, AST, CK, CK-MB, CK-MM, Cu, eos, ESR, globulins, haptoglobin, HLA – (DR5, DR7, DRw52, DRw53), IgD, LD, LD5, LE cells, lym, WBC, Mb, MD, non-histone ANA, PM-1 antigen, RF, thymic antinuclear Ab, Ab against coxsackie
 - ↓ albumin, RBC, Hb, HCT, CHS, complement – (C2, C3, C4), plasmocytes
 - **Urine** ↑ creatine, Mb
 - **Synovial Fluid** ↑ crystals – (hydroxyapatite)
- Dermatosis**
- ↓ vitamin – (B₂, B₁₂)
- Diabetes Insipidus**
- central diabetes insipidus**
- ↑ albumin, proteins, chloride, uric acid, Na, osmolality
 - ↓ * ADH
 - **Urine** ↑ volume
 - ↓ * specific gravity, * osmolality
- nephrogenic diabetes insipidus**
- ↑ ADH, albumin, chloride, uric acid, Na, osmolality
 - ↓ ADH
 - **Urine** ↑ ADH, alpha-aminonitrogen, G, volume
 - ↓ * specific gravity, * osmolality
 - **Sweat** ↑ chloride, Na
- psychogenic diabetes insipidus**
- **Urine** ↑ volume
 - ↓ specific gravity

Diabetes Mellitus

- ↑ AAT, ACE, acetone, ACP, PLT adhesion, alpha-aminonitrogen, PLT aggregation, albumin, aldolase, aldosterone, **alpha-2-antiplasmin**, **alpha-2-globulins**, ALP, ALT, A₂MG, **amino acids**, AMS, amylin, ANA, Apo B, ASAL, AST, AT III, bas, **beta-carotene**, **beta globulins**, **beta-galacturonidase**, proteins, Ca, CK, 2,3-DPG (RBC), ESR, factor - (VIII), FDP, fibrinogen, **glucagon**, * G, GIP, glutathione reductase (RBC), glycerol, * **glycated Hb (HbA_{1c})**, glycated protein, GMT, haptoglobin, hemopexin, **hexosaminidase**, hexosaminidase A, **cholesterol**, **chylomicrons**, CHS, IDL-C, IgG, IGFBP-1, inositol, insulin, K, ketobodies, complement - (C₃), **uric acid**, creatine, cryofibrinogen, **creatinine**, LA, LD, LDL-C, lipase, **lipids**, beta-LP, MAC, Mg, MPV, O₂ satur., **osmolality**, P, PG, PL, PP, proinsulin **anti-beta cells Ab**, **pyruvate**, secretin, selectin - (E, P), GH, TAG, PLT, TPA, throm-bomodulin, **urea**, vitamin - (A, B₁₂), VLDL-C, FFA, vWf
- ↓ ACE, PLT adhesion, Al, alanine, **albumin**, **aldosterone**, alpha-2-globulins, AMS, amylin, AST, AT III, **proteins**, Ca, CO₂, C-peptide, euglobulin lysis time, estriol, G tolerance, glutathione (RBC), glycine, HDL-C, **chloride**, ILGF-I, IGFBP-1, immunoreactive trypsin, **insulin**, K, carnitine, catecholamines, uric acid, LH, lipase, lipoprotein lipase, lym, Mg, Na, norepinephrine, **plasma volume**, P, pCO₂, pH, PRA, prealbumin, prostacyclin, T₃, transketolase, **trypsin**, vitamin - (B₆, B₉, folate), Zn
 - **Urine** ↑ acetone, aldosterone, **amino acids**, ammonia, AMS, **proteins**, Ca, Cr, * G, 2,3-DPG, FDP, hexosaminidase, chloride, K, **ketones**, 17-ketosteroids, creatine, creatinine, lipids, lysozyme, **specific gravity**, Mb, Mg, Na, **volume**, oxalate, pH, casts - (granular c.)
 - ↓ aldosterone, AMS, estriol, 17-OHCS, 17-KGS, catecholamines, uric acid, pH
 - **Cerebrospinal Fluid** ↑ G, proteins
 - ↓ AMS
 - **Amniotic Fluid** ↑ creatinine, **volume**, rT₃
 - **Sweat** ↑ chloride, Na
 - **Stool** ↑ fat
 - **Hair** ↑ Mn
 - ↓ Cr, Zn
- insulin-dependent diabetes mellitus (IDDM, type I)**
 - ↑ ANA, * G, * IAA, HLA - (Bw15, B8, DQw8, DR2, DR3, DR4), antityrosine-phosphatase Ab - (IA-2A, IA-2-beta-A), IgA, IGFBP-1, * **anti-GAD Ab**, antiintrinsic factor Ab, * **HbA_{1c}**, * ICA, E selectin
 - ↓ C-peptide, **insulin**, IRI, vitamin - (D)
 - Note: MODY (maturity onset diabetes of the young)
- non-insulin-dependent diabetes mellitus (NIDDM, type II)**
 - ↑ amylin, C-peptide, * **HbA_{1c}**, IRI, proinsulin
 - ↓ C-peptide, Cr, IGFBP-1, insulin

Diabetes, Phosphate

- ↑ ALP, Ca, cAMP, osteocalcin, PTH, vitamin D
- ↓ Ca, Ca²⁺, osteocalcin, P, vitamin - (D)
- **Urine** ↑ **amino acids**, Ca, cAMP, G, hydroxyproline - (total, free), P
 - ↓ Ca, Ca²⁺, hydroxyproline, P

Dialysis

- ↑ **B2M**, Ca, Cu, ferritin, **cholesterol**, K, **creatinine**, **Mg**, Na, Ni, E selectin, TAG, TPA, urea
- ↓ Ca, ferritin, GHb, K, Mg, Mn, Na, neu, P, Se, vitamin - (B_6 , folate)
- **Urine** ↓ K

hemodialysis

- ↑ PLT adhesion, PLT aggregation, ALP, ALP (intestinal isoenzyme), Apo B-100, AT III, * **B2M**, * **Ca**, cTnT, cTnI, RBC, ferritin, **GHb**, cholesterol, IDL-C, K, complement - (C_3a , C_5a), **creatinine**, LDL-C, **Mg**, Na, selectin - (E, P), TAG, PLT, thrombomodulin, VCAM-1, VLDL-C, vWF
- ↓ * **albumin**, ALT, alpha-2-antiplasmin, Apo A-I, AST, AT III, proteins, Ca^{2+} , BT, EDRE, endothelin 1, eos, Fe, * **ferritin**, FT4, HDL-C, K, lymph, Mg, Mn, Na, PGL2, plasminogen, protein - (C, S), Se, vitamin - (B_6 , B_{12} , C, * **folate**)
- **Urine** ↑ Al
↓ K, Se
- **Synovial Fluid** ↑ crystals - (hydroxyapatite, calcium oxalate)

peritoneal dialysis

- ↑ G, Mg
- ↓ albumin, folate
- **Peritoneal Fluid** ↑ eos
↓ protein
- **Pleural Fluid** ↓ protein
- **Synovial Fluid** ↑ crystals - (hydroxyapatite, calcium oxalate)

Diarrhea

- ↑ albumin, ALP, **proteins** (early), Ca, RBC, **Hb**, **HCT**, chloride, K, **creatinine**, WBC, MAC, motilin, Na, osmolality, PT, **urea**
- ↓ albumin, proteins (later), Ca, CO_2 , Cu, RBC, Fe, G, Hb, HCO_3^- , **chloride**, K, Mg, Na, **plasma volume**, osmolality, P, pCO_2 , **pH**, vitamin - (B_1 , B_2 , K, folate, niacin)
- **Urine** ↑ ammonia, K, ketones, lactose, LD, specific gravity, reducing sugars
↓ **chloride**, K, Mg, Na, niacin, **volume**, **pH**, **UBG**
- **Stool** ↑ Bil, **mucus**, **pus**, chloride, **blood**, Mg, Na, pH, WBC, **volume**, muscle fibres, fat, water
↓ pH

acute diarrhea

- ↑ HCT, chloride, MAC, Na, proteins, creatinine, osmolality, WBC
- ↓ HCO_3^- , chloride, K, **pH**
- **Urine** ↑ **UBG**
- **Stool** ↑ **mucus**, **pus**, **blood**, WBC, **volume**, **muscle fibres**, fat, water
↓ pH

chronic diarrhea

- ↑ albumin, ALP, Ca, RBC, Hb, HCT, chloride, K, creatinine, WBC, motilin, Na, osmolality, PT, urea
- ↓ albumin, proteins (later), Ca, Cu, RBC, Fe, G, Hb, HCO_3^- , chloride, K, Mg, Na, plasma volume, P, pH, vitamin - (B_1 , B_2 , K, folate, niacin)
- **Urine** ↑ K, ketones, lactose, LD, specific gravity, reducing sugars
↓ chloride, K, Mg, Na, niacin, **volume**, **pH**, **UBG**

- **Stool** ↑ mucus, pus, blood, WBC, volume, muscle fibres, fat, water
- ↓ pH

diarrhea due to laxative abuse

- ↑ chloride, MAC
- ↓ K, HCO₃⁻
- **Urine** ↓ K
- **Stool** ↑ K

osmotic diarrhea

- **Stool** ↑ osmotic gap

Diet

high purine diet

- **Urine** ↑ uric acid

non-carbohydrate diet

- ↓ porphyrins
- **Urine** ↑ ketones, creatine

pure carbohydrate diet

- ↑ TAG
- ↓ Apo A-I
- **Urine** ↑ casts - (granular, hyaline)

vegane diet

- ↑ Bil, folate, PTH, SOD, GP
- ↓ Ca, Ca⁺⁺, Cu, G, Hb, cholesterol, uric acid, LDL-C, lipids, Mg, PL, Se, TAG, urea, vitamin - (B₁₂), VLDL-C
- **Urine** ↑ chloride, K, oxalate, pH
- ↓ ammonia, creatinine
- **Stool** ↑ volume

weight reduction diet

- ↑ Apo A-I, HDL-C, **acetone, acetoacetic acid, aldosterone, amino acids, BHBA, Bil, unconjugated Bil, Ca, gamma globulins, GIP, glucagon, ketobodies, uric acid, MAC, fatty acids, Na, rT₃, secretin, GH, urea, FFA**
- ↓ ACTH, aldosterone, ACE, **albumin, ALP, AMS, proteins, estradiol (F), Ca, C-peptide, EPO, Fe, folate, G, Hb, HDL-C, HCT, HCO₃⁻, cholesterol, ILGF-I, insulin, K (later), LDL-C, LH, lipids, Mg, osmolality, P, pH, T₃, TAG, TIBC, urea, LA, vitamin B₁₂**
- **Urine** ↑ acetone, Ca, **chloride, K, ketones, creatine, creatinine, uric acid, Mg, Na, volume, VMA**
- ↓ chloride, K, **creatinine, uric acid, osmolality, pH**

Disease

Alzheimer's disease

- ↑ alpha-1-antichymotrypsin, Apo - (E-IV - later)
- ↓ beta-amyloid precursor protein
- **Urine** ↑ blood, proteins, pus, casts - (RBC)
- **Cerebrospinal Fluid** ↑ glial fibrillary acidic protein, pyruvic acid, taurine
- ↓ ADH, somatostatin

Note: molecular biology - presenilin-1, presenilin-2 polymorphisms

Behcet's disease

- **Cerebrospinal Fluid** ↑ proteins, WBC

Berger's disease

- ↑ IgA

- **Urine** ↑ blood, proteins, RBC
- Bornholm disease**
- ↑ trypsin
- celiac disease**
- ↑ * **ALP, ANCA, * antiendomysial Ab, * antigliadin Ab, antireticulin Ab**, anti-tissue transglutaminase autoantibodies, CEA, G tolerance, GIP, HLA – (B₅, B₈, DQ₂, DR₃, DR₇), CHS, IgA, uric acid, LD, MCV, mono, PT, PTH, serotonin, PLT, TIBC
- ↓ * **albumin, ALP, beta-carotene, proteins, Ca, Ca²⁺, ceruloplasmin, CO₂, Cu, * RBC, * Fe, ferritin, * Hb, HCT, chloride, CHE, cholesterol, IgG, * IgM, K, complement – (* C₃, * C₄), uric acid, LD, WBC, lipids, lym, MCH, MCHC, MCV, Mg, Na, P, pCO₂, PT, * prothrombin, secretin-cholecystokinin, STH, T₃, T₄, TBG, transferrin satur., urea, uric acid, vitamin – (A, B₂, B₆, B₁₂, D, E, K, * folic acid), Zn**
- **Urine** ↑ 5-HIAA, oxalate, P
- ↓ 17-OHCS, 17-KS
- **Stool** ↑ Ca, * fat, HCO₃⁻, volume, pH
- ↓ pH
- **Hair** ↓ Zn
- chronic granulomatous disease**
- ↑ antithyroglobulin Ab, AST, ESR, gamma globulins, WBC
- ↓ Hb, HCT
- chronic obstructive pulmonary disease**
- ↑ aldosterone, BNP, CK-MB (exac.), eos, EPO, RBC, Hb, HCO₃⁻, K, WBC, MAC+RAC, MAL+RAC, pCO₂, AAT, Apo B, Hb, HCT, chloride, cholesterol, LDL-C, pH, pO₂, TAG
- cold agglutinin disease**
- ↑ * cold antibodies, * MCH, * MCV, spherocytes
- ↓ Hb, HCT
- **Urine** ↑ Bence Jones protein, hemosiderin
- coronary artery disease**
- ↑ Apo B, CK, factor VIII, fibrinogen, homocysteine, cholesterol, plasminogen activator inhibitor, LDL-C, TAG, Zn
- ↓ Apo A-I, HDL-C, vitamin – (B₁₂, folate)
- Crohn's disease (regional enteritis)**
- ↑ **Ab against Saccharomyces cerevisiae, AGP, ALP, ALP (WBC), alpha-1-glycoprotein, alpha-1-antichymotrypsin, ALT, ANA, ANCA, p-ANCA, atypical-ANCA, anti-reticulin Ab, B₂M, CEA, CRP, ESR, gamma globulins, globulins, GM-CSF, haptoglobin, hCG, HLA-B₂₇, IFN-gamma, IgA, IL – (1, 2, 6, 8), uric acid, LD, WBC, lym, lysozyme, MAC, mono, motilin, mucoproteins, Na, neu, PT, T₃, TBG, TIBC, TNF-alpha, PLT**
- ↓ ACE, albumin, beta-carotene, proteins, RBC, Fe, globulins, Hb, HCT, K, MCH, MCHC, MCV, Mg, Na, pH, prealbumin, PT, transferrin satur., tryptophan, vitamin – (B₂, B₁₂, folate), Zn, bile acids
- **Urine** ↑ Ca, lysozyme, uric acid, oxalate
- **Stool** ↑ blood, WBC, fat
- **Synovial Fluid** ↑ clot formation, WBC, PMN, volume
- ↓ viscosity
- Cushing's disease**
- ↑ ACTH, alanine, DHEA, DHEAS, G, calcitonin, cortisol, MAL, PRL, tri-iodothyronine resin uptake

- ↓ albumin, ALP, aldosterone, CK, K
- **Urine** ↑ K, 17-OHCS, 17-KS, volume

duodenal ulcer disease

- ↑ ACE, ALP, **alpha-1-globulins**, **alpha-2-globulins**, AMS, Ca, CEA, CO₂, ESR, **gastrin**, haptoglobin, hCG, IgA-specific Ab, IgG-specific Ab, immunoreactive trypsin, cryofibrinogen, **WBC**, **lipase**, norepinephrine, **pepsinogen**, pH, PP, secretin, somatostatin, TIBC, trypsin, **urea**
- ↓ **albumin**, A₂MG, **Fe**, **proteins**, G, G tolerance, Hb, HCT, chloride, K, MCH, MCHC, MCV, Na, transferrin satur., vitamin C (WBC)
- **Urine** ↑ uropepsin
- **Gastric Fluid** ↑ **BAO**, basal secretion, **HCl**, **blood**, LD, lysolecithin, MAO, volume, PAO, pH
- ↓ pH
- **Peritoneal Fluid** ↑ ammonia, AMS
- **Stool** ↑ **blood**, fat

Fabry's disease

- ↓ alpha-galactosidase (+ WBC)
- **Urine** ↓ alpha-galactosidase
- **Tears** ↓ alpha-galactosidase

Gamstorp's disease

- ↑ * **K** (attack)

Gaucher's disease

- ↑ ACE, * **ACP**, ALP, ALT, anisocytes, AST, conjugated Bil, **nucleated RBC**, beta-glucuronidase, beta-glucosidase (+RBC), GMT, lym, lysozyme, uric acid, LD, **mono**, 5-NT, PAP, poikilocytes, RTC, vitamin B₁₂ binding protein, VLDL-C
- ↓ albumin, * **beta-glucosidase** (WBC), **RBC**, **factor IX**, **Fe**, **glucocerebroxidase**, Hb, HCT, cholesterol, WBC, O₂ satur., pO₂, **PLT**
- **Cerebrospinal Fluid** ↑ AST
- **Synovial Fluid** ↑ WBC, macrophages, viscosity

Gilbert's disease

- ↑ **Bil**, * **Bil unconjugated**, delta Bil, GMT, **CHS**
- ↓ UDPGT
- **Urine** ↑ conjugated Bil, UBG
- ↓ UBG
- **Stool** ↓ UBG

graft-versus-host disease, acute

- ↑ * **ALP**, * **AST**, ALT, **B₂M**, * **Bil**, IL - (2, 6), 5-nucleotidase, TNF-alpha
- ↓ WBC, lym, **PLT**
- **Stool** ↑ **blood**

graft-versus-host disease, chronic

- ↑ * **ALP**, ALT, **B₂M**, * **Bil**, IL - (2, 6), 5-nucleotidase, TNF-alpha
- ↓ **B lym**, catalase, WBC, lym, * **PLT**

Graves' disease

- ↑ ACE, ALP, ALT, ANA, **antimicrosomal Ab**, antithyroglobulin Ab, antithyroid Ab, antithyroid peroxidase Ab, **thyroxine autoantibodies**, AST, Ca, Ca²⁺, ferritin, * **FT₄**, FTI, G, HLA - (B₈, B₂₇, **DR₃**, **Dw₃**), IgG, IgM, **creatine**, LATS, lym, P, prostacyclin, **anti-TSH receptor Ab**, * **T₃**, * **T₄**, **thyroglobulin**
- ↓ albumin, **cholesterol**, Hb, lipids, PTH, TIBC, * **TSH**, vitamin - (D₃)
- **Urine** ↑ Ca, creatine, G

- *Stool* ↑ Ca
- Hartnup disease**
 - ↓ amino acids, niacin, tryptophan
 - *Urine* ↑ alanine, arginine, asparagine, citrulline, cystathionine, cysteine, cystine, ethanolamine, phenylalanine, glutamine, glycine, histidine, homocitrulline, hydroxylysine, hydroxyproline, isoleucine, aspartic acid, leucine, lysine, methionine, ornithine, proline, serine, threonine, tryptamine, tryptophan, tyrosine, valine
 - ↓ 5-HIAA, niacin
 - *Cerebrospinal Fluid* ↑ leucine
- hemoglobin C disease**
 - ↑ Bil, * HbC, HbF, RTC, target cells
 - ↓ Hb, HCT, osmotic fragility
- hemoglobin D disease**
 - ↑ * HbD, spherocytes, target cells
 - ↓ Hb, HCT
- hemoglobin E disease**
 - ↑ * HbE, RBC, microcytes
 - ↓ Hb, HCT, MCV
- Hurler's disease**
 - *Urine* ↑ dermatan sulfate, heparan sulfate
- immune-complex disease**
 - ↓ complement – (C1r, C1s, C2, C3, C4, C5, C6, C7, C8, C9, CH50)
- inflammatory bowel disease**
 - ↑ TM – (CA 19-9, CA 125, M2-PK), p-ANCA
 - ↓ albumin
 - *Synovial Fluid* ↑ clot formation, WBC, volume
- ischemic cerebral disease**
 - ↑ A2MG, antiphospholipid Ab, AST, CK, Cu
 - *Cerebrospinal Fluid* ↑ CK, Cu, G, GMT, LA, LD, WBC, MBP
 - ↓ Mg, pH
- ischemic heart disease**
 - ↑ PLT adhesion, AST, CEA, CK, CK-MB, fibrinogen, homocysteine, cholesterol, uric acid, LDL-C, Lp(a), mAST, P-selectin, TAG, thrombomodulin, troponin I, troponin T, vWf
 - ↓ Cu, HDL-C, IDL-C, vitamin – (B₁₂, folate), Zn
- Jacobs-Creutzfeld disease**
 - *Cerebrospinal Fluid* ↑ enolase
 - Note: molecular biology – PRNP gene polymorphism. CSF – 14-3-3 BP (p 130/131)
- Krabbe's disease**
 - ↓ * beta-glucosidase (+ WBC)
 - *Cerebrospinal Fluid* ↑ albumin, alpha-globulin
 - ↓ beta-globulin, gamma-globulin
- Leterer-Siwe disease**
 - ↑ ALT
 - ↓ WBC
- maple syrup urine disease**
 - ↑ allosisoleucine (attack), isoleucine, uric acid, leucine (attack), MAC, Mn, valine

↓ G

- **Urine** ↑ amino acids, citrulline, glutamine, glycine, hydroxyproline, * isoleucine, crystals – (leucine, tyrosine), * leucine, WBC, methionine, proline, serine, * valine, branched-chain keto acids

- **Cerebrospinal Fluid** ↑ leucine

Ménétrier's disease

↓ albumin

- **Gastric Fluid** ↑ pH

↓ HCl

mixed connective tissue disease (MCTD)

- ↑ aldolase, ANA, ANCA, anti-ds-DNA, anti-ss-DNA, anti-RA₃₃, anti-RNA Ab, * antinucleolar-RNP Ab, anti-Ro/SSA, anti-Scl-70 Ab, ASMA, CIC, CK, ESR, gamma globulins, HLA – (DR₂, DR₄), complement – (C₃, C₄), LE cells, RF, VDRL (false)

↓ CK, RBC, Hb, complement – (C₃, C₄), WBC, PLT

- **Urine** ↑ proteins, RBC, blood, casts

- **Synovial Fluid** ↑ mono, WBC, RBC, PMN, volume

↓ viscosity

neonatal hemorrhagic disease

↑ BT, coagulation time, PTT, PT

↓ anisocytes, RBC, Fe, Hb, HCT, poikilocytes

Niemann-Pick disease

↑ ACE, ACP, aldolase, ALP, ALT, anisocytes, AST, elliptocytes, nucleated RBC, WBC, lipids, mono, PAP, poikilocytes, vitamin B₁₂ binding protein, VLDL-C

↓ beta-glucosidase, RBC, Hb, HCT, cholesterol, WBC, * sphingomyelinase (WBC), PLT

- **Cerebrospinal Fluid** ↑ aldolase, AST

- **Urine** ↓ * sphingomyelinase

- **Synovial Fluid** ↑ macrophages

oasthouse urine disease

↑ phenylalanine, tyrosine, methionine, valine, leucine, isoleucine

- **Urine** ↑ phenylalanine, tyrosine, methionine, valine, leucine, isoleucine

Paget's disease

↑ ACP, ACP (prostatic), * ALP, Ca, Ca²⁺, calcitonin, osteocalcin, P, PICP, N-telopeptides

↓ Mg, osteocalcin

- **Urine** ↑ Ca, Ca²⁺, hydroxyproline – (total, free), P, pyridinoline

- **Synovial Fluid** ↑ WBC, viscosity

Parkinson's disease

↓ dopamine, serotonin

- **Urine** ↓ dopamine, catecholamines

pelvic inflammatory disease

↑ CRP, mucoproteins, ESR, WBC

↓ albumin

polycystic kidney disease

↑ AFP, EPO, RBC, HCT, factor D, HLA – (B₅), creatinine, uric acid, WBC, urea

↓ amino acids, RBC, HCT, IGFBP-1, osmolality, tyrosine

- **Urine** ↑ albumin, proteins, RBC, Hb, pus, blood, WBC, volume, fat, casts – (RBC)

- ↓ creatinine, specific gravity, volume, urea
- Raynaud's disease**
 - ↑ ANA, anti-histidyl-tRNA synthetase Ab
- Refsum's disease**
 - ↑ **phytanic acid, phytanate, pipercolic acid, FA** (very long chain)
 - ↓ cholesterol
 - **Cerebrospinal Fluid** ↑ **proteins**
- Rendu-Osler disease**
 - ↓ RBC, Hb, HCT
 - **Stool** ↑ **blood**
- Rh-null disease**
 - ↑ HbF, osmotic fragility, stomatocytes
 - ↓ Hb, HCT
- serum disease (serum sickness)**
 - ↑ CIC, eos, ESR, WBC, lym, plasmocytes
 - ↓ complement – (C3, C4), WBC
 - **Urine** ↑ **proteins, blood**
 - **Synovial Fluid** ↑ WBC, mono, PMN
 - ↓ viscosity
- silo-filler disease**
 - ↑ ASLO, bas, C3 complement, CIC, eos, fibrinogen, ESR, haptoglobin, IgA, IgE, IgE specific Ab, WBC
 - ↓ complement – (C2, C3, C4), WBC, T-lym
- stomach ulcer disease**
 - ↑ ACE, **alpha-1-globulins, alpha-2-globulins**, ALP, AMS, APA, Ca, CCK-PZ, CEA, CO₂, echinocytes, ESR, **gastrin**, haptoglobin, hCG, IgA-specific Ab, IgG-specific Ab, immunoreactive trypsin, cryofibrinogen, **lipase, WBC, MAL**, norepinephrine, pepsinogen, pH, TIBC, trypsin, urea
 - ↓ Al, **albumin**, A2MG, bas, **proteins**, Fe, G, G tolerance, Hb, HCT, chloride, K, MCH, MCHC, MCV, Na, vitamin C (WBC)
 - **Urine** ↑ **AMS**
 - **Gastric Fluid** ↑ **HCl, blood, LD, lysolecithin, pH**
 - ↓ basal secretion, HCl, pH
 - **Peritoneal Fluid** ↑ **AMS, proteins**
 - **Stool** ↑ **blood, fat**
- Tangier disease**
 - ↑ RTC, TAG
 - ↓ alpha-1-globulins, Apo – (A-I, A-II, C-I, C-II, C-III), HDL-C, **cholesterol, LDL-C, PL, pre-betalipoproteins, PLT**
- Weber-Christian disease**
 - ↑ ANA, IgA, IgG, IgM
- Whipple's disease**
 - ↑ ALT, ESR, WBC, MAC
 - ↓ **albumin, proteins, RBC, gamma globulins, Hb, HCT, cholesterol, folate, lym**
 - **Urine** ↑ **5-HIAA**
 - **Stool** ↑ **fat**
 - **Synovial Fluid** ↑ WBC, mono, PMN
 - ↓ viscosity

von Willebrand's disease

↑ APTT, BT, PT

↓ PLT, PLT adhesion, PLT aggregation, factor VIII, clot retraction, * von Willebrand's factor

■ *Synovial Fluid* ↑ RBC

Wilson's disease

↑ ALP, ALT, AST, Bil, BSP retention, Ca²⁺, Cu, ESR, G, gamma globulins, GMT, Hb (free), chloride, IgG, IgM, creatinine, LAP, LD, 5-NT, PT, pyruvate, urea

↓ alpha-1-globulins, albumin, ALP, proteins, Bil, unconjugated Bil, Ca, * ceruloplasmin, * Cu, RBC, G, G tolerance, haptoglobin, Hb, HCT, cholesterol, IgA, IgG, K, creatinine, uric acid, WBC, P, PTH, PLT, urea

■ *Urine* ↑ alpha-aminonitrogen, alanine, amino acids, proteins, Ca, Cu, RBC, phenylalanine, phosphates, fructose, G, 5-HIAA, homocysteine, isoleucine, uric acid, P, pH, proline, reducing sugars, threonine, tryptophan, tyrosine, valine

↓ creatinine clearance, GFR, specific gravity

■ *Cerebrospinal Fluid* ↑ Cu

■ *Synovial Fluid* ↑ pyrophosphate

Wolman's disease

↓ Hb, HCT

Diseases

allergic diseases

↑ ASLO, bas, C₃ complement, CIC, eos, fibrinogen, fibronectin, ESR, haptoglobin, IgA, IgE, IgE specific Ab, IgG, alpha-1 proteinase inhibitor, cryoglobulins, WBC, neu, pCO₂, PMN, RAC, RAL, RF, T-lym

↓ albumin, bas, RBC, HCT, IgA, complement - (C₂, C₃, C₄), WBC, neu, pO₂, T-lym, PLT, transferrin

■ *Urine* ↑ proteins, RBC, Hb, pentoses, casts - (RBC)

■ *Bronchoalveolar Lavage Fluid* ↑ eos, IgG, IgM, lym, neu, T-lym

■ *Pleural Fluid* ↑ eos, lym, neu

↓ alveolar macrophages

■ *Sputum* ↑ eos, lym, neu, PMN, viscosity

↓ alveolar macrophages

■ *Synovial Fluid* ↑ eos, WBC, PMN

arterial diseases

↑ AAT, ACLA, alpha-1-globulins, alpha-2-globulins, ALP, ALT, ANA, ANCA, AST, CIC, CRP, fibrinogen, ESR, gamma globulins, haptoglobin, cholesterol, HLA - (B8, Bw2, Bw52, DQ, DR4), IgA, IgG, IgM, IL-6, WBC, LE cells, lym, neu

↓ B-lym, RBC, Hb, HCT

■ *Urine* ↑ estrogens (females)

autoimmune diseases

↑ ACTH, ADA, AMA, ANA, anti-ds-DNA (double stranded) Ab, anti-Sm Ab, PLT Ab, antithyroglobulin Ab, unconjugated Bil, B2M, soluble CD4, phospholipase A2, h-sICAM-1, IgG, IgM, IL-6, sIL-2R, complement - (C4a), cryoglobulins, lupus inhibitor, lym, neopterin, orosomucoid, PLT

↓ ACTH, albumin, ceruloplasmin, IgG, factor - (VIII), IgG, complement - (C1, C1q, C1r, C1s, C2, C3, CH50), cortisol, lipids, protein C, protein S, PTH

biliary tract diseases

- ↑ AFP, Al, alpha-1-globulins, alpha-2-globulins, ALP, ALT, AMA, AMS, AST, beta globulins, Bil, Bil conjugated, Bil unconjugated, B2M, CA 15-3, CA 19-9, CA 50, CA 125, CEA, ceruloplasmin, Cu, delta Bil, Fe, ferritin, ESR, gamma globulins, GMD, GMT, HDL-C, cholesterol, chymotrypsin, IgM, chenodeoxycholic acid, cholic acid, LAP, LDL-C, WBC, lipase, lipids, MCA, Mn, 5-nucleotidase, PT, PL, TAG, trypsin, bile acids
- ↓ albumin, Apo A-I, AT III, beta-carotene, proteins, RBC, Fe, Hb, HDL-C, HCT, prothrombin, vitamin – (B₁₂, E)
- **Urine** ↑ AMS, Bil, Bil conjugated, oxalate, UBG
- **Peritoneal Fluid** ↑ AMS, protein
- **Stool** ↓ UBG

bone diseases

- ↑ ACP, aldolase, ALP, Ca, Ca²⁺, cAMP, deoxy pyridinoline, fibrinogen, ESR, hyaluronate, hydroxyproline, calcitonin, keratan sulfate, mucoproteins, Ne, TM – (ACP), 5-nucleotidase, osteocalcin, P, PTH, pyridinone, Tr
- ↓ Ca, fluoride, cholesterol, osteocalcin, P, vitamin – (D)
- **Urine** ↑ amino acids, Ca, deoxy pyridinoline, phosphoethanolamine, glycosaminoglycans, hydroxyproline, P
- ↓ Ca, hydroxyproline, specific gravity, P
- **Synovial Fluid** ↑ RBC, complement – (C₃), crystals – (hydroxyapatite, calcium pyrophosphate), WBC, viscosity

cardiac diseases

- ↑ AAT, Ab against beta-2 GP I, ACLA, ACP, epinephrine, AGP, **aldolase**, **alpha-1-globulins**, **alpha-2-globulins**, alpha-HBD, ALP, ALT, **anti-myocardial Ab**, Apo – ((a), B-100), ALT, ANA, antienterovirus Ab, **antiviral Ab**, ASLO, AST, beta-glucuronidase, Bil, BNP, cGMP, CK, * **CK-MB**, CK-MM, CRP, Cu, **elastase**, enolase, FDP, **fibrinogen**, phosphohexoisomerase, phospholipase A₂, fructose-1,6-diphosphate aldolase, ESR, **fibrinogen**, G, glutathione reductase, **glycogen phosphorylase BB**, GMT, G6PD (RBC), **haptoglobin**, HBD, hexosaminidase, HMWK, HCT, cholesterol, IgA, IgG, IgM, **plasminogen activator inhibitor**, catecholamines, complement – (C₃), creatinine, uric acid, LA, LD, LD₁, LD₂, LD₁:LD₂, LP(a), LDL-C, lym, WBC, **mAST**, MD, Mn, mono (remission), **mucoproteins**, **myoglobin**, L-myosin, neu, Ni, norepinephrine, OCT, PL, PMN, pyruvate kinase, ribonuclease, serotonin, TAG, **tropomyosin**, * **troponin I**, * **troponin T**, TSH, urea, VLDL-C, FFA
- ↓ albumin, bas, eos, Fe, HDL-C, CHS, K, LDL-C, lym, Na, orosomucoid, pH, pO₂, prealbumin, **transferrin satur.**, T₃, vitamin – (B₆), Zn
- **Urine** ↑ G, hexosaminidase, catecholamines, crystals – (urate), Mb, VMA
- **Cerebrospinal Fluid** ↑ G
- **Pericardial Fluid** ↑ volume

central nervous system diseases

– infectious c. n. s. diseases

- ↑ ADH, alpha-2-globulins, CK, CRP, fibrinogen
- **Cerebrospinal Fluid** ↑ gamma globulins (chronic stage), IgG (chronic stage)

- **inflammatory c. n. s. diseases**

↑ alpha-1-globulins, alpha-2-globulins, AMS, CK

- **Cerebrospinal Fluid** ↑ A2MG, bas, CRP, IgG, acid proteinases, plasmocytes

- **parasitic c. n. s. diseases**

- **Cerebrospinal Fluid** ↑ bas, eos, lym, mono, plasmocytes

congenital heart diseases

↑ RBC, FDP, Hb, HCT, nucleated RBC, PLT

↓ PLT adhesion, albumin, estriol, **factor XI**, G, pO₂, free estriol

- **cyanotic c. h. diseases**

↑ RBC, LA

↓ PLT

connective tissue diseases

↑ ACE, AMA, anti-ds-DNA, anti-ss-DNA, ASLO, CK-MB, cryoglobulins, Cu, eos, **IgD**, anti-RNP Ab, LE cells, OCT

↓ albumin, CK

- **Cerebrospinal Fluid** ↑ IgG

- **Pleural Fluid** ↑ B2M, CIC, **proteins**, fibronectin

↓ pH

- **Synovial Fluid** ↑ WBC, clot formation, mono, PMN, volume

↓ viscosity

immunologically mediated diseases

↑ anti-GBMAB, anti-TBMAb, eos, HLA - (Bw35, B12, DR2, Dr4), IgA

- **Urine** ↑ **proteins**, **epithelial cells**, RBC, blood, WBC, casts - (**cellular**)

inflammatory diseases

- **acute inflammatory diseases**

↑ AAT, AD, AGP, A2MG, **alpha-1-antichymotrypsin**, alpha-2-antiplasmin, **alpha-1-globulins**, **alpha-2-globulins**, amyloid A, Apo E, AT III, **proteins**, B2M, CA 19-9, CA 50, CEA, **ceruloplasmin**, CRP, Cu, D-dimers, **elastase**, factor I, factor H, **factor VIII**, **ferritin**, **fibrinogen**, phospholipase A2, ESR, G, gamma globulins, **haptoglobin**, hemopexin, heme oxygenase, h-sVCAM-1, IgA, IgG, IL-6, C1-esterase inhibitor, kininogenase, complement - (C2, C3, C4, C5, C9, CH50), cryofibrinogen, WBC, Lp(a), **mucoproteins**, **neu**, **orosomuroid**, plasminogen, lipopolysaccharide binding protein, RE, serotonin, superoxide dismutase, TT, TPA, **PLT**, von Willebrand's factor, zinc protoporphyrin

↓ **albumin**, proteins, CBG, Fe, fibrinogen, Hb, cholesterol, IgA, IgG, inter-alpha-trypsin inhibitor, complement - (C3), prealbumin, **TIBC**, transferrin, transferrin sat., Zn

- **Urine** ↑ RBC, Hb, Zn

↓ UBG

- **Cerebrospinal Fluid** ↑ plasmocytes

- **Pericardial Fluid** ↑ RBC

- **Peritoneal Fluid** ↑ proteins, RBC, IgA, IgG, LA, LD, WBC

↓ G, pH

- **Pleural Fluid** ↑ AAT, A2MG, RBC, haptoglobin, hemopexin, LD, orosomuroid

- **Sputum** ↑ PMN

- **chronic inflammatory diseases**

↑ AAT, AD, AGP, **alpha-1-globulins**, **alpha-2-globulins**, amyloid A, anti-La/SSB, bas, proteins, B2M, C3, CA 19-9, CA 50, CBG, CEA, **ceruloplasmin**, CRP, Cu, D-dimers, **elastase**, **ferritin**, **fibrinogen**, ESR,

gamma globulins, haptoglobin, IgA, IgG, mucoproteins, neu, orosomucoid, plasminogen, serotonin, TT, TIBC, TPA, PLT, zinc protoporphyrin

↓ **albumin, RBC, Fe, Hb, inter-alpha-trypsin inhibitor, complement – (C₃), prealbumin, TIBC, transferrin, transferrin sat., vitamin – (B₆, C), Zn**

■ **Urine** ↑ RBC, Hb, Zn

↓ UBG

■ **Peritoneal Fluid** ↑ RBC, LA, WBC

↓ G, pH

gastrointestinal tract inflammatory diseases

↑ **AAT, AFP, AGP, alpha-1-globulins, alpha-2-globulins, A₂MG, ANCA, B₂M, CEA, CRP, Cu, elastase, fibrinogen, phospholipase A₂, ESR, gamma globulins, haptoglobin, hCG, HLA – (B₂₇), IgA, IgG, ketobodies, complement – (CH₅₀), WBC, MAC, mono, motilin, mucoproteins, Na, OCT, alpha-1-acid glycoprotein, PT, serotonin, TPA, PLT**

↓ **albumin, beta-carotene, proteins, RBC, Fe, gamma globulins, Hb, HCT, CHS, IgA, IgG, IgM, K, lym, Mg, Na, pH, TBG, TIBC, transferrin, tryptophan, urea, vitamin – (B₂, B₁₂, folate, K), Zn**

■ **Urine** ↑ Ca, lysozyme, oxalate

↓ estriol

■ **Peritoneal Fluid** ↑ proteins, WBC, volume

↓ pH

■ **Stool** ↑ AAT, albumin, mucus, blood, fat

■ **Synovial Fluid** ↑ crystals – (calcium oxalate)

↓ viscosity

intestine diseases

↑ **AAT, AFP, alpha-1-globulins, alpha-2-globulins, ALP, A₂MG, ammonia, AMS, CEA, CK, Cu, elastase, Eo, gamma globulins, gastrin, haptoglobin, IgA, IgG, complement – (CH₅₀), ketobodies, LD, WBC, MAC, MAL, serotonin, TPA, Tr, urea**

↓ **albumin, ALP, A₂MG, Ca, ceruloplasmin, Cu, factor II, Fe, G, GIP, Hb, HDL-C, chloride, cholesterol, CHS, IgA, K, LDL-C, Mg, Na, PT, TAG, TBG, TIBC, transferrin, urea, vitamin – (A, B₂, B₆, B₁₂, beta-carotene, C, D, E, K, folic acid), Zn**

■ **Urine** ↑ oxalate

↓ estriol, K

■ **Stool** ↑ pus, blood, volume, fat

■ **Peritoneal Fluid** ↑ AMS, proteins, WBC, volume

↓ pH

joint diseases

↑ **AAT, ACE, ADA, alanine, alpha-1-globulins, alpha-2-globulins, ALP, A₂MG, ASLO, AST, proteins, beta globulins, Bil conjugated, ceruloplasmin, CIC, CRP, Cu, elastase, eos, ferritin, fibrinogen, ESR, gamma globulins, GMT, haptoglobin, HLA, cholesterol, IDL-C, IFN-gamma, IgA, IgG, IgM, IL – (1, 6), complement – (Ba, Bb, C₃, C₄, C₉), creatinine, creatine, glutamic acid, uric acid, cryoglobulins, WBC, LE cells, lupus inhibitor, lym, mono, mucoproteins, neu, orosomucoid, osteocalcin, RF, TAG, TNF-alpha, PLT, transferrin, urea, viscosity**

↓ **albumin, alpha globulins, ALP, A₂MG, proteins, RBC, Fe, glutamine, Hb, HCT, cholesterol, complement – (C_{1r}, C_{1s}, C₂, C₃, C₄, CH₅₀), LDL-C, WBC, Mb, neu, osteocalcin, TIBC, transferrin, vitamin – (C, D), Zn**

- **Urine** ↑ alanine, proteins, Cu, glutamine, glycine, hexosaminidase, hydroxyproline, crystals – (urate), uric acid
 - ↓ 17-KS, uric acid
 - **Synovial Fluid** ↑ proteins, ceruloplasmin, clot formation, Cu, eos, RBC, pus, IFN-gamma, IL – (1, 2, 6, 8), complement – (C₃), crystals – (urate), LA, LD, WBC, lym, lymphokines, macrophages, mono, neu, PMN, TNF-alpha, **volume**
 - ↓ C₃ complement, RBC, G, crystals – (hydroxyapatite, calcium pyrophosphate), WBC, mono, neu, viscosity
 - **Pleural Fluid** ↑ adenosine deaminase, proteins, eos, crystals – (cholesterol), LD, WBC, lym, PMN, RF
 - ↓ G, complement – (C₃, C₄), viscosity
- degenerative diseases of joints
- ↑ complement – (C₉)
 - **Urine** ↑ hexosaminidase
 - **Synovial Fluid** ↑ WBC
- liver diseases
- ↑ AAT, ACE, ACP, ADA, ADH, acanthocytes, **aldolase**, **aldosterone**, alpha globulins, ALP, ALT, AMA, **A₂MG**, aminotripeptidase, ammonia, AMS, ANA, APTT, arginase, ASAL, ASMA, AST, ATPase, bas, beta globulins, **beta-glucuronidase**, **proteins** (early, compensated), **Bil**, **Bil conjugated**, **Bil unconjugated**, B₂M, BNP, ceruloplasmin, C-peptide, Cu, euglobulin lysis time, enolase, **estradiol**, estrogens, FDP, Fe, ferritin, fibrinogen, phosphoglucomutase, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, FSH, fumarase, **ESR**, G, **gamma globulins**, gastrin, **glucagon**, glutathione reductase, glycerol, GMD, GMT, guanase, HBD, hCG, HDL-C, hexosaminidase, hydroxyproline, **cold agglutinins**, chloride, cholesterol, ICD, **IgA**, **IgG**, IgM, immunoreactive proinsulin, complement – (C₂, C₃, C₄), **ketobodies**, **uric acid**, creatinine, **cryoglobulins**, LA, LAP, LD, LD₅, LDL-C, LE cells, LH, lipase, lipids, lipoprotein lipase, lym, macrocytes, MAL (later), mAST, MD, microcytes, Mn, mono, Na, TM – (AFP, CA 15-3, CA 19-9, CA 27-29, CA 50, CA 125, CA 549, CEA, MCA, SCCA), neu, NT-pro-ANP, **5-nucleotidase**, plasma volume, **OCT**, orosomucoid, PT, PL, PRA, PRL, proconvertin, prothrombin, pyruvate kinase, RBP, RDW, RF, RTC, SD, serotonin, **SHBG**, somatostatin, GH, T₃, T₄, **TAG**, TBG, TIBC, TPA, PLT, transferrin, transketolase, TSH, TT, urea, **VIP**, viscosity, vitamin – (B₁₂), **bile acids**
 - ↓ AAT, **albumin**, alpha-1-globulins, alpha-2-globulins, **A₂MG**, AMS, Apo – (B-48, B-100), AST, AT III, beta globulins, **proteins**, C₃, Ca, ceruloplasmin, Cu, RBC, factor IX, **fibrinogen**, G, granulocytes, haptoglobin, Hb, HDL-C, hemopexin, HCT, chloride, **cholesterol**, cholesterol esterase, CHS, IgG, IgM, **ILGF-I**, K, acid uric, **WBC**, Mg, mucoproteins, Na (later), neu, orosomucoid, osmolality, **oxalate**, P, pentoses, PICP, porphyrins, **prealbumin**, pseudocholinesterase, RBP, RTC, transferrin satur., Se, T₃, T₄, **TBG**, **testosterone**, TIBC, transferrin, **PLT**, UBBC, **urea**, vitamin – (D, E, folate, niacin), **Zn**
 - **Urine** ↑ alpha-aminonitrogen, ALT, amino acids, **conjugated Bil**, RBC, estrogens, fructose, G, K, crystals – (leucine, tyrosine), DALA, fructose, G, galactose, **uric acid**, WBC, **osmolality**, **porphyrins**, reducing sugars, transferrin satur., T₃, transferrin, **UBG**, urobilin, casts – (epithelial, granular, hyaline), **Zn**

- ↓ 17-KS, Na, niacin, volume, pH, UBG, urea
- **Stool** ↑ blood, fat
- ↓ UBG
- **Cerebrospinal Fluid** ↑ proteins, glutamine, lym, tryptophan
- **Pleural Fluid** ↑ AMS, eos, LA, volume
- ↓ A2MG, **proteins**, haptoglobin, hemopexin, orosomuroid
- **Peritoneal Fluid** ↑ proteins, RBC, **WBC**
- ↓ proteins, LA
- acute liver diseases
- ↑ ACP, Al, aldolase, ALP, ALT, **AMS**, AST, beta globulins, BHBA, proteins, B2M, ceruloplasmin, citrulline, FDP, **ferritin**, glycerol, GMD, GMT, chymotrypsin, **IgD**, IgE, immunoreactive trypsin, IRI, **LA**, LD, LD5, LDL-C, **mAST**, MD, Mn, OCT, PT, PRA, PTH, RF
- ↓ **alpha-2-antiplasmin**, AMS, Ca, factor II, **fibrinogen**, G, gc-globulin, haptoglobin, cortisol, uric acid, LCAT, **WBC**, neu, RBP, PLT
- **Urine** ↑ proteins, conjugated Bil, estrogens, **uric acid**, porphyrins, UBG
- ↓ AMS, estriol, pregnanediol, urea
- **Peritoneal Fluid** ↑ RBC
- chronic liver diseases
- ↑ **AAP**, AAT, acanthocytes, ACE, ACP, AFP, Al, aldolase, ALP, AMS, ANA, Apo B, beta globulins, BHBA, B2M, BNP, Ca, CA 15-3, CA 19-9, CA 50, CA 125, CA 549, CEA, ceruloplasmin, citrulline, estradiol, FDP, **ferritin**, ESR, G, **gamma globulins**, glycerol, GMD, GMT, hPL (F), chymotrypsin, IgA, **IgD**, IgE, IgG, IgM, immunoreactive trypsin, IRI, **LA**, LD, LD5, LDL-C, LH, MAC, macrocytes, MCA, MCV, methionine, Mn, 5-nucleotidase, NT-pro-ANP, OCT, **RBC osmotic resistance**, PT, PRA, PRL, prothrombin fragment 1.2, PTH, RF, rT₃, SHBG, GH, target cells, TAG, TBG, TT, trypsin, VIP, vitamin - (B₁₂)
- ↓ AAT, **alpha-2-antiplasmin**, alpha-1-globulins, AMS, AT III, **beta globulins**, beta-carotene, **proteins**, Ca, CBG, euglobulin lysis time, factors - (II, V, VII, IX, X, XI, XII, XIII), Fe, **fibrinogen**, **haptoglobin**, G, Hb, HDL-C, **CHS**, ILGF-I, complement - (C₄, C₅, C₆, C₇, C₈, C₉, CH50), **cortisol**, uric acid, LCAT, **WBC**, neu, Ni, **RBC osmotic fragility**, osteocalcin, **plasminogen**, prekallikrein, **protein C**, **protein S**, pyruvate kinase, RBP, T₄, TBG, testosterone, TIBC, **transferrin**, PLT, vitamin - (A, B₁, B₂, B₁₂, D, K, folate), Zn
- **Urine** ↑ proteins, Bence Jones protein, conjugated Bil, estrogens, G, hexosaminidase, coproporphyrin III, crystals - (leucine, tyrosine), **uric acid**, porphyrins, UBG
- ↓ estriol, pregnanediol, urea
- **Peritoneal Fluid** ↑ protein
- **Stool** ↓ UBG
- lymphoproliferative diseases
- ↑ cold agglutinins, paraproteins, uric acid, UBBC, viscosity
- ↓ IgM, C₁-esterase inhibitor, lym
- **Pleural Fluid** ↑ adenosine deaminase
- **Synovial Fluid** ↑ crystals - (urate)
- muscular inflammatory diseases
- ↑ ACA, AHBD, aldolase, **alpha-1-globulins**, alpha-2-globulins, ALP, ALT, ANA, anti-ds-DNA, anti-histidyl-tRNA synthetase Ab, anti-Ku, anti-Mi-2, anti-RNP, anti-Scl 70, anti-Sm, anti-SRP, anti-Ro/SSA, anti-

La,Ha/SSB, antisynthetase Ab, ASMA, AST, beta globulins, ceruloplasmin, CK, CK-MB, CK-MM, Cu, elastase, enolase, eos, ESR, HLA - (B8, DR3, DR5, DR7, DRw6, DRw52, DRw53), gamma globulins, IL-2, LD, LD5, WBC, LE cells, Mb, MD, mono, mucoproteins, neu, antithyroid Ab, pCO₂, pyruvate kinase, RF, T-lym, PLT

↓ RBC, gamma globulins, Hb, HCT, CHS, complement - (C2, C3, C4)

■ **Urine** ↑ creatine, Mb

↓ creatinine

■ **Synovial Fluid** ↑ crystals - (hydroxyapatite), WBC, PMN

↓ viscosity

myeloproliferative diseases

↑ ACP, **PLT aggregation**, ALP (WBC), **bas**, eos, HbF, **uric acid**, LD, **WBC**, macrocytes, megalocytes, **mono**, **MPV**, **neu**, transcobalamin II, **PLT**, **UBBC**, urea, vitamin - (B₁₂)

↓ PTL adhesion, HDL-C, folate, LDL-C

■ **Synovial Fluid** ↑ RBC, crystals - (urate), volume

pancreatic diseases

↑ **AAP**, **ACA**, **ADH**, aldolase, ALP, **AMS**, **AST**, beta-glucuronidase, **Bil**, **Bil conjugated**, Ca, Ca²⁺, **CCK-PZ**, **CEA**, **CRP**, euglobulin lysis time, elastase, endorphins, enkephalins, Fe, ferritin, fibrinogen, ESR, G, glucagon, glucocorticoids, **GMT**, Hb, HCT, cholesterol, chymotrypsin, **ILGF-II**, immunoreactive trypsin, calcitonin, catecholamines, creatinine, glutamic acid, **LAP**, LD, LDL-C, lipase, WBC, lipids, **MAC**, **MAL**, methalbumin, **TM** - (CA 15-3, CA 19-9, CA 125), pancreatic ribonuclease, **PP**, **PTH**, somatostatin, **GH**, **GH-RH**, **TAG**, thrombomodulin, trypsin, trypsinogen, urea, **VLDL-C**

↓ albumin, alpha-2-globulins, **A2MG**, **AMS**, proteins, Ca, Ca²⁺, RBC, Fe, fibrinogen, glucagon, Hb, HCT, chloride, immunoreactive trypsin, insulin, K, complement - (C₃), lipase, lipoprotein lipase, Mg, Na, P, pH, pO₂, trypsin, vitamin - (A, B₁₂, D, E, K)

■ **Urine** ↑ **AMS**, G, 17-OHCS

↓ Mg, volume

■ **Peritoneal Fluid** ↑ * **AMS**, proteins, RBC, lipase, methalbumin, specific gravity

↓ pH

■ **Pleural Fluid** ↑ **AMS**, proteins, RBC, LD, **WBC**, lipase, neu, orosomucoid

■ **Stool** ↑ volume, fat

peripheral vessels diseases

↑ cold agglutinins, P-selectin

pleural diseases

↑ **AAT**, alpha-1-globulins, alpha-2-globulins, ceruloplasmin, **CRP**, fibrinogen, ESR, gamma globulins, **WBC**, lym, mucoproteins, **neu**

↓ proteins

■ **Bronchoalveolar Lavage Fluid** ↑ globulins, IL, tumor-necrosis factor alpha, free oxygen radicals

■ **Pleural Fluid** ↑ **AAT**, adenosine deaminase, albumin, **A2MG**, **AMS**, **ANA**, anti-DNA, bacteria (culture), beta-glucuronidase, **B2M**, proteins, CK, eos, RBC, **FDP**, fibronectin, haptoglobin, Hb, hemopexin,

cholesterol, IgA, IgG, creatinine, blood, LA, LD, WBC, LE cells, lipase, lym, lysozyme, specific gravity, mucopolysaccharides, neu, volume, orosomucoid, pH, PMN, RF, TAG

↓ alpha globulins, proteins, G, cholesterol, complement - (C₃, C₄, CH₅₀), LD, WBC, lipids, lym, pH

■ **Sputum** ↑ volume, PMN

prostate diseases

↑ ACP, AMS, CK, ESR, G, creatinine, WBC, Na, TM - (CA 549, PSA), PAP, plasmin, plasminogen, PRL, urea

↓ RBC, Hb, HCT

■ **Urine** ↑ ACP, bacteria (+ culture), proteins, RBC, Hb, pus, blood, WBC
↓ pH

psychiatric diseases

↑ ADH, aldolase, CK, FT₄, HLA - (A28), index FT₄, cortisol, norepinephrine, serotonin, T₃, T₄, TSH

↓ epinephrine, CHS, norepinephrine, oxytocin, pCO₂, serotonin, taurine, FFA

■ **Urine** ↑ cAMP, catecholamines, PABA, VMA

↓ cAMP, 5-HIAA

■ **Cerebrospinal Fluid** ↑ CRH

pulmonary diseases

↑ AAT, ACE, ACTH, ADH, albumin, aldolase, **alpha-1-globulins**, alpha-2-globulins, ALP, AMS, ANA, anti-DNA, ASAL, ASLO, AST, bacteria (culture), proteins, Bil, Ca, ceruloplasmin, CIC, CK, CK-BB, CK-MB, CK-MM, CRH, CRP, Cu, euglobulin lysis time, elastase, eos, RBC, FDP, ferritin, **fibrinogen**, ESR, G, gamma globulins, gastrin, glucagon, GMT, haptoglobin, Hb, hPL, cold agglutinins, IgA, IgE, IgE specific antibodies, IgG, complement - (C₃), uric acid, LA, lactoferrin, LD, LD₃, WBC, lipase, lym, MAC, macrocytes, mono, **mucoproteins**, neu, NSE, TM - (AFP, aldolase, CA 15-3, CA 19-9, CA 50, CA 72-4, CA 549, CEA, CYFRA 21-1, DU-PAN-2, hCG, hPL, sialic acid, NSE, orosomucoid, oxytocin, PRL, PSA, PTH, ribonuclease, SCCA, sialyltransferase, TPA, VIP), pCO₂, PT, gastrin releasing peptide, pH, RAC, RAL, RF, somatostatin, GH, GH-RH, T-lym, PLT

↓ AAT, ACE, ADH, AMS, albumin, alpha-aminonitrogen, Apo B, proteins, RBC, fibrinogen, Hb, HCT, chloride, cholesterol, IgA, cortisol, complement - (C₃, C₄), LDL-C, WBC, Na, P, pCO₂, pO₂, prealbumin, T₃, T₄, PLT, transferrin, Zn

■ **Bronchoalveolar Lavage Fluid** ↑ alveolar macrophages, proteins, eos, RBC, globulins, IL, lipids, lym, mastocytes, mesothelial cells, neu, PMN, T-lym, TNF-alpha, free oxygen radicals

■ **Pleural Fluid** ↑ AAT, adenosine deaminase, albumin, A2MG, AMS, ANA, anti-DNA, bacteria (culture), beta-glucuronidase, B2M, proteins, CK, eos, RBC, FDP, fibronectin, haptoglobin, Hb, hemopexin, cholesterol, IgA, IgG, creatinine, blood, LA, LD, WBC, LE cells, lipase, lym, lysozyme, specific gravity, mucopolysaccharides, neu, volume, orosomucoid, pH, PMN, RF, TAG

↓ alpha globulins, proteins, G, cholesterol, complement - (C₃, C₄, CH₅₀), LD, WBC, lipids, lym, pH

- **Sputum** ↑ asbestos particles, bacteria (+ culture), Curschmann's spirals, eos, histiocytes, mucus, pus, Charcot-Leyden crystals, blood, WBC, lym, macrophages, neu, volume, PMN, viscosity
↓ alveolar macrophages
- **Urine** ↑ albumin, alpha-aminonitrogen, AMS, proteins, Ca, hCG, ketones, creatinine, uric acid, WBC, UBG, casts – (granular, hyaline)
- **Peritoneal Fluid** ↑ RBC, TM – (CEA)

inflammatory pulmonary diseases

- ↑ AAT, **alpha-1-globulins**, alpha-2-globulins, CA 15-3, CA 19-9, CEA, ceruloplasmin, CRP, Cu, elastase, ferritin, **ESR**, G, gamma globulins, GMT, haptoglobin, Hb, IgG, **WBC**, mucoproteins, neu, NSE, orosomucoid, TPA, PLT
- ↓ AAT, proteins, IgA, complement – (C₃), prealbumin, transferrin
- **Bronchoalveolar Lavage Fluid** ↑ globulins, IL, tumor-necrosis factor alpha, free oxygen radicals
- **Pleural Fluid** ↑ AAT, A₂MG, haptoglobin, hemopexin, WBC, neu, volume, orosomucoid
- **Sputum** ↑ PMN

renal diseases

- ↑ AAT, ACP, ACTH, epinephrine, Al, aldosterone, alpha-aminonitrogen, ALP, ALT, **A₂MG**, **ammonia**, AMS, amylin, ANF, Apo B, AST, beta-endorphins, beta globulins, BHBA, B₂M, BNP, proteins, Ca, Ca²⁺, CA 27-29, CEA, ceruloplasmin, CIC, CK, CK-MB, CK-MM, C-peptide, CRP, Cu, CYFRA 21-1, cystine, BT, enkephalins, eos, estriol, factor D, RBC, FDP, Fe, ferritin, fibrinogen, fructosamine, **ESR**, G, gamma globulins, gastrin, GIP, glucagon, glycerol, glycine, glycosylated albumin, glycated Hb, GMT, haptoglobin, histamine, HCO₃⁻, chloride, cholesterol, CHS, chymotrypsin, IDL-C, ILGF-I, immunoreactive proinsulin, immunoreactive trypsin, insulin, K, calcitonin, carnitine, catecholamines, complement – (C₃, C₄), cortisol, creatine, **creatinine**, **uric acid**, **cryoglobulins**, LA, LD, LD₁, LD₂, LDL-C, WBC, LH, lipase, lipids, LPs, lysozyme, MAC, MAL, Mb, Mg, Na, neu, neurotensin, Ni, norepinephrine, NT-pro-ANP, plasma volume, osmolality, osteocalcin, P, PT, porphyrins, PP, PRA, PRL, PSA, PTH, RF, RTC, SCCA, Se, secretin, somatostatin, GH, TAG, thrombomodulin, trypsin, trypsinogen, TSH, urea, vitamin – (A, B₁₂, D, E)
- ↓ AAT, **albumin**, aldosterone, alpha-2-globulins, alpha-aminonitrogen, ALT, amino acids, Apo A-I, AST, AT III, beta globulins, proteins, Ca, Ca²⁺, CBG, ceruloplasmin, Cu, EPO, RBC, estrogens, Fe, fibrinogen, FT₃, FT₄, G, **globulins**, HBA_{1c}, Hb, HDL-C, HCT, HCO₃⁻, chloride, ILGF-I, K, carbonic anhydrase, complement – (C_{1r}, C_{1s}, C₂, C₃, C₄), cortisol, glutamic acid, LCAT, WBC, lipoprotein lipase, lym, Mg, Na, Ni, volume, ornithine, osmolality, P, pH, PRA, progesterone, RTC, Se, serotonin, T₃, T₄, TBG, testosterone, TIBC, PLT, **transferrin**, tyrosine, vitamin – (B, B₆, B₁₂, D, folate), Zn
- **Urine** ↑ AAP, ACP, albumin, alpha-aminonitrogen, ALP, ALT, ammonia, AMS, bacteria (+ culture), beta-2-glycoprotein I, proteins, Ca, Ca²⁺, cAMP, cystine, eos, RBC, G, Hb, hexosaminidase, pus, HCO₃⁻, hydroxyproline, K, blood, crystals – (Ca-phosphate, Ca-oxalate, urate, waxy), alpha-ketoglutaric acid, uric acid, LD, WBC, lysozyme, Mb,

- specific gravity, Na, volume, osmolality, oxalates, P, pH, lipids, uroporphyrin, casts – (epithelial, RBC, **granular**, **hyaline**, WBC, Mb, lipid, waxy)
- ↓ Ca, FDP, chloride, K, carnitine, 17-KS, uric acid, specific gravity, Mg, Na, volume, osmolality, oxalates, P, pH, UBG, urea
 - **Peritoneal Fluid** ↑ RBC
 - **Sweat** ↑ Na
- acute renal diseases**
- ↑ epinephrine, alpha-1-globulins, alpha-2-globulins, A2MG, ASLO, Ca, CIC, CRP, elastase, eos, ESR, gamma globulins, GMT, haptoglobin, chloride, cholesterol, IgA, IgE, IgG, IgM, K, creatinine, uric acid, cryoglobulins, LA, LD, LD5, WBC, lipase, lysozyme, MAC, Na, neu, orosomucoid, osmolality, P, urea
 - ↓ albumin, RBC, estriol, Hb, HCT, HCO_3^- , chloride, K, complement – (C1q, C3, C4, C6, CH50), Mg, Na, pCO_2 , PT, pH, PLT
 - **Urine** ↑ AAP, amino acids, bacteria (+ culture), proteins, Ca, eos, RBC, G, Hb, hexosaminidase, pus, HCO_3^- , K, blood, WBC, lysozyme, specific gravity, nitrates, volume, pH, PO_4^- ; tubular cells, casts – (epithelial, RBC, granular, hyaline, WBC, lipid, mixed)
 - ↓ Ca, estriol, chloride, K, creatinine, specific gravity, volume, osmolality, P, urea
- chronic renal diseases**
- ↑ epinephrine, albumin, alpha-1-globulins, alpha-2-globulins, A2MG, BNP, CIC, CRP, CYFRA 21-1, elastase, FDP, ferritin, ESR, G, gamma globulins, GMT, haptoglobin, HbF, chloride, cholesterol, IgA, IgE, IgG, IgM, K, **creatinine**, **uric acid**, LA, LD, lipase, lipids, lysozyme, MAC, MAL, Mg, Na, norepinephrine, orosomucoid, osmolality, P, PT, plasmocytes, PTH, RBP, urea, vitamin – (A, beta-carotene)
 - ↓ alanine, albumin, proteins, Ca, Ca^{2+} , EPO, RBC, estriol, Fe, Hb, HCT, CHS, K, complement – (C1r, C1s, C2, C3, C4, CH50), WBC, Mg, Na, Ni, pH, RTC, **transferrin**, vitamin – (A)
 - **Urine** ↑ AAP, amino acids, bacteria (+ culture), proteins, Ca, eos, RBC, G, Hb, hexosaminidase, pus, K, creatinine, blood, crystals – (Ca-oxalate), WBC, lipids, nitrates, volume, retinol binding protein, fat, casts – (epithelial, RBC, granular, hyaline, WBC, lipid, waxy, mixed)
 - ↓ Ca, estriol, GMT, chloride, K, creatinine, uric acid, specific gravity, volume, P, urea
- infectious renal diseases**
- ↑ AAT, alpha-aminonitrogen, alpha-1-globulins, alpha-2-globulins, A2MG, ASLO, proteins, CIC, CRP, elastase, Fe, ESR, G, gamma globulins, haptoglobin, chloride, cholesterol, IgA, IgG, IgM, K, creatinine, creatinine, uric acid, cryoglobulins, LA, LD, LD5, WBC, lipids, lysozyme, MAC, mucoproteins, Na, orosomucoid, osmolality, P, urea
 - ↓ albumin, proteins, estriol, HCO_3^- ; chloride, K, complement – (C1r, C1s, C2, C3, C4, C6, CH50), LD, Na, osmolality, PT, pH, PLT, urea, vitamin – (A)
 - **Urine** ↑ AAP, AST, bacteria (+ culture), proteins, estriol, RBC, G, Hb, hexosaminidase, pus, K, blood, LAP, LD, WBC, lysozyme, specific gravity, nitrates, pH, casts – (epithelial, RBC, granular, hyaline, WBC)
 - ↓ Ca, estriol, chloride, K, creatinine, uric acid, specific gravity, Na, volume, osmolality, P, pH, urea

rheumatic diseases

- ↑ AAT, ACA, ACE, AGP, alpha-1-antichymotrypsin, alpha-1-globulins (acute period), alpha-2-globulins (acute period), ALP, A2MG, AMA, ANA, ANCA, anti-ds-DNA, anti-ss-DNA, anti-endothelial Ab, anti-HSP 65, antikeratin Ab, antimicrobial Ab, antimyocardial Ab, anti-RNP, anti-Scl-70, anti-Ro/SSA, anti-La, Ha/SSB, APF, ASLO, ASMA, proteins, beta globulins, ceruloplasmin, CIC, CRP, Cu, elastase, eos, ESR, ferritin, fibrinogen, gamma globulins (chronic stage), gastrin, glycosylated Hb, GMT, **haptoglobin**, HLA - (B27, DPw4, DQ7, DQw7, DR1, DR4, DR6, Dw4, Dw10, Dw13, Dw14, Dw15), IgA, IgE, IgG, IgM, IFN-gamma, IL - (1, 6), complement - (Ba, Bb, C3, C4, C4d, C9), creatine, uric acid, cryoglobulins, glutamic acid, LE cells, **WBC** (acute stage), lupus inhibitor, lym, Mn, mono, mucoproteins, neu, osteocalcin, PT, anti-DNA-histone complex Ab, antithyroglobulin Ab, antithyroid Ab, RANA, RF - (IgA, IgM), TNF-alpha, PLT, transferrin, viscosity
- ↓ albumin, ALP, A2MG, amino acids, arginine, beta-2-glycoprotein I, proteins, **RBC**, Fe, glutamine, Hb, HCT, cholesterol, complement - (C1r, C1s, C2, C3, C4, CH50), WBC, Mb, neu, osteocalcin, transferrin satur., TIBC, PLT, transferrin, vitamin - (C, D), Zn
- **Urine** ↑ alanine, Cu, glutamine, glycine, hexosaminidase, hydroxyproline
↓ threonine
- **Pericardial Fluid** ↑ RBC, volume
- **Pleural Fluid** ↑ adenosine deaminase, B2M, proteins, CSF - (GM, M), eos, RBC, crystals - (cholesterol), LA, LD, WBC, lym, neu, PMN, RF
↓ C3, C4, G, pH, viscosity
- **Bronchoalveolar Lavage Fluid** ↑ lym
- **Synovial Fluid** ↑ ceruloplasmin, Cu, eos, RBC, pus, IFN-gamma, IL - (1, 2, 6, 8), LA, LD, WBC, lym, lymphokines, macrophages, mono, neu, PMN, TNF-alpha, volume
↓ C3, G, viscosity
- **Saliva** ↑ IgA, Na

skin diseases

- ↑ antiendomysial Ab, antireticulin Ab, CIC, eos, HLA - (B8, DQw2, DR3, Dw3, Dw5), IgE, IgG, WBC, lym, neu, RF
- ↓ Al, albumin, proteins, Fe, CHS, vitamin - (B₂, B₁₂, folic acid)

spleen diseases

- ↓ WBC, PLT

thyroid gland diseases

- ↑ AAT, ADH, epinephrine, ALP, AMA, ANA, antiadrenal Ab, anti-ds-DNA, antimicrobial Ab, antithyroglobulin Ab, **antithyroid Ab**, antithyroxine Ab, **APA**, bas, beta-carotene, proteins, Ca, cAMP, ceruloplasmin, CK, Cu, DPD, endorphins, enkephalins, FT3, FT4, ESR, G, histaminase, HLA - (Bw35, B37, DR5), cholesterol, CHS, IgA, IgM, iodine, calcitonin, catecholamines, complement - (C3), acetoacetate acid, uric acid, LATS, LD, WBC, lym, macrocytes, neu, TM - (ACTH, AFP, **beta-lipotropin**, CA 50, CEA, hCG, NSE, TPA), norepinephrine, plasma volume, P, PP, antibodies against thyroid peroxidase, anti-TSH receptors Ab, PTH, SHBG, somatostatin, substance P, **T3**, **T4**, TAG, **TSH**, **thyroglobulin**, VIP

↓ albumin, ALP, AMS, Ca, Ca²⁺, RBC, Hb, HCT, cholesterol, IgA, iodine, K, complement – (C₃), WBC, neu, pepsinogen, PRL, T₃, T₄, TBG, TSH, vitamin – (D₃)

■ **Urine** ↑ cAMP, 5-HIAA, 17-OHCS

↓ Ca, cAMP, 17-OHCS, 17-KS, P

■ **Stool** ↑ fat

■ **Cerebrospinal Fluid** ↑ proteins

urinary tract diseases

↑ alpha-1-globulins, alpha-2-globulins, AMS, CRP, ESR, gamma globulins, WBC, neu

↓ albumin

■ **Urine** ↑ acetone, alanine, albumin, ammonia, AMS, bacteria (+ culture), proteins, Ca, DALA, Eo, RBC, estriol, G, Hb, hexosaminidase, pus, HCO₃⁻, chloride, K, catecholamines, ketones, creatinine, crystals – (Ca-phosphate), uric acid, WBC, leukocyte esterase, Mb, Na, nitrites, volume, osmolality, P, pH, casts – (granular, hyaline)

↓ estriol, hCG, Mg, volume, pH, pregnanediol, urea

- infectious urinary tract diseases

↑ alpha-1-globulins, alpha-2-globulins, CRP, ferritin, ESR, WBC, neu

■ **Urine** ↑ bacteria (+ culture), proteins, RBC, G, Hb, WBC, volume, casts – (granular, hyaline)

Diseases, Infectious

actinomycosis (*Actinomyces israelii*)

↑ ESR, WBC, IgA, IgG, IgM

↓ albumin, Hb, HCT

■ **Sputum** ↑ * bacilli (+ culture)

■ **Pleural Fluid** ↑ * bacilli (+ culture)

acute infectious diseases

↑ AAT, AD, PLT adhesion, AGP, ALP, ALT, AMS, alpha-aminonitrogen, alpha-1-antichymotrypsin, alpha-1-globulins, alpha-2-globulins, ASLO, AST, BHBA, conjugated Bil, B₂M, B-lym, ceruloplasmin, CIC, CRP, Cu, D-dimers, elastase, eos, FDP, ferritin, fibrinogen, ESR, gamma globulins, IFN-gamma, glucagon, haptoglobin, IgA, IgE specific antibodies, IgG, IgM, IL – (2, 4, 6), K, complement – (C₃, C₄), cortisol, creatinine, cryoglobulins, uric acid, LA, LD, WBC, lym, lysozyme, MAC, mono, mucoproteins, neu, orosomucoid, RE, TNF, PLT, tropomyosin, trypsin, urea, viscosity

↓ ACE, albumin, proteins, carbohydrate-deficient transferrin (false), ceruloplasmin, Cu, eos, Fe, RBC, fibronectin, G6PD (RBC), Hb, HDL-C, HCT, chloride, cholesterol, CHS, complement – (C_{1r}, C_{1s}, C₃, CH₅), lym, neu, pH, pO₂, transferrin satur., PLT, transferrin, vitamin – (A, C), Zn

■ **Urine** ↑ bacteria (+ culture), proteins, Ca, RBC, fructose, G, galactose, Hb, hemosiderin, pus, ketobody, 17-KGS, 17-KS, uric acid, WBC, lysozyme, Mb, volume, reducing sugars, UBG, casts – (granular, hyaline, WBC)

↓ P

■ **Cerebrospinal Fluid** ↑ proteins, IgG, LA, WBC, lym, MBP, PMN, pressure

↓ G

- **Sputum** ↑ eos, mucus, Charcot–Leyden crystals, blood
- **Peritoneal Fluid** ↑ LA, RBC, WBC
- ↓ pH
- **Pleural Fluid** ↑ AMS, B2M, proteins, RBC, fibronectin, IgG, LD, lym, lysozyme, mucopolysaccharides, neu, volume
- **Stool** ↑ proteins, heme, mucus, pus, blood
- **Synovial Fluid** ↑ CIC, eos, pus, complement – (C₃, C₄), crystals – (calcium oxalate), WBC, macrophages, PMN
- ↓ viscosity

AIDS (HIV positivity)

- ↑ ACE, ALP, ALT, ANA, ANCA, c-ANCA, atypical-ANCA, anti-CMV Ab, anti-EBV Ab, anti-RBC, **p24 antigen**, **anticardiolipin Ab**, * **anti-HIV Ab** (IgG), antilymphocyte Ab, anti-PLT Ab, APA, ASMA, AST, **B2M**, B-lym, soluble CD4, CD8-lym (suppressant), ceruloplasmin, CIC, CRP, **elastase**, **ESR**, ferritin, **gamma globulins**, G, GM-CSF, GMT, * **HIV antigen**, * **HIV-1 RNA**, * **HIV** (culture), * **HIV DNA** (PCR), HbCag, h-sICAM-1, **IgA**, **IgD**, IgE, IgG, **IgM**, **IFN-alpha** (acid labile), IFN-gamma, cortisol, IL – (2, 4, 6), sIL-2R, sIL-6R, IL2 receptors, LD, **WBC**, **lysozyme**, **neopterin**, antibrain Ab, RF, T₄, TAG, alpha-1-thymosin, TNF-alpha, PLT, VDRL (false)
- ↓ aldosterone, albumin, anti-EBV-VCA (false), **CD4-lym (helper)**, EPO, **RBC**, G, **Hb**, **HDL-C**, **HCT**, cholesterol, **IgD**, IgG, IL-2, complement – (C_{1r}, C₃), cortisol, **WBC**, **lym**, Na, neu, protein S, Se, serotonin, T-lym (T₄, CD4+), T₄/T₈ ratio, PLT, vitamin B₁₂
- **Urine** ↑ proteins, **anti-HIV Ab**
- **Cerebrospinal Fluid** ↑ * **anti-HIV**, proteins, B2M, WBC, MBP
- **Synovial Fluid** ↑ clot formation, WBC, PMN, volume

amebiasis (*Entamoeba histolytica*)

- ↑ ALP, ALT, * **antibodies against E. histolytica** (IgG, IgM), AST, Bil, eos, ESR, GMT, LAP, LD, neu, 5-NT, WBC
- ↓ albumin, CHS, Hb, HCT, WBC, microcytes
- **Cerebrospinal Fluid** ↑ proteins, RBC, lym, WBC, PMN, pressure
- ↓ G
- **Pleural Fluid** ↑ proteins, specific gravity
- ↓ pH
- **Stool** ↑ proteins, * **entamoebal antigen**, heme, mucus, Charcot–Leyden crystals, **blood**, * **protozoans**, WBC

anthrax (*Bacillus anthracis*)

- ↑ * **bacilli**, ESR, WBC, PMN
- **Urine** ↑ Hb
- **Cerebrospinal Fluid** ↑ bacilli, proteins, RBC, PMN
- ↓ G
- **Peritoneal Fluid** ↑ bacilli
- **Pleural Fluid** ↑ bacilli
- **Stool** ↑ bacilli

ascariasis (*Ascaris lumbricoides*)

- ↑ eos, WBC, IgE
- **Stool** ↑ * **parasite ova**

aspergillosis (*Aspergillus fumigatus* + species)

- ↑ ADH, ALT, * antibodies against aspergillus (IgG, IgM), * aspergillus antigen, eos, IgE, IgE specific Ab, WBC, urea
- ↓ albumin, HCO₃⁻, WBC, pH, pO₂, pCO₂
- **Sputum** ↑ Curshmann's spirals, * fungi, eos, mucus, Charcot-Leyden crystals, mycelia, casts, color changes
- **Bronchoalveolar Lavage Fluid** ↑ macrophages
- **Synovial Fluid** ↑ crystals – (calcium oxalate)

babesiosis (*Babesia microti*)

- ↑ ALT, AST, * protozoans (+ RBC), * babesia antigen, * babesia DNA (PCR), Bil, GMT, LD
- ↓ RBC, Hb, HCT, WBC, PLT
- **Urine** ↑ Hb

bacterial infectious diseases

- ↑ unconjugated Bil, CK-MB, CRP, elastase, ESR, complement – (C₃), WBC, neu, PCT, tropomyosin
- ↓ albumin, complement – (C1r, C1s, C4, C5, C6, C7, C8, C9, CH50), C1-INH
- **Pleural Fluid** ↑ WBC
- **Bronchoalveolar Lavage Fluid** ↑ neu

- acute bacterial infectious diseases

- ↑ AAT, ADA, ADH, aldolase, alpha-1-antichymotrypsin, alpha-1-globulins, A2MG, ANA, antimyocardial Ab, Apo E, ASLO, AT III, beta globulins, unconjugated Bil, proteins, Ca, ceruloplasmin, CIC, CRP, elastase, eos, RBC, fibrinogen, ESR, G, gamma globulins, haptoglobin, Hb, cold agglutinins, IgA, IgG, kininogenase, complement – (C₂, C₃, C₄, C₅, C₉), uric acid, LA, lactoferrin, WBC, lipase, lym, lysozyme, MAC, mono, mucoproteins, neu, orosomuroid, pCO₂, PT, plasminogen, plasmocytes, RF, febrile agglutinins, tropomyosin, urea, VDRL (false)
- ↓ ACE, albumin, proteins, RBC, G, Hb, HCT, cholesterol, IgM, complement – (C1r, C1s, C5, C6, C7, C8, C9, CH50), cortisol, pH, PLT
- **Urine** ↑ proteins, Ca, RBC, Hb
- **Sputum** ↑ bacteria (+ culture), RBC, blood
- **Pleural Fluid** ↑ ADA, B2M, proteins, RBC, fibronectin, IgG, LD, lym, lysozyme, mucopolysaccharides, neu, WBC, volume
- **Stool** ↑ mucus, blood, WBC

- chronic bacterial infectious diseases

- ↑ ASLO, CIC, CRP, ESR, complement – (C₃, C₄), WBC, lym, RF, urea
- ↓ complement – (C1r, C1s, C5, C6, C7, C8, C9, CH50)

balantidiasis (*Balantidium coli*)

- **Stool** ↑ * protozoans

bartonellosis (*Bartonella quintana*)

- ↑ * bacilli, * antibodies against *Bartonella quintana* (IgG), nucleated RBC, WBC

cat scratch disease (*Bartonella henselae*)

- ↑ * bacilli (PCR), * antibodies against *Bartonella henselae* (IgG, IgM), eos, ESR, WBC
- **Cerebrospinal Fluid** ↑ * bacilli (PCR)

bejel (*T. pallidum*, subspecies *endemicum*)

- ↑ syphilis Ab (false), treponemal antibodies (false), VDRL

blastomycosis (*Blastomyces dermatitidis*, *Paracoccidioides brasiliensis*)

↑ ALP, * antibodies against *B. dermatitidis*, ESR, WBC

↓ albumin, Hb, HCT

■ *Sputum* ↑ * fungi (+ culture)

borreliosis, Lyme (*Borrelia burgdorferi*)

↑ ALP, ALT, * Ab against *B. burgdorferi*, AST, treponemal antibodies (false), CIC, CK-MB, ESR, GMT, HLA – (DR2, DR4), HCT, IgG, IgM, cryoglobulins, LAP, LD, 5-NT, WBC

↓ RBC, ESR, Hb, HCT, WBC

■ *Synovial Fluid* ↑ C₃, C₄, CIC, eos, pus, WBC, PMN

↓ viscosity

■ *Cerebrospinal Fluid* ↑ * antibody against *B. burgdorferi*, proteins, IgG, lym, PMN, pressure, WBC

↓ G

brucellosis (*Brucella melitensis*, *B. suis*, *B. abortus*)

↑ * Ab against brucella, ALP, ALT, AST, ESR, IgG, IgM, LAP, WBC, lym, mono, febrile agglutinins, 5-NT, RF, syphilis Ab (false), VDRL (false)

↓ albumin, RBC, ESR, Hb, HCT, WBC, neu

■ *Cerebrospinal Fluid* ↑ proteins, lym

↓ G, chloride

campylobacteriosis (*Campylobacter jejuni* + species)

↑ * bacteria (culture)

■ *Stool* ↑ * bacteria (culture)

■ *Synovial Fluid* ↑ clot formation, volume

candidiasis (moniliasis) (*Candida albicans*)

↑ * antibodies against *C. albicans*, * fungi (culture), Ca, IgE, WBC

↓ complement – (C₃), WBC

■ *Nails* ↑ * fungi (culture)

cholera (*Vibrio comma*)

↑ * antitoxin Ab, ASLO, proteins, RBC, Hb, HCT, chloride, creatinine, uric acid, LA, WBC, MAC, Na, neu, P, specific gravity, urea, * vibriocidal Ab, viscosity

↓ HCO₃⁻; chloride, K, Na, pH

■ *Urine* ↓ volume

■ *Stool* ↑ HCO₃⁻; chloride, Na

chronic infectious diseases

↑ AD, AGP, alpha-1-globulins, ALP, ALT, AMS, ASLO, AST, BHBA, conjugated Bil, ceruloplasmin, CIC, CRP, Cu, D-dimers, elastase, eos, FDP, ESR, ferritin, fibrinogen, gamma globulins, glucagon, haptoglobin, IgA, IgD, IgG, K, complement – (C₃, C₄), cortisol, uric acid, LA, LD, WBC, lym, lysozyme, mono, mucoproteins, neu, TBG, TPA, PLT, tropomyosin, urea

↓ albumin, proteins, Cu, eos, RBC, Fe, galactose, G6PD (RBC), Hb, HCT, HDL-C, cholesterol, CHS, complement – (C₃, C₄, C₅, C₆, C₇, C₈, C₉, CH₅₀), LDL-C, WBC, lym, neu, plasma volume, RTC, transferrin satur., PLT, TIBC, transferrin, vitamin – (A, B₁₂, C)

■ *Urine* ↑ bacteria (+ culture), proteins, G, Hb, hemosiderin, 17-KGS, 17-KS, WBC, lysozyme, volume, reducing sugars, casts – (granular, hyaline, WBC)

clonorchiasis (*Clonorchis sinensis*)

■ *Stool* ↑ * parasite ova, * *Clonorchis sinensis* antigen

- *Duodenal Content* ↑ * parasite ova
- clostridial infectious diseases (*Clostridium perfringens*)**
 - ↑ Bil, CK-MB, WBC, creatinine, spherocytes, osmotic fragility (RBC), MHb
 - ↓ Hb, HCT, PLT
 - *Urine* ↑ proteins, Hb, hemosiderin, casts
 - ↓ volume
 - *Stool* ↑ WBC
- coccidioidomycosis (*Coccidioides immitis*)**
 - ↑ * Ab against *Coccidioides immitis* (IgG, IgM), * fungi (culture), ACE, Ca, eos, ESR, IgE, WBC
 - ↓ ACE, albumin, G
 - *Sputum* ↑ * fungi (+ culture)
 - *Bronchoalveolar Lavage Fluid* ↑ * fungi (+ culture)
 - *Cerebrospinal Fluid* ↑ proteins, * Ab against *Coccidioides immitis* (IgG, IgM), * fungi (culture), eos, WBC, pressure
 - ↓ G
 - *Stool* ↑ * fungi (culture)
 - *Urine* ↑ * fungi (culture)
- coccidiosis (*Isospora hominis*, *I. belli*, *Cryptosporidium parvum*)**
 - *Stool* ↑ * protozoan oocysts
- cryptococcosis (*Cryptococcus neoformans*)**
 - ↑ ALT, * cryptococcal antigen, * fungi (culture), * antibodies against *C. neoformans* (IgG, IgM), WBC
 - *Cerebrospinal Fluid* ↑ proteins, * fungi (culture), * cryptococcal antigen, * antibodies against *C. neoformans* (IgG, IgM), WBC, lym, pressure
 - ↓ G
 - *Sputum* ↑ * fungi (culture)
 - *Urine* ↑ * fungi (culture)
 - *Stool* ↑ * fungi (culture)
- cryptosporidiosis (*Cryptosporidium*)**
 - ↑ * cryptosporidial antigen
 - *Stool* ↑ * protozoans
- cysticercosis (*Cysticercus cellulosae*, larva of *Taenia solium*)**
 - ↑ CK-MB, proteins, mono
 - ↓ G
 - *Cerebrospinal Fluid* ↑ proteins, WBC, pressure
 - ↓ G
- dengue (flaviviruses)**
 - ↑ * antibodies against flavivirus (IgM), * flavivirus DNA (PCR)
 - ↓ WBC, PLT
- diphtheria (*Corynebacterium diphtheriae*)**
 - ↑ globulins, neu, toxoid antibodies, WBC, urea
 - ↓ G, Hb, HCT, WBC
 - *Urine* ↑ albumin, blood, casts
 - *Cerebrospinal Fluid* ↑ proteins, mono
- disease, legionnaires' (*Legionella pneumophila*)**
 - ↑ ALP, ALT, AST, * antibodies against *Legionella* (IgG, IgM), * bacilli (culture), Bil, ESR, LD, WBC, * PCR (*Legionella*), PMN
 - ↓ albumin, WBC, Na, P, pCO₂, pO₂

- *Urine* ↑ * bacillus Ag, * PCR (Legionella), proteins, RBC, blood
 - *Sputum* ↑ * bacilli (culture), PMN, positive DNA probe
 - *Bronchoalveolar Lavage Fluid* ↑ positive DNA probe, * PCR (Legionella)
 - *Pleural Fluid* ↑ * bacilli (culture), bacillus Ag, positive DNA probe
- dysentery, bacillary (Shigella species)**
- ↑ chloride, ↑ RBC, Hb, K, WBC, MAC, neu, Na, urea
 - ↓ chloride, proteins, G, Hb, HCT, K, WBC, Na, pCO₂, pH, PLT
 - *Stool* ↑ * bacteria (culture), RBC, mucus, blood, WBC, pus
- ehrlichiosis (ricketsial-like coccobacillus)**
- ↑ * Ehrlichia DNA (PCR), ALT, AST, * antibodies against Ehrlichia (IgG, IgM)
 - ↓ Hb, HCT, WBC, PLT
 - *Cerebrospinal Fluid* ↑ * Ehrlichia DNA (PCR), proteins, lym
- erysipelas (Str. pyogenes)**
- ↑ ESR, WBC
- erythema infectiosum (fifth disease) (Parvovirus B19)**
- ↑ * antibodies against parvovirus B19 (IgG, IgM), eos
- exanthema subitum (human herpesvirus 6)**
- ↑ * HHV-6, * early viral antigen, * antibodies against HHV-6, * HHV-6 DNA (PCR), WBC (early), lym
 - ↓ WBC (later)
- fascioliasis (Fasciola hepatica)**
- ↑ ALT, AST, eos, * antibodies against F. hepatica (IgG, IgM), IgE, WBC
 - *Stool* ↑ * parasite ova, * F. hepatica antigen
 - *Duodenal Content* ↑ * parasite ova
- fever, Colorado tick (reoviridae)**
- ↑ * antibodies against orbivirus (IgG, IgM), * orbivirus antigen (RBC)
 - ↓ WBC, PMN
- fever, hemorrhagic**
- ↑ APTT, * antibodies against hantavirus (IgG, IgM), Hb, HCT, LD, WBC, Na, PT, WBC, urea
 - ↓ albumin, proteins (total), WBC, PLT
 - *Urine* ↑ proteins
 - ↓ volume
- Hantavirus pulmonary syndrome**
- ↑ * antibodies against hantavirus (IgG, IgM), Hb, HCT
 - ↓ PLT
- fever, paratyphoid (Salmonella paratyphi A or B)**
- ↑ * bacteria (culture), lym, WBC
 - ↓ eos, Hb, HCT, WBC, neu
- fever, Rocky Mountain, spotted (Rickettsia rickettsii)**
- ↑ ALT, * Ab against R. rickettsii (IgG, IgM), AST, * R. rickettsii DNA (PCR), CK-MB, WBC, mono, urea
 - ↓ albumin, proteins, Ca, factor - (II, V, XII), fibrinogen, Hb, HCT, WBC, Na, neu, PLT
 - *Urine* ↑ casts
 - ↓ volume
 - *Cerebrospinal Fluid* ↑ * Ab against R. rickettsii (IgG, IgM)

fever, typhoid (*Salmonella typhi*)

- ↑ ADA, Ag H, Ag O, ALP, ALP isoenzymes, ALT, AST, * **bacteria** (culture), * **anti-typhoid Ab**, Bil, CK, Cu, ESR, globulins, IgA, complement – (C₃), LD, WBC (early), lym, MD, T₄
- ↓ eos, ESR, Fe, Hb, HCT, WBC, neu, T₃, TBG, Zn
- **Urine** ↑ albumin, alpha-aminonitrogen, * **bacteria** (culture), **proteins**, Hb, ketones, creatinine
- ↓ chloride, volume
- **Stool** ↑ blood, * **bacteria** (culture)

fever, yellow (flaviviruses)

- ↑ ALT, * **anti-arbovirus Ab**, Bil
- ↓ G, WBC, lym, neu
- **Urine** ↑ proteins
- ↓ volume
- **Stool** ↑ blood

filariasis (*Wuchereria bancrofti*, *Brugia malayi*)

- ↑ * **Ab against filaria**, * **filaria antigen**, * **parasite**, ALT, eos, IgE, RF
- **Urine** ↑ chylus, * **filaria antigen**
- **Cerebrospinal Fluid** ↑ * **parasite** (non-lymphatic filariasis)
- **Peritoneal Fluid** ↑ proteins, TAG

fungal infectious disease

- ↑ ACE, Ca, CK-MB, IgA, IgM, WBC, neu, PCT
- ↓ RBC
- **Synovial Fluid** ↑ clot formation, volume

giardiasis (*Giardia lamblia*)

- ↑ antibodies against *G. lamblia* (IgG, IgM)
- **Stool** ↑ * **protozoans**, * **Giardia antigen**

gonorrhoea (*Neisseria gonorrhoeae*)

- ↑ WBC, neu
- **Urine** ↑ * **bacteria** (+ culture), * **gonococcal antigen**
- **Stool** ↑ * **bacteria** (+ culture)

herpes simplex (*Herpes simplex virus*)

- ↑ * **anti-Herpes simplex virus 1,2 Ab** (IgG, IgM), * **HSV DNA** (PCR)
- **Cerebrospinal Fluid** ↑ proteins, WBC, lym

herpes zoster (*Herpes zoster virus*)

- ↑ * **antibodies against Herpes zoster virus**, ALP, ALT, AST, B₂M, creatinine, LD, WBC, mono, neu, PRL, urea
- ↓ albumin, Hb, HCT, WBC
- **Cerebrospinal Fluid** ↑ proteins, 5-HIAA, HVA, WBC, lym, mono, pleocytosis, pressure
- **Urine** ↑ Mb

histoplasmosis (*Histoplasma capsulatum*)

- ↑ ALT, * **Ab against H. capsulatum** (IgG, IgM), * **fungi** (+ culture), * **histoplasma antigen**, ACE, Ca, lym, WBC
- ↓ RBC, Fe, Hb, HCT, WBC, neu, PLT
- **Sputum** ↑ * **histoplasma antigen**, * **fungi** (+ culture)
- **Urine** ↑ * **histoplasma antigen**
- **Cerebrospinal Fluid** ↑ * **histoplasma antigen**
- **Bronchoalveolar Lavage Fluid** ↑ * **histoplasma antigen**

hookworm disease (*Necator americanus*, *Ancylostoma duodenale*)

- ↑ anisocytes, bas, eos, cholesterol, IgE, IgM, WBC, poikilocytes, TIBC
- ↓ albumin, proteins, Fe, RBC, Hb, HCT, iron, MCH (RBC), MCHC (RBC), MCV (RBC), microcytes, transferrin satur.
- Urine ↑ proteins
- Stool ↑ * parasite ova, blood

i. d. caused by adenoviruses

- ↑ * antibodies against adenoviruses, ESR
- ↓ WBC

i. d. caused by cestodes

- ↑ eos, IgE
- ↓ folic acid

i. d. caused by chlamydia

- ↑ * bacteria (culture), * antibodies against chlamydia (IgG, IgM), * chlamydia antigen, VDRL (false)

i. d. caused by coxsackie

- ↑ * Ab against coxsackie, trypsin
- Urine ↑ Mb
- Cerebrospinal Fluid ↑ proteins, lym, PMN

i. d. caused by cytomegalovirus

- ↑ * anti-CMV Ab (IgG, IgM), * CMV DNA (PCR), * CMV antigen, ALP, ALT, ANA, anti-EBV-VCA IgG (false), AST, Bil, CRP, h-sVCAM-1, * cytomegalovirus (PCR, WBC), cold agglutinins, IgE, IgG, IgM, complement – (C₃), cryoglobulins, lym, mono, RF
- ↓ albumin, Hb, HCT, complement – (C₄), neu, PLT
- Urine ↑ * CMV antigen, * cytomegalovirus (culture), * CMV DNA (PCR), casts – (epithelial)
- Stool ↑ * CMV antigen
- Amniotic Fluid ↑ * cytomegalovirus (culture)
- Bronchoalveolar Lavage Fluid ↑ * anti-CMV Ab (IgG, IgM), * CMV antigen
- Cerebrospinal Fluid ↑ proteins, * CMV DNA (PCR), * anti-CMV Ab (IgG, IgM), pp65 antigen (WBC)

i. d. caused by *Haemophilus influenzae*

- ↑ * bacteria (culture), WBC, PMN
- Urine ↑ * bacterial capsular Ag (type B)
- Cerebrospinal Fluid ↑ * bacterial capsular Ag (type B)

i. d. caused by *Helicobacter pylori*

- ↑ * antibodies against *H. pylori* (IgG)
- Stool ↑ * *H. pylori* antigen
- Urine ↑ antibodies against *H. pylori* (IgG)
- Saliva ↑ antibodies against *H. pylori* (IgG), PCR
- Gastric Fluid ↑ PCR

i. d. caused by *Neisseria*

- ↓ complement – (C₅, C₆, C₇, C₈)

i. d. caused by Parainfluenza virus

- ↑ * Ab against Parainfluenza virus
- ↓ WBC

i. d. caused by parvoviruses

- ↑ * Ab against Parvovirus B19
- ↓ neu

i. d. caused by *Pneumocystis carinii*

- ↑ * *P. carinii* DNA (PCR), antibodies against *P. carinii* (IgG, IgM), LD, pCO₂
- ↓ Hb, HCT, lym, pO₂
- **Bronchoalveolar Lavage Fluid** ↑ * fungi
- **Sputum** ↑ * fungi

i. d. caused by *Pseudomonas aeruginosa*

- ↑ * bacteria (culture), ESR, WBC, pCO₂
- ↓ WBC, pO₂

i. d. caused by respiratory syncytial virus

- ↑ * Ab against respiratory syncytial virus (IgG, IgM), * respiratory syncytial virus antigen, ESR, WBC

i. d. caused by *Yersinia pestis*

- ↑ ALT, AST, * bacteria (+ culture), * antibodies against *Yersinia pestis*, FDP, WBC, PT, PMN
- **Sputum** ↑ * bacteria
- **Cerebrospinal Fluid** ↑ proteins, PMN
- ↓ G
- **Synovial Fluid** ↑ clot formation, volume

i. d. caused by *Yersinia enterocolitica*

- ↑ * antibodies against *Yersinia enterocolitica*
- **Stool** ↑ RBC, blood, WBC, * bacteria (culture)

influenza

- ↑ * Ab against Influenza virus (IgG, IgM), BzM, CRP, cold agglutinins, WBC, lym, RF
- ↓ WBC, lym, pCO₂, neu
- **Urine** ↑ Mb

intra-amniotic i. d.

- ↑ CRP, IL-6, WBC, PMN
- **Amniotic Fluid** ↑ * bacteria (culture), WBC, acid – (acetic, propionic, butyric, succinic)
- ↓ * G

leishmaniasis (kala-azar) (*Leishmania donovani*)

- ↑ * protozoans (+ culture), gamma globulins, ESR, complement – (C1q), IgG, cryoglobulins, mono
- ↓ albumin, RBC, Hb, HCT, WBC, neu, PLT
- **Urine** ↑ proteins, blood

leprosy (*Mycobacterium leprae*)

- ↑ ACE, ANA, Ca, CIC, CRP, ESR, fibrinogen, globulins, histamine, IgA, IgE, IgG, IgM, complement – (C₃, total), cryoglobulins, LE cells, WBC, mono, plasmocytes, RF, T_H-lym, syphilis Ab (false), VDRL (false)
- ↓ albumin, alpha-1-globulins, Ca, FDP, RBC, T-lym, cholesterol, Hb, HCT, Mg
- **Synovial Fluid** ↑ macrophages

leptospirosis (*Leptospira icterohaemorrhagiae*, *L. canicola*, *L. pomona*)

- ↑ ALP, ALT, AST, * antibodies against leptospira (IgG, IgM), * bacteria (culture), Bil, CK, ESR, IgM, IL – (6, 8), * leptospira DNA (PCR), WBC, neu, TNF, urea, VDRL (false)
- ↓ ESR, Hb, HCT, WBC, pCO₂, PLT
- **Urine** ↑ proteins, * bacteria (culture), RBC, WBC, casts
- ↓ volume

- **Cerebrospinal Fluid** ↑ proteins, * bacteria (culture), WBC, lym, mono, PMN, pressure
- listeriosis (*Listeria monocytogenes*)**
 - ↑ * bacteria (+ culture), ESR, WBC
 - **Cerebrospinal Fluid** ↑ proteins, * bacteria (+ culture), WBC, PMN
- Lymphogranuloma venereum (*Chlamydia trachomatis*)**
 - ↑ * antibodies against *Chlamydia trachomatis* (L1, L2, L3), ESR, VDRL (false), lym (relat), mono (relat), WBC
 - ↓ Hb, HCT
- malaria (*Plasmodium vivax*, *P. malariae*, *P. falciparum*, *P. ovale*)**
 - ↑ ALT, ALP, AST, * antibodies against *Plasmodium* (IgG, IgM), Bil, conjugated Bil, unconjugated Bil, CRP, ESR, DNA probe (*P. falciparum*), gamma globulins, GMT, cold agglutinins, IgM, creatinine, LA, WBC, lym, methemalbumin, mono, * parasite, * plasmodium DNA (PCR), PT, RF, urea, syphilis Ab (false), VDRL (false), viscosity
 - ↓ albumin, AT III, Ca, RBC, fibrinogen, G, granulocytes, haptoglobin, Hb, HCT, HCO₃⁻, complement - (C₃, C₄), WBC, Na, neu, P, pH, PLT
 - **Urine** ↑ proteins, RBC, Hb, WBC, UBG
 - ↓ volume
 - **Cerebrospinal Fluid** ↑ proteins, LA, WBC, lym, pressure
 - ↓ G
- measles (rubeola) (paramyxoviruses)**
 - ↑ * Ab against rubeola virus (IgG, IgM), B2M, cold agglutinins, ESR, WBC, lym
 - ↓ complement - (C₃), WBC (later), lym, neu, PLT (early)
 - **Sputum** ↑ giant cells
 - **Urine** ↑ rubeola antigen (sediment cells)
 - **Cerebrospinal Fluid** ↑ proteins, WBC, lym, mono, pressure
- mononucleosis, infectious (Epstein-Barr virus)**
 - ↑ ACP (WBC), ADA, aldolase, ALP, * ALT, AMA, aminotripeptidase, AMS, ANA, anti-ss-DNA, * anti-EBV Ab, ASMA, AST, Bil, B2M, BSP retention, CRP, EBNA Ab (IgG, IgM), early antigen anti-D Ab, early antigen anti-R Ab, eos, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, globulins, GMT, guanase, Hb, HCT, HBD, cold agglutinins, ICD, IgA, IgE, IgG, IgG-VCA, IgM-VCA, IgM, uric acid, cryoglobulins, LAP, LD, LD - (2, 3, 4, 5), WBC (later), * lym, MD, mono, neu, plasmocytes, RF, syphilis Ab (false), VDRL (false)
 - ↓ PLT aggregation, albumin, eos, RBC, ESR, haptoglobin, Hb, HCT, cholesterol, CHS, WBC (early), neu, PLT
 - **Urine** ↑ albumin, RBC, coproporphyrin, Mb, UBG
- mucormycosis (*Zygomycetes* species)**
 - ↑ antibodies against *Zygomycetes* species (IgG, IgM)
 - **Cerebrospinal Fluid** ↑ * fungi (culture)
- mycoplasmosis (*Mycoplasma pneumoniae*)**
 - ↑ * Ab against *Mycoplasma pneumoniae* (IgG, IgM), * bacteria (+ culture), CRP, ESR, WBC, cold agglutinins, lym, VDRL (false), * mycoplasma antigen
 - **Synovial Fluid** ↑ clot formation, volume
- mycosis fungoides**
 - ↑ ALT
 - ↓ lym, WBC

nocardiosis (*Nocardia asteroides*)

- ↑ * antibodies against *N. asteroides* (mycobacteriaceae), WBC
- **Sputum** ↑ * fungi (culture)
- **Bronchoalveolar Lavage Fluid** ↑ * fungi (culture)

opisthorchiasis (*Opisthorchis felineus*)

- ↑ * antibodies against *O. felineus* (IgE, IgG), * **opisthorchis antigen**
- **Stool** ↑ * parasite ova
- **Duodenal Content** ↑ * parasite ova

paragonimiasis (*Paragonimus westermani*)

- ↑ * antibodies against *P. westermani*, * **paragonimus antigen, eos**
- **Stool** ↑ * parasite ova, blood
- **Sputum** ↑ * parasite ova, blood

parasitic infectious diseases

- ↑ AFP, aldolase, ALP, ALT, AST, proteins, ClC, eos, cold agglutinins, IFN-gamma, IgE, IgG, IgM, IL-2, LD, WBC, mono, neu, PCT, poikilocytes, RF
- ↓ albumin, proteins, RBC, Fe, Hb, HCT, CHS, complement – (C₃), WBC, vitamin – (B₁₂, folate), PLT, Zn
- **Urine** ↑ proteins, RBC, Hb, blood
- **Cerebrospinal Fluid** ↑ bas, eos
- **Synovial Fluid** ↑ eos
- **Stool** ↑ proteins, blood, WBC

– acute parasitic infectious diseases

- ↑ eos, IgG, neu
- ↓ Zn

parotitis, epidemic (mumps) (paramyxoviruses)

- ↑ AMS, * antibodies against mumps virus (IgG, IgM), B₂M, cold agglutinins, ESR, lipase, WBC, lym, mono, trypsin
- ↓ WBC, neu
- **Urine** ↑ AMS, G, blood, * **mumps virus antigen**
- **Cerebrospinal Fluid** ↑ proteins, * antibodies against mumps virus (IgG, IgM), G, IgG, IgM, oligoclonal immunoglobulins, WBC, lym, mono, PMN, pressure
- ↓ G
- **Synovial Fluid** ↑ WBC, clot formation, PMN, volume

pertussis (*Bordetella pertussis*)

- ↑ * Ab against *B. pertussis* (IgG, IgM), * **bordetella antigen, WBC, lym**
- **Sputum** ↑ * bacteria (+ culture)

pinta

- ↑ syphilis Ab (false), **treponemal antibodies** (false), VDRL

poliomyelitis, acute anterior (poliovirus)

- ↑ ALT, * **anti-poliovirus Ab**, AST, B₂M, creatine, LA, WBC, mucoproteins, neu, pCO₂, PMN (early)
- ↓ chloride, WBC, mono (later), neu (later), pO₂
- **Cerebrospinal Fluid** ↑ AST, proteins, G, LD, LD₂, LD₃, WBC, lym, mono, PMN, pressure
- ↓ vitamin C
- **Stool** ↑ * **poliovirus** (culture)

protozoan infectious diseases

- ↑ unconjugated Bil
- ↓ WBC, PLT

pseudomalleus (*Burkholderia pseudomallei*)

↑ * **Ab against *Burkholderia pseudomallei***

psittacosis (*Chlamydia psittaci*) (+ornithosis)

↑ **ALT, * antibodies against *Chlamydia psittaci* (IgG, IgM), ESR, cold agglutinins, VDRL (false), WBC**

↓ **WBC (early)**

■ **Urine** ↑ albumin, proteins

■ **Cerebrospinal Fluid** ↑ **WBC**

■ **Sputum** ↑ * **bacteria (culture)**

■ **Pleural Fluid** ↑ * **bacteria (culture)**

Q-fever (*Coxiella burnetii*)

↑ **ALT, * antibodies against *C. burnetii* (IgG, IgM), WBC**

↓ **WBC**

rabies (**hydrophobia**) (**rhabdoviruses**)

↑ * **Ab against Rabies virus, WBC, mono, PMN**

■ **Urine** ↑ albumin, proteins, G, ketone bodies, casts – (hyaline)

■ **Cerebrospinal Fluid** ↑ **proteins, * Ab against Rabies virus, * Rabies virus RNA (PCR), lym, WBC, PMN**

■ **Saliva** ↑ * **Rabies virus RNA (PCR), * Rabies virus (culture)**

rickettsiosis

↑ * **Ab against Rickettsia species (IgG, IgM), ESR, lym, mono, neu, febrile agglutinins, WBC (later), urea, VDRL (false)**

↓ **albumin, proteins, WBC (early), Hb, HCT, Na, neu, PLT**

■ **Urine** ↑ albumin, Hb, blood, casts – (granular)

■ **Cerebrospinal Fluid** ↑ eos, WBC

rubella (**German measles**) (**Rubella virus**)

↑ * **Ab against rubella virus (IgG, IgM), unconjugated Bil, B2M, IgM, WBC (acute stage), lym, plasmocytes**

↓ **WBC (later), neu, PLT**

■ **Amniotic Fluid** ↑ * **rubella virus**

■ **Synovial Fluid** ↑ **WBC, clot formation, mono, PMN, volume**

salmonellosis

↑ **mono, febrile agglutinins**

■ **Urine** ↑ **Hb**

■ **Stool** ↑ **blood, WBC**

scabies (**Sarcoptes scabiei**)

↑ **eos**

scarlatina (**scarlet fever**) (**Streptococci A**)

↑ * **ASLO, * bacteria (+ culture), CRP, eos, ESR, cold agglutinins, WBC, VDRL (false)**

■ **Urine** ↑ **proteins, albumin, RBC, Hb, casts**

↓ **chloride**

schistosomiasis (**Schistosoma species**)

↑ * **Ab against Schistosoma species, AFP, ALP, ALT, eos, CIC, CK-MB, ESR, IgE, IgG, IgM, WBC, RF**

↓ **WBC**

■ **Urine** ↑ **proteins, * parasite ova (chronic), RBC, Hb, blood**

■ **Sputum** ↑ * **parasite ova**

■ **Stool** ↑ * **parasite ova (chronic)**

sporotrichosis (**Sporothrix schenckii**)

↑ * **antibodies against Sporothrix schenckii (IgG, IgM)**

- *Cerebrospinal Fluid* ↑ * antibodies against *Sporothrix schenckii* (IgG, IgM)
- streptococcal infectious diseases**
 - ↑ antimyocardial Ab, * ASLO, * bacteria (+ culture), CRP, eos, ESR, WBC
 - *Urine* ↑ albumin, RBC, Hb, casts
- strongyloidiasis (*Strongyloides stercoralis*)**
 - ↑ * antibodies against *S. stercoralis*, eos, WBC
 - *Stool* ↑ * larvae
 - *Sputum* ↑ * larvae
 - *Duodenal Content* ↑ * larvae
- syphilis (*Treponema pallidum*)**
 - ↑ ALP, AMA, unconjugated Bil, ESR, cold agglutinins, cryoglobulins, WBC, lym, mono, RF, * syphilis Ab, * treponemal antibodies, * VDRL
 - ↓ LH
 - *Urine* ↑ proteins, WBC
 - *Cerebrospinal Fluid* ↑ proteins, lym, WBC, pressure, * treponemal DNA (PCR), * VDRL
 - ↓ G
 - *Synovial Fluid* ↑ volume
- **neurosyphilis**
 - ↑ globulins, cold agglutinins, cryoglobulins, RF, * syphilis antibodies, VDRL
 - ↓ ADH
 - *Cerebrospinal Fluid* ↑ proteins, G, gamma globulins, IgG, WBC, lym, MBP, mono, RBC, pressure, VDRL
 - ↓ G
- tapeworm infestation**
 - tapeworm infestation caused by *Diphyllobothrium latum*
 - *Stool* ↑ * parasite ova
 - tapeworm infestation caused by *Echinococcus granulosus* (echinococcosis)
 - ↑ ALT, eos, IgE, * antibodies against echinococcus, WBC
 - ↓ albumin
 - *Pleural Fluid* ↓ pH
 - tapeworm infestation caused by *Hymenolepis nana*
 - ↑ eos, WBC
 - ↓ Hb, HCT, macrocytes
 - *Stool* ↑ * parasite ova
 - tapeworm infestation caused by *Taenia saginata*
 - ↑ eos
 - *Stool* ↑ * parasite ova
 - tapeworm infestation caused by *Taenia solium*
 - ↑ eos, * antibodies against taenia, ESR
 - *Cerebrospinal Fluid* ↑ eos, * antibodies against taenia, proteins
 - ↓ G
 - *Stool* ↑ * parasite ova
- tetanus (*Clostridium tetani*)**
 - ↑ aldolase, ALT, * anti-tetanus toxin Ab, AST, CK, ESR, catecholamines, WBC, neu, pH, pCO₂
 - ↓ CO₂, CHS, lym, pCO₂, pH
 - *Urine* ↑ albumin, catecholamines, creatine, creatinine, WBC
 - *Cerebrospinal Fluid* ↑ pressure

- toxocariasis (visceral larva migrans) (*Toxocara caninum*, T. cati)**
 ↑ * anti-toxocara Ab, eos, gamma globulins, IgE, WBC
- toxoplasmosis (*Toxoplasma gondii*)**
 ↑ ALT, * anti-toxoplasma Ab (IgA, IgG, IgM), AST, unconjugated Bil, CK-MB, eos, ESR, gamma globulins, GMT, IgM, LD, lym, MAC, mono, * toxoplasma antigen, WBC
 ↓ Hb, HCT, PLT, WBC
 ■ **Cerebrospinal Fluid** ↑ proteins, * toxoplasma antigen, * anti-toxoplasma Ab (IgG, IgM), eos, * protozoans, WBC, mono, * toxoplasma DNA (PCR), pressure
 ■ **Urine** ↑ * toxoplasma antigen
 ■ **Amniotic Fluid** ↑ * toxoplasma DNA (PCR)
- trachoma (*Chlamydia trachomatis*)**
 ↑ * antibodies against *Chlamydia trachomatis* (A, B, C) (IgG, IgM), * chlamydia antigen
- trichinosis (*Trichinella spiralis*)**
 ↑ aldolase, alpha-2-globulins, ALT, * anti-trichinella Ab, * trichinella antigen, AST, CK, CK-MB, eos, ESR, gamma globulins, IgE, IgM, LD, WBC, neu
 ↓ albumin, proteins, ESR, Hb, HCT, CHS
 ■ **Urine** ↑ albumin, creatine, Mb, casts – (hyaline c., granular c.)
 ■ **Cerebrospinal Fluid** ↑ proteins, * anti-trichinella Ab, eos, lym, WBC
- trichomoniasis (*Trichomonas vaginalis*)**
 ■ **Urine** ↑ pus
- trichostrongylosis (*Trichostrongylus* spp.)**
 ↑ eos, WBC
 ■ **Stool** ↑ * parasite ova
- trichuriasis (*Trichuris trichiura*)**
 ↑ eos, WBC
 ↓ Hb, HCT, microcytes
 ■ **Stool** ↑ * parasite ova
- trypanosomiasis (*Trypanosoma rhodesiense*, T. gambiense)**
 ↑ ALT, AST, * antibodies against *Trypanosoma*, cold agglutinins, ESR, gamma globulins, GMT, IgM, WBC, lym, mono, * protozoans, RF, VDRL (false)
 ↓ Hb, HCT, complement – (C₃), neu
 ■ **Cerebrospinal Fluid** ↑ proteins, * protozoans, IgM, WBC, lym, plasma cells
- Chagas' disease (*T. cruzi*)
 ↑ * protozoans, * antibodies against *Trypanosoma* (IgG), * DNA probe (*Trypanosoma*), lym, WBC
 ■ **Cerebrospinal Fluid** ↑ * protozoans
- tuberculosis (*Mycobacterium tuberculosis*)**
 ↑ ADA, ADH, aldolase, alpha-1-globulins, ALP, ALT, ANA, * mycobacterial antigen, * anti-mycobacteria Ab, ASLO, AST, Bil, beta globulins, proteins, Ca, CRP, Cu, * mycobacterial DNA (PCR), eos, fibrinogen, ESR, gamma globulins, GMT, IgA, IgG, uric acid, LA, LAP, LD, WBC, lipase (early), lipids, lym, lysozyme, MAC+RAL, microcytes, mono, mucoproteins, neu, 5-NT, pCO₂, PT, plasmocytes, PRL, RF, E selectin, PLT, VDRL (false), vitamin – (D₃)
 ↓ ACE, albumin, proteins, RBC, Hb, HCT, cholesterol, IgM, cortisol, WBC, LH, Na, PLT, T-lym, vitamin – (A)

- **Urine** ↑ arylsulfatase, proteins, * **bacteria** (+ culture), Ca, blood, pus
 - **Sputum** ↑ blood, * **bacteria** (+ culture)
 - **Pleural Fluid** ↑ adenosine deaminase, AMS, * **bacteria** (+ culture), B2M, proteins, RBC, fibronectin, IgG, LD, lym, lysozyme, mucopolysaccharides, neu, TM – (CEA), volume
 - ↓ C3, C4, G, pH
 - **Bronchoalveolar Lavage Fluid** ↑ RBC, * **bacteria** (+ culture)
 - **Cerebrospinal Fluid** ↑ proteins, * **bacteria** (+ culture), eos, LA, WBC, lym, lysozyme, macrophages, mono, P, plasmocytes, RBC, pressure
 - ↓ G, chloride
 - **Gastric Fluid** ↑ * **bacteria** (+ culture)
 - **Peritoneal Fluid** ↑ proteins, RBC, lym, WBC, mono, specific gravity
 - ↓ G
 - **Synovial Fluid** ↑ clot formation
 - **Pericardial Fluid** ↑ cholesterol
- adrenal tuberculosis
- ↑ ACTH
 - ↓ cortisol
- CNS tuberculosis
- **Cerebrospinal Fluid** ↑ proteins, WBC, lym, PMN, pressure
 - ↓ G
- lung tuberculosis
- ↑ ACE, ADH, ALP, AMS, ANA, ASLO, AST, bas, proteins, Ca, CEA, CO₂, CRP, Cu (+RBC), eos, fibrinogen, ESR, gamma globulins, globulins, IgA, IgG, uric acid, WBC, lym, lysozyme, MAC+RAL, microcytes, mono, mucoproteins, neu, pCO₂, PT, RF, PLT, vitamin – (D3)
 - ↓ ACE, ADH, AMS, albumin, proteins, RBC, Hb, HCT, cholesterol, IgM, cortisol, Na, neu, O₂ satur., T-lym, Zn
 - **Urine** ↑ arylsulfatase, proteins, Ca
 - **Sputum** ↑ blood, mycobacteria
 - **Pleural Fluid** ↑ adenosine deaminase, AMS, B2M, proteins, CEA, RBC, fibronectin, cholesterol, IgG, LD, WBC, lym, lysozyme, mono, mononuclear cells, mucopolysaccharides, neu, pH, specific gravity, TM – (CEA), volume
 - ↓ C3, C4, G, lym, pH
 - **Bronchoalveolar Lavage Fluid** ↑ RBC
 - **Peritoneal Fluid** ↑ proteins, lym, mono
 - ↓ G
- miliary tuberculosis
- ↑ ALT, ESR, nucleated RBC, neu, syphilis Ab (false)
 - ↓ WBC, lym, vitamin – (A)
- prostate tuberculosis
- ↑ ESR
 - ↓ RBC, Hb, HCT
 - **Urine** ↑ pus
 - ↓ pH
- renal tuberculosis
- **Urine** ↑ albumin, proteins, Ca, RBC, pus, blood, WBC, lysozyme, volume
 - ↓ pH, urea

tularemia (*Francisella tularensis*)

- ↑ * **Ab against Fr. Tularensis** (IgG, IgM), ALT, AST, eos, ESR, WBC, febrile agglutinins
- ↓ WBC, neu

typhus, epidemic (exanthematous t., Brill-Zinsser d.) (*Rickettsia prowazekii*)

- ↑ ALT, * **antibodies against R. prowazekii** (IgG, IgM), Bil, ESR, GMT, WBC, mono, PT, VDRL (false), urea
- ↓ albumin, proteins, eos, RBC, fibrinogen, Hb, HCT, chloride, WBC, Na, neu, PLT
- **Urine** ↓ volume

varicella (chickenpox) (*Varicella-zoster virus*)

- ↑ B2M, * **antibodies against Varicella-zoster virus** (IgG, IgM), CRP, WBC, lym, neu
- ↓ WBC, neu
- **Cerebrospinal Fluid** ↑ * **antibodies against varicella-zoster virus**

variola vera (smallpox) (orthopoxviruses)

- ↑ bas, B2M, * **antibodies against orthopoxvirus**, WBC, lym, neu
- ↓ WBC, PLT

viral infectious diseases

- ↑ ASMA, B2M, unconjugated Bil, BT, CRP, elastase, h-sICAM-1, cold agglutinins, LD – (2, 3, 4), lupus inhibitor, lym, mono, RF, thymidine kinase, tropomyosin, trypsin
- ↓ ADH, albumin, RBC, complement – (C1r, C1s), PLT
- **Urine** ↑ AMS, casts – (epithelial)

– acute viral infectious diseases

- ↑ **Ab against Influenza virus**, ASMA, B2M, CRP, elastase, cold agglutinins, RF, thymidine kinase, tropomyosin, trypsin
- ↓ albumin, complement – (C1r, C1s), lupus inhibitor, neu

yaws (*Treponema pertenuae*)

- ↑ **Ab against B. burgdorferi**, syphilis Ab (false), treponemal antibodies (false), VDRL

Diuresis

– forced diuresis

- ↑ aldosterone, MAL, Na, pH, PRA,
- ↓ Ca, K, Mg

– osmotic diuresis

- ↑ Na
- ↓ K, Na, osmolality
- **Urine** ↑ volume

Diverticulitis

- ↑ CEA, CRP, elastase (PMN), ESR, WBC, neu
- ↓ RBC, Fe, Hb, HCT, WBC
- **Urine** ↑ RBC, Hb
- **Stool** ↑ mucus, pus, Hb, blood

Drainage, Ileostomic

- ↑ MAC
- ↓ K, pH, HCO³⁻
- **Urine** ↓ K³

Drowning, Near

freshwater drowning

- ↑ Hb, K, MAC, urea

- ↓ **chloride** (severe), Hb, HCT, RBC, Na (severe), pO_2 , pH
 - **Urine** ↑ proteins, Hb
 - ↓ volume
- seawater drowning
 - ↑ **chloride**, MAC, Na
 - ↓ K, Hb, HCT, pO_2 , pH, plasma volume
- Dysautonomia, Familial
 - **Urine** ↑ HVA
 - ↓ VMA
- Dysfibrinogenemia
 - ↑ **APTT**, PT, TT
 - ↓ **fibrinogen**
- Dysgammaglobulinemia
 - ↑ Apo B, IgA, IgG, IgM, LDL-C
 - ↓ **IgM**
- Dysgenesis, Reticular, With Aleukocytosis
 - ↓ lym, WBC
- Dysmenorrhea
 - ↑ FSH, LH, PRL, prostacyclin
 - ↓ estradiol, FSH, progesterone
 - **Urine** ↓ pregnanediol
- Dysproteinemia
 - ↑ BT, IgG, lupus inhibitor, TAG, PLT, viscosity, VLDL-C
 - ↓ alpha-1-globulins, alpha-2-globulins, beta globulins, Cu
- Dysrhythmia
 - ↑ ALT, CK, LA, FFA
 - ↓ Hb, HCT, K, Mg, pO_2
- Dystrophy
 - acute hepatic dystrophy
 - ↑ ALP, ALT, aminonitrogen, **ammonia**, AST, Bil, GMD, GMT, vitamin B₁₂
 - ↓ **fibrinogen**, CHS, **cholesterol**, LD, **urea**
 - **Urine** ↑ alpha-aminonitrogen, **Bil**, G, leucine, tyrosine
 - ↓ P, urea
 - muscular dystrophy
 - ↑ aldolase, ALT, AST, CK, CK-MB, **creatinine**, LD, pyruvic acid
 - **Urine** ↑ cystine
 - Duchenne's muscular dystrophy
 - ↑ **aldolase**, AST, CK, CK-MB, GMT, LD, **Mb**
 - ↓ IgG, testosterone
 - **Urine** ↑ **creatine**
 - ↓ creatinine
 - progressive muscular dystrophy
 - ↑ **aldolase**, ALT, AST, CK, CK-MB, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, GMT, IRI, creatine, **creatinine**, LD, LD5, Mb, norepinephrine, pyruvate kinase, urea
 - ↓ CHS, IgG, creatinine, testosterone
 - **Urine** ↑ alpha-aminonitrogen, amino acids, catecholamines, **creatine**, **creatinine**, cystine, Mb, reducing sugars
 - ↓ hydroxyproline, 17-ketosteroids, creatine, creatinine
 - progressive muscular dystrophy (limb-girdle)
 - ↑ aldolase, AST, CK, LD

- **Urine** ↑ creatine
↓ creatinine
- myotonic dystrophy**
 - ↑ aldolase, ALT, AST, CK, CK-MB
 - **Urine** ↑ creatine
↓ 17-ketosteroids
- Ecchymoses**
- ↑ BT, unconjugated Bil
- Eclampsia**
 - ↑ aldosterone, alpha-aminonitrogen, alpha-1-globulins, alpha-2-globulins, ADH, ALP, amino acids, AST, proteins, Bil, fibrinogen, G, hCG, HCT, chloride, creatinine, uric acid, LA, beta-LP, WBC, Mg, neu, P, PAI-I, PAPP-A, plasminogen, PRA, PT, viscosity
 - ↓ albumin, AMS, CO₂, estrogens, fibrinogen, G tolerance, globulins, GFR, chloride, immunoglobulins, LD, WBC, Mg, Na, pCO₂, plasma volume, plasminogen, PLT, PRA, progesterone, urea
 - **Urine** ↑ alpha-aminonitrogen, albumin, amino acids, proteins, hCG, 17-OHCS, 17-KGS, catecholamines, lipids, tetrahydrocortisol, casts – (epithelial c.)
↓ proteins, estriol, uric acid, Na, pregnanediol
 - **Cerebrospinal Fluid** ↑ proteins, RBC
↓ Mg
- Eczema**
 - ↑ eos, eosinophil cationic protein, IgE, IgE (specific)
 - ↓ proteins
- Edema**
 - cardiac edema**
 - ↑ aldosterone, ANP, BNP, PRA
 - ↓ albumin, chloride
 - cerebral edema**
 - **Cerebrospinal Fluid** ↑ LA, pressure
 - hepatic edema**
 - ↑ aldosterone, PRA
 - ↓ albumin, chloride, K (RBC)
 - pulmonary edema**
 - ↑ CK, MAC, MAC+RAC, MAC+RAL, pCO₂
 - ↓ chloride, pO₂
 - **Sputum** ↑ blood
 - **Pleural Fluid** ↑ IL-8
 - renal edema**
 - ↑ aldosterone, PRA
- Effusion**
 - ↑ ALT, AST
 - ↓ albumin
 - **Peritoneal Fluid** ↑ LAP, LD, volume
 - **Pleural Fluid** ↑ ACP, albumin, A2MG, ALP, proteins, B2M, blood, CEA, CK, eos, FDP, haptoglobin, hemopexin, RBC, IgA, IgG, LA, LD, lym, WBC, volume, mononuclear cells, mucopolysaccharides, neu, PMN, RF
 - ↓ alpha globulins, AAT, A2MG, C₃, C₄, G, haptoglobin, hemopexin, orosomucoid, pH

bacterial edema

- **Pleural Fluid** ↑ eos, proteins, LA, LD, lym, **WBC**, neu, PMN, RBC, RF, volume
- ↓ C₃, C₄, G, pH

malignant edema

- **Peritoneal Fluid** ↑ AMS, bacteria (culture), blood, * **cholesterol**, * **CEA**, * **fibronectin**, LA, LAP, LD, lym, neu, proteins, pus, RBC, * **WBC**, PMN, volume, TM – (CEA)
- ↓ G, pH
- **Pleural Fluid** ↑ ACP, albumin, A₂MG, AMS, beta-glucuronidase, **blood**, proteins, eos, RBC, FDP, IgA, IgG, LA, LD, lym, WBC, mononuclear cells, mucopolysaccharides, TM – (CEA, CA-125), orosomucoid, volume, RF
- ↓ alpha globulins, C₃, C₄, G, pH

pericardial edema

- **Peritoneal Fluid** ↑ bacteria (+ culture), RBC, WBC, volume
- ↓ G

peritoneal edema

- **Peritoneal Fluid** ↑ AMS, bacteria (+ culture), blood, LA, LD, lym, methemalbumin, neu, proteins, pus, RBC, * **WBC**, PMN, volume, TM – (CEA)
- ↓ G, pH

pleural edema

- ↑ ALT
- ↓ Na
- **Pleural Fluid** ↑ ACP, adenosine deaminase, AMS, ANA, bacteria (+ culture), albumin, ALP, A₂MG, **blood**, proteins, B₂M, CEA, eos, RBC, FDP, G, IgA, IgG, LA, LD, LE cells, **WBC**, creatinine, lipids, lym, volume, mononuclear cells, mucopolysaccharides, neu, pH, PMN, specific gravity, RF
- ↓ alpha globulins, AAT, A₂MG, C₃, C₄, G, haptoglobin, hemopexin, cholesterol, WBC, orosomucoid, pH

rheumatoid edema

- **Pleural Fluid** ↑ adenosine deaminase, proteins, CSF – (GM, M), eos, epithelial cells, crystals – (cholesterol), LD, WBC, lym, mononuclear cells, PMN, RF
- ↓ C₃, C₄, G, pH, viscosity

traumatic edema (blunt)

- **Peritoneal Fluid** ↑ * AMS, * RBC, * WBC
- ↓ RBC

traumatic edema (penetrating)

- **Peritoneal Fluid** ↑ ALP, AMS, bacteria (+ culture), * RBC, * WBC

tuberculous edema

- **Pleural Fluid** ↑ adenosine deaminase, AMS, * bacteria (+ culture), B₂M, proteins, RBC, fibronectin, IgG, LA, LD, lym, lysozyme, mucopolysaccharides, neu, RF, TM – (CEA), volume
- ↓ C₃, C₄, G, pH
- **Peritoneal Fluid** ↑ bacteria (+ culture), proteins, RBC, fibronectin, neu, volume

Electroacupuncture

- **Cerebrospinal Fluid** ↑ enkephalins

Electromyography

↑ CK, CK-mass, CK-MM, Mb

Embolism

- ↑ ACE, ACP, ACP (prostatic), ALP, ALT, AST, Bil, CK, CRP, D-dimers, elastase, **factor VIII**, FDP, fibrinopeptide A, ESR, cold agglutinins, LA, LD, LD - (1, 2, 3, 4), **WBC**, lipase, pH, RAL, TAG, thrombomodulin, FFA
- ↓ AGP, AT III, Ca, factor - (II), fibrinogen, Hb, CHS, pCO₂, pO₂, **sat. O₂**, PLT
- **Urine** ↑ ALP, RBC, Hb, blood, LD, Mb, fat
- **Cerebrospinal Fluid** ↑ proteins, RBC, blood, WBC, PMN
- **Pleural Fluid** ↑ AAT, A₂MG, AMS, RBC, haptoglobin, hemopexin, neu, orosomuroid
- **Sputum** ↑ fat
- **Bronchoalveolar Lavage Fluid** ↑ fat

air embolism

↑ RAC, WBC

amniotic fluid embolism

- ↑ euglobulin lysis time, WBC
- ↓ fibrinogen

cerebral embolism

- ↑ WBC
- **Cerebrospinal Fluid** ↑ proteins, CK, RBC, blood, lym, WBC, PMN, pressure

fat embolism

- ↑ lipase, TAG, WBC, FFA
- ↓ Ca, Hb, pCO₂, pO₂, PLT
- **Urine** ↑ fat
- **Sputum** ↑ fat
- **Bronchoalveolar Lavage Fluid** ↑ fat

mesenteric artery embolism

- ↑ ACP, ALP, ALP (isoenzymes), ALT, AMS, AST, CK, HCT, LA, LD, lipase, WBC, MAC, P, PT, **urea**
- ↓ albumin, pH, proteins, cholesterol
- **Urine** ↑ AMS
- **Peritoneal Fluid** ↑ AMS
- **Stool** ↑ fat

paradoxical embolism

↑ AST, WBC

pulmonary embolism

- ↑ ACE, ACP, ALP, ALT, AST, Bil, unconjugated Bil, CK, CRP, * **D-dimers**, elastase, FDP, fibrinopeptide A, ESR, GMT, cold agglutinins, LA, LD, LD - (1, 2, 3, 4), **WBC**, pH, RAL
- ↓ AGP, fibrinogen, CHS, pCO₂, pO₂, **sat. O₂**, PLT
- **Pleural Fluid** ↑ AAT, A₂MG, AMS, blood, RBC, haptoglobin, Hb, hemopexin, mononuclear cells, neu, orosomuroid, PMN, WBC

renal artery embolism

- ↑ ALP, AST, LD, WBC
- **Urine** ↑ ALP, RBC, Hb, blood, LD

Emphysema, Pulmonary

- ↑ AAT, ADH, A₂MG, **ammonia**, CEA, EPO, RBC, Hb, HCO₃⁻, HCT, plasma volume, pCO₂, RAC
- ↓ AAT, **alpha-1-globulins**, **chloride**, pH, pO₂, **sat. O₂**
- **Urine** ↓ chloride, Na, pH

Empyema, Pleural

- **Pleural Fluid** ↑ adenosine deaminase, proteins, eos, RBC, ESR, LA, LD, WBC, mucopolysaccharides, neu, TM - (CEA), PMN
- ↓ G, pH
- **Sputum** ↑ volume

subdural empyema

- ↑ WBC
- **Cerebrospinal Fluid** ↑ proteins, WBC, PMN, pressure

Encephalitis

- ↑ ADH, anti-arbovirus Ab, anti-enterovirus Ab, anti-Hu Ab, CK, ESR, G, Hb, WBC, Na
- ↓ WBC
- **Urine** ↑ volume
- **Cerebrospinal Fluid** ↑ proteins, G, chloride, LD, WBC, lym, MBP, mono, Na, PMN, pressure
- ↓ G, chloride, WBC, vitamin C

acute hemorrhagic encephalitis

- **Cerebrospinal Fluid** ↑ proteins, WBC, PMN, pressure

aseptic encephalitis

- **Cerebrospinal Fluid** ↑ lym, mono

bacterial encephalitis

- **Cerebrospinal Fluid** ↓ G

cytomegalovirus encephalitis

- ↑ WBC
- ↓ albumin

encephalitis lethargica

- ↑ ALT, lym

herpetic encephalitis

- ↑ lym
- ↓ WBC

Japanese B encephalitis

- ↑ ALT, anti-arbovirus Ab, AST
- **Cerebrospinal Fluid** ↑ MBP, proteins, WBC

postinfectious encephalitis

- **Cerebrospinal Fluid** ↑ WBC

postvaccinal encephalitis

- **Cerebrospinal Fluid** ↑ WBC

St. Louis encephalitis

- ↑ ALT, * anti-St. Louis encephalitis virus Ab (IgM, IgG), lym, WBC
- ↓ WBC
- **Cerebrospinal Fluid** ↑ proteins, * anti-St. Louis encephalitis virus Ab (IgM, IgG), WBC

viral encephalitis

- **Cerebrospinal Fluid** ↑ proteins, lym, MBP, mono, Na, plasmocytes, pressure

Encephalocele

- ↑ AFP
- **Amniotic Fluid** ↑ AFP, ACHE

Encephalomyelitis

acute disseminated encephalomyelitis

- ↑ ALT
- **Cerebrospinal Fluid** ↑ lym, proteins

acute viral encephalomyelitis

- **Cerebrospinal Fluid** ↑ proteins (later), WBC, PMN (early), lym (later)

amebic encephalomyelitis

- **Cerebrospinal Fluid** ↑ proteins, RBC, lym, WBC, PMN, pressure

epidemic myalgic encephalomyelitis

- ↑ ALT
- ↓ WBC

Encephalopathy

arsenical encephalopathy

- **Cerebrospinal Fluid** ↑ pressure, lym

drug encephalopathy

- ↑ AMS, AST, ALT, CK, eos, HBsAg, LD, lym, Mb, T₄
- ↓ c-AMP, cholesterol, O₂ satur., pO₂, testosterone
- **Urine** ↑ Mb
- **Cerebrospinal Fluid** ↑ lym, mono

hepatic encephalopathy

- ↑ amino acids, ammonia, Bil, phenylalanine, MAL, Na, pH, RAL, tryptophan, FFA
- ↓ albumin, isoleucine, K, leucine, Na, valine
- **Cerebrospinal Fluid** ↑ glutamine, WBC, tryptophan

hypertensive encephalopathy

- **Cerebrospinal Fluid** ↑ proteins, pressure

lead encephalopathy

- **Cerebrospinal Fluid** ↑ proteins, WBC, lym, pressure

septic encephalopathy

- **Cerebrospinal Fluid** ↑ glutamine

Wernicke's encephalopathy

- ↑ ALT, G, pyruvic acid
- ↓ transketolase

Endocarditis

bacterial endocarditis

- ↑ alpha-1-globulins, ALT, ANA, ANCA, c-ANCA, atypical-ANCA, anti-myocardial Ab, ASLO, AST, bacteria (culture), * CIC, * CRP, * ESR, fibrinogen, gamma globulins, globulins, IgG, IgM, * creatinine, cryoglobulins, * teichoic acid antibodies (Sta. aureus endocarditis), LA, WBC, macrophages, mono, * mucoproteins, * neopterin, neu, * PCT, pH, RF, SAA, urea, VDRL (false)
- ↓ albumin, AMS, RBC, factor B, Fe, haptoglobin, Hb, HCT, cholesterol, IgA, complement - (C₃, C₄), WBC, pCO₂, PLT
- **Urine** ↑ albumin, proteins, RBC, Hb, blood, casts - (RBC c.)
- **Cerebrospinal Fluid** ↑ proteins, WBC, lym, PMN, pressure
- **Pericardial Fluid** ↑ bacteria (culture), WBC, volume
- ↓ G
- **Pleural Fluid** ↑ eos, WBC
- **Synovial Fluid** ↑ WBC, clot formation, lym, PMN, volume

Löffler's parietal fibroplastic endocarditis

- ↑ eos, WBC

rheumatic endocarditis

- ↑ alpha-1-globulins, ASLO, AST, CIC, CRP, ESR, gamma globulins, haptoglobin, complement - (C₃), LE cells, WBC, mucoproteins, neu, RF, PLT

- ↓ albumin
 - **Urine** ↑ proteins, RBC
- subacute endocarditis**
 - ↑ alpha-1-globulins, antimyocardial Ab, gamma globulins, cryoglobulins, LA, WBC, RF
 - ↓ RBC, factor B, haptoglobin, complement – (C3)
 - **Urine** ↑ proteins, RBC, blood
 - **Cerebrospinal Fluid** ↑ proteins, pressure
 - **Synovial Fluid** ↑ WBC, PMN, volume
- Endometriosis**
 - ↑ hCG, TM – (CA 15-3, CA 27-29, CA 125)
 - **Pleural Fluid** ↑ RBC
- Enteritis**
 - ↑ ALP, MAC, OCT
 - ↓ pH, vitamin – (B₂, beta-carotene)
 - **Stool** ↓ pH
- Enterocolitis**
 - idiopathic enteritis**
 - ↑ WBC
 - ↓ beta-carotene, HCT
 - infectious enteritis**
 - ↑ beta-carotene, CRP, WBC, urea
 - ↓ albumin, HCT
 - **Stool** ↑ mucus, blood, pH
 - necrotizing enteritis in infancy**
 - ↑ WBC, MAC
 - ↓ Hb, HCT, Na, neu
 - **Stool** ↑ mucus, Hb, pH, blood
 - **Urine** ↓ volume
 - tuberculous enteritis**
 - ↑ WBC
 - ↓ albumin
- Enteropathy**
 - necrotic enteropathy**
 - ↑ conjugated Bil, unconjugated Bil, PT
 - ↓ Hb, Na
 - protein-losing enteropathy**
 - ↑ A2MG, alpha-1-globulins, alpha-2-globulins, beta-carotene, eos, fibrinogen
 - ↓ AAT, albumin, beta-carotene, proteins, Ca, CBG, RBC, factor B, gamma globulins, globulins, Hb, HCT, CHS, IgA, IgG, IgM, K, complement – (C2), lym, TAG, T4, TBG, vitamin – (E)
 - **Stool** ↑ AAT, albumin, fat
- Eosinophilia, Tropical**
 - ↑ eos, WBC
- Epididymitis**
 - ↑ CRP, ESR, WBC
 - **Urine** ↑ WBC, pus
- Epiglottitis (Croup)**
 - ↑ ESR, neu, WBC

Epilepsy

- ↑ anion gap, K, LA, MAC, urea
- ↓ Mg, Mn
- **Cerebrospinal Fluid** ↑ proteins, CK

Error, Inborn, of Amino Acid Metabolism

- ↑ ALT, anion gap, AST, G, MAC
- ↓ neu
- **Urine** ↑ RBC, Hb, ketones

Erythema

erythema multiforme

- ↑ eos
- **Synovial Fluid** ↑ WBC, PMN
- ↓ viscosity

erythema nodosum

- ↑ anti-Mycoplasma pneumoniae Ab, WBC, IgE
- **Synovial Fluid** ↑ WBC, PMN

Erythroblastosis, Fetal

- ↑ aldolase, ammonia, anisocytes, Bil, * unconjugated Bil, BT, Hb, nucleated RBC, MCV, MCH, macrocytes, WBC, methemalbumin, neu, RTC, osmotic fragility, spherocytes
- ↓ fibrinogen, G, haptoglobin, Hb, HbF, HCT, RBC, RBC osmotic resistance, proconvertin, RTC, PLT, vitamin - (K)
- **Amniotic Fluid** ↑ anti-Rh factor, Bil, RBC (nucleated), hCG, placental lactogen
- **Amniotic Fluid** ↑ estriol
- **Urine** ↑ hCG, UBG
- **Stool** ↑ UBG

Erythrocytosis, Familial

- ↑ unconjugated Bil, * RBC, HCT, EPO
- ↓ 2,3-DPG

Eunuchoidism

- ↑ PRL, SHBG
- ↓ androstenedione, EPO, estradiol, estrogens, FSH, * GRH, LH, progesterone, * testosterone, free testosterone, Zn
- **Urine** ↓ FSH, 17-KS

Exanthema, Viral

- ↑ B2M, lym

Exudate

- ↓ albumin
- **Bronchoalveolar Lavage Fluid** ↑ proteins
- **Pericardial Fluid** ↑ AAT, A2MG, proteins, cholesterol
- **Peritoneal Fluid** ↑ proteins, fibrinogen, cholesterol, LD, specific gravity
- ↓ G, LD
- **Pleural Fluid** ↑ AAT, A2MG, proteins, RBC, fibrinogen, globulins, haptoglobin, hemopexin, cholesterol, specific gravity, orosomucoid, TM - (CA-125)
- ↓ G, LD, pH

Factors, Interfering - Age

adolescents

- ↑ ACE, estrone, ILGF-I, osteocalcin

- children**
- ↓ Fe, T₄
 - ↑ ALP, cAMP, 5-nucleotidase, P, PSA, SHBG, TIBC, transferrin, vitamin – (D₂)
 - ↓ AGP, Fe, fructosamine, complement – (C_{1q}, C₄), ILGF-I, urea, vitamin – (B₁₂)
 - **Urine** ↑ arginine
- elder people**
- ↑ PLT adhesion, ALP, ANA, antithyroglobulin Ab, APA, ASMA, Cu, euglobulin lysis time, ferritin, fibrinogen, gastrin, glucose, cholesterol, IgM, creatinine, cryoglobulins, uric acid, WBC, macrocytes, Na, neu, norepinephrine, 5-nucleotidase, osteocalcin, PP, PTH, RF, TAG, urea, vitamin – (D₂, D₃), VDRL (false)
 - ↓ albumin, aldosterone, Ca, Cr, DHEA, Fe, ILGF-I, creatinine, LD, plasma volume, P, Se, T₃, testosterone, vitamin – (B₁, B₆, B₁₂, C, D, E, folate), Zn
- healthy adult people**
- ↑ AAT, ANA, antithyroid Ab, anti-myelin Ab, antireticulin Ab, ASMA, delta Bil, lupus inhibitor
 - **Urine** ↑ Ca
 - **Gastric Fluid** ↑ HCl
- newborns**
- ↑ ACE, ACTH, angiotensin I, angiotensin II, beta-endorphins, unconjugated Bil, DHEA, Hg, calcitonin, WBC, macrocytes, mono, neu, PRL, pyknocytes, schistocytes, siderocytes, GH, T₄, TBG
 - ↓ ceruloplasmin, Cu, euglobulin lysis time, factor – (II, IX, XI, XII), Mg, T₃, vitamin – (K)
 - **Urine** ↑ arginine, galactose (till 6th day)
 - **Cerebrospinal Fluid** ↑ glutamine
- postmenopause female**
- ↑ albumin, ALP, ALT, AST, G, gonadotropins, cholesterol, uric acid, Na, osteocalcin, P, PL
 - ↓ euglobulin lysis time, SHBG
 - **Urine** ↓ estrogens, gonadotropins, 17-KS
- smaller of twins**
- ↓ G
- Factors, Interfering – Body Posture**
- supine body posture**
- ↑ ANF, plasma volume
 - ↓ aldosterone, PSA (prolonged)
- upright body posture**
- ↑ aldosterone, angiotensin I, II, catecholamines, PRA
 - ↓ plasma volume
- Factors, Interfering – Diurnal Variations**
- ↑ PLT adhesion, osteocalcin, PRA
 - ↓ osteocalcin
- early morning**
- ↑ Ca, Ca²⁺, DHEA, DHEAS, DOC, Fe, histamine, ILGF-I, K, cortisol, uric acid, MSH, osteocalcin, PRA, 17-OH progesterone, PTH, testosterone, vitamin C, Zn
 - ↓ ACP, Apo A, Cu, enkephalins, progesterone, GH, TIBC

evening

- ↑ ACP, Apo A, Ca, Cu, enkephalins, estradiol, creatinine, PTH, SHBG, TIBC
- ↓ androstenedione, beta-endorphins, DHEA, DHEAS, DOC, Fe, histamine, uric acid, LH, MSH, PRA, 17-OH progesterone, transferrin satur., TSH, Zn

morning

- ↑ androstenedione, beta-endorphins, cAMP, DHEAS, DOC, enkephalins, gastrin, insulin, K, cortisol, PRA, TSH

sleep

- ↑ angiotensin I, creatinine, LH, osteocalcin, PRL, progesterone, GH, TSH
- ↓ cAMP, estradiol, Fe, gastrin, ILGF-I, cortisol, SHBG

Factors, Interfering – Environment

cold environment

- ↑ epinephrine, G, Hb, catecholamines, WBC, neu, GH
- ↓ eos, PLT
- **Urine** ↑ protein

heat environment

- ↑ ALT, AST, CK-MM, G, Hb, HCT, Na, neu, GH, LD, lym, WBC
- ↓ Na
- **Urine** ↑ proteins, Mb
- **Sweat** ↑ chloride, Na

high altitude environment

- ↑ RBC, EPO, FT₃, Hb, HCT, K, pCO₂, PRL, RAL, T₃, transferrin receptor, PLT
- ↓ aldosterone, estriol, LH, pO₂
- **Urine** ↑ HCO₃⁻, volume
- ↓ estriol
- **Cerebrospinal Fluid** ↑ pressure

Factors, Interfering – Exertion

active athletes (predominantly aerobic activities)

- ↑ ACTH, ADH, PLT adhesion, **epinephrine**, A₂MG, cAMP, androstenedione, Apo A-I, AST, CK, COHb, euglobulin lysis time, **beta-endorphins**, enkephalins, EPO, FDP, Hb, HDL-C, IgA, IGF-I, IGF-II, K, catecholamines, cortisol, acetoacetic acid, ketobodies, LA, LD, WBC, MAC, Mb, MSH, neu, NT-pro-ANP, blood volume, osteocalcin, plasminogen, PRL, pyruvate kinase, secretin, testosterone, TIBC, VIP, FFA, Zn
- ↓ Apo B-100, estradiol (F), G, HbA_{1c}, IgA, **insulin**, calcitonin, progesterone, PTH, SHBG, vitamin - (B₆)
- **Urine** ↑ creatinine, casts - (RBC, granular, hyaline), VMA
- ↓ **osmolality**
- **Sweat** ↑ chloride, Na

physical exertion generally

- ↑ ACTH, ADH, PLT adhesion, **epinephrine**, A₂MG, ammonia, androstenedione, Apo A-I, AST, **beta-endorphins**, cAMP, CK, COHb, euglobulin lysis time, enkephalins, EPO, Hb, IgA, ILGF-I, ILGF-II, K, catecholamines, cortisol, **ketobodies**, acetoacetic acid, LA, LD, WBC, MAC, melatonin, myoglobin, neu, NT-pro-ANP, osteocalcin, plasminogen, PRL, pyruvate kinase, secretin, testosterone, TIBC, VIP, FFA, Zn

↓ Apo B-100, estradiol (F), G, **insulin**, calcitonin, progesterone, PTH, SHBG

■ **Urine** ↑ ammonia, proteins, **Hb**, K, catecholamines, creatinine, alpha-ketoglutaric acid, casts – (RBC, granular, hyaline), VMA

■ **Sweat** ↑ chloride

prolonged physical exertion

↑ ACTH, A2MG, Apo A-I, AST, beta-endorphins, cAMP, CK, DHEA, enkephalins, EPO, RBC, FDP, glucagon, Hb, HDL-C, HCT, ILGF-II, calcitonin, catecholamines, **ketobodies**, acetoacetic acid, **LA**, LD, LD – (4, 5), myoglobin, neu, osteocalcin, secretin, **GH**, VIP

↓ estradiol (F), G, IgA, IgG, Na, progesterone, PTH, SHBG, testosterone, vitamin – (B₁)

■ **Urine** ↑ pregnanetriol

■ **Sweat** ↑ chloride

strenuous exertion

↑ ACTH, **aldolase**, **epinephrine**, A2MG, Apo A-I, AST, **beta-endorphins**, **unconjugated Bil**, cAMP, ceruloplasmin, CK, **CK-MB**, COHb, enkephalins, factor XII, **FDP**, glucagon, glutathione reductase (RBC), Hb, IgA, catecholamines, **ketobodies**, acetoacetic acid, **uric acid**, **LA**, LD, LD – (4, 5), WBC, **Mb**, **MD**, melatonin, neu, norepinephrine, osteocalcin, plasminogen, pO₂, pyruvate kinase, secretin, testosterone, PLT, VIP

↓ Cu, estradiol (F), G, glutathione (RBC), haptoglobin, Hb, IgA, IgG, **insulin**, LH, P, progesterone, PTH, SHBG, T₄, vitamin B₁

■ **Urine** ↑ ammonia, proteins, Cr, **Hb**, K, **catecholamines**, creatinine, blood, alpha-ketoglutaric acid, **Mb**, pregnanetriol, casts – (RBC, **granular**, **hyaline**), VMA

↓ osmolality

■ **Sweat** ↑ chloride

fasting

↑ beta-endorphins, ferritin, glucagon, **ketobodies**, **acetoacetic acid** (later), SHBG, GH, uric acid

↓ ILGF-I, insulin, melatonin, PRL, T₃

■ **Urine** ↑ **ketones**

hyperventilation

↑ euglobulin lysis time, pH

Factors, Interfering – Nutrition (increased intake of)

animal lipids (fats)

↑ Apo B, **ketobodies**, **acetoacetic acid**, LDL-C, TAG, urea

↓ PT

■ **Urine** ↑ **ketones**

avocado

■ **Urine** ↑ 5-HIAA

banana

↑ serotonin

■ **Urine** ↑ 5-HIAA, UBG, VMA

■ **Stool** ↑ blood

beans

■ **Urine** ↑ oxalate

beets	■ <i>Urine</i> ↑ oxalate
cabbage	■ <i>Urine</i> ↑ crystals – (Ca-oxalate)
caffeine	↑ beta-endorphins
calcium	↑ Ca
carbohydrates	↑ TAG ↓ Apo A-I, HDL-C, LD ■ <i>Urine</i> ↑ G, P ■ <i>Stool</i> ↑ volume
cheese	■ <i>Urine</i> ↑ VMA
cherries	■ <i>Urine</i> ↑ pentoses
chewing gum	■ <i>Urine</i> ↑ VMA
chloride	↑ chloride
chocolate	■ <i>Urine</i> ↑ oxalate, VMA
cholesterol	↑ Apo B, cholesterol, LDL-C
cocoa	■ <i>Urine</i> ↑ oxalate, VMA
coffee	↓ uric acid ■ <i>Urine</i> ↑ 5-HIAA, VMA
dressings	■ <i>Urine</i> ↑ VMA
fatty acids	
– polyunsaturated fatty acids	↑ HDL-C ↓ LDL-C, TAG
– polysaturated fatty acids	↑ LDL-C, urea ↓ HDL-C
fibres	↑ TAG ↓ HDL-C, cholesterol, LDL cholesterol, TAG
garlic	↓ fibrinogen, cholesterol, TAG ■ <i>Urine</i> ↑ crystals – (Ca-oxalate)
gelatin	■ <i>Urine</i> ↑ oxalate, VMA
glucose	■ <i>Urine</i> ↑ Cr, P ■ <i>Stool</i> ↑ volume
grapes	■ <i>Urine</i> ↑ pentoses

horse radish	■ <i>Stool</i> ↑ blood
kalium	↑ aldosterone, K
kiwi	■ <i>Urine</i> ↑ 5-HIAA
legumes	↑ uric acid
lettuce	■ <i>Stool</i> ↑ blood
leucine	■ <i>Urine</i> ↓ niacin
meal (postprandial)	↑ ALT, Apo A-IV, AST, G, K, uric acid, P, proinsulin, PTH, secretin, somatostatin, trypsin, FFA ↓ progesterone
meat	↑ carnosine, creatinine , uric acid ■ <i>Urine</i> ↓ pH ■ <i>Stool</i> ↑ volume
milk	↓ PTH ■ <i>Urine</i> ↑ Ca, lactose
- milk in children	↓ Fe ■ <i>Urine</i> ↑ galactose, LD
mushrooms	■ <i>Urine</i> ↑ 5-HIAA
nuts	↑ serotonin ■ <i>Urine</i> ↑ 5-HIAA
oil	
- fish oil	↑ Apo A-I, Apo B, BT, G, HbA _{1c} , HDL-C, cholesterol, plasminogen activator inhibitor, LDL cholesterol ↓ Apo B, PLT aggregation, fibrinogen, HDL-C, cholesterol, insulin, LDL cholesterol, Lp(a), norepinephrine, renin, GH, TAG, PLT, VLDL-C
- olive oil	↓ LDL cholesterol, TAG, VLDL-C
- soya oil	↓ HDL-C, cholesterol, LDL cholesterol
- sunflower oil	↓ Apo A-I, Apo B, HDL-C, cholesterol
orange	■ <i>Urine</i> ↑ crystals - (Ca-oxalate)
pepper	■ <i>Urine</i> ↑ oxalate
pineapple	↑ serotonin ■ <i>Urine</i> ↑ 5-HIAA
plums	■ <i>Urine</i> ↑ 5-HIAA, pentoses

proteins	<ul style="list-style-type: none"> ↑ ammonia, cAMP, uric acid, GH, urea ↓ ALP, uric acid, PTH ■ Urine ↑ phosphoethanolamine, ketones, creatinine, osmolality, oxalate, urea ■ Stool ↓ volume
rhubarb	<ul style="list-style-type: none"> ■ Urine ↑ crystals – (Ca-oxalate), oxalate, reducing sugars ■ Synovial Fluid ↑ crystals – (calcium oxalate)
salt	↓ PRA
spinach	■ Urine ↑ crystals – (Ca-oxalate), oxalate
tea	<ul style="list-style-type: none"> ↓ uric acid, vitamin – (B₁) ■ Urine ↑ crystals – (Ca-oxalate), oxalate, VMA
tomatoes	<ul style="list-style-type: none"> ↑ serotonin ■ Urine ↑ crystals – (Ca-oxalate), 5-HIAA, oxalate
water	<ul style="list-style-type: none"> ↓ albumin, osmolality ■ Urine ↑ volume
yeast	↑ uric acid
Factors, Interfering – Nutrition (insufficient intake of)	
calcium	↓ Ca, Ca ²⁺
cholesterol	↓ Apo B
chromium	↓ Cr
iron	<ul style="list-style-type: none"> ↑ anisocytes, carbohydrate-deficient transferrin, GHb, microcytes, porphyrins, TIBC, PLT, zinc protoporphyrin ↓ albumin, Fe, ferritin, Hb, WBC, RTC, transferrin satur., PLT, transferrin, vitamin – (B₁₂) ■ Urine ↑ hemosiderin
magnesium	↑ ALP, Ca ²⁺ , K
phosphorus	↑ Ca, P
proteins	<ul style="list-style-type: none"> ↓ ferritin, LD, urea ■ Urine ↓ urea
salt	↑ PRA
selenium	<ul style="list-style-type: none"> ↑ AST, macrocytes, CK ↓ glutathione peroxidase (RBC)

total parenteral nutrition

- ↑ Al, ALP, ALT, AST, ammonia, Bil, conjugated Bil, Ca, Ca²⁺, eos, G, glutamine, GMT, HCT, chloride, cholesterol, K, creatine, LA, LD, MAC, Na, osmolality, pCO₂, TAG, urea
- ↓ Apo A-IV, biotin, Ca, Ca²⁺, **ceruloplasmin**, Cr, Cu, FA, folate, G, HCT, HCO₃⁻, chloride, cholesterol, K, uric acid, LD, **Mg**, Na, osmolality, P, prealbumin, Se, urea, transthyretin, Zn
- **Urine** ↑ Hb

vitamin A

- ↓ RBC, Hb, cholesterol, **carotene**, **retinol**

vitamin B₁

- ↑ **pyruvic acid**
- ↓ AST, RBC, Hb, HCT, * **thiamine**, **RBC transketolase**
- **Urine** ↓ **thiamine**
- **Synovial Fluid** ↑ crystals – (calcium oxalate)

vitamin B₂

- ↓ RBC, glutathione (RBC), Hb, HCT, * **riboflavin**
- **Gastric Fluid** ↑ pH

vitamin B₆

- ↑ anisocytes, Fe, Hb, mono, poikilocytes, RBC basophilic stippling, RTC, PLT, protoporphyrin (RBC), **transferrin satur.**
- ↓ ALP (WBC), ALT, AST, RBC, folate, haptoglobin, HCT, CHS (RBC), WBC, MCH, MCHC, MCV, neu, RBC osmotic fragility, * **pyridoxine**, PLT, RTC, TIBC
- **Urine** ↑ cystathionine, cystine, homocystine, oxalate
↓ * **pyridoxic acid**
- **Synovial Fluid** ↑ crystals – (calcium oxalate)

vitamin B₁₂

- ↑ anisocytes, **Bil**, Fe, **gastrin**, **HbA₂**, **HbF**, RBC Howell–Jolly bodies, * **homocysteine**, LD, **macrocytes**, **megaloblasts**, * **methylmalonic acid**
- ↓ ALP, neu, PLT, vitamin B₁₂
- **Urine** ↑ alpha-aminonitrogen, methylmalonic acid

vitamin C

- ↑ haptoglobin, MCV, RTC
- ↓ albumin, ALP, Fe, fibrinogen, **folate**, Hb, HCT, * **ascorbic acid**, MCH, MCHC, TIBC
- **Urine** ↑ blood, RBC, alpha-aminonitrogen
↓ ascorbic acid
- **Stool** ↑ blood

vitamin D

- ↑ ALP, PTH, vitamin – (D₂, D₃)
- ↓ ALP, Ca, Ca²⁺, **citrate**, * **1,25-(OH)₂D₃**, P
- **Urine** ↑ cAMP, hydroxyproline, P
↓ Ca, Ca²⁺

vitamin E

- ↑ CK, RTC, PLT
- ↓ RBC, **haptoglobin**, HCT, * **tocopherol**

vitamin K

- ↑ APTT, BT, **coagulation time**, PT
- ↓ factor – (VII, IX, X), proconvertin, **protein C**, **protein S**, prothrombin

water

↑ **chloride**, osmolality

zinc

↓ ALP, RBP, vitamin - (A), Zn

■ **Urine** ↑ Zn

↓ Zn

■ **Hair** ↓ Zn

Factors, Interfering – Psychic Conditions

– emotions

↑ Apo B, epinephrine, beta-endorphins, G, cortisol, WBC, VLDL-C

– fear

↑ epinephrine

radiation therapy

↑ CEA, MHB, mono, neu, **uric acid**

↓ bas, gamma globulins, Hb, HCT, IgE, lym, **neu**, **RTC**, **PLT**, vitamin - (B_{12}), **WBC**

■ **Synovial Fluid** ↑ eos

radiographic contrast media

↑ AMS, unconjugated Bil, eos, histamine, catecholamines, creatinine, T₄, TSH, urea

↓ albumin, GFR, uric acid, T₃, PLT

■ **Urine** ↑ proteins, G, 17-KGS, crystals, **uric acid**, specific gravity

↓ catecholamines, VMA

■ **Cerebrospinal Fluid** ↑ proteins, eos, WBC, macrophages, pressure

■ **Synovial Fluid** ↑ eos

Factors, Interfering – Variations, Seasonal

spring

↑ AST, cAMP, hydroxyproline, TAG

↓ ALT, beta-carotene, G, T₃, T₄, urea

summer

↑ Ca, creatinine, uric acid, LD, LH, P, PTH, vitamin C

↓ albumin, ALT, FT₄, cholesterol, Mg, T₃, T₄, TSH, urea

autumn (fall)

↑ albumin, beta-carotene, Ca, G, hydroxyproline, urea

↓ AST, TAG

winter

↑ ALT, FT₄, cholesterol, Mg, T₃, T₄, TAG, TSH

↓ Ca, cAMP, hydroxyproline, creatinine, uric acid, LD, LH, P, PTH, vitamin - (C, D₃)

Failure

adrenal failure

↑ * ACTH, Ca, K, PRL

↓ androstenedione, HCO_3^- ; * **chloride**, * **cortisol**, * **Na**

■ **Urine** ↑ Na, pH

↓ K, 17-OHCS, volume, * **free cortisol**

■ **Saliva** ↓ cortisol

bone marrow failure

↓ RBC, HCT, WBC, RTC

gonadal failure (female)

↑ * **FSH**, * **LH**, PRL, SHBG

↓ androstenedione, **dihydrotestosterone**, EPO, * **estradiol**, estrogens, FSH, LH, progesterone, * **testosterone**, free testosterone, Zn

- **Urine** ↑ * FSH, * LH
 - ↓ estradiol, estrogens, FSH, 17-KS, pregnanediol, pregnanetriol
- gonadal failure (male)**
 - ↑ anti-testicular Ab
 - ↓ LH, testosterone
 - **Urine** ↑ 17-KS
 - **Seminal Fluid** ↓ volume, spermatozoa count
- heart failure**
 - ↑ ACA, ADA, ADH, aldosterone, alpha-aminonitrogen, ALP, ALP (isoenzymes), * ALT, amino acids, ammonia, * ANF, ASAL, AST, Bil, * conjugated Bil, * unconjugated Bil, BNP, BSP retention, CK, Cu, D-dimers, RBC, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, ESR, FSH, G, gamma globulins, cGMP, GMT, Hb, HBD, HCO₃⁻, CHS, ICD, K, K (RBC), creatinine, uric acid, LA, LAP, * LD, LD - (2, 3, 4, * 5), LH, * mAST, MAL, MCV, MD, Mg, Na, norepinephrine, NT-pro-ANP, plasma volume, OCT, PT, pCO₂, pH, * PRA, prostacyclin, pyruvate, ribonuclease, urea, vitamin - (B₁₂)
 - ↓ ADH, albumin, AMS, proteins, CO₂, eos, ESR, fibrinogen, G, HCT, chloride, cholesterol, cholinesterase, K, lym, * Mg, Na, osmolality, pH, pCO₂, pO₂, O₂ satur., plasmocytes, PLT, testosterone, vitamin - (B, folate)
 - **Urine** ↑ albumin, Bil, proteins, RBC, WBC, specific gravity, osmolality, UBG, casts - (RBC, granular, hyaline, WBC)
 - ↓ chloride, GFR, LD, Na, specific gravity, volume
 - **Cerebrospinal Fluid** ↑ pressure
 - **Sputum** ↑ blood
 - **Pleural Fluid** ↑ AMS, eos, complement - (CH₅₀), LA, LD, lym, mono, mononuclear cells, pH, RBC, volume
 - ↓ AAT, A₂MG, proteins, haptoglobin, hemopexin, WBC, orosomucoid, pH
 - **Peritoneal Fluid** ↑ proteins, RBC, G, WBC, specific gravity
 - ↓ albumin, proteins, eos
 - **Seminal Fluid** ↓ volume
 - **Sweat** ↑ K
 - **Saliva** ↑ K, Na
 - ↓ chloride, Na
 - **Synovial Fluid** ↑ volume

Note: hCG test, GnRH, karyotype, molecular biology (Y-chromosome long arm deletion)
- fetal heart failure**
 - **Amniotic Fluid** ↑ volume
- liver failure**
 - ↑ alpha-aminonitrogen, AFP, ALP, * ALT, * ammonia, APTT, * AST, * Bil, * BT, BNP, BSP retention, CO₂, D-dimers, * FDP, globulins, glucagon, GMT, HDL-C, creatinine, LD, WBC, lym, MAC, MAL, pCO₂, * PT, RAL, thrombomodulin, TT, urea
 - ↓ * albumin, ALT (later), AST (later), AT III, beta-glucuronidase, proteins, euglobulin lysis time, RBC, factor - (II, * V, VII, IX, X), * fibrinogen, G, G tolerance, haptoglobin, CHS, cholesterol, HDL-C, LDL-C, G, Hb, HCT, ILGF-I, complement - (C₃), K (early), Mg, Na, Ni, P, pCO₂, pH, somatomedin C, T₄, TBG, PLT, urea, vitamin - (A)
 - **Urine** ↑ amino acids, fructose, RBC, hydroxyproline, hippuric acid, leucine, WBC, Na, specific gravity, * tyrosine, casts - (hyaline)
 - ↓ GFR, Na

- **Peritoneal Fluid** ↑ ALP, AMS, bacteria (culture), **proteins**, GMT, HCO_3^- , RBC, blood, K, LD, WBC, metHb, neu, P, PMN, **volume**, TAG, turbidity, color changes
- ↓ cholesterol, HCO_3^- , pH
- **Cerebrospinal Fluid** ↑ leucine

lung failure

- ↑ AB, aldosterone, ammonia, BE, Ca, eos, EPO, RBC, ESR, Hb, HCT, HCO_3^- , K, LA, WBC, MAC, * pCO_2 , * RAC
- ↓ AAT, AB, ACE, BE, Hb, HCT, HCO_3^- , chloride, K, pH, * pO_2 , * satur. O_2 , PLT

- acute lung failure

- ↑ LA, WBC, * pCO_2 , * PCT, RAC
- ↓ Hb, HCT, K, WBC, pH, pO_2

ovary failure

- ↑ anti-ovarian Ab, FSH, LH
- ↓ androstenedione, estradiol, **estrogens**, FSH, LH, progesterone
- **Urine** ↑ FSH
- ↓ **estrogens**, FSH, gonadotropins, pregnanediol

pituitary failure

- ↑ eos, K, WBC
- ↓ **aldosterone**, estradiol, * FSH, Hb, HCT, cortisol, * LH, Na, * PRA, * GH, T₄

placental failure

- ↑ Hb, HCT, IgA, IgM, viscosity
- ↓ ALP, estriol, hPL, IgG, pregnancy-associated plasma protein - (A, B), pregnancy specific beta-1-glycoprotein
- **Urine** ↓ estriol, pregnanediol
- **Amniotic Fluid** ↑ AFP, creatinine, uric acid, PL, urea
- ↓ LAP

renal failure

- acute renal failure

- ↑ ACP, AGBMA, Al, ALP, AMS, * ANA, * ANCA, anti-Sm Ab, ANF, Apo B, ASLO, AST, beta-endorphins, BHBA, * B₂M, BNP, proteins, Ca, CIC, CK, CK-MM, C-peptide, * **cystatine C**, BT, D-dimers, enkephalins, eos, factor D, fructosamine, G, GIP, glucagon, glycosylated albumin, cGMP, HCO_3^- , IDL-C, IGFBP-3, chloride, **chymotrypsin**, insulin, * K, * **uric acid**, creatine, * **creatinine**, cryoglobulins, LA, LD, LDL-C, LH, lipase, WBC, MAC, MAL, Mb, Mg, Na (recovery phase), neurotensin, NT-pro-ANP, plasma volume, osmolality, P, PT, PRL, PSA, PTH, RF, thrombomodulin, **trypsin**, trypsinogen, * **urea**
- ↓ ALT, **proteins**, * Ca (early), * Ca^{2+} , calcitriol, folic acid, PLT aggregation, PLT adhesiveness, * EPO, RBC, G, Hb (later), HCT (later), HCO_3^- , chloride, K (diuretic phase), complement - (* C₃, C₄), cortisol, lipoprotein lipase, **lym**, Mg, Na, volume, osmolality, P (recovery phase), pH, Se, serotonin, T₄, PLT
- **Urine** ↑ * AMS, **proteins**, eos, RBC, pus, K (diuretic phase), WBC, creatinine, creatinine urine/serum, blood, specific gravity, * Na (early), * **volume** (polyuric phase), * **osmolality**, **tubular cells**, casts - (RBC, granular, hyaline, WBC, myoglobin, **tubular cells**, waxy)
- ↓ chloride, K, creatinine, specific gravity, Mg, Na, * **volume** (early), osmolality, oxalate

■ **Sweat** ↑ chloride, Na

– **chronic renal failure**

↑ ACE, ACP (+RBC), ACTH, epinephrine, * **Al**, aldosterone, * **alpha-aminonitrogen**, * **ALP**, alpha-1-globulins, alpha-2-globulins, **ALT**, amino acids, ammonia, **AMS**, **ANA**, **ANF**, anion gap, **Apo B**, beta-endorphins, **BHBA**, * **B2M**, **BNP**, **Ca**, * **Ca₂₊** (stage dependent), **cAMP**, **CA 19-9**, **CEA**, **CK**, **CK-MB**, **Co**, **C-peptide**, **BT**, * **cystatine C**, **cystine**, **D-dimers**, **2,3-DPG (RBC)**, **EPO**, **estriol**, **factor VIII**, **FDP**, **Fe**, fibrinogen, fluoride, fructosamine, **ESR**, **G**, **gastrin**, **GLP**, **glucagon**, **glycerol**, glycine, glycated albumin, **GHb**, **cGMP**, **G6Pase**, **HbF**, **Hb (free)**, histamine, **HCO₃⁻**; homocysteine, * **chloride**, **cholesterol**, **chymotrypsin**, **ILGF-I**, **IGFBP-3**, immunoreactive proinsulin, immunoreactive trypsin, **insulin**, * **K**, **K (RBC)**, **calcitonin**, **catecholamines**, ketobodies, **cortisol**, **creatine**, * **creatinine**, **uric acid**, **LA**, **LD**, * **LDL-C**, **LH**, lipids, pre-beta-LPs, beta-LPs, **LPs**, **WBC**, **MAC**, **MCV**, **melatonin**, **Mg (+RBC)**, **Na (+RBC)**, **neu**, neurotensin, **Ni**, norepinephrine, **NT-pro-ANP**, plasma volume, * **osteocalcin**, **P**, **PT**, **PP**, **PRA**, **PRL**, protoporphyrin (**RBC**), * **PTH**, **RTC**, schistocytes, **Se**, **secretin**, **somatostatin**, sulfate, **GH**, * **TAG**, **cTnT**, thrombomodulin, **PLT**, **trypsin**, **TSH**, * **urea**, vitamin – (**A**, **B₁₂**, **D**, **E**), **VLDL-C**, **vWF**

↓ **PLT** adhesion, **PLT** aggregation, **alanine**, * **albumin**, aldosterone, **ALT**, ammonia, **Apo A-I**, **arginine**, **proteins**, **B2M**, **Ca**, * **Ca²⁺** (stage dependent), **Cd**, **CO₂**, **RBC**, * **EPO**, estrogens, factor – (**II**, **V**, **VII**, **IX**, **X**, **XIII**), * **Fe**, **FT₃**, **FT₄**, **G**, **Hb**, **GHb**, **HDL-C**, **HCT**, **HCO₃⁻**; **chloride**, **ILGF-I**, **K**, complement – (**C₃**, **C₄**), **cortisol**, **glutamic acid**, **LCAT**, **WBC**, lipoprotein lipase, **lym**, **Mg**, **MCHC**, **MCV**, **Na (+RBC)**, **ornithine**, **pCO₂**, **pH**, plasma volume, **plasmocytes**, **PRA**, progesterone, **RTC**, **Se**, **serotonin**, **T₃**, **T₄**, **testosterone**, **TIBC**, **PLT**, **transferrin**, **transferrin receptor**, **threonine**, **tyrosine**, vitamin – (**B₁**, **B₆**, **D₃**, **folate**), **FFA**, **Zn**

■ **Urine** ↑ **ACP**, **alanine**, **albumin**, aldosterone, **ALP**, amino acids, **AMS**, * **proteins**, **B2M**, * **RBC**, **G**, **pus**, hexosaminidase, **insulin**, **K**, coproporphyrin III, * **blood**, **uric acid**, **LD**, **WBC**, **lysozyme**, **mono**, **Na**, **volume (early)**, **pH**, **Se**, **GH**, **uroporphyrin**, casts – (**cellular**, **granular**, **hyaline**, **waxy**)

↓ ammonia, **Ca**, **GFR**, * **specific gravity**, **17-OHCS**, **17-KGS**, **Mg**, **Na**, osmolality, * **volume (later)**, **oxalate**, **pH**, **Se**

■ **Cerebrospinal Fluid** ↑ **proteins**, **creatine**, **WBC**

■ **Pleural Fluid** ↑ **pH**

↓ **LD**, **specific gravity**

■ **Gastric Fluid** ↑ **pH**

↓ **HCl**

■ **Saliva** ↑ **urea**

■ **Seminal Fluid** ↓ **spermatozoa** count

■ **Synovial Fluid** ↑ **crystals** – (**hydroxyapatite**, **urate**)

■ **Sweat** ↑ **chloride**, **Mg**, **Na**, **phosphate**

■ **Stool** ↑ **K**

Fasciitis

eosinophilic fasciitis

↑ **eos**, **WBC**

necrotizing fasciitis

↑ **ESR**, **WBC**

Feeding, Breast

↓ Cr, Mn

Feminization

adrenal feminization

■ *Urine* ↑ * estrogens, 17-KS

feminization in children

↑ estradiol

testicular feminization

↑ estradiol, LH, testosterone

Fever

familial Mediterranean fever

↑ eos (attack), ESR (attack), fibrinogen, alpha-2-globulins, glycoprotein, WBC

↓ Hb, HCT

■ *Urine* ↑ cAMP

rheumatic fever

↑ ADA, alpha-1-globulins, alpha-2-globulins, ALT, ANA, * antideoxy-ribonuclease B, anti-DNAase, * antihyaluronidase, antimyocardial Ab, antistreptokinase, * ASLO, AST, proteins, CIC, cold agglutinins, * CRP, Cu, elastase, fibrinogen, * ESR, gamma globulins, globulins, haptoglobin, IgA, IgG, immunoglobulins, complement - (C₃, total), cryofibrinogen, sialic acid, LD, LE cells, * WBC, MPV, mucoproteins, neu, plasma volume, PLT, * troponin - (I, T)

↓ albumin, RBC, Hb, HCT, complement - (C₃, CH₅₀, total)

■ *Urine* ↑ albumin, epinephrine, proteins, RBC, homocystine, catecholamines, coproporphyrin, WBC, norepinephrine, casts
↓ G

■ *Synovial Fluid* ↑ eos, clot formation, LE cells, WBC, neu, PMN, viscosity, volume

↓ complement - (C₃, total), viscosity

■ *Pleural Fluid* ↑ eos

Fibrinolysis, Primary

↑ APTT, D-dimers, FDP, PT, schistocytes

↓ A₂MG, euglobulin lysis time, fibrinogen, coagulation factor - (V, VIII), plasminogen

Fibrosis

cystic pancreatic fibrosis

↑ Al, ALP, ALT, alpha-1-antichymotrypsin, atypical-ANCA, conjugated Bil, CA 19-9, elastase, G, gamma globulins, GMT, glucagon, GHb, chymotrypsin, IgA, IgE, IgG, IgM, IL-8, immunoreactive trypsin, WBC, MAC, MAL, pCO₂, serotonin, trypsin, bile acids

↓ albumin, AMS, beta-carotene, proteins, Cu, RBC, Hb, HCT, chloride, cholesterol, CHS, K, lipase, lipids, pO₂, prealbumin, prothrombin, RBP, vitamin - (A, B₁₂, D, E, K)

■ *Urine* ↑ Al, G, 5-HIAA

↓ AMS

■ *Amniotic Fluid* ↑ ALP

↓ alpha-glucosidase

■ *Sweat* ↑ * chloride, K, * Na

■ *Saliva* ↑ AMS, proteins, K, Na

■ *Bronchoalveolar Lavage Fluid* ↑ neu, PMN

- *Seminal Fluid* ↓ spermatozoa
- *Stool* ↑ albumin, protein, pH, fat
↓ chymotrypsin, trypsin
- *Gastric Fluid* ↓ pepsin

pulmonary cystic fibrosis

- ↑ ACE, ALT, alpha-1-globulins, alpha-2-globulins, atypical-ANCA, EPO, gamma globulins, IgA, IgG, IgM, IL-8, WBC, MAL, pCO₂
- ↓ albumin, beta-carotene, essential fatty acid, cholesterol, K, carotenoids, pO₂, vitamin - (A, E)
- *Urine* ↑ G
- *Gastric Fluid* ↑ viscosity
↓ enzyme activity, HCO₃⁻
- *Sweat* ↑ Al, chloride, K, Na
- *Bronchoalveolar Lavage Fluid* ↑ neu, PMN
- *Stool* ↑ fat

retroperitoneal fibrosis

- ↑ ESR, eos, gamma globulins, WBC
- ↓ proteins, Hb, HCT

Fissure, Anal

- *Stool* ↑ blood

Fistula

arterio-venous fistula

- ↓ plasma volume
- *Synovial Fluid* ↑ RBC

esophago-pericardial fistula

- *Pericardial Fluid* ↑ WBC

gastric-duodenal fistula

- ↑ ALP, CEA, HCT, pH, WBC
- ↓ proteins, chloride, CO₂, Hb, HCT, K, Na, pH, pCO₂,
- *Stool* ↑ fat

intestinal fistula

- ↑ chloride, MAC, osmolality
- ↓ albumin, chloride, K, Mg, Na
- *Urine* ↓ K
- *Stool* ↑ pus, fat

lymphatic fistula

- ↓ albumin

pancreatic fistula

- ↑ MAC
- *Urine* ↓ K

Fluorosis

- ↑ fluoride, PTH

Fractures, Healing

- ↑ ALP, beta globulins, LD, lipids, osteocalcin, P
- ↓ P
- *Urine* ↑ Ca, hydroxyproline, creatine, creatinine, lipids

Fructosuria

- ↑ fructose, GHb
- *Urine* ↑ fructose, reducing sugars

Galactorrhea

- ↑ PRL
- ↓ estradiol, FSH, LH

Galactosemia

- ↑ ALT, AST, Bil, conjugated Bil, unconjugated Bil, phenylalanine, * galactose, galactose-1-phosphate (RBC), GHb, inositol
- ↓ albumin, G, * GPUT (RBC), galactokinase (RBC), uric acid
- **Urine** ↑ albumin, amino acids, proteins, * galactose, galactose-1-phosphate, reducing sugars, tyrosine

Gammopathy

monoclonal gammopathy

- benign monoclonal gammopathy

- ↑ alpha-2-globulins, ANCA, c-ANCA, gamma globulins, cholesterol, LDL-C, paraproteins (IgA, IgD, IgE, IgG, IgM), monoclonal M-chain, L-chain kappa/lambda Ig, prealbumin, viscosity
- ↓ IgG, IgM
- **Urine** ↑ proteins, monoclonal light chain kappa/lambda Ig, Bence Jones protein

- malignant monoclonal gammopathy

- ↑ alpha-1-globulins, alpha-2-globulins, ANCA, c-ANCA, beta globulins, proteins, ESR, gamma globulins, HbF, cholesterol, chylomicrons, IDL-C, creatinine, LDL-C, paraproteins, prealbumin, VLDL-C
- ↓ albumin, Hb, IgM
- **Urine** ↑ Bence Jones protein, proteins

-- heavy-chain disease

- ↑ eos, ESR, prealbumin, uric acid, lym, plasmocytes, urea
- ↓ albumin, Ca, RBC, gamma globulins, globulins, Hb, HCT, IgA, IgG, IgM, PLT, WBC
- **Urine** ↑ proteins, Bence Jones protein
- **Stool** ↑ K, fat

--- heavy-chain alpha disease

- ↑ monoclonal heavy chain alpha Ig, lym
- **Urine** ↑ Bence Jones protein

--- heavy-chain gamma disease

- ↑ eos, ESR, lym (relative), monoclonal heavy chain gamma Ig, plasmocytes, prealbumin, urea, uric acid
- ↓ albumin, Ca, RBC, * gamma globulins, globulins, Hb, HCT, IgA, IgG, IgM, WBC, PLT
- **Urine** ↑ proteins, Bence Jones protein
- **Stool** ↑ K, fat

--- heavy-chain Mu disease

- ↑ lym, monoclonal heavy chain Mu Ig, monoclonal light chain kappa/lambda Ig
- **Urine** ↑ Bence Jones protein, monoclonal light chain kappa/lambda Ig

-- plasmocytoma (incl. multiple myeloma)

- ↑ ACE, ACP, ACTH, albumin, alpha-1-globulins, ALP, ALP (WBC), A2MG, AMS, AST, Bence Jones protein, beta globulins, beta-lipotropin, proteins, Ca, BT, endorphins, enkephalins, eos, factor VIII, ferritin, fibrinogen, ESR, nucleated RBC, gamma globulins, globulins, HbF, hexosaminidase, cold agglutinins, chloride, cholesterol, chylomicrons, IDL-C, IgA, IgD, IgE, IgG, IgM, IL-6, sIL-6R, nucleated RBC, uric acid, creatinine, cryofibrinogen, cryoglobulins, LD, beta-LP, lupus

- inhibitor, lym, WBC, lysozyme, macrocytes, MCV, Mg, Mo, mono, TM – (B₂M, ferritin, fibronectin), plasma volume, osteocalcin, P, * paraproteins, monoclonal M-chain, L-chain kappa/lambda Ig, plasma volume, plasmocytes, prealbumin, pyroglobulins, RF, N-telopeptides, T_S-lym (CD8), TT, UBBC, urea, VDRL (false), viscosity, VLDL-C
- ↓ ACE, albumin, alpha-1-globulins, alpha-2-globulins, A₂MG, Apo B, EPO, RBC, factor – (II, XIII), gamma globulins, globulins, Hb, HCT, cholesterol, IgA, IgG, IgM, complement – (C₃), K, uric acid, LDL-C, WBC, Mg, Na, neu, P, pO₂, T_H-lym (CD4), transferrin, vitamin – (B₁₂), PLT
 - **Urine** ↑ albumin, amino acids, *Bence Jones protein, proteins, Ca, G, globulins, hexosaminidase, hydroxyproline – (total, free), K, crystals – (uric acid), monoclonal light chain kappa/lambda Ig, uric acid, TM – (hCG, hydroxyproline), volume, P, casts
 - ↓ GFR, osmolality, specific gravity, volume
 - **Cerebrospinal Fluid** ↑ albumin, proteins, globulins, IgG
 - **Pleural Fluid** ↑ B₂M, proteins
 - **Synovial Fluid** ↑ crystals – (cryoglobulin)
- IgA plasmocytoma (light-chain disease)
- ↑ Bence Jones protein, IgA, monoclonal heavy chain alpha Ig, monoclonal light chain kappa/lambda Ig, viscosity
 - ↓ IgA, IgG, IgM, WBC
 - **Urine** ↑ * Bence Jones protein
- IgD plasmocytoma (light-chain disease)
- ↑ IgD, monoclonal heavy chain delta Ig, monoclonal light chain lambda Ig
 - ↓ WBC
 - **Urine** ↑ * Bence Jones protein
- IgG plasmocytoma (light-chain disease)
- ↑ IgG, monoclonal heavy chain gamma Ig, monoclonal light chain kappa/lambda Ig, viscosity
 - ↓ IgA, IgM, WBC
 - **Urine** ↑ * Bence Jones protein
- solitary plasmocytoma
- ↑ monoclonal light chain kappa Ig, paraproteins
 - **Urine** ↑ Bence Jones protein
 - **Cerebrospinal Fluid** ↑ albumin, IgG, proteins
- Waldenstrom's macroglobulinemia
- ↑ ACP (WBC), ANA, alpha-1-globulins, beta globulins, * proteins, B₂M, BT, eos, factor VIII, ESR, gamma globulins, cold agglutinins, cholesterol, chylomicrons, IDL-C, IgG, * IgM, cryofibrinogen, cryoglobulins, uric acid, WBC, lym, macroglobulins, mastocytes, mono, plasma volume, paraproteins, monoclonal Mu-chain, L-chain kappa/lambda Ig, PT, plasmocytes, prealbumin, RF, TT, urea, viscosity, VLDL-C
 - ↓ albumin, RBC, ESR, factor – (II, V, VII, X), fibrinogen, Hb, HCT, IgA, IgG, IgM, complement – (total), WBC, lym, neu, clot retraction, PLT
 - **Urine** ↑ * Bence Jones protein, monoclonal light chain kappa/lambda Ig, proteins

- polyclonal gammopathy**
 ↑ alpha-1-globulins, alpha-2-globulins, gamma globulins, LDL-C, WBC, paraproteins, prealbumin
 ■ *Urine* ↑ protein
- Gangliopathy**
 ↑ anti-Hu Ab
- Gangliosidosis GM1 (Landing's disease)**
 ↓ * acid beta-galactosidase (WBC)
- Gangliosidosis GM2**
Sandoff's disease
 ↓ * hexosaminidase A (+ WBC), * hexosaminidase B (+ WBC)
 ■ *Urine* ↓ * hexosaminidase A, * hexosaminidase B
 ■ *Tears* ↓ * hexosaminidase A, * hexosaminidase B
- Tay-Sachs disease**
 ↑ AST, hexosaminidase B, LD
 ↓ * hexosaminidase A (+ WBC), fructose 1-phosphate aldolase
 ■ *Urine* ↓ * hexosaminidase A
 ■ *Cerebrospinal Fluid* ↑ AST
 ■ *Tears* ↓ * hexosaminidase A
- Gangrene**
 ↑ aldolase, ALP, ALT, AST, CK, CO₂, CRP, ESR, cryoglobulins, LD, pCO₂, pH, WBC, neu
 ↓ Hb, HCT, chloride, Na, pO₂, pCO₂
 ■ *Urine* ↑ proteins
- diabetic gangrene**
 ↑ ALP, ALT, AST, G
 ■ *Urine* ↑ G
- gaseous gangrene**
 ↑ WBC
 ■ *Urine* ↑ Hb
- muscular gangrene**
 ↑ ALT, AST, ESR, neu, WBC
- penis gangrene**
 ↑ ALT, WBC
- pulmonary gangrene**
 ↑ ESR, WBC, neu
 ↓ Hb, HCT
 ■ *Urine* ↑ protein
 ■ *Sputum* ↑ blood, volume
- Gastrectomy**
 ↑ AMS, ASAL, CCK-PZ, TIBC (subtotal)
 ↓ Ca, Cr, Fe, G, Mn, transferrin satur., vitamin - (B₁₂, D, folate), Zn
- Gastritis**
 ↑ APA, AST, eos, gastrin, Ab against *H. pylori*, neu, WBC, TIBC
 ↓ albumin, proteins, CEA, RBC, Fe, Hb, HCT, MCH, MCHC, pepsinogen, transferrin satur., vitamin - (B₁₂)
 ■ *Urine* ↓ uropepsinogen
 ■ *Gastric Fluid* ↑ HCl, mucus, blood, pH
 ↓ HCl, intrinsic factor, MAO, pepsin, pH
 ■ *Stool* ↑ proteins, Hb, blood

atrophic gastritis

- ↑ APA
- ↓ Fe, pepsinogen
- *Gastric Fluid* ↑ pH
- ↓ intrinsic factor
- *Stool* ↑ blood

- chronic atrophic gastritis

- ↑ antiintrinsic factor Ab, APA, CEA, gastrin
- ↓ RBC, Fe, gastrin, Hb, HCT, pepsinogen, vitamin - (B₁₂)
- *Gastric Fluid* ↓ hydrochloric acid, MAO

Gastroenteritis

- ↑ eos, G, Hb, HCT, chloride, WBC, MAL (during vomiting), MAC (during diarrhea), Na, neu, pH
- ↓ albumin, A₂MG, proteins, beta-carotene, CO₂, factor II, G, chloride (during vomiting), K, lym, Mg, Na, pCO₂
- *Urine* ↑ specific gravity
- *Cerebrospinal Fluid* ↓ G

eosinophilic gastroenteritis

- ↑ eos, WBC, MAL (during vomiting), MAC (during diarrhea)
- ↓ albumin, A₂MG, beta-carotene, factor II, chloride (during vomiting), K, Na

Gastroenteropathy, Allergic

- ↑ CIC, eos, IgE
- ↓ albumin, RBC, HCT, PLT
- *Stool* ↑ Charcot-Leyden crystals, blood

Gastropathy, Hypertrophic Hypersecretory

- *Gastric Fluid* ↑ HCl
- ↓ pH

Gigantism

- ↑ ALP, Ca, Ca²⁺, G, GH-RH, * IGF-I, insulin, creatinine, P, PRL, * GH, urea
- ↓ neu, SHBG
- *Urine* ↑ Ca, hydroxyproline, creatinine

Glomerulonephritis

cute glomerulonephritis (streptococcal)

- ↑ alpha-2-globulins, A₂MG, amino acids, * AGBMA, ANA, * ANCA, * p-ANCA, c-ANCA, anti-DNAase B, antihyaluronidase, anti-MPO, anti-streptokinase, * ASLO, beta globulins, Ca, * CIC, C-3 nephritic factor, CRP, * FDP, * fibrinogen, * ESR, gamma globulins, HLA - (DR₂), chloride, cholesterol, IgA, * IgG, * IgM, IL-6, * creatinine, uric acid, * cryoglobulins, LD, WBC, lipids, MAC+RAL, orosomucoid, P, plasmin, PMN, RF, schistocytes, urea
- ↓ albumin, proteins, factor B, RBC, Hb, HCT, C₁-INH, complement - (* C_{1q}, * C_{1r}, * C₂, * C₃, * C₄, * CH₅₀), creatinine clearance, Mg, PLT
- *Urine* ↑ AAP, * proteins, RBC (dysmorphous), FDP, Hb, hexosaminidase, pus, blood, WBC, * specific gravity, casts - (epithelial, * RBC, * granular, * hyaline, WBC, lipid, mixed)
- ↓ aldosterone, GFR, K, creatinine, uric acid, volume, osmolality, urea

- membranoproliferative glomerulonephritis

- ↑ * C-3 nephritic factor
- ↓ factor B, complement - (* C₃, * CH₅₀)

- **postinfectious glomerulonephritis (non-streptococcal)**

↑ **alpha-2-globulins, anti-DNAase B, anti-diphosphopyridine nucleotidase, antinicotinamide adenine dinucleotidase, * antihyaluronidase Ab, antikidney Ab, antistreptokinase Ab, * ASLO, beta globulins, CIC, C-3 nephritic factor, CRP, factor - (VIII), FDP, fibrinogen, ESR, gamma globulins, cholesterol, IgG, creatinine, cryoglobulins, WBC, plasmin, PMN, RF, urea**

↓ **albumin, RBC, factor B, Hb, HCT, complement - (C₃, CH₅₀), PLT**

■ **Urine** ↑ **aldosterone, proteins, RBC, FDP, Hb, blood, WBC, specific gravity, casts - (epithelial, RBC, granular, WBC, fatty)**

↓ **aldosterone, GFR, Na, volume, urea**

- **rapidly progressive glomerulonephritis**

↑ **ESR, creatinine, urea**

■ **Urine** ↑ **proteins, Hb, blood, RBC, WBC, casts - (hyaline, granular, RBC, WBC)**

↓ **volume**

chronic glomerulonephritis

↑ **albumin, A₂MG, c-ANCA, alpha-2-globulins, * CIC, * FDP, ESR, * cholesterol, * IgA, * IgG, * IgM, creatinine, uric acid, LD, lipids, MAC, orosomucoid, P, PT, urea**

↓ **albumin, proteins, RBC, Hb, HCT, * complement - (C₃, C₄, CH₅₀)**

■ **Urine** ↑ **AAP, amino acids, * proteins (+ non-selective), * RBC (dysmorphic), G, Hb, pus, blood, volume, * casts - (epithelial, RBC, granular, hyaline, lipid, waxy, mixed)**

↓ **K, creatinine, uric acid, volume, urea**

subacute glomerulonephritis

↑ **A₂MG, anti-DNAase B, * AGBMA, antihyaluronidase, antistreptokinase, ASLO, Ca, CIC, factor VIII, ESR, chloride, cholesterol, IgA, IgG, IgM, creatinine, uric acid, cryoglobulins, LD, orosomucoid, P, urea**

↓ **albumin, complement - (C₁q, C₃, C₄, CH₅₀)**

■ **Urine** ↑ **AAP, proteins, RBC, Hb, hexosaminidase, pus, blood, WBC, tubular cells, specific gravity, casts - (epithelial, RBC, granular, hyaline, WBC, lipid, mixed)**

↓ **creatinine, volume, osmolality, urea**

■ **Peritoneal Fluid** ↓ **protein**

■ **Pleural Fluid** ↓ **protein**

Glomerulosclerosis, Diabetic

↑ **cholesterol**

↓ **albumin**

■ **Urine** ↑ **proteins, microalbumin, oligopeptides, casts - (lipid)**

Glycogenosis

↑ **acetoacetic acid, ketobodies, uric acid, LA, LDL-C, MAC, TAG, VLDL-C**

↓ **PLT adhesion, G, WBC**

■ **Urine** ↑ **ketones, uric acid**

type I (von Gierke's disease)

↑ **ALT, AST, cholesterol, chylomicrons, GMT, ketones, acetoacetic acid, uric acid, LA, LDL-C, lipids, MAC, PL, pyruvate, TAG, VLDL-C, FFA**

↓ **ALP, RBC, G, G6Pase, Hb, HCT, LP lipase, P, pH, PLT**

■ **Urine** ↑ **acetone, amino acids, G, ketones, proteins, P**

■ **Sweat** ↑ **chloride, Na**

type II (Pompe's disease)

- ↑ **cholesterol**, chylomicrons, acetoacetic acid, **ketobodies**, **uric acid**, **LA**, LDL-C, pyruvate, **TAG**, VLDL-C, FFA
- ↓ **G**, **G6Pase**, * **alpha-1,4-glucosidase**, Hb, HCT, LP lipase, P
- **Urine** ↑ acetone, amino acids, G
- **Sweat** ↑ chloride, Na
- **Amniotic Fluid** ↑ CK
- ↓ * **alpha-1,4-glucosidase**
- **Tears** ↓ * **alpha-1,4-glucosidase**

type III (Forbes' disease, Cori's disease)

- ↑ ALT (children), AST (children), cholesterol, CK, ketobodies, uric acid, TAG
- ↓ G
- **Urine** ↑ acetone

type IV (Andersen's disease)

- ↑ AST, Bil, globulins, ketobodies, WBC
- ↓ Hb, HCT, cholesterol

type V (McArdle's disease)

- ↑ aldolase, CK, K, LA, LD, LDL-C, myoglobin
- ↓ albumin, * **phosphorylase** (WBC)
- **Urine** ↑ Mb

type VI (Hers' disease)

- ↑ ALT, cholesterol, ketones, uric acid, TAG
- ↓ G, * **phosphorylase** (WBC)

type VII (Lewis-Thompson disease)

- ↑ aldolase, CK, K, LA, LD, LDL-C
- ↓ G, * **phosphofructokinase** (RBC)
- **Urine** ↑ Mb

type VIII (Tar-rui disease)

- ↓ G
- **Urine** ↑ epinephrine, norepinephrine

Glycosuria

- ↓ P
- **Urine** ↑ estriol, specific gravity, volume, Na, **reducing sugars**

Goiter

- ↑ * **antimicrosomal Ab**, * **antithyroglobulin Ab**, **AGBMA**, antithyroid Ab, thyroxine autoantibodies, **FT4**, iodine, * **TSH**, thyroglobulin
- ↓ iodine

adenomatous goiter

- ↑ **antimicrosomal Ab**, antithyroidal Ab

nodular goiter

- ↑ **antimicrosomal Ab**, antithyroglobulin Ab, **antithyroidal Ab**, thyroxine autoantibodies, **T₃**, **T₄**

Granulomatosis, Wegener's

- ↑ **ANCA**, * **c-ANCA**, * **p-ANCA**, antiendothelial Ab, antithyroglobulin Ab, ALT, AST, * **CIC**, **CRP**, eos, **ESR**, gamma globulins, **IgA**, **IgG**, complement - (C₃, C₄), **creatinine**, cryoglobulins, HLA - (DR₂, DR₄, DRw₇), **WBC**, **MAC+RAL**, **RF**, **PLT**, **urea**
- ↓ albumin, * **RBC**, **Hb**, **HCT**, complement - (* C₃), **WBC**, **PLT**

- *Urine* ↑ proteins, RBC, Hb, blood, casts – (RBC, granular, WBC)
- *Cerebrospinal Fluid* ↑ ANCA
- *Synovial Fluid* ↑ WBC, PMN

Growth

physiological body growth

- ↑ ACP, Ca, ILGF-I
- ↓ Zn

physiological bone growth

- ↑ ACP, ALP

Gynecomasty

- ↑ estradiol, PRL

Hematoma

- ↑ AAT, ALT, unconjugated Bil
- ↓ **haptoglobin**

subdural hematoma

- *Cerebrospinal Fluid* ↑ proteins, RBC, blood, pressure

Hemochromatosis

- ↑ ADA, AFP, ALT, AST, Ca, Cu, * Fe, * ferritin, G, HLA – (A3, B7, B14), CHS, PTH, * transferrin satur., siderocytes, GH, TIBC
- ↓ albumin, ACTH, Cu, FSH, LH, P, PTH, GH, testosterone, * TIBC, transferrin, uric acid, TSH
- *Urine* ↑ * Fe, G, Hb, * hemosiderin, * porphyrins
- ↓ FSH
- *Sputum* ↑ blood
- *Synovial Fluid* ↑ crystals – (calcium pyrophosphate), WBC, viscosity

neonatal hemochromatosis

- ↑ acanthocytes, AFP, Bil
- ↓ albumin, ALT, AST, G, Hb, HCT, PLT

primary idiopathic hemochromatosis

- ↑ ALT, AST, Bil, Fe, ferritin, gamma globulins, HLA – (A3, B7, B14), PT, transferrin satur.
- ↓ albumin, WBC, TIBC, PLT
- *Urine* ↑ protein

Hemoconcentration

- ↑ albumin, beta-carotene, proteins, Ca, Hb, HCT, oxytocin
- ↓ ESR

Hemodilution

- ↑ ESR

Hemoglobin F, Hereditary Persistence

- ↑ * HbF
- ↓ MCV, MCHC

Hemoglobinopathy

- ↑ microcytes, unconjugated Bil, RBC Heinz bodies, uric acid, RBC osmotic resistance, sickle cells, target cells
- ↓ RBC, estriol, Hb, MCV, osmotic fragility
- *Urine* ↓ estriol

Hemoglobinuria

march hemoglobinuria

- *Urine* ↑ Hb, Mb

paroxysmal cold hemoglobinuria

↑ * **anisocytes**, Bil, * **cold autohemolysin**, cold agglutinins, LD, MCV, methemalbumin, MHB, nucleated RBC, * **poikilocytes**, * **spherocytes**

↓ RBC, Hb, HCT

■ **Urine** ↑ * **Hb, hemosiderin**, casts – (Hb, Mb)

paroxysmal nocturnal hemoglobinuria

↑ **PLT Ab**, AST, Bil, **unconjugated Bil**, Hb, Hb (free), HbF, complement – (C₃), LD, WBC, macrocytes, **methemalbumin**, MCV, MHB, osmotic fragility, RTC

↓ **ACHE (RBC)**, **ALP (WBC)**, RBC, factor B, factor XI, Fe, **haptoglobin**, Hb, HCT, CHS, folate, complement – (C₃), WBC, MCV, **neu**, pancytopenia, pH, schistocytes, **PLT**

■ **Urine** ↑ albumin, Fe, RBC, Hb, **hemosiderin**, UBG, casts – (Hb, Mb)

■ **Stool** ↑ UBG

Hemolysis

acute hemolysis

↑ **ACP**, AST, Bil, unconjugated Bil, **K**, uric acid, LD, lipoprotein lipase, WBC, MD, Mg, NSE, RTC, urea, zinc protoporphyrin

↓ alpha-2-globulins, RBC, haptoglobin, Hb, HCT, hemopexin, vitamin – (E)

■ **Urine** ↑ Hb, hemosiderin

infectious hemolysis

↑ **ACP**, AST, Bil, unconjugated Bil, **CRP**, **K**, uric acid, LD, WBC, MD, Mg, ornithine, P, urea

↓ RBC, haptoglobin, transferrin satur.

■ **Urine** ↑ Hb

intravascular hemolysis

↑ **AAT**, **ACP**, **PLT aggregation**, AST, Bil, unconjugated Bil, COHb, delta Bil, nucleated RBC, Hb, **K**, uric acid, LD, lipoprotein lipase, **macrocytes**, MD, methemalbumin, ornithine, * **RTC**, urea

↓ alpha-2-globulins, RBC, * **haptoglobin**, * **Hb**, HCT, hemopexin

■ **Urine** ↑ **Bil**, Hb, **hemosiderin**, methemalbumin, UBG

↓ volume

■ **Stool** ↑ UBG

mechanic hemolysis

↑ **cTnI**, **cTnT**, ornithine, urea

↓ **ACP**, alpha-2-globulins, Bil, unconjugated Bil, * **proteins**, * **ferritin**, haptoglobin, Hb, uric acid, LD

medicamentous hemolysis

↑ ornithine, urea

↓ **ACP**, alpha-2-globulins, Bil, unconjugated Bil, haptoglobin, Hb, uric acid, LD

Hemoperfusion

↓ Ca, G, WBC

Hemophilia

hemophilia A

↑ anti-La/SSB, * **APTT**, AST, BT, * **clotting time** (Lee White), HBsAg, * **PT**, TGT

- ↓ * **factor VIII**, cholesterol, Hb, HCT
 - **Urine** ↑ RBC, Hb, cystine
 - **Gastric Fluid** ↑ blood
 - **Sputum** ↑ blood
 - **Synovial Fluid** ↑ crystals – (calcium pyrophosphate), lym, volume
- hemophilia B**
- ↑ anti-La/SSB, * **APTT**, **AST**, **BT**, **clotting time** (Lee White), **PT**, **TGT**
 - ↓ * **factor IX**, cholesterol
 - **Urine** ↑ RBC, Hb, cystine
 - **Gastric Fluid** ↑ blood
 - **Sputum** ↑ blood
 - **Synovial Fluid** ↑ crystals – (calcium pyrophosphate), lym, volume
- hemophilia C**
- ↑ coagulation time, **PT**, **TGT**
 - ↓ * **factor XI**
- Hemorrhage**
- ↑ **ADH**, **aldosterone**, **ALT**, ammonia, **AST**, **BT**, **CK**, **EPO**, fibrinogen, **ESR**, glutamine, **K**, **LA**, **WBC**, neu, **PRA**, **RTC**, **TIBC**, **PLT**, transferrin, urea
 - ↓ **albumin**, **proteins**, **RBC**, **Fe**, ferritin, **G6PD**, **Hb**, **HCT**, chloride, **catecholamines**, **cortisol**, **MCV**, **Na**, plasma volume, porphyrins, **PT**, transferrin satur.
 - **Urine** ↑ **G**, 5-HIAA, cholesterol
 - **Cerebrospinal Fluid** ↑ adenylate kinase, proteins, **CK**, eos, **RBC**, **IgG**, blood, **LA**, **LD**, **WBC**, **Ly**, pressure
 - ↓ **G**, **pH**
 - **Stool** ↑ blood
- acute hemorrhage**
- ↑ **RTC** (3-4 days later), transferrin, **PLT**
 - ↓ **Fe**, ferritin (2 weeks later), plasma volume, **PT**, transferrin satur.
- anovulatory hemorrhage**
- **Urine** ↓ estrogens
- cerebral hemorrhage**
- ↑ **AST**, **BT**, **ESR**, glutamine, **WBC**
 - **Urine** ↑ **G**, cholesterol
 - **Cerebrospinal Fluid** ↑ **proteins**, **CK**, eos, **RBC**, **IgG**, blood, **LA**, lym, **WBC**, pressure
- chronic hemorrhage**
- ↑ **TIBC**, transferrin
 - ↓ **Fe**, ferritin, **G6PD** (**RBC**), **HCT**, transferrin satur.
- esophageal varices hemorrhage**
- ↑ ammonia, urea
 - ↓ proteins, **HCT**
 - **Stool** ↑ blood
- gastrointestinal tract hemorrhage**
- ↑ ammonia, gastrin, urea
 - ↓ proteins, **HCT**, **Na**
 - **Stool** ↑ blood
- intraamniotic hemorrhage**
- **Amniotic Fluid** ↑ blood
- intracranial hemorrhage**
- ↑ **AST**

- **Cerebrospinal Fluid** ↑ RBC, IgG, blood, LA, LD, WBC, macrophages, pressure
↓ cAMP
- neonatal hemorrhage**
 - **internal neonatal hemorrhage**
 - ↑ unconjugated Bil
 - ↓ Hb, HCT
 - **twin-to-twin neonatal hemorrhage (recipient twin shows)**
 - ↑ * unconjugated Bil, * Hb, * HCT
 - **twin-to-twin neonatal hemorrhage (donor twin shows)**
 - ↑ nucleated RBC, RTC
 - ↓ * Hb, HCT
- subarachnoid hemorrhage**
 - ↑ ADH, CK
 - **Cerebrospinal Fluid** ↑ adenylate kinase, proteins, CK, CRP, eos, cholesterol, blood, LA, LD, RBC, WBC, lym, pressure
↓ G, pH
- subdural hemorrhage**
 - **Cerebrospinal Fluid** ↑ blood, lym, pressure
- Hemorrhoids**
 - ↓ RBC, Fe, Hb, HCT
 - **Stool** ↑ blood
- Hemothorax**
 - ↑ pCO₂
 - ↓ Hb, pH, pO₂
 - **Pleural Fluid** ↑ blood, LD, RBC
↓ pH
- Hepatitis**
 - acute hepatitis**
 - ↑ AAT, ACP, ADA, AFP, **aldolase**, alpha globulins, ALP, ALP (hepatic isoenzyme), ALT, ammonia, AMS, anti-DNA, ASMA, AST, beta globulins, B2M, Bil, **conjugated Bil**, unconjugated Bil, C3, CEA, **ceruloplasmin**, enolase, Fe, ferritin, fibrinogen, ESR, gamma globulins, GD, GMT, IgA, IgG, IgM, uric acid, LAP, LD, LD5, LE cells, lipids, lym, macrocytes, Mn, mono, 5-nucleotidase, orosomucoid, PT, PRA, RBP, serotonin, SHBG, T4, TBG, TIBC, TPA, **transferrin**, PLT, vitamin - (B₁₂), bile acids
 - ↓ AAT, **albumin**, AMS, Apo A-IV, G, Hb, HCT, HDL-C, hemopexin, cholesterol, CHS, IgM, C₁-INH, prealbumin, Se, triiodothyronine resin uptake, urea
 - **Urine** ↑ alpha-aminonitrogen, ALT, **conjugated Bil**, DALA, fructose, G, **galactose**, reducing sugars, UBG, urobilin, casts - (epithelial, granular)
 - **acute fulminant hepatitis with hepatic failure**
 - ↑ ACP, AFP, **aldolase**, ALP, ALT, **ammonia**, anti-HBc Ab, anti-HBc IgM, ASMA, AST, Bil, **conjugated Bil**, **unconjugated Bil**, B2M, CEA, Fe, ESR, gamma globulins, GMT, HBsAg, HBcAg, HBeAg, ICD, IgA, IgG, IgM, LAP, LD, WBC, mAST, PT, PL, serotonin, T₃, T₄, TBG, TIBC, transferrin
 - ↓ **albumin**, alpha-1-globulins, alpha-2-globulins, AST (later), beta globulins, proteins, RBC, G, Hb, HCT, **cholesterol**, CHS, WBC, neu, PL, T₃, transferrin, PLT

- **Urine** ↑ amino acids, Bil, UBG
↓ UBG
- **Stool** ↑ fat
↓ UBG
- **Cerebrospinal Fluid** ↑ proteins, lym
- acute hepatitis A
 - ↑ * anti-HAV-IgM, * anti-HAV-IgG, * anti-HAV, * HAV-RNA
 - ↓ WBC
- acute hepatitis B (high infectivity)
 - ↑ anti-HBc-IgM, anti-HBc, * HBeAg, * HBsAg, * HBV-DNA
 - ↓ WBC
- acute hepatitis B (late, low infectivity)
 - ↑ anti-HBc, anti-HBc-IgG, anti-HBe, HBeAg, HBsAg
- acute hepatitis B (serologic gap)
 - ↑ anti-HBc, anti-HBc-IgM
- acute hepatitis B (convalescence)
 - ↑ anti-HBe, anti-HBc, anti-HBc, * anti-HBs -IgM
- acute hepatitis B (recovery)
 - ↑ * anti-HBe, anti-HBc, * anti-HBs, anti-HBc-IgG
- acute hepatitis C
 - ↑ * anti-HCV
- acute hepatitis D
 - ↑ * anti-HDV-IgM, anti-HDV, * HDAG
 - ↓ WBC
- acute hepatitis E
 - ↑ * anti-HEV
 - ↓ WBC
- acute viral hepatitis (hepatitis A, B, C, D, E)
 - ↑ AAP, AAT, ACP, ADA, ADH, AFP, aldolase, ALP, ALP (WBC), alpha-1-glycoprotein, alpha-2-globulins, * ALT, AMA, AMS, ANA, anti-DNA, anti-HAV, anti-HAV-IgG, anti-HAV-IgM, anti-HBc, anti-HBe, anti-HBs, anti-HBc-IgG, anti-HBc-IgM, anti-HBe, anti-HBsAg, anti-HBs-IgG, anti-HBV, anti-HCV, anti-HDV, anti-HEV, ASAL, ASMA, AST, beta globulins, beta-glucuronidase, B2M, Bil, conjugated Bil, unconjugated Bil, BSP retention, CEA, ceruloplasmin, CRP, Cu, Fe, phenylalanine, folate, ESR, gamma globulins, GMD, GMT, guanine deaminase, HAV-RNA, HBsAg, HBcAg, HBeAg, HBV-RNA, HCV-RNA, HDAG, HDV-RNA, HEV-RNA, hexosaminidase, chenodeoxycholic acid, cold agglutinins, cholic acid, ICD, IgA, IgG, IgM, isoleucine, complement - (C3), cryoglobulins, uric acid, LAP, LD, LD5, LDL-C, lecithin (RBC), leucine, WBC, lym, MD, Mn, mono, neu, 5-nucleotidase, OCT, phenylalanine, PT, PL, PRA, RF, RTC, serotonin, T3, T4, TAG, TBG, TIBC, transferrin, thymidine kinase, tyrosine, valine, VLDL-C, bile acids
 - ↓ albumin, alpha-1-globulins, alpha-2-globulins, beta globulins, beta-carotene, proteins, RBC, G, G tolerance, glycoproteins, Hb, HCT, cholesterol, CHS, complement - (C3), LD (isoenzymes), lipase, WBC, lym, Mg, mono, mucoproteins, neu, Ni, pCO₂, PL, plasmocytes, PLT, prealbumin, RBP, Se, T3, transferrin, vitamin - (A), Zn
 - **Urine** ↑ albumin, alpha-aminonitrogen, ALT, amino acids, proteins, conjugated Bil, DALA, fructose, G, galactose, coproporphyrin, blood, porphyrins, UBG, urobilin, casts - (epithelial, granular), Zn

- ↓ 17-KS, specific gravity, UBG
- **Stool** ↑ fat
- ↓ Bil, UBG
- **Cerebrospinal Fluid** ↑ proteins, lym
- **Synovial Fluid** ↑ clot formation, WBC, PMN, volume

alcoholic hepatitis

- ↑ ACP, AFP, ALP, ALP (hepatic isoenzyme), ALT, ammonia (later), ANA, Apo – (A-I, A-II, B), AST, Bil, conjugated Bil, unconjugated Bil, B₂M, carbohydrate-deficient transferrin, ceruloplasmin, CK-MB, ferritin, gamma globulins, GMT, Hb, cholesterol, IgA, IL-8, WBC, MAL, mAST, MCH, MCV, Ni, 5-nucleotidase, OCT, osmolality, Pb, pH, PT, PRA, serotonin, T₄, bile acids
- ↓ albumin, ALT, AST (later), proteins, Ca, CK, Cr, RBC, Fe, Hb, HCT, CHS, K, LD (later), WBC, Mg, Mn, Na, osteocalcin, pH, PLT, porphyrins, urea, vitamin – (B₂, B₁₂, folate)
- **Urine** ↑ ALT, conjugated Bil, DALA, fructose, galactose, K, UBG
- ↓ UBG
- **Stool** ↓ UBG

autoimmune chronic active hepatitis

- ↑ * ALP, * ALT, ANA, * anti-LKM-1, anti-soluble liver Ag (anti-SLA), anti-actin Ab, antimicrosomal Ab, antimitochondrial Ab, antithyroidal Ab, * ASMA, * AST, Bil, CIC, * gamma globulins, globulins, HLA – (A₁, B₁, B₈, DRw₃, DRw₄, DW₃), IgG, complement – (C₂, C₄), PT, liver specific sialoglycoprotein receptor Ab, RF
- ↓ albumin, C₃ complement, WBC

chronic hepatitis

– chronic active hepatitis B (progressive)

- ↑ AAT, ACP, AFP, ALP, ALT, A₂MG, AMA, ANA, anti-ds-DNA, anti-ss-DNA, anti-HBc, anti-HBe, antimicrosomal Ab, anti-Salmonella Ab, ASMA, AST, Bil, conjugated Bil, unconjugated Bil, B₂M, BSP retention, CA 15-3, CBG, CEA, ceruloplasmin, FDP, gamma globulins, glycoproteins, GMD, GMT, * HBeAg, * HBsAg, * HBV-DNA, HDL-C, HLA – (B₈, DR₃), cholesterol, CHS, IgA, IgG, IgM, cortisol, cryoglobulins, chenodeoxycholic acid, cholic acid, LAP, LE cells, Mn, PT, plasmocytes, anti-DNA-histone complex Ab, antihepatocyte membrane Ab, PRA, RF, SHBG, T₃, T₄, TBG, TIBC, TSH, viscosity, VLDL-C, bile acids, FFA
- ↓ albumin, Apo AI, AT III, ceruloplasmin, G, haptoglobin, Hb, HCT, HDL-C, cholesterol, CHS, IGFBP-3, IgM, complement – (C₃, total), WBC, T-lym, Mg (+RBC), neu, pCO₂, RBP, PLT, Se, FFA, Zn
- **Urine** ↑ Bil, Cu, UBG

– chronic hepatitis B (high infectivity)

- ↑ ALT, anti-HBc-IgG, * anti-HBc, AST, Bil, * HBeAg, * HBsAg, * HBV-DNA, PT
- ↓ albumin

– chronic hepatitis B (late, low infectivity)

- ↑ anti-HBc-IgG, anti-HBc, anti-HBe, HBeAg, * HBsAg

– chronic hepatitis B (chronic persistent)

- ↑ ACE, ACP, ADA, AFP, aldolase, alpha-aminonitrogen, A₂MG, ALP, ALT, AMA, aminotripeptidase, ANA, anti-LKM-1, anti-HBe, anti-HBc, APTT, arginase, ASMA, AST, ATPase, beta-glucuronidase, Bil, B₂M, CA 15-3, CEA, ceruloplasmin, enolase, FDP, Fe, ferritin, phosphoglu-

comutase, phosphohexoisomerase, fructose-1,6-di-phosphate aldolase, fumarase, gamma globulins, glutathione reductase, GMD, GMT, guanase, HBD, **HBeAg**, * **HBsAg**, HDL-C, cholesterol, ICD, IgA, **IgG**, IgM, cortisol, LAP, LD, LD5, LDL-C, LE cells, lipoprotein lipase, lym, MD, mono, 5-nucleotidase, OCT, PT, PRA, pyruvate kinase, RF, serotonin, SHBG, T4, TIBC, TPA, transferrin, transketolase, vitamin – (B₁₂), bile acids

↓ **albumin**, AT III, beta globulins, C₃, ceruloplasmin, Cu, fibrinogen, granulocytes, **haptoglobin**, HDL-C, hemopexin, CHS, IgM, Mg, **prealbumin**, pseudocholinesterase, Se, transferrin, PLT, urea

■ **Urine** ↑ alpha-aminonitrogen, ALT, Bil, DALA, fructose, G, galactose, UBG

– chronic hepatitis C

↑ ALT, * **anti-HCV**, **anti-LKM-1**, AST, Bil, HCV RNA, PT

– chronic hepatitis D

↑ ALT, anti-HBc-IgG, anti-HBc-IgM, * **anti-HDV**, anti-LKM-3, AST, HBsAg, HDag, HDV-RNA

hepatitis B (HBV)

↑ ACE, ACP, ADA, AFP, **aldolase**, ALP, * ALT, alpha-aminotripeptidase, aminonitrogen, A₂MG, AMA, ANA, anti-ds-DNA, **anti-ss-DNA**, anti-LKM-1, **anti-HBc**, **anti-HBe**, antimicrosomal Ab, anti-Salmonella Ab, APTT, arginase, ASMA, AST, Bil, B₂M, beta-glucuronidase, CBG, CEA, ceruloplasmin, enolase, FDP, Fe, **ferritin**, phosphoglucomutase, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, fumarase, **gamma globulins**, GMD, GMT, HBD, * **HBeAg**, * **HBsAg**, * **HBV-DNA**, HDL-C, HLA – (B₈, DR₃), **cholesterol**, CHS, ICD, IgA, **IgG**, **IgM**, cortisol, cryoglobulins, LAP, LD, LD5, LDL-C, LE cells, lipoprotein lipase, lym, MD, mono, 5-nucleotidase, OCT, PT, anti-DNA-histone complex Ab, antihepatocyte membrane Ab, PRA, pyruvate kinase, RF, serotonin, SHBG, T₃, T₄, TBG, TIBC, TPA, transferrin, transketolase, TSH, viscosity, bile acids

↓ **albumin**, AT III, beta globulins, C₃, ceruloplasmin, Cu, fibrinogen, granulocytes, **haptoglobin**, HDL-C, hemopexin, CHS, IGFBP-3, IgM, complement – (C₃), Mg, neu, **prealbumin**, pseudocholinesterase, RBP, Se, transferrin, PLT

■ **Urine** ↑ alpha-aminonitrogen, ALT, Bil, Cu, DALA, fructose, G, galactose, UBG

hepatitis C (HCV)

↑ ALT, * **anti-HCV**, **anti-LKM-1**, AST, Bil, HCV RNA, PT

hepatitis D (HDV)

↑ ALT, anti-HBc-IgG, anti-HBc-IgM, * **anti-HDV**, * **anti-HDV-IgM**, anti-LKM-3, AST, HBsAg, * **HDag**, HDV-RNA

hepatitis E (HEV)

↑ ALT, * **anti-HEV**, Bil, HEV-RNA

↓ WBC

hepatitis G (HGV)

↑ **anti-HGV**, HGV-RNA

infectious hepatitis (HAV)

↑ ADA, ADH, AFP, **aldolase**, ALP, ALT, AMA, * **anti-HAV**, **anti-HAV-IgA**, **anti-HAV-IgG**, * **anti-HAV-IgM**, ASAL, ASMA, AST, beta globulins, **beta-glucuronidase**, B₂M, Bil, **conjugated Bil**, **unconjugated Bil**,

ceruloplasmin, CRP, Fe, phenylalanine, ESR, **gamma globulins**, GMT, * HAV-RNA, IgA, IgG, IgM, ICD, complement - (C₃), cryoglobulins, LDL-C, leucine, WBC, **lym**, mono, **PT**, PL, SD, syphilis Ab (false), T₃, T₄, TBG, thymidine kinase, TIBC, transferrin, VLDL-C

↓ **albumin**, **alpha-1-globulins**, alpha-2-globulins, beta globulins, beta-carotene, proteins, RBC, cholesterol, complement - (C₃), WBC, mono, mucoproteins, **neu**, PL, T₃, transferrin, UBBC, vitamin - (A), Zn, bile acids

■ **Urine** ↑ albumin, alpha-aminonitrogen, ALT, **amino acids**, **conjugated Bil**, DALA, fructose, G, **galactose**, **porphyrins**, transferrin satur., T₃, transferrin, **UBG**, Zn

↓ 17-KS, UBG

■ **Stool** ↑ fat

↓ Bil, UBG

■ **Cerebrospinal Fluid** ↑ proteins, **lym**

■ **Synovial Fluid** ↑ WBC, PMN

lupus hepatitis

↑ ALP, ALT, AST, Bil, ASMA

neonatal hepatitis

↑ ALP, ALT, AST, **Bil**, **conjugated Bil**, ESR, GMT, **lym** (relat.), mono (relat.), PL

↓ Hb, HCT, **lym**, **neu**, PL, WBC

■ **Urine** ↑ albumin, **conjugated Bil**, UBG

peliosis hepatitis

↑ ALP, ALT

■ **Urine** ↑ proteins

postmedicamentous hepatitis

↑ ALP, ALT, ANA, anti-LKM-1, ASMA, AST, **Bil**, **conjugated Bil**, **unconjugated Bil**, ceruloplasmin, GMT, IgG

■ **Urine** ↑ **conjugated Bil**, UBG

↓ UBG

■ **Stool** ↓ Bil, UBG

toxic hepatitis

↑ AAP, AAT, aldolase, ALP, alpha-1-glycoprotein, ALT, AMA, A₂MG, ASAL, AST, ATIII, **Bil**, **conjugated Bil**, unconjugated Bil, **beta-glucuronidase**, B₂M, BSP retention, ceruloplasmin, CO₂, gamma globulins, G₆PD, GMT, cholesterol, ICD, LAP, LD, LD₅, Mn, 5-NT, PT, SD, TBG, VLDL-C

↓ AMS, G, cholesterol, proteins, Ni, urea

■ **Urine** ↑ **Bil**, UBG

■ **Stool** ↓ Bil, UBG

Hepatopathy

↑ ACE, ACP, AFP, ALP, ammonia, AST, beta globulins, proteins, Bil, **conjugated Bil**, unconjugated Bil, BSP, BT, gamma globulins, G, HDL-C, LD, LD₅, LDL-C, WBC, RBC osmotic resistance, PT, serotonin

↓ albumin, alpha-1-globulins, alpha-2-globulins, proteins, Ca, Ca²⁺, fibrinogen, G, Hb, HCT, cholesterol, CHS, IGFBP-3, K, cortisol, folic acid, WBC, Na, P, proconvertin, prothrombin, TIBC, PLT, urea

■ **Urine** ↑ ALT

■ **Stool** ↑ fat

Hepatosplenomegaly

↑ anti-toxocara Ab

Hernia

diaphragmatic hernia

- **Stool** ↑ blood
- **Amniotic Fluid** ↑ volume

hiatal hernia

- ↓ Fe
- **Urine** ↑ lactose, reducing sugars

Hirsutism

- ↑ androstenedione, **DHEA**, **DHEAS**, pregnenolone, SHBG, **testosterone**, free testosterone (F)

Histidinemia

- ↑ **alanine**, arginine, cystathionine, cysteine, cystine, * **histidine**, hydroxylysine, lysine, ornithine
- ↓ glutamic acid
- **Urine** ↑ alanine, arginine, cystathionine, cysteine, cystine, ethanolamine, * **histidine**, hydroxylysine, glutamic acid, **imidazole pyruvic acid**, imidazole acetic acid, imidazole lactic acid, lysine, ornithine, threonine
- **Cerebrospinal Fluid** ↑ glutamine

Histiocytosis X

- ↑ ALP, ALT, mono
- ↓ Hb, HCT, lym, WBC, PLT, pO₂
- **Urine** ↑ Ca, volume
- **Bronchoalveolar Lavage Fluid** ↑ eos, **Langerhans cells**, lym, macrophages, neu
- **Synovial Fluid** ↑ macrophages

Homocysteinuria

- ↑ PLT adhesion, * **homocysteine**, * **methionine**, valine
- ↓ cystine, folate
- **Urine** ↑ amino acids, asparagine, cystathionine, * **homocystine**, **methionine**
- **Cerebrospinal Fluid** ↑ **homocystine**, **methionine**

Hydrocephalus

non-obstructive hydrocephalus

- ↑ AFP
- **Cerebrospinal Fluid** ↑ eos, ependymal cells, glial fibrillary acidic protein, **CHS**, **LA**, **MBP**, pressure
- **Amniotic Fluid** ↑ AFP, volume

obstructive hydrocephalus

- **Cerebrospinal Fluid** ↑ prealbumin, pressure

Hydronephros

- ↑ RBC
- **Urine** ↑ proteins, RBC, Hb, pus, blood

Hydrops, Fetal

- ↑ hPL
- **Amniotic Fluid** ↑ volume

Hydrothorax

- **Urine** ↑ pH
- **Pleural Fluid** ↓ proteins, cholesterol, LD, lipids, lym

Hydroxyprolinemia, Hereditary

- ↑ * **hydroxyproline**

- *Urine* ↑ * hydroxyproline – (total, free)
- Hyperadrenalism**
- ↑ prealbumin
 - ↓ amino acids
 - *Urine* ↑ G, K, 17-KS, 17-KGS, pregnanediol
 - *Cerebrospinal Fluid* ↑ protein
 - *Sweat* ↑ K
- Hyperalbuminemia**
- ↑ albumin, Ca, osmolality
 - ↓ ESR
- Hyperaldosteronism**
- primary hyperaldosteronism (Conn's disease)**
- ↑ * aldosterone, 18-OH DOC, G, HCO_3^- , MAL, Na, volume, pCO_2 , pH
 - ↓ angiotensin II, chloride, * K, K (RBC), Mg, * PRA
 - *Urine* ↑ aldosterone, * K, pH, volume
 - ↓ chloride, Na, pH, specific gravity
 - *Sweat* ↓ Na
- secondary hyperaldosteronism (Bartter's sy)**
- ↑ * aldosterone, angiotensin, G, HCO_3^- , kallikrein, uric acid, * MAL, * PGE₂, PGF₂, PGI₂, pH, * PRA
 - ↓ * K, K (RBC), Mg, Mg (WBC), Na, PLT aggregation, chloride, volume (plasma)
 - *Urine* ↑ aldosterone, * chloride, * K, Na, kallikrein, * Mg, volume, PG
 - ↓ * osmolality
- Hyperammonemia, Congenital**
- ↑ * ammonia
 - ↓ urea
- Hyperbetaalaninemia**
- ↑ * beta-alanine, MAC
 - *Urine* ↑ beta-alanine, beta-aminobutyric acid, taurine
- Hyperbilirubinemia, Familial in Infants**
- ↑ Bil, TT
 - *Urine* ↑ conjugated Bil
- Hypercalcemia**
- ↑ ALP, ALT, AST, * Ca, Ca^{2+} , chloride, ESR, gastrin, cholesterol, calcitonin, uric acid, creatinine, LD, MAC, osmolality, P, PTH, TAG, urea
 - ↓ albumin, Hb, HCT, HCO_3^- , WBC, Mg, P, pCO_2 , PTH
 - *Urine* ↑ Ca, Ca^{2+} , hydroxyproline, K, volume
 - ↓ P
 - *Cerebrospinal Fluid* ↑ protein
- familial hypocalciuric hypercalcemia**
- ↑ * Ca, Ca^{2+} , Mg, * PTH, vitamin – (D₃)
 - ↓ P
 - *Urine* ↑ cAMP
 - ↓ Ca, Mg
- hypercalcemia of malignancy**
- ↑ ACE, ALP, * Ca, ESR, HCO_3^- , MAL, osteocalcin, P, pH, * PTHrP, TAG, vitamin – (D₃)
 - ↓ albumin, RBC, Hb, HCT, chloride, osteocalcin, P, * PTH, vitamin – (D₃)
 - *Urine* ↑ Ca, cAMP

Hypercalciuria, Renal Idiopathic

- ↑ PTH, vitamin - (D₂, D₃)
- ↓ P
- **Urine** ↑ * Ca, cAMP, creatinine, crystals - (Ca, P)

Hypercapnia

- ↑ pCO₂
- **Cerebrospinal Fluid** ↑ proteins, glutamine

Hyperemesis Gravidarum

- ↑ FT₄, MAL, T₄, urea
- ↓ proteins, chloride, K, Na, TSH
- **Urine** ↑ proteins, ketone bodies

Hyperfibrinogenemia

- ↑ PLT adhesion, ESR, fibrinogen, viscosity, von Willebrand's factor
- ↓ factor XIII, clot retraction

Hyperfibrinolysis

- ↑ APTT, PT, TT

Hypergammaglobulinemia

- ↑ CIC, ESR, * gamma globulins, proteins
- ↓ complement - (C₄)

Hyperglycemia, Chronic

- ↑ acetone, G, glycated Hb, ketobodies, acetoacetic acid, osmolality
- ↓ ESR, HCO₃⁻, chloride, Mg, Na, GH
- **Urine** ↑ acetone, G, creatinine
- **Cerebrospinal Fluid** ↑ G

Hyperglycinemia

- ↑ * glycine, ketones, MAC
- ↓ G, gamma globulins, neu, PLT
- **Urine** ↑ * glycine, ketones

Hyperhydration

- ↑ MAC, Na, osmolality
- ↓ albumin, proteins, RBC, Hb, HCT, chloride, LD, Na, NBB, plasma volume, osmolality, urea
- **Urine** ↑ specific gravity, volume
- ↓ K, specific gravity

hypertonic hyperhydration

- ↑ Na, osmolality
- **Urine** ↑ specific gravity

hypotonic hyperhydration

- ↑ MAC
- ↓ proteins, RBC, HCT, chloride, Na, osmolality
- **Urine** ↑ volume
- ↓ specific gravity

isotonic hyperhydration

- ↓ proteins, RBC, HCT
- **Urine** ↑ Na, volume
- ↓ K, specific gravity

Hyperinsulinism

- ↑ C-peptide, ketobodies, acetoacetic acid, insulin
- ↓ G, isoleucine, leucine, P, SHBG, valine
- **Urine** ↑ ketones

Hyperkalemia

↑ aldosterone, K, MAC

↓ PRA

■ *Urine* ↓ volume

Hyperlipidemia

↑ PLT adhesion, beta globulins, Ca, GMT, lipids, TAG, vitamin – (A, E), vWf

↓ Na, LCAT, lipase

Hyperlipoproteinemia

chylomicron hyperlipoproteinemia

↑ apolipoprotein – (A-IV, B-48, C-II), cholesterol, chylomicrons, TAG, VLDL-C

↓ Apo C-II, HDL-C

hyperlipoproteinemia I

↑ apolipoprotein – (A-I, A-II, A-IV, B-48, C-I, C-II, C-III, E), beta globulins, beta-carotene, glucagon, GHb, cholesterol, chylomicrons, plasminogen activator inhibitor, uric acid, LDL-C, WBC, LP lipase, pre-beta-LP, TAG, VLDL-C, viscosity

↓ alpha-1-LP, Apo – (A-I, B-100), beta-LPs, HDL-C, LDL-C, lipoprotein lipase

■ *Synovial Fluid* ↑ WBC, PMN

hyperlipoproteinemia II

↑ PLT aggregation, apolipoprotein B-100, beta-carotene, beta-LPs, glucagon, GHb, HDL-C, cholesterol, IDL-C, uric acid, LDL-C, PL, TAG, viscosity, VLDL-C

↓ HDL-C

■ *Amniotic Fluid* ↑ LDL-C

■ *Synovial Fluid* ↑ WBC, PMN

hyperlipoproteinemia III

↑ apolipoprotein – (B-100, C-I, C-II, C-III, E-II), beta-lipoproteins, G, GHb, cholesterol, chylomicrons, IDL-C, uric acid, LDL-C, pre-beta-lipoproteins, TAG, VLDL-C

↓ apolipoprotein – (A-I, E-III, E-IV), HDL-C, LDL-C

■ *Synovial Fluid* ↑ WBC, PMN

hyperlipoproteinemia IV

↑ apolipoprotein – (B-48, B-100, C-I, C-II, C-III, E), beta-LPs, GIP, cholesterol, uric acid, pre-beta-LPs, TAG, VLDL-C

↓ alpha-1-LP, HDL-C

hyperlipoproteinemia V

↑ apolipoprotein – (B-48, B-100, C-I, C-II, C-III, E), beta-LPs, G, cholesterol, chylomicrons, uric acid, pre-beta-LPs, TAG, VLDL-C

↓ alpha-1-LP, Apo A-I, beta-LPs, HDL-C, LDL-C

■ *Synovial Fluid* ↑ WBC, PMN

HDL hyperlipoproteinemia

↑ Apo A-I, Apo A-II, HDL-C, cholesterol

IDL hyperlipoproteinemia

↑ Apo E-II, cholesterol, TAG

↓ Apo E-III, Apo E-IV, HDL-C, LDL-C

LDL hyperlipoproteinemia

↑ Apo B-100, cholesterol, LDL-C

↓ HDL-C

LDL, VLDL hyperlipoproteinemia

- ↑ Apo B-100, cholesterol, LDL-C, TAG
- ↓ HDL-C

VLDL hyperlipoproteinemia

- ↑ Apo B-100, Apo C-II, cholesterol, TAG
- ↓ Apo C-II, HDL-C

VLDL, chylomicron hyperlipoproteinemia

- ↑ apolipoprotein – (B-48, B-100, C-II), cholesterol, TAG
- ↓ Apo C-II, HDL-C

Hyperlordosis

- *Urine* ↑ protein

Hyperlysineamia

- ↑ ammonia, **ethanolamine**, GABA, glutamine, * **lysine**, saccharopine, **ornithine**
- *Urine* ↑ ammonia, ethanolamine, alpha-aminoadipic acid, **lysine**, saccharopine

Hypermagnesemia

- ↑ Ca, K, Mg

Hypermethioninemia

- ↑ conjugated Bil, unconjugated Bil, * **methionine**

Hypernatremia

essential hypernatremia

- ↑ **chloride**, * **Na**, * **osmolality**
- ↓ **aldosterone**
- *Urine* ↑ osmolality

sodium overload hypernatremia

- ↑ Na,
- *Urine* ↑ Na

water deficiency hypernatremia

- ↑ Na

Hyperornithinemia

- ↑ alanine, ammonia (after meals), glutamine, * **ornithine**
- ↓ ammonia
- *Urine* ↑ homocitrulline, ornithine

Hyperosmolality

- ↑ **osmolality**
- *Cerebrospinal Fluid* ↓ **pressure**

Hyperostosis, Diffuse Idiopathic Skeletal (dish)

- ↑ G, cholesterol, IRI, retinol, urea

Hyperoxaluria

- *Urine* ↑ * **calcium oxalate**, RBC, **glycosaminoglycans**, Hb, crystals – (Ca-oxalate)

Hyperparathyroidism

primary hyperparathyroidism

- ↑ ACE, ACP, ACP (prostatic), **alpha-2-globulins**, ALP, beta globulins, * **Ca**, * **Ca²⁺**, citrate, Cu, ESR, G, **gastrin**, hydroxyproline, * **chloride**, in-sulin, K, **calcitonin**, creatinine, **uric acid**, **MAC**, osteocalcin, **P**, * **PTH**, N-telopeptides, urea, vitamin – (D₂, D₃), Zn
- ↓ **K**, **HCO₃⁻**, Hb, HCT, **cholesterol**, calcitonin, WBC, **Mg**, **P**, pCO₂, pH, RBP, T₃, TAG

- **Urine** ↑ amino acids, Ca, Ca²⁺, cAMP, Cu, hydroxyproline – (total, free), chloride, K, crystals – (Ca, P, Ca-phosphate, Ca-oxalate), Na, volume, P, pH, Zn
- ↓ Ca, specific gravity, P
- **Cerebrospinal Fluid** ↑ Ca
- **Gastric Fluid** ↑ basal acid secretion
- **Synovial Fluid** ↑ crystals – (hydroxyapatite, calcium pyrophosphate), pyrophosphate

secondary hyperparathyroidism

- ↑ ACP, ALP, Ca, Ca²⁺, calcitonin, MAC, P, * PTH
- ↓ Ca, Ca²⁺, P
- **Urine** ↑ Ca, hydroxyproline
- ↓ Ca, P

Hyperphosphatasemia

benign familial hyperphosphatasemia

- ↑ ACP, ALP

benign transient hyperphosphatasemia

- ↑ ALP, ALT, AST, GMT, vitamin – (D₃)

Hyperphosphatasia

- ↑ ACP, * ALP, ALP (WBC), uric acid, P
- ↓ Ca, vitamin – (D₂)
- **Urine** ↑ uric acid
- **Synovial Fluid** ↑ crystals – (calcium pyrophosphate)

Hyperpituitarism

- ↑ G, ILGF-I, Mg, P, PRL, GH
- **Urine** ↑ 17-KS

Hyperplasia

adrenal cortex hyperplasia

- ↑ ACTH, aldosterone, androstenedione, 11-deoxycortisol, DHEA, DHEAS, estrogens, HLA – (Bw47, Bw51, Bw53, Bw60, Dr7), PRA, progesterone, 17-OH progesterone, testosterone
- ↓ aldosterone, cortisol, DHEA, 17-OH progesterone, PRA
- **Urine** ↑ aldosterone, estriol, estrogens, 17-KGS, 17-KS, cortisol, pregnanediol, pregnanetriol
- ↑ aldosterone, 17-OHCS, 17-KS, pregnanetriol
- **Sweat** ↓ chloride, Na
- **Amniotic Fluid** ↑ * androstenedione, deoxycorticosterone, 11-deoxycortisol, HLA – (Bw47, Bw51, Bw53, Bw60, Dr7), * 17-OH-progesterone, PRA, testosterone

benign prostate hyperplasia

- ↑ ACP, AMS, androgens, RBC, G, cholesterol, K, creatinine, uric acid, WBC, mono, Na, neu, PAP, PRL, progesterone, PSA, testosterone, urea
- ↓ RBC, Hb, HCT, LH
- **Urine** ↑ albumin, proteins, bacteria (+ culture), RBC, Hb, pus, blood, WBC

Hyperplasia of Thyroid C-Cells

- ↑ calcitonin

Hyperprolactinemia

- ↑ * PRL
- ↓ estradiol, FSH, LH, progesterone, SHBG

Hyperprolinemia

- ↑ * **proline**
- **Urine** ↑ **glycine, hydroxyproline, proline**

Hyperproteinemia

- ↑ **proteins, Ca**

Hypersplenism

- ↑ **nucleated RBC, plasma volume, RTC, spherocytes, target cells**
- ↓ **eos, RBC, Hb, HCT, WBC, MPV, neu, PLT**

Hypertension

arterial hypertension

- ↑ **ACA, aldosterone, ANF, AST, beta-glucuronidase, Ca, Cd, CEA, Cu, 18-OH DOC, eos, epinephrine, ESR, G, globulins, cholesterol, CHS, insulin, K, catecholamines, uric acid, creatinine, LDL-C, WBC, lipids, PRA, TAG, PLT, urea**
- ↓ **albumin, aldolase, proteins, RBC, haptoglobin, Hb, HDL-C, HCT, hPL (F), K, lym, Na, Pb, PRA, prostacyclin, PG, TIBC, PLT, Zn**
- **Urine** ↑ **aldosterone, proteins, beta-glucuronidase, RBC, phosphoethanolamine, G, haptoglobin, hexosaminidase, 17-OHCS, catecholamines, WBC, Na, volume, casts – (granular, hyaline), VMA**
- ↓ **aldosterone, specific gravity**

intracranial hypertension

- **Cerebrospinal Fluid** ↑ **CK, CRP, LA**
- ↓ **protein**

malignant hypertension

- ↑ **aldosterone, HCT, cholesterol, pCO₂, pH, PL, PRA, schistocytes, TAG, urea**
- ↓ **ammonia, Hb, HCT, K, prostacyclin**
- **Urine** ↑ **albumin, aldosterone, proteins, RBC, Hb, catecholamines, hexosaminidase, 17-OHCS, 17-KGS, WBC, blood, Mb, volume, casts – (RBC, granular, hyaline, fatty, waxy)**
- ↓ **specific gravity, volume**

portal hypertension

- ↑ **ALP, ALT, ammonia**
- ↓ **AAT, albumin, neu**

pregnancy induced hypertension

- ↑ * **alpha-aminonitrogen, ALP, amino acids, beta globulins, chloride, D-dimers, FDP, Hb, HCT, ICD, * creatinine, * uric acid, LA, WBC, neu, PAPP-A, PT, PTT, * plasminogen, TAG**
- ↓ **albumin, aldosterone, AMS, * fibrinogen, haptoglobin, * Mg, placental lactogen, plasminogen, progesterone, * PLT, * urea**
- **Urine** ↑ * **alpha-aminonitrogen, * amino acids, * proteins, ketones, uric acid, specific gravity, Na, casts – (epithelial)**
- ↓ **estriol, uric acid**
- **Amniotic Fluid** ↑ **creatinine, uric acid**
- ↓ **AFP, volume**

pulmonary hypertension

- ↑ **ANA, RBC**
- ↓ **pCO₂, pO₂ (later)**

renovascular hypertension

- ↑ **aldosterone, HCT, K, creatinine, uric acid, Na, PRA, urea**
- ↓ **K**

- **Urine** ↑ proteins, K, blood

Hyperthermia, Malignant

- ↑ * **AST**, * **Ca** (early), * **CK**, * **K** (early), * **LD**, **WBC**, * **Mb**, **P**, * **MAC-RAC**, **pCO₂**, pyruvate
- ↓ **BE**, **Ca** (later), **K** (later), **pCO₂**, **pO₂**, **pH**
- **Urine** ↑ ketones, * **Mb**
- ↓ volume (later)

Hyperthyroidism, Primary

- ↑ **ACE**, aldolase, aldosterone, alpha-aminonitrogen, **ALP**, **ALT**, amino acids, antimicrobial Ab, anti-TSH-receptor Ab, antithyroidal Ab, anti-thyroglobulin Ab, **AST**, **Bil**, unconjugated **Bil**, **BSP** retention, * **Ca**, **Ca²⁺**, **cAMP**, ceruloplasmin, **CK-MB**, **Cu**, 2,3-DPG (**RBC**), eos, **estradiol**, estrogens, **factor VIII**, **ferritin**, fibronectin, * **FTI**, **FT3**, * **FT4**, **ESR**, **G**, **gastrin**, **glycerol**, **GMT**, **G6PD** (**RBC**), **HbA₂**, **HbF**, **HLA** – (**A₂**, **B₈**, **B₃₅**, **DR₃**), **hydroxyproline**, cholesterol, **CHS**, insulin, **FT₄** index, iodine, carboanhydrase (**RBC**), ketones, 17-ketosteroids, **cortisol**, **creatinine**, **creatine**, **LATS**, **LH**, **lym**, mono, **MPV**, **Na**, **osteocalcin**, **P**, **pH**, **PL**, plasma volume, **PRA**, proinsulin, anti-intrinsic factor Ab, **PTH**, **RF**, **SHBG**, **GH**, * **T₃**, **T₃** uptake, * **T₄**, **N**-teloptides, **testosterone**, **thyroglobulin**, triiodothyronine resin uptake, transketolase (**RBC**), **TSH**, **tyrosine**, **urea**, **FFA**
- ↓ **albumin**, **AMS**, **Apo A-I**, **Apo B**, bas, **proteins**, **Bil**, **CBG**, **CK**, **G** tolerance, **Hb**, **HCT**, **HDL-C**, **cholesterol**, immunoglobulins, **K**, catecholamines, carbonic anhydrase, ascorbic acid, **LDL-C**, **lipids**, **WBC**, **LPs**, **MCH**, **MCHC**, **MCV**, **Mg**, neu, **O₂** satur., **pCO₂**, **PL**, **pO₂**, prealbumin, **PTH**, **RBP**, **TBG**, **TAG**, **TIBC**, **PLT**, * **TSH**, vitamin – (**B₁**, **B₂**, **B₁₂**, **C**, **D₃**, **folate**), **VLDL-C**
- **Urine** ↑ **ALT**, proteins, **Ca**, **G**, **total hydroxyproline**, ketones, **creatinine**, creatinine, 17-OHCS, 17-KGS, **Mg**, **volume**, **P**, tyrosine, urea, **VMA**
- ↓ 17-OHCS, 17-KGS, hydroxyproline, creatinine
- **Cerebrospinal Fluid** ↑ **Na**
- ↓ protein
- **Stool** ↑ **Ca**, **P**, urobilin

Hypertriacylglycerolemia

- ↑ plasminogen activator inhibitor, **LCAT**, * **TAG**, **VLDL**
- ↓ **Apo C-II**, **HDL-C**

familial hypertriacylglycerolemia

- ↑ **TAG**, **VLDL-C**

Hypertyrosinemia

- ↑ **AFP**, **ALT**, **AST**, **Bil**, **MAC**, methionine, **succinylacetate**, **succinylacetate**, * **tyrosine**
- ↓ **RBC**, **Hb**
- **Urine** ↑ **RBC**, **G**, **methionine**, **succinylacetate**, **succinylacetate**, **tyrosine**

Hyperuricemia

- ↑ cholesterol, **GPs**, * **uric acid**, **IRI**, **LDL-C**, **MDA**, **SOD**, * **TAG**
- ↓ **HDL-C**
- **Urine** ↑ crystals – (urate)
- **Synovial Fluid** ↑ crystals – (urate)

Hyperventilation

- ↑ **chloride**, **LA**, **MAL**, **Na**, osmolality, **pH**, **pO₂**

- ↓ HCO_3^- , K, Na, P, * pCO_2
- **Urine** ↑ HCO_3^- , K, Na
- ↓ chloride

Hypervitaminosis

nicotinic acid hypervitaminosis

- ↑ G, uric acid

vitamin A hypervitaminosis

- ↑ ALP, Bil, Ca, GMT, carotene, ESR, PT, vitamin - (* A)
- ↓ albumin, Hb, HCT, PTH
- **Urine** ↑ proteins, Ca

vitamin C hypervitaminosis

- ↑ estrogens, vitamin C
- **Urine** ↑ uric acid, oxalate

vitamin D hypervitaminosis

- ↑ ALP, Ca, Ca^{2+} , MAC, P, * vitamin D₃
- ↓ ALP, PTH
- **Urine** ↑ proteins, Ca, RBC, Hb, crystals - (Ca-oxalate), P
- **Stool** ↓ Ca
- **Synovial Fluid** ↑ crystals - (hydroxyapatite)

vitamin E hypervitaminosis

- ↑ PT, urea, vitamin E
- ↓ PLT

Hypoadrenalism

- ↑ eos, HCT, K, creatinine, lym, urea
- ↓ estrogens, G, Hb, cortisol, Na, RTC
- **Urine** ↑ Ca, chloride
- ↓ estrogens, 17-OH corticosteroids, 17-ketosteroids
- **Sweat** ↓ Na, chloride

Hypoalbuminemia

- ↓ * albumin, Ca, Zn

hypoanabolic hypoalbuminemia

- ↑ cholesterol
- ↓ * albumin

Hypoaldosteronism

primary hypoaldosteronism

- ↑ K, chloride, MAC, PRA
- ↓ * aldosterone, Na, pH, * PRA
- **Urine** ↑ Na
- ↓ Mg, K

secondary hypoaldosteronism

- ↑ K, chloride, MAC, PRA
- ↓ * aldosterone, pH, PRA
- **Urine** ↑ Na

Hypocalcemia

- ↑ PO_4 , PTH, urea
- ↓ albumin, * Ca, Ca^{2+} , PTH
- **Urine** ↑ Ca

hereditary hypocalcemia

- ↑ PO_4
- ↓ albumin, proteins, * Ca, Ca^{2+} , PTH

Hypocapnia

- ↑ LA
- ↓ $p\text{CO}_2$, pH
- **Cerebrospinal Fluid** ↑ LA

Hypocorticism, Central

- ↑ Ca
- ↓ ACTH, androgens, EPO, cortisol

Hypofibrinogenemia

- ↑ PLT aggregation, APTT, BT, coagulation time, FDP, PT, clot retraction, TT
- ↓ * fibrinogen, ESR, PLT

Hypogammaglobulinemia

- ↓ albumin, proteins, B-lym, * gamma globulins, IgA, IgE, * IgG, IgM, complement - (C1q, C3), lym
- **Sweat** ↓ chloride

Hypoglycemia

- ↑ ACTH, epinephrine, factor VIII, * glucagon, glycine, * catecholamines, cortisol, Mb, norepinephrine, PRL, GH
- ↓ alanine, * G, K, P
- **Urine** ↑ glycine
- ↓ G
- **Cerebrospinal Fluid** ↓ G

Hypogonadism

central hypogonadism

- ↑ PRL, SHBG
- ↓ androstenedione, EPO, estradiol, estrogens, FSH, * GRH, LH, progesterone, * testosterone, free testosterone, Zn
- **Urine** ↓ FSH, 17-KS

male hypogonadism

- ↑ FSH (early months), LH (early months), testosterone (early months)
- ↓ FSH (until puberty), LH (until puberty), testosterone (until puberty)

peripheral hypogonadism

- ↑ FSH, LH, PRL, SHBG
- ↓ estradiol, estrogens, progesterone, testosterone, Zn
- **Urine** ↑ FSH

Hypoinsulinism

- ↑ IGFBP-1, K
- ↓ C-peptide, * insulin

Hypokalemia

- ↑ CK, HCO_3^- , MAL, Mb, osmolality, $p\text{CO}_2$, pH, PRA, RAL
- ↓ aldosterone, insulin, proteins, K, P
- **Urine** ↑ K, Mb, volume

Hypolipoproteinemia

- ↑ cholesterol, LDL-C, TAG
- ↓ apolipoprotein - (A-I, A-II, C-III), HDL-C, cholesterol, LDL-C, PL, TAG

HDL hypolipoproteinemia

- ↑ cholesterol, LDL-C, TAG
- ↓ apolipoprotein - (A-I, A-II, C-III), HDL-C, cholesterol

LDL hypolipoproteinemia

- ↓ Apo B-100, LDL-C, TAG

Hypomagnesemia

↓ Ca, Ca²⁺, K, Mg, PO₄; PTH, vitamin – (D₂)

■ *Urine* ↑ Mb

■ *Synovial Fluid* ↑ crystals – (calcium pyrophosphate)

Hyponatremia

hypervolemic hyponatremia

↑ aldosterone

↓ chloride, Na, TSH

■ *Urine* ↑ osmolality

↓ Na

hypervolemic hypotonic hyponatremia

■ *Urine* ↑ Na

↓ volume, Na

hypovolemic hyponatremia

– extrarenal hypovolemic hyponatremia

↓ Na

■ *Urine* ↑ osmolality

↓ Na

– renal hypovolemic hyponatremia

↑ urea

↓ Na

■ *Urine* ↑ Na

isovolemic hypotonic hyponatremia

↑ ADH

↓ uric acid, urea

normovolemic hyponatremia

↑ Ca

↓ chloride, Na, osmolality, urea

■ *Urine* ↑ Na, osmolality

Hypoosmolality Due to Hemodialysis

■ *Cerebrospinal Fluid* ↑ pressure

Hypoparathyroidism

↑ antiadrenal Ab, CK, CK-MB, uric acid, MAL, P, pH

↓ ALP, * Ca, Ca²⁺, cAMP, Mg, osteocalcin, P, * PTH, vitamin – (D₂, D₃)

■ *Urine* ↑ PO₄

↓ Ca, Ca²⁺, cAMP, hydroxyproline, creatinine, P

■ *Cerebrospinal Fluid* ↑ proteins

■ *Sweat* ↓ Na, chloride

idiopathic hypoparathyroidism

↑ anti-parathyroid Ab

Hypophosphatasia

↑ Ca, * phosphoethanolamine

↓ * ALP

■ *Urine* ↑ * phosphoethanolamine

↓ hydroxyproline

Hypophosphatemia

↑ adolase, ALP, Ca, CK, megakaryocytes, spherocytes, vitamin – (D₃)

↓ 2,3-DPG, Mg, * P, PTH, PLT, uric acid, vitamin – (D)

■ *Urine* ↑ Mb, Mg

↓ Ca, osteocalcin, P

■ *Stool* ↑ Ca

Hypopituitarism

- ↑ ADH, conjugated Bil, Cu
- ↓ ACTH, Ca, EPO, estradiol, estriol, **estrogens**, FSH, FTI, G, Hb, HCT, LH, pepsinogen, PRL, * ILGF-I, IRI, **cortisol**, neu, RTC, GH, T₄, testosterone, TSH
- **Urine** ↑ ketones
- ↓ **estriol**, estrogens, FSH, hydroxyproline, 17-OHCS, 17-KGS, 17-KS, **cortisol**, LH, tetrahydrodeoxycortisol
- **Amniotic Fluid** ↓ FSH
- **Seminal Fluid** ↑ spermatozoa

selective hypopituitarism

- ↓ ACTH, estradiol, FSH, G, Hb, HCT, ILGF-I, cortisol, LH, PRL, progesterone, GH, T₄, testosterone, TSH
- **Urine** ↑ ketones
- ↓ FSH, 17-ketosteroids, 17-OHCS, cortisol
- **Amniotic Fluid** ↑ FSH

Hypoproteinemia

- ↑ cholesterol
- ↓ albumin, **alpha-1-globulins**, alpha-2-globulins, beta globulins, **proteins**, fructosamine, NBB, osmolality, TBG, TIBC

Hyposplenism

- ↑ * RBC **Howell-Jolly bodies**, **target cells**
- ↓ RBC osmotic fragility

Hypotension

- ↑ ADH, ALP, **epinephrine**, LD
- ↓ HCO₃⁻, PRA, urea
- **Urine** ↑ specific gravity
- **Cerebrospinal Fluid** ↑ LA

fetal hypotension

- **Amniotic Fluid** ↑ meconium

Hypothermia

- ↑ ALT, AST, AMS, * CK, * G, Hb, HCT, * K, LA, LD, LD₅, MAC, 11-OHCS, RAL (early), pCO₂, RAC (later), * FFA
- ↓ G, Mg, P, Na, O₂ satur., pCO₂, pO₂, pH, **tryptophan**, tyrosine, WBC
- **Urine** ↑ G, Na, norepinephrine
- ↓ specific gravity, volume
- **Pleural Fluid** ↑ CK

Hypothyroidism

central hypothyroidism

- ↓ EPO, FT₃, FT₄, Hb, cholesterol, TAG, TSH, T₃, T₄, vitamin B₁₂

hypothyroidism in children

- ↑ Bil, conjugated Bil, unconjugated Bil, FSH, LH, TSH
- ↓ FT₄, T₃, T₄

primary hypothyroidism

- ↑ ADH, epinephrine, **albumin**, aldolase, alpha-aminonitrogen, ALP, ALT, anisocytes, * **anti-microsomal Ab**, **antithyroglobulin Ab**, * **anti-thyroperoxidase Ab**, * **anti-thyroid Ab** (early), **anti-TSH-receptor Ab**, * **thyroxine autoantibodies**, Apo A-I, Apo B, AST, **bas**, beta globulins, **beta-carotene**, beta-lipoprotein, Bil, conjugated Bil, Ca, CEA, * CK, CK-MB, CK-MM, Cu, EPO, estrogens, ESR, G, G tolerance, HCO₃⁻, HLA - (DR₃, DR₅), 11-OHCS, * **cholesterol**, **chylomicrons**,

- * **IDL-C**, immunoreactive proinsulin, **ILGF-I**, carotene, **catecholamines**, creatine, creatinine, **uric acid**, cryofibrinogen, **LD**, * **LDL-C**, **LH**, **lipids**, **macrocytes**, **Mb**, **MCH**, **MCV**, **Mg**, **norepinephrine**, **pCO₂**, **PL**, prealbumin, **PRL**, **TAG**, * **TBG**, testosterone, **Tg**, **TIBC**, * **TSH**, **urea**, **VLDL-C**
- ↓ **ACE**, * **ALP**, **EPO**, **RBC**, estradiol, factor – (**VIII**, **IX**), **Fe**, ferritin, fibronectin, **FT₃**, * **FT₄**, **G**, **gastrin**, **GFR**, **GMT**, **G6PD** (**RBC**), **Hb**, **HCT**, **HDL-C**, chloride, **CHS**, **ILGF-I**, **FT₄ index**, **iodine**, 17-ketosteroids, cortisol, lipoprotein lipase, **MCH**, **MCV**, **Na**, neu, **O₂ satur.**, osmolality, osteocalcin, **P**, **pO₂**, plasma volume, **PRA**, **RTC**, **SHBG**, somatomedin **C**, **GH**, **T₃**, * **T₄**, **TAG**, testosterone, **TIBC**, **T₃ resin uptake**, transferrin satur., **TSH**, tyrosine, vitamin – (**A**, **B₂**, **B₁₂**, **folate**)
- **Urine** ↑ albumin, conjugated **Bil**, **proteins**, hydroxyproline, 17-OHCS, 17-KS, **catecholamines**, **creatinine**, **Na**
- ↓ **Ca**, **cAMP**, **Cu**, 17-OHCS, hydroxyproline, 17-KGS, 17-KS, **creatine**, **Mg**, **P**, specific gravity
- **Cerebrospinal Fluid** ↑ **proteins**
- **Pericardial Fluid** ↑ cholesterol
- **Pleural Fluid** ↑ **proteins**, specific gravity
- ↓ **pH**
- **Gastric Fluid** ↑ **pH**
- **Synovial Fluid** ↑ pyrophosphate
- **Sweat** ↓ chloride, **Na**
- secondary hypothyroidism (pituitary h.)**
- ↓ **FT₄**, **T₃**, **T₄**, **TSH**
- **Urine** ↓ 17-ketosteroids
- tertiary hypothyroidism (hypothalamic h.)**
- ↓ **FT₄**, **T₃**, **T₄**, **TSH**
- Hypoventilation**
- ↑ **RBC**, **pCO₂**, **RAC**
- ↓ **pH**, **pO₂**
- Hypoxia**
- ↑ **AST**, **FDP**, **uric acid**, * **LA**, **LD**
- ↓ plasma volume, **pH**, **pCO₂**, **pO₂**
- **Urine** ↑ **ALP**, **LAP**
- **Cerebrospinal Fluid** ↑ **LA**
- central nervous system hypoxia**
- **Cerebrospinal Fluid** ↑ **LA**, **MBP**
- Idiocy, Familial Amaurotic**
- **Cerebrospinal Fluid** ↑ **aldolase**
- Ileostomy**
- **Stool** ↑ chloride, **Na**
- ↓ **K**
- Ileus**
- gallstone ileus**
- ↑ **ALP**, **ALT**, **AMS**, **AST**, **Bil**, **ESR**, gamma globulins, **GMT**, cholesterol, lipase, **WBC**
- ↓ albumin, **proteins**
- mechanic ileus**
- ↑ creatinine, **uric acid**, **urea**
- ↓ **proteins**, cholesterol

- meconium ileus
 - ↑ unconjugated Bil
 - **Sweat** ↓ chloride, Na
- postsurgery ileus
 - ↑ creatinine, uric acid, serotonin, urea
- Iminoglycinuria
 - **Urine** ↑ glycine, proline, hydroxyproline
- familial iminoglycinuria
 - **Urine** ↑ glycine, hydroxyproline, proline
- Immaturity, Pulmonary
 - **Amniotic Fluid** ↓ phosphatidylglycerol
- Immobilization
 - ↑ ALP, Ca, Ca²⁺, G, osteocalcin
 - ↓ albumin, HDL-C, PTH, testosterone, vitamin D₃
 - **Urine** ↑ Ca, Ca²⁺, PO₄⁻; hydroxyproline
- Immunodeficiency
 - cellular immunodeficiency
 - ↑ * eos, IgD, IgE
 - ↓ IgA, * lym, * neu, * T-lym
 - common variable immunodeficiency
 - ↓ B-lym, * IgA, * IgG, * IgM
 - severe combined immunodeficiency (autosomal recessive)
 - ↑ eos, mono
 - ↓ adenosine deaminase, complement - (C1q), B-lym, IgG, IgA, purine nucleoside phosphorylase, T-lym, * lym
- Infarction
 - adrenal infarction
 - ↓ cortisol
 - **Urine** ↓ 17-OHCS
 - cerebral infarction
 - ↑ Ab against beta-2 GP I, ACLA, A2MG, AST, CK, CK-BB, Cu
 - ↓ TAG
 - **Cerebrospinal Fluid** ↑ CK, Cu, G, GMT, LA, RBC, WBC, macrophages, MBP
 - ↓ pH
 - liver infarction
 - ↑ ALT, AST, Bil, WBC
 - mesenterial infarction
 - ↑ ALP, ALT, AMS, AST, CK, LA, LD, lipase, WBC, MAC, P, urea
 - **Urine** ↑ AMS
 - **Peritoneal Fluid** ↑ AMS
 - myocardial infarction
 - ↑ AAT, Ab against beta-2 GP I, ACLA, ACP, epinephrine, AGP, aldolase, alpha-1-globulins, alpha-2-globulins, alpha-1-antichymotrypsin, alpha-HBD (12–24 hrs after, peak 24–48 hrs, decrease 3–14 d), ALP, ALT, antimyocardial Ab, Apo - ((a), B-100), AST (5x) (6–24 hrs after, peak 24–72 hrs, decrease 3–7 d), AT III, beta-glucuronidase, Bil, BNP, CK (6–12x) (2–12 hrs after, peak 12–48 hrs, decrease 2–4 d), * CK-MB (16x) (3–12 hrs after, peak 12–24 hrs, decrease 24–72 hrs), CK-MM, CRP, Cu, elastase, enolase, epinephrine, estrogens, factor - (IV), FDP, fibrinogen, phosphohexoisomerase, phospholipase A₂,

fructose-1,6-diphosphate aldolase, ESR (12–48 hrs after, peak 4–5 d, decrease 1–4 months), G, glutathione reductase, **glycogen phosphorylase BB**, GMT (24 hrs after), **G6PD** (RBC), **haptoglobin**, **HBD** (6–12 hrs after, peak 2–6 d, decrease 4–14 d), **hexosaminidase**, **HMWK**, **HCT**, hypoxanthine, **cholesterol**, IgA, IgG, IgM, **plasminogen activator inhibitor**, **catecholamines**, complement – (C₃), **creatinine**, cortisol, cryofibrinogen, **uric acid**, **LA**, **LD** (3x) (6–48 hrs after, peak 24–72 hrs, decrease 4–14 d), **LD₁** (6–24 hrs after, peak 24–144 hrs, decrease 4 d), **LD₂**, **LD₁:LD₂**, **LP(a)**, **LDL-C**, **WBC** (6–12 hrs after, decrease 3–7 d), **mAST**, **Mb**, **MD**, **Mn**, mono (remission), **mucoproteins**, **myoglobin** (10x) (1–6 hrs after, peak 6–12 hrs, decrease 12–24 hrs), **L-myosin** (3–14 hrs after, peak 24–36 hrs, decrease 14 d), **neu**, **Ni**, **norepinephrine**, **OCT**, **PL**, plasma volume, **PMN**, pyruvate kinase, **RF**, ribonuclease, serotonin, **TAG**, **tropomyosin**, * **troponin I** (2–12 hrs after, peak 10–24 hrs, decrease 4–14 d), * **troponin T** (2–12 hrs after, peak 10–96 hrs, decrease 5 d – 3 months), **TSH**, **urea**, **VLDL-C**, viscosity, **FFA**

- ↓ **albumin**, platelet aggregation, **AT III**, bas, eos, epinephrine, factor – (XIII), **Fe**, G tolerance, **HCT**, **HDL-C**, **CHS**, **K**, **LDL-C**, lym, **Na**, **Ni**, **O₂** satur., orosomucoid, **pH**, plasma volume, plasmocytes, **pO₂**, prealbumin, **transferrin satur.**, **T₃**, vitamin – (B₆), **Zn**
- **Urine** ↑ **G**, hexosaminidase, catecholamines, 17-KGS, 17-OHCS, crystals – (urate), **LD**, **Mb**, norepinephrine, **VMA**
- **Cerebrospinal Fluid** ↑ **G**, **K**
- ↓ **pH**
- **Pericardial Fluid** ↑ volume

pituitary infarction

↓ **LH**, **GH**

placental infarction

↑ antiphospholipid **Ab**

prostate infarction

↑ **PAP**, **PSA**

pulmonary infarction

↑ aldolase, **ALP**, **ALT**, **AMS**, **AST**, **Bil**, unconjugated **Bil**, **CK**, **CRP**, **ESR**, **FDP**, **GMT**, **ICD**, **LD**, **LD** – (2, 3, 4), **pH**, **trypsin**, **WBC**

↓ **pO₂**, **pCO₂**

■ **Urine** ↑ **AMS**, **UBG**

■ **Bronchoalveolar Lavage Fluid** ↑ **RBC**

■ **Pleural Fluid** ↑ **ALP**, **AMS**, blood, **Hb**, proteins, **RBC**, **LD**, **WBC**, **neu**, **PMN**

■ **Peritoneal Fluid** ↑ protein

■ **Sputum** ↑ blood

■ **Stool** ↑ **UBG**

renal infarction

↑ **ALP**, **ALT**, **AST**, **CRP**, eos, **ESR**, **LD**, **LD₁**, **LD₁:LD₂**, **WBC**, **PRA**

■ **Urine** ↑ **ALP**, eos, proteins, **RBC**, **Hb**, blood, **LD**, lysozyme, pus, casts – (**RBC**)

pinal cord infarction

■ **Cerebrospinal Fluid** ↑ proteins, **CK**, eos, **RBC**, **IgG**, blood, **LA**, lym, **WBC**, **pressure**

- spleen infarction
 - ↑ ALP, WBC
- Infertility
 - male infertility
 - ↑ ALT, * anti-testicular Ab, * antibodies against spermatozoa, AST, eos, GMT, WBC
 - ↓ Hb, HCT, testosterone
 - *Urine* ↓ 17-ketosteroids
 - *Seminal Fluid* ↑ antibodies against spermatozoa
 - ↓ alpha-glucosidase, spermatozoa motility/count
 - primary female infertility
 - ↑ antispermatozoal Ab
 - ↓ FSH
- Injection
 - intramuscular injection
 - ↑ ALT, CK, CK-MM
 - intrathecal injection
 - *Cerebrospinal Fluid* ↑ eos, WBC, macrophages
- Injury, Endothelial
 - ↑ thrombomodulin, TPA, vWF
- Insufficiency
 - adrenal insufficiency
 - primary adrenal insufficiency (Addison's disease)
 - ↑ * ACTH, ADH, aldosterone, AMA, ANA, * antiadrenal Ab, anti-ovarian Ab, antithyroidal Ab, APA, proteins, Ca, Ca²⁺, Cu, DHEAS, eos, HLA - (B8, DR3, Dw3), HCT, chloride, K, ketones, creatinine, uric acid, lym, WBC, lym, MAC, Mg, osmolality, P, PRA, PRL, antiintrinsic factor Ab, urea
 - ↓ * aldosterone, C-peptide, DHEA, DHEAS, RBC, G, Hb, HCT, HCO₃⁻, chloride, cholesterol, K, * cortisol, WBC, lym, mucoproteins, Na, neu, osmolality, P, pCO₂, pH, pepsinogen, PMNs, pH, 17-OH progesterone, RTC, TAG, urea, volume
 - *Urine* ↑ ammonia, aldosterone, ketones, 17-OHCS, 17-KS, Na, osmolality, pH
 - ↓ aldosterone, ammonia, Cu, chloride, GFR, K, 17-OHCS, 17-KGS, 17-KS, cortisol, tetrahydrodeoxycortisol, free cortisol, volume
 - *Cerebrospinal Fluid* ↓ chloride
 - *Sweat* ↓ chloride, Na
 - *Stool* ↑ fat
 - *Saliva* ↑ cortisol
 - *Gastric Fluid* ↑ pH
 - secondary adrenal insufficiency
 - ↑ ACTH, Ca, K, WBC, PRL
 - ↓ HCO₃⁻, chloride, cortisol, creatinine, K, Na, urea
 - *Urine* ↑ Na, pH
 - ↓ K, 17-OHCS, volume, free cortisol
 - *Saliva* ↓ cortisol

cardiac insufficiency

- ↑ ACA, ADA, aldosterone, ALP, ALT, ANF, ASAL, AST, conjugated Bil, unconjugated Bil, CK, RBC, ESR, G, gamma globulins, GMT, Hb, HBD, chloride, cholesterol, CHS, ICD, K, creatine, creatinine, uric acid, LA, LD, MAC, mAST, MD, Mg, Na, pCO₂, PT, pH, PRA, prostacyclin, pyruvate, trypsin, urea
- ↓ albumin, **proteins**, eos, ESR, G, HCT, chloride, cholesterol, lym, Mg, Na, osmolality, pCO₂, pO₂, O₂ satur., PLT, vitamin – (B, folate)
- **Urine** ↑ **proteins**, UBG, VMA

coronary insufficiency

- ↑ AAT, PLT adhesion, epinephrine, aldolase, ALT, AST, CK, CK-MB, elastase, FDP, fibrinogen, ESR, G, HBD, cholesterol, catecholamines, uric acid, LA, LD, LD₁, WBC, LP(a), MD, Mb, neu, norepinephrine, pCO₂, PMN, pyruvate kinase, TAG, thrombomodulin, tropomyosin, troponin I, troponin T, urea, FFA, von Willebrand's factor
- ↓ HDL-C, CHS, K, Na, pH, pO₂, satur. O₂, Se, Zn

corpus luteum insufficiency

- ↑ PRL
- ↓ estradiol

gonadal insufficiency

- ↑ FSH, LH, PRL, SHBG
- ↓ androstenedione, EPO, estradiol, estrogens, FSH, LH, progesterone, testosterone, free testosterone, Zn
- **Urine** ↑ FSH, LH
- ↓ estradiol, estrogens, FSH, 17-KS, pregnanediol, pregnanetriol

hepatic insufficiency

- ↑ alpha-aminonitrogen, ALP, ALT, ammonia, AST, Bil, conjugated Bil, unconjugated Bil, BT, factor – (VIII), FDP, Fe (early), gamma globulins, glucagon, insulin, citric acid, pyruvic acid, LA, WBC, MAC, MAL (early), PT, RAL, thrombomodulin, TT, urea, vitamin B₁₂ (early), FFA
- ↓ AFP, albumin, alpha-aminonitrogen, ALT, AST, AT III, beta-glucuronidase, **proteins**, Ca, euglobulin lysis time, RBC, factor – (II, VII, IX, X, XIII), fibrinogen, G, cholesterol, CHS, ILGF-I, K, complement – (C₃), LD, Mg, Na, P, PT, testosterone, PLT, urea
- **Urine** ↑ ALA, cystine, creatinine, crystals – (leucine, tyrosine), beta-hydroxybutyric acid, specific gravity, taurine

hypophysis insufficiency

- ↑ Ca, eos, G tolerance, cholesterol, chylomicrons, K, lym, WBC
- ↓ ACTH, aldosterone, angiotensin, Ca, estradiol, FSH, G, Hb, HCT, hCG, cortisol, LH, Na, P, PRA, PRL, progesterone, RTC, somatomedin C, GH, testosterone, TSH, T₄, WBC
- **Urine** ↑ chloride, volume
- ↓ aldosterone, hCG, 17-KGS, 17-OHCS, pregnanetriol

hypothalamus insufficiency

- **Urine** ↓ FSH, LH

ovarian insufficiency

– primary ovarian insufficiency

- ↑ FSH, LH
- ↓ estradiol, **estrogens**, FSH, progesterone
- **Urine** ↑ FSH
- ↓ **estrogens**, pregnanediol

- secondary ovarian insufficiency

↓ FSH, * LH

■ *Urine* ↓ estrogens, FSH, * gonadotropins, pregnanediol

pancreatic insufficiency

↑ CCK-PZ, Fe, PP

↓ AMS, proteins, beta-carotene, cholesterol, lipase, PT, vitamin - (A, B₁₂, D)

■ *Urine* ↑ oxalate, porphyrins

↓ AMS

■ *Stool* ↑ fat

↓ chymotrypsin, trypsin

placental insufficiency

↑ Hb, HCT, IgA, IgM, viscosity

↓ ALP, estriol, IgG, hPL, pregnancy-associated plasma protein - (A, B), pregnancy specific beta-1-glycoprotein

■ *Urine* ↓ estriol

■ *Amniotic Fluid* ↑ AFP, creatinine, uric acid, PL, urea

↓ LAP

renal insufficiency

- acute renal insufficiency

↑ ACP, AGBMA, Al, ALP, AMS, amylin, ANA, ANCA, ANF, Apo B, beta-endorphins, BHBA, B₂M, proteins, Ca, Cl, CK, CK-MM, C-peptide, BT, enkephalins, eos, factor D, fructosamine, G, gastrin, GIP, glucagon, glycated albumin, haptoglobin, HCO₃⁻, chloride, chymotrypsin, IDL-C, K, complement - (C₃, C₄), creatine, creatinine, uric acid, LD, LDL-C, lipase, WBC, MAC, MAL, Mg, myoglobin, Na, neu, neurotensin, plasma volume, osmolality, P, PT, PRL, PSA, PTH, PRL, thrombomodulin, trypsin, trypsinogen, urea

↓ ALT, proteins, Ca, Ca²⁺, EPO, RBC, G, Hb, HCT, HCO₃⁻, chloride, K, cortisol, lipoprotein lipase, Lym, Mg, Na, volume, osmolality, P, pH, Se, serotonin, T₄, PLT

■ *Urine* ↑ AMS, proteins, RBC, Hb, pus, K, crystals - (urate, waxy), WBC, specific gravity, Na, volume, osmolality, tubular cells, casts - (RBC, granular, WBC, Mb)

↓ Ca, chloride, K, uric acid, specific gravity, Mg, Na, volume, P, urea, UBG

- chronic renal insufficiency

↑ ACP, Al, ALP, AMS, ANCA, c-ANCA, ANF, B₂M, Ca, estriol, Fe, G, gastrin, glycated Hb, HCO₃⁻, chloride, K (later), * creatinine, creatine, uric acid, LDL-C, lipase, MAC, Mg, Na, plasma volume, osmolality, P, porphyrins, PTH, E selectin, trypsin, urea

↓ amino acids, AST, proteins, Ca, EPO, RBC, Fe, Hb, HCT, HCO₃⁻, chloride, K, Mg, Na, osmolality, P, TIBC, vitamin - (D), Zn

■ *Urine* ↑ AMS, proteins, RBC, Hb, crystals - (urate), volume, casts - (waxy)

↓ Ca, FDP, carnitine, uric acid, specific gravity, Mg, volume, P, pH, UBG, urea

respiratory insufficiency

↑ AB, aldosterone, ammonia, BE, Ca, eos, EPO, RBC, ESR, Hb, HCT, HCO₃⁻, K, LA, WBC, MAC, pCO₂, RAC

↓ AAT, AB, ACE, BE, Hb, HCT, HCO₃⁻, chloride, K, pH, pO₂, satur. O₂, PLT

- testes insufficiency
 - ↓ LH, testosterone
 - *Urine* ↓ 17-ketosteroids
- Intestine, Blind Loop of
 - ↑ neu
 - ↓ RBC, Hb, HCT, vitamin - (B₁₂)
- Intolerance
 - disaccharide intolerance
 - *Urine* ↑ galactose, lactose, saccharose
 - fructose intolerance
 - ↑ amino acids, ALT, AST, Bil, fructose, IRI, uric acid
 - ↓ aldolase, G, uric acid, P
 - *Urine* ↑ amino acids, proteins, conjugated Bil, fructose, reducing sugars
 - monosaccharide intolerance
 - *Urine* ↑ galactose, reducing sugars
 - *Stool* ↑ pH
- Intoxication by
 - acetaminophen
 - ↑ ALT, AST, Bil, PT, * PTT
 - ↓ G
 - acetone
 - ↑ creatinine, MAC, osmolar gap
 - ↓ Hb, HCT, pH
 - *Urine* ↑ acetone, proteins, G, ketones, UBG
 - aflatoxin
 - ↑ ALT, AST, GMT
 - alcohol, acute
 - ↑ acetone, AMS, * alcohol, ALT, AST, ANF, beta-endorphins, BHBA, Ca, CK, GMT, ketones, uric acid, LA, LAP, LD, MAC, MAL, Ni, osmolality, osmolal gap, pCO₂, pH, urea
 - ↓ BE, chloride, G, Mg, Na, pCO₂, pH, pO₂, PRL, uric acid, PLT
 - *Urine* ↑ ketones, volume
 - ↓ aldosterone
 - *Cerebrospinal Fluid* ↑ protein
 - aluminum
 - ↑ * Al, Ca, microcytes
 - ↓ PTH, Hb, HCT, microcytes, RBC
 - *Urine* ↑ * Al
 - Amanita phalloides
 - ↑ albumin, ALT (peak 72 hrs, decrease from 4th day), ammonia, AST, proteins, Bil, conjugated Bil, Fe, gamma globulins, GMD, Hb, HCT, K, creatinine, LA, LD, WBC, MAC (early), pyruvate, urea
 - ↓ albumin (later), factors - (V, VII, X), fibrinogen, G, Hb, HCT, HCO₃⁻, chloride, CHS, K, Na, pCO₂, PT, pH (early), plasminogen, prothrombin
 - *Urine* ↑ protein (later), G, urobilin, casts
 - ↓ volume
 - *Cerebrospinal Fluid* ↑ pressure
 - ammonia
 - ↑ uric acid

aniline	<ul style="list-style-type: none"> ↑ anisocytes, Bil, Heinz bodies (RBC), MHb, poikilocytes, RTC ↓ RBC, Hb, HCT ■ Urine ↑ proteins, blood, MHb
antacids	<ul style="list-style-type: none"> ↑ Ca, creatinine, MAL, Mg, urea
antimony	<ul style="list-style-type: none"> ↑ ALT, AST, GMT, pyruvate, Sb
arsenic	<ul style="list-style-type: none"> ↑ alpha-aminonitrogen, ALT, * As, AST, BSP retention, Ca, eos, ESR, GMT, guanosine deaminase, cholesterol, ICD, creatinine, lym, WBC, MAC, neu, RBC basophilic stippling, pyruvate, RTC, urea ↓ ALP, CO₂, RBC, G, Hb, HCT, chloride, cholesterol, WBC, Na, pO₂, PLT ■ Urine ↑ albumin, * As, proteins, RBC, Hb (acute), hemosiderin, blood, coproporphyrin III, casts ↓ phosphate, volume ■ Cerebrospinal Fluid ↑ proteins, WBC ■ Stool ↑ As ■ Hair ↑ * As ■ Bone ↑ As ■ Nails ↑ * As
baryum	<ul style="list-style-type: none"> ↓ K ■ Urine ↓ volume
battery-industry environment	<ul style="list-style-type: none"> ↑ Cd, Mn, Pb ■ Urine ↑ Cd, Mn, Pb
benzene	<ul style="list-style-type: none"> ↑ CK, eos, WBC, neu, RTC ↓ proteins, RBC, gamma globulins, Hb, HCT, IgA, lym, WBC, neu, PLT ■ Urine ↑ Mb
- chronic intoxication by benzene	<ul style="list-style-type: none"> ↑ BT, eos, WBC (early) ↓ RBC, Hb, HCT, IgA, WBC (later), PLT
beryllium	<ul style="list-style-type: none"> ↑ Ca, WBC, uric acid ↓ ALP
bismuth	<ul style="list-style-type: none"> ↑ amino acids ■ Urine ↑ Bi
botulotoxin	<ul style="list-style-type: none"> ↓ ACH
bromide	<ul style="list-style-type: none"> ↑ * bromide ■ Urine ↑ * bromide ↓ volume ■ Cerebrospinal Fluid ↑ proteins, pressure
cadmium	<ul style="list-style-type: none"> ↑ ALT ■ Urine ↑ * Cd

- carbon dioxide**
 - ↑ CK
- carbon disulfide**
 - ↑ ALT, AST, GMT
- carbon monoxide**
 - ↑ AMS, anion gap, CK, CK-MB, RBC, G, * **carboxy-Hb** (COHb), uric acid, LA, WBC, lym, MAC, neu, RAL (early)
 - ↓ ESR, pH, pCO₂, pO₂
 - **Urine** ↑ Mb
 - ↓ volume
- carbon tetrachloride**
 - ↑ ALT, AST, WBC
- chloroform**
 - ↑ alpha-aminonitrogen, lipids
 - ↓ G, cholesterol
 - **Urine** ↑ UBG
- chromium**
 - ↑ ALT, AST, Cr, GMT
 - ↓ RBC, Hb, HCT
 - **Urine** ↑ proteins, Cr, blood
 - ↓ volume
- cobalt**
 - ↑ * Co, lipids
 - **Urine** ↑ Co
- cocaine**
 - ↑ CK, ALT, AST, catecholamines, eos, HBsAg, lym, PRL, RAL, tropomyosin
 - **Hair** ↑ * cocaine
- copper**
 - acute intoxication by copper
 - ↑ ALT, AST, * Cu, GMT
 - **Urine** ↑ Cu, Mb
 - chronic intoxication by copper
 - ↑ ALT, ceruloplasmin, Cu, GMT
 - ↓ RBC, Hb
 - **Urine** ↑ Cu, RBC, Hb, Mb
 - ↓ volume
- coumarin**
 - ↓ * PT, * PTT
- cyanide**
 - ↑ proteins, * cyanide, G, LA, MAL (early), MAC (later), RAC (later)
 - ↓ ALP, AST, HCO₃⁻, uric acid, pH
- drugs (chronic)**
 - ↑ ALT, AMS, AST, CK, eos, HBsAg, LD, lym, Mb, T₄
 - ↓ c-AMP, cholesterol, O₂ satur., pO₂
- dyes/paint-industry**
 - ↑ Cd, Cr, Mn, Pb, Sb
 - **Urine** ↑ Cd, Cr, Mn, Pb, Sb
- EDTA**
 - ↓ ALP
- electro-industry**
 - **Urine** ↓ Se

ether	
	↓ pH
ethylene glycol	<ul style="list-style-type: none"> ↑ anion gap, * ethylene glycol, * glycolic acid, glycol, WBC, * MAC, MAC + RAC, neu, osmolality, osmolal gap ↓ Ca, HCO₃⁻, Na, pH, pCO₂ ■ Urine ↑ albumin, proteins, RBC, Hb, pus, blood, hippurate, crystals, oxalate, fat, casts – (epithelial) ↓ volume ■ Cerebrospinal Fluid ↑ proteins, PMN, pressure ■ Synovial Fluid ↑ crystals – (calcium oxalate)
fluoride	
	↑ CT, G
	↓ Ca, ALP, AST, Ca
fluorine	
	↑ K, MAC
	↓ Ca, Mg
food (staphylococci, clostridia, salmonella)	
	↑ MAC
formaldehyde	
	↑ MAC
	↓ AST
	■ Urine ↑ proteins, RBC, UBG, casts
	↓ volume
fungicides	
	↑ Hg, Mn
	■ Urine ↑ Hg, Mn
glass-industry	
	↑ Mn, Pb, Sb
	■ Urine ↑ Mn, Pb, Sb, Se
glycerol	
	↑ osmolal gap
gold salts	
	↑ pyruvate
halothane	
	↑ GMD
heavy metals	
	↑ ALP, ALT, AST, B2M, BSP retention, Ca, eos, ESR, guanine deaminase, cholesterol, ICD, creatinine, lysozyme, WBC, MAC, neu, pyruvate, RTC, TAG, urea
	↓ CO ₂ , RBC, Hb, HCT, CHS, ICD, uric acid, WBC, Na, vitamin – (C)
	■ Urine ↑ albumin, As, proteins, RBC, Hb, hexosaminidase, coproporphyrin, porphyrins, casts – (epithelial)
	↓ phosphate
	■ Cerebrospinal Fluid ↑ protein
heparin	
	↓ * PT, * PTT
herbicides	
	↑ aldolase, ALT, AST, Bil, CK, GMT, creatinine, LD, WBC, urea
	↓ RBC, haptoglobin, Hb, HCT
	■ Urine ↑ Mb

heroin	<ul style="list-style-type: none"> ↑ AMS, ALT, AST, eos, HBsAg, lym, TBG ■ <i>Urine</i> ↑ Hb
hexachloride	<ul style="list-style-type: none"> ■ <i>Urine</i> ↑ Mb
insecticides	<ul style="list-style-type: none"> ↑ AMS, G, WBC ↓ * CHS, * CHS (RBC), CK, K ■ <i>Urine</i> ↑ proteins, G
iron	<ul style="list-style-type: none"> ↑ ALT, AST, * Fe, G, GMT, WBC, MAC, TIBC, transferrin satur. ↓ transferrin ■ <i>Urine</i> ↑ DALA ↓ volume
isopropanol (isopropyl alcohol)	<ul style="list-style-type: none"> ↑ acetone, * isopropanol, MAC, osmolal gap ■ <i>Urine</i> ↑ acetone
lead	<ul style="list-style-type: none"> ↑ ALA, aldolase, ALT, anisocytes, AST, Bil, Cu (RBC), eos, ESR, * RBC basophilic stippling, Fe, GMT, HbA_{1c}, Hb (free), uric acid, * coproporphyrin, WBC, lym, mechanical fragility (RBC), MCV, microcytes, neu, * Pb, PBG, poikilocytes, * porphyrins, RTC, Sb, siderocytes, target cells, * free RBC protoporphyrin, * zinc protoporphyrin, urea ↓ delta-aminolevulinic dehydratase, RBC, factor XIII, glutathione (RBC), * Hb, * HCT, MCH, MCHC, MCV, RBC osmotic fragility, WBC, RBC osmotic resistance, pyrimidine-5 nucleotidase (RBC), PLT ■ <i>Urine</i> ↑ * ALA, alanine, albumin, amino acids, beta-amino-isobutyric acid, proteins, citrate, * DALA, G, fructose, glutathione peroxidase (RBC), glycine, Hb (free), coproporphyrin I, coproporphyrin III, uric acid, * Pb, phosphate, porphobilinogen, porphyrins, protoporphyrin, Sb, UBG, uroporphyrin, casts – (granular, hyaline) ↓ uric acid, volume ■ <i>Cerebrospinal Fluid</i> ↑ proteins, mono, pressure ■ <i>Stool</i> ↑ CP, * Pb, protoporphyrins ■ <i>Hair</i> ↑ Pb ■ <i>Synovial Fluid</i> ↑ crystals – (urate)
lipid-lowering drugs	<ul style="list-style-type: none"> ↑ ALT, AST, G, chloride, MAC, uric acid ↓ TAG
lithium	<ul style="list-style-type: none"> ↑ Ca, * Li, WBC, Mg ↓ lym, Na ■ <i>Urine</i> ↓ specific gravity
magnesium	<ul style="list-style-type: none"> ↑ Ca, Mg
manganese	<ul style="list-style-type: none"> ↑ * Mn ↓ ALP ■ <i>Urine</i> ↑ Mn ■ <i>Stool</i> ↑ Mn

mannitol	↑ osmolal gap
marijuana	↑ ALT, AST, eos, HBsAg, lym, RAL
mercury	<ul style="list-style-type: none"> ↑ * Hg, WBC, neu, pyruvate, urea ↓ chloride ■ Urine ↑ albumin, proteins, RBC, fructose, Hb, * Hg, coproporphyrin III, reducing sugars, fat, casts ↓ volume (later) ■ Cerebrospinal Fluid ↑ proteins, * Hg, WBC
methanol (methyl alcohol)	<ul style="list-style-type: none"> ↑ AMS, anion gap, ketones, uric acid, formic acid, * MAC, methanol, osmolality, osmolal gap, urea ↓ Ca²⁺, HCO₃⁻, Na, pCO₂, pH ■ Urine ↑ acetone, proteins, RBC, Hb, ketones, formic acid, methanol ↓ volume ■ Cerebrospinal Fluid ↑ pressure
methyl bromide	<ul style="list-style-type: none"> ↑ ALT, AST ■ Cerebrospinal Fluid ↑ pressure
mining-industry environment	<ul style="list-style-type: none"> ↑ Hg, Mn, Pb ■ Urine ↑ Hg, Mn, Pb
mushroom	<ul style="list-style-type: none"> ↑ ACH, albumin, ALT, ammonia, AST, proteins, Bil, conjugated Bil, Fe, gamma globulins, GMD, GMT, Hb, HCT, K, creatinine, LA, LD, WBC, MAC, pyruvate, urea ↓ albumin, factors – (V, VII, X), fibrinogen, G, Hb, HCT, HCO₃⁻, chloride, CHS, K, Na, pCO₂, PT, pH, plasminogen, prothrombin, urea (later) ■ Urine ↑ proteins, Bil, G, urobilin, casts – (hyaline), UBG ↓ volume ■ Cerebrospinal Fluid ↑ pressure
naphthalene	<ul style="list-style-type: none"> ↑ ALT, AST, GMT ■ Urine ↑ RBC, Hb ↓ volume
narcotics	↑ ALT, AST, eos, HBsAg, lym, MAC+RAC, Mb
nickel	↑ * Ni, WBC
nitrite/nitrate	<ul style="list-style-type: none"> ↑ Heinz bodies (RBC) ■ Urine ↑ blood, nitrates
nitrobenzene	<ul style="list-style-type: none"> ↑ ALT, AST, Bil, GMT, Heinz bodies (RBC), MHb, RTC ■ Urine ↑ Hb, MHb, urobilin
opiates	<ul style="list-style-type: none"> ↑ ALT, HbA_{1c}, neu ■ Urine ↑ proteins, Mb

organophosphates

- ↑ ACH, AMS, G, WBC, MAC, PT
- ↓ G, * CHS, * CHS (RBC)
- **Urine** ↑ proteins, RBC, G, Hb

oxalates

- ↑ **oxalate**
- ↓ ALP
- **Urine** ↑ volume

paraldehyde

- ↑ osmolal gap

paraquat

- ↑ ACE
- **Urine** ↓ volume

pesticides

- ↑ G, WBC
- ↓ CHS, CHS (RBC), K
- **Urine** ↑ proteins, G

petrol

- ↑ lym
- ↓ WBC
- **Urine** ↑ porphyrins

petrol-industry environment

- ↑ Mn
- **Urine** ↑ Mn

phenacetine

- ↑ **Heinz bodies** (RBC), MHB, urea
- ↓ Hb, HCT
- **Urine** ↑ **p-aminophenol**, proteins, blood, WBC

phenols

- ↑ MAC
- **Urine** ↑ albumin, RBC, Hb, Mb, casts
- ↓ volume

phosphorus

- ↑ alpha-aminonitrogen, ALT, AST, Bil, GMT, lipids, WBC, MAC
- ↓ fibrinogen, ESR, G, cholesterol, prothrombin
- **Urine** ↑ amino acids, ammonia, proteins, RBC, blood, P, urea
- ↓ volume

plastics-industry environment

- ↑ Pb
- **Urine** ↑ Pb

rodenticides

- ↑ PT
- ↓ factors – (VII, X)

salicylates

- ↑ ALT, anion gap, AST, G (children), **chloride**, HCO_3^- , **MAC** (later), MAL, PT, pH, RAC, **RAL** (early), * **salicylate**
- ↓ G, HCO_3^- , hydroxyproline, K, Na, P, pCO_2 , pH, thrombin
- **Urine** ↑ G, K, ketones, Na, pH, RBC, reducing substances
- ↓ pH, hydroxyproline, volume

selen

- ↑ Se

- silver**
- ↑ pH, urea
 - ↓ chloride, Na
 - **Urine** ↑ proteins
- smelting-industry environment**
- ↑ Mn, Pb
 - **Urine** ↑ Mn, Pb
- snake venom (snake bite)**
- ↑ ALT, APTT, ACH, anti-ACHR, AST, CK, CT, eos, FDP, LD, WBC, neu, PT, PTT, urea
 - ↓ fibrinogen, Hb, HCT, PLT
 - **Urine** ↑ albumin, proteins, RBC, Hb, Mb
- spider venom (spider bite)**
- ↑ ALT, AST, CK, CT, eos, LD, WBC, PT, urea
 - ↓ Hb, HCT, PLT
 - **Urine** ↑ proteins, Hb, Mb
- steel-industry environment**
- ↑ Cd, Cr, Mn
 - **Urine** ↑ Cd, Cr, Mn
- strychnine**
- ↓ G
 - **Urine** ↑ Mb
- styrene**
- **Urine** ↑ VMA
- tetrachlorethane**
- ↑ lym
 - ↓ RBC, Hb, HCT
- tetrachlormethane**
- ↑ alpha-aminonitrogen, ALT, AST, Bil, conjugated Bil, lipids
 - ↓ G, cholesterol
 - **Urine** ↑ benzoic acid, hippuric acid, uric acid, porphyrins
 - ↓ volume
- thallium**
- ↑ lym, WBC, urea
 - ↓ WBC
 - **Urine** ↑ proteins, RBC, coproporphyrin, WBC, thallium, casts
 - ↓ volume
 - **Cerebrospinal Fluid** ↑ pressure
- toluene**
- ↑ MAC
 - ↓ WBC
 - **Urine** ↑ hippuric acid, uric acid, Mb
 - ↓ volume
 - **Cerebrospinal Fluid** ↑ pressure
- trichlorethylene**
- ↑ ALT, AST, GMT
 - **Urine** ↑ * trichloroacetic acid, * trichlorethanol
- turpentine**
- ↑ WBC, neu
 - **Urine** ↑ proteins, RBC, Hb, blood
 - ↓ volume

- vinyl chloride**
 - ↑ ALP, ALT, AST
 - ↓ albumin
- water**
 - ↑ Mb
 - ↓ albumin, chloride, Na, osmolality, proteins
- weapons-industry environment**
 - ↑ Sb
 - **Urine** ↑ Sb
- xylene**
 - ↑ CK
- zinc**
 - ↑ Zn
 - **Urine** ↑ Mb
- Ischemia**
 - cerebral ischemia**
 - ↑ antiphospholipid Ab, CK
 - **Cerebrospinal Fluid** ↑ CK, LA, LD
 - ↓ Mg
 - hepatic ischemia**
 - ↑ ALT, AST, LAP, WBC, 5-nucleotidase
 - intestinal ischemia**
 - ↑ ALP, CK, WBC, LD
 - myocardial ischemia**
 - ↑ AAT, ACP, PLT adhesion, epinephrine, AGP, **aldolase**, **alpha-1-globulins**, **alpha-2-globulins**, AST, CEA, CK, CK-MB, CRP, Cu, elastase, enolase, FDP, **fibrinogen**, ESR, G, haptoglobin, **HBD**, **cholesterol**, plasminogen activator inhibitor, uric acid, LD, LD₁, LD₂, LDL-C, LP(a), WBC, mAST, MD, Mb, **mucoproteins**, neu, norepinephrine, OCT, PMN, pyruvate kinase, selectin, serotonin, TAG, thrombomodulin, tropomyosin, troponin I, urea, VLDL-C, FFA, vWf, Zn
 - ↓ Cu, HDL-C, CHS, IDL-C, K, pH, pO₂, transferrin satur., Zn
 - **Urine** ↑ G, hexosaminidase, catecholamines, Mb, VMA
 - renal ischemia**
 - ↑ **aldosterone**, ammonia, urea
 - **Urine** ↑ K
- Rh Isoimmunisation**
 - ↑ AFP
 - ↓ estriol, PLT
 - **Urine** ↓ estriol
 - **Amniotic Fluid** ↑ AFP, volume, PRL
- Jaundice**
 - hemolytic jaundice**
 - ↑ ACP, ALP, ALT, **Bil**, **unconjugated Bil**, Fe, gamma globulins, GMT, uric acid, LD, MD, RBC osmotic fragility, urea
 - ↓ conjugated Bil, Cu, **Hb**, cholesterol, RBC osmotic resistance
 - **Urine** ↑ ALT, conjugated Bil, UBG
 - **Stool** ↑ UBG
 - ↓ UBG
 - **congenital hemolytic jaundice**
 - ↑ **Bil**, **conjugated Bil**, uric acid, urea
 - ↓ ceruloplasmin, Cu

hepatocellular jaundice

- ↑ ALP, ALT, AST, **Bil, conjugated Bil**, unconjugated Bil, Cu, Fe, GMT, LAP, LD, PT
- ↓ cholesterol
- **Urine** ↑ ALT, conjugated Bil, UBG
- ↓ UBG

mechanic jaundice

- ↑ ACP, ADA, aldolase, alpha-1-globulins, ALP, ALT, AST, **Bil**, unconjugated Bil, ceruloplasmin, Fe, gamma globulins, GMT, cholesterol, creatinine, uric acid, LD, MD, PT, TIBC, urea
- ↓ beta-carotene, proteins, conjugated Bil, Cu, Fe, fibrinogen, glucuronosyltransferase, Hb, cholesterol, CHS
- **Urine** ↑ ALT, conjugated Bil, UBG
- **Stool** ↑ UBG

neonatal jaundice

- ↑ **Bil, unconjugated Bil**, delta Bil
- **Urine** ↑ conjugated bilirubin, galactose, reducing sugars

obstructive jaundice

- ↑ ACP, ADA, **aldolase**, alpha-1-globulins, ALP, ALT, aminotripeptidase, AST, ATPase, **beta globulins, Bil, conjugated Bil, unconjugated Bil, ceruloplasmin**, Cu, Fe, ferritin, phosphohexoisomerase, fructose-1,6-diphosphate aldolase, **gamma globulins, GMT**, guanine deaminase, **cholesterol**, CHS, ICD, IgA, IgG, complement - (C₃), creatinine, LAP, LD, lipids, macrocytes, MD, 5-nucleotidase, **OCT**, RBC osmotic resistance, PL, **TAG**, target cells, TIBC
- ↓ AAT, Apo A-IV, beta-carotene, proteins, Ca, Fe, fibrinogen, ESR, glucuronosyltransferase, CHS, uric acid, ligandin, TBG, vitamin - (A, K)
- **Urine** ↑ ALT, conjugated Bil, **porphyrins**
- ↓ UBG

Kwashiorkor

- ↑ **alanine**, insulin, transferrin
- ↓ epinephrine, **albumin**, ALP, ALT, amino acids, AST, beta-carotene, **proteins**, C₂, C₃, Ca, **ceruloplasmin**, Cr, **Cu, RBC, Fe, G**, glycine, **Hb, HCT**, ICD, **ILGF-I**, isoleucine, K, cortisol, leucine, Mg, proconvertin, **RBP, transferrin satur., TIBC, transferrin, transthyretin, tryptophan**, valine, vitamin - (A, B₁, B₂, B₆, B₁₂)
- **Urine** ↑ amino acids, ketones (early), volume
- ↓ Cu, hydroxyproline, osmolality

Lactation

- ↑ CA 15-3, Cu, DPD, osteocalcin, PTH, vitamin - (D)
- ↓ ACTH, Ca, Ca²⁺, Fe, Mg, vitamin - (B₁, B₆, folate), Zn
- **Urine** ↑ G, lactose, **reducing sugars**

vegane mother lactation

- ↑ **folate**, PTH
- ↓ Ca, Ca²⁺, Mg, vitamin B₁₂
- **Urine** ↑ pH

Lesion

choroid plexus lesion

- **Cerebrospinal Fluid** ↑ albumin

CNS lesion

- ↑ LD, osmolality
- **Cerebrospinal Fluid** ↑ CHS, IDH, MBP, somatostatin

- hypothalamus lesion**
 ↓ FSH
 ■ **Urine** ↓ FSH
- liver lesion**
 ↑ AAT, AD, ALT, A2MG, amino acids, aminonitrogen, AST, Bil, conjugated Bil, clotting time, Fe, ferritin, IgA, IgG, LA, LD, mAST, PT
 ↓ albumin, alpha-1-globulins, alpha-2-globulins, AT III, factor II, haptoglobin, hemopexin, cholesterol, CHS, complement – (C3, C4), orosomucoid, P, prealbumin, protein C, TIBC, transferrin, urea
 ■ **Urine** ↑ alpha-aminonitrogen, amino acids, conjugated Bil, G, galactose, P, reducing sugars, UBG
 ↓ UBG
- toxic liver lesion**
 ↑ ALP, aminonitrogen, AST, Bil, ESR, GMT, IgA, LD
 ↓ albumin, proteins
 ■ **Urine** ↑ Bil, G, UBG
- minor myocardial lesion**
 ↑ troponin T
- pituitary gland lesion**
 ↓ FSH, LH
 ■ **Urine** ↓ FSH
- renal lesion**
 ↑ B2M, FDP, LA, LD, LDL-C
 ↓ aldosterone, EPO, PRA
 ■ **Urine** ↑ RBC, G, LAP, casts – (RBC)
 ↓ creatinine, specific gravity
- toxic renal lesion**
 ■ **Urine** ↑ AST, G
- skeletal muscle lesion**
 ↑ ALT, AST, CK, creatinine, creatine, LD, LD – (1, 2, 3, 4, 5), tropomyosin, troponin I
 ■ **Urine** ↑ creatine, creatinine
- eucemia**
 ↑ ACE, ACP, ACP (prostatic), ADA, ADH, Al, aldolase, alpha-aminonitrogen, alpha-1-globulins, alpha-2-globulins, ALP, ALP (tumor isoenzyme), ALP (WBC), ALT, ammonia, ANA, anisocytes, anti-ss-DNA, AST, bas, RBC basophilic stippling, B2M, Ca, CEA, ceruloplasmin, CRP, Cu, BT, euglobulin lysis time, elastase, eos, Fas-ligand, FDP, Fe, ferritin, fibrinogen, FPA, ESR, gamma globulins, glutathione peroxidase (RBC), HbF, HBsAg, cold agglutinins, ICD, IgG, sIL-2R, sIL-6R, K, creatinine, cryoglobulins, uric acid, LA, LAP (WBC), LD, LD – (1, 2, 3, 4), WBC, lipids, lym, lymphoblasts, lysozyme, macrocytes, MD, mono, MPV, myeloblasts, neu, TM – (ALP, ALP, beta-glucuronidase, B2M, c-abl/bcr-translocation, CEA, ferritin, chromogranin A, B, sialic acid, LD, lym, myeloperoxidase, N-ras-mutation, 5-nucleotidase, glucocorticoid receptors, terminal deoxytransferase, thymidine kinase), P, paraproteins, PT, poikilocytes, prothrombin fragment 1.2, RF, RTC, substance P, PLT, transcobalamin I, urea, vitamin B₁₂ binding capacity, viscosity, vitamin – (B₁), hairy cells

- ↓ ACE, PLT aggregation, albumin, ALP, AT III, beta globulins, proteins, Ca, RBC, factor II, fibrinogen, FPA (remission), gamma globulins, Hb, HCT, IgA, IgG, IgM, K, folate, WBC, lym, lysozyme, Mg, mono, Na, neu, PTH, pyruvate kinase, PLT, vitamin - (B₆, B₁₂), Zn
 - **Urine** ↑ alpha-aminonitrogen, arylsulfatase A, Bence Jones protein, proteins, Ca, RBC, Hb, crystals - (urate), uric acid, lysozyme, porphyrins
 - ↓ creatinine, lysozyme
 - **Cerebrospinal Fluid** ↑ bas, B2M, **proteins**, CK, eos, fibronectin, IgG, blood, LA, lym, LD, WBC, RBC, MBP, **pressure**
 - ↓ G
 - **Gastric Fluid** ↑ BAO, blood
 - **Pleural Fluid** ↑ AMS, eos, lym, lysozyme
 - **Sputum** ↑ blood
 - **Synovial Fluid** ↑ PMN
 - ↓ viscosity
- acute leukemia**
- ↑ ACE, CEA, ceruloplasmin, Cu, BT, FDP, Fe, HbF, creatinine, K, **uric acid**, LA, LD, P, WBC, urea
 - ↓ ACE, PLT aggregation, albumin, Ca, RBC, fibrinogen, Hb, HCT, K, Mg, PLT
 - **Urine** ↑ lysozyme
 - **Cerebrospinal Fluid** ↑ B2M, LD, pressure, WBC
- adult human T-cell leukemia/lymphoma sy**
- ↑ * anti-HTLV-I antibodies, * Ca, * WBC
 - ↓ Hb, HCT, PLT
- basophilic leukemia**
- ↑ bas
 - **Gastric Fluid** ↑ BAO
- chronic myelomonocytic leukemia**
- ↑ WBC, lysozyme, mono, neu
 - ↓ albumin, proteins, RBC, Hb, HCT, PLT, vitamin - (B₁₂)
- eosinophilic leukemia**
- ↑ eos
- erythroleukemia**
- ↑ HbA₂, HbF
 - ↓ RBC
- hairy cell leucemia**
- ↑ ALP (WBC), * hairy cells, ESR, HTLV I/II Ab, sIL-2R
 - ↓ Hb, HCT, lym, WBC, lysozyme, mono, PLT
- lymphatic leucemia**
- acute lymphatic leucemia
- ↑ ACP, ALT, anti-ss-DNA Ab, CEA, glutathione peroxidase (RBC), cold agglutinins, sIL-2R, K, **uric acid**, LAP (WBC), LD, LD - (1, 2, 3), * WBC, lym, lymphoblasts, TM - (beta-glucuronidase, 5-nucleotidase, terminal deoxytransferase, thymidine kinase), P, **terminal deoxynucleotidyl transferase**
 - ↓ Ca, RBC, Hb, HCT, IgA, K, WBC, lysozyme, Na, neu, PTH, PLT
 - **Urine** ↓ lysozyme
 - **Cerebrospinal Fluid** ↑ **proteins**, fibronectin, B2M
 - ↓ G

- chronic lymphatic leucemia

- ↑ ACP, ammonia, anti-ss-DNA, B₂M, CEA, ESR, gamma globulins, HbF, cold agglutinins, sIL-2R, cryoglobulins, uric acid, LD, LD - (2, 3, 4), WBC, * lym, paraproteins, substance P
- ↓ ACE, albumin, ALP, beta globulins, RBC, gamma globulins, Hb, HCT, IgA, IgG, IgM, lysozyme, neu, PTH, PLT, vitamin - (B₁₂)
- Urine ↑ Bence Jones protein, uric acid
- Pleural Fluid ↑ AMS, lym
- Cerebrospinal Fluid ↑ eos

megakaryocyte leucemia

- ↑ PLT

monocytic leucemia

- ↑ ALP, ALP (WBC), APTT, AST, proteins, FDP, Fe, gamma globulins, globulins, IgA, IgG, IgM, creatinine, uric acid, LD, WBC, lysozyme, mono, PT, RTC, TT, urea, vitamin - (B₁₂)
- ↓ albumin, ALP (WBC), beta globulins, proteins, factor - (V, VIII), fibrinogen, Hb, HCT, cholesterol, WBC, neu, PLT, Zn
- Urine ↑ proteins, lysozyme
- Pleural Fluid ↑ proteins

myelogenous leucemia

- acute myelogenous leucemia

- ↑ ACP, ADA, aldolase, alpha-aminonitrogen, alpha-1-globulins, alpha-2-globulins, alpha-1-antichymotrypsin, alpha-1-glycoprotein, ALP (+ WBC), ALT, ANA, anisocytes, anti-ss-DNA, APTT, arylsulfatase A, AST, bas, beta globulins, Ca, Cu, eos, EPO, FDP, Fe, ferritin, gamma globulins, globulins, Hb (free), ICD, K, creatinine, uric acid, LD, WBC, lysozyme, malate dehydrogenase, MCH, MCV, Mg, mono, MPV, myeloblasts, Na, neu, TM - (CEA, myeloperoxidase), P, phosphoglucomutase, poikilocytes, PLT, PT, RF, TT, UBBC, urea, vitamin - (B₁₂)
- ↓ ACE, ALP (WBC), albumin, proteins, beta globulins, Ca, RBC, factor - (V, VIII), fibrinogen, Hb, HCT, cholesterol, K, WBC, lysozyme, Na, neu, PTH, PLT, RTC, Zn
- Urine ↑ alpha-aminonitrogen, Ca, creatine, K, uric acid, lysozyme
- Cerebrospinal Fluid ↑ proteins
- ↓ G
- Pleural Fluid ↑ proteins, lysozyme

- chronic myelogenous leucemia

- ↑ ACE, ACP, aldolase, alpha-1-globulins, alpha-2-globulins, ALP, ALP (WBC), ALT, ammonia, anti-ss-DNA, APTT, arylsulfate, AST, bas, Ca, CEA, eos, ESR, FDP, ferritin, fibrinogen, G, gamma globulins, globulins, granulocytes, HbF, Hb, HCT, histamine, cholesterol, ICD, K, creatinine, uric acid, alpha-ketoglutaric acid, LA, LD, LD₅, * WBC, lysozyme, malate dehydrogenase, megakaryocytes, metamyelocytes, mono, MPV, myeloblasts, myelocytes, Na, neu, substance P, phosphoglucomutase, PT, RTC, terminal deoxynucleotidyl transferase, transcobalamin I, PLT, TT, urea, vitamin B₁₂, binding capacity, vitamin - (B₁₂)
- ↓ albumin, ALP, ALP (WBC), AT III, beta globulins, proteins, RBC, factor - (II, V, VIII), fibrinogen, G, Hb, HCT, IgA, complement - (C₄, total), LD₅, lym, plasminogen, PTH, RTC, PLT, Zn
- Urine ↑ alpha-aminonitrogen, creatine, uric acid, lysozyme

- *Cerebrospinal Fluid* ↑ bas, WBC
- *Pleural Fluid* ↑ proteins
- juvenile chronic myelogenous leucemia
 - ↑ ALP (WBC), HbF, mono, WBC
 - ↓ ALP (WBC)
- Leukocytosis**
 - ↑ K, WBC, viscosity, vitamin - (B₁₂)
 - ↓ ESR
- Leukodystrophy, Metachromatic**
 - ↑ ALT
 - ↓ * arylsulfatase A (+ WBC)
 - *Urine* ↑ lipids
 - ↓ * arylsulfatase A
 - *Cerebrospinal Fluid* ↑ proteins, * MBP
 - *Tears* ↑ * arylsulfatase A
- Leukoencephalitis, Subacute Sclerosing**
 - *Cerebrospinal Fluid* ↑ proteins, eos, gamma globulins, IgG, lym, MBP, mono, plasmocytes
- Lipodystrophy**
 - ↑ C-3 nephritic factor, G, TAG, VLDL-C
 - ↓ complement - (C₃)
- Lipoidosis**
 - ↑ beta globulins, fibrinogen, cholesterol, LDL-C, lipids
 - ↓ albumin, Ca, gamma globulins, Mg
 - *Urine* ↑ proteins, lipids, casts
- ceramide lactoside lipoidosis
 - ↓ beta-galactosidase (+WBC)
- Liver, Fatty (liver steatosis)**
 - ↑ acanthocytes, aldosterone, * ALP, * ALT, ammonia, * AST, * Bil, * conjugated Bil, unconjugated Bil, C-peptide, factors - (II, VII, IX, X), ferritin, G, globulins, GMT, * cholesterol, CHS, insulin, creatinine, uric acid, pre-beta LP, WBC, MDA, * PT, RAL, * TAG, transferrin satur., urea, VLDL-C
 - ↓ albumin, ALT, AST, RBC, Hb, HCT, K, WBC, Mg, Na, P, PLT
 - *Urine* ↑ K, Mg, P
- acute fatty liver in pregnancy
 - ↑ ammonia, * AST, * ALT, * Bil, FDP, creatinine, MAC, uric acid, WBC, PT, PTT, urea
 - ↓ * fibrinogen, G, * PLT, PT
 - *Urine* ↑ * acetone, specific gravity
- Lupus**
- CNS lupus**
 - *Cerebrospinal Fluid* ↑ proteins, IgG, MBP
- discoid lupus**
 - ↑ ANA, anti-RNP Ab
 - ↓ complement - (C₃)
- drug-induced lupus**
 - ↑ * ANA, ANCA, anti-ds-DNA, anti-ss-DNA, * antihistone Ab, anti-poly (ADP-ribose), anti-RNP, anti-Ro/SSA, anti-La/SSB, anti-Sm, HLA-DR4

systemic lupus erythematosus

- ↑ AAT, Ab against beta-2 GP I, ACE, AGP, albumin, aldolase, alpha-1-globulins, **alpha-2-globulins**, alpha-1-antichymotrypsin, ALT, A2MG, AMA, * ANA, ANCA, p-ANCA, * anti-ds-DNA, anti-ss-DNA, anti-DNP, antiendothelial Ab, antierythrocyte Ab, antihistone Ab, anti-HSP 65, anti-HSP 90, **antiphospholipid Ab**, **anti-WBC**, **anticardiolipin Ab**, anti-Ku Ab, antilymphocyte Ab, **antimicrosomal Ab**, anti-MPO, antimyocardial Ab, antineuronal Ab, anti-p16, anti-p 56, anti-poly (ADP-ribose), antiribosomal-Po Ab, anti-RNA, **anti-PCNA**, anti-RA33, **anti-RNP**, anti-Scl-70, * **anti-Sm**, **anti-Ro/SSA**, anti-La, Ha/SSB, **antiplatelet Ab**, antithyroglobulin Ab, **antithyroidal Ab**, APTT, ASMA, AST, beta-2-glycoprotein I, proteins, CIC, CK, CK-MB, C-3 nephritic factor, CRP, Cu, CT, factor D, ferritin, ESR, FDP, fibrinogen, **gamma globulins**, globulins, glycoproteins, hexosamine, histones, HLA - (A1, B8, C4A, DQ3, Dqw1, DR2, DR3, DR4), h-sICAM-1, h-sVCAM-1, cold agglutinins, cholesterol, chylomicrons, IFN, IgA, IgD, IgG, IgM, K, complement - (Ba, Bb, C3, C3a, C4d, C9, total), creatine, **creatinine**, cryofibrinogen, **cryoglobulins**, LCA, LD, LD - (3, 4), * **LE cells**, lupus inhibitor, WBC, lym, MAC+RAL, Mb, Mg, **mono**, MPV, mucoproteins, neopterin, 5-NT, PT, **anti-small nuclear RNP**, anti-p56 annexin XI Ab, antinuclear antigen Ab, pyroglobulins, RTC, RF, syphilis Ab (false), TAG, TT, thrombomodulin, UBBC, **urea**, VDRL (false), **viscosity**, VLDL-C
- ↓ **albumin**, proteins, CRP, RBC, **factor B**, factors - (VIII, IX, XI, XII), beta-galactosidase, **haptoglobin**, Hb, HCT, IL-1, IL-2, C1-esterase inhibitor, complement - (C1q, C1qINH, C1r, C1s, C2, * C3, * C4, C5, C6, C7, C8, * CH50), WBC, lipids, lym, neu, T-lym, **transferrin**, transferrin satur., PLT, Zn
 - **Urine** ↑ albumin, proteins, RBC, Hb, LD, creatine, WBC, volume, PG, PT, casts - (RBC, cellular, **granular**, Hb, fatty, hyaline, tubular, miscellaneous, waxy)
 - ↓ specific gravity, volume, Zn
 - **Cerebrospinal Fluid** ↑ anti-ds-DNA, proteins, IgA, IgG, IgM, WBC, mono, antineuronal Ab
 - ↓ G, complement - (C4, total)
 - **Synovial Fluid** ↑ ANA, proteins, clot formation, chylomicrons, crystals - (hydroxyapatite), WBC, **LE cells**, lym, macrophages, mono, MPS, PMN, RF, viscosity, **volume**
 - ↓ proteins, complement - (C3, C4, total), G, WBC, neu, RF, **viscosity**
 - **Pericardial Fluid** ↑ RBC, complement - (C4, total), volume
 - **Pleural Fluid** ↑ AMS, ANA, anti-DNA, proteins, CIC, **LE cells**, lym, mononuclear cells, neu, PMN, specific gravity
 - ↓ complement - (C3, C4, CH50, total), G, pH

Lymphadenitis, Mesenterial

↑ ESR, WBC, lym, neu

Lymphadenopathy, Angioimmunoblastic

↑ **gamma globulins**, WBC

↓ Hb, RBC, HCT, WBC, lym, PLT

Lymphangiectasis, Intestinal

↑ WBC

↓ lym

Lymphangitis

↑ ESR, neu, WBC

Lymphogranuloma inguinale

↑ B2M, proteins, eos, gamma globulins, mono

Macroamylasemia

↑ * AMS, AAT, lipase

■ *Urine* ↓ AMS

Malabsorption

↑ ALP, ALP (intestinal isoenzyme), amino acids, AMS, AST, proteins, ceruloplasmin, Cu, DPD, eos, ferritin, ESR, G, G tolerance, haptoglobin, HCT, HCO_3^- , K, folate, LD, lipids, lym, MAC, MCV, Na, P, PT, PTH, PLT, urea, TIBC

↓ AAT, albumin, ALP, Apo A-IV, * proteins, Bil, Ca, ceruloplasmin, CO_2 , * Cu, factor - (II), * Fe, RBC, ferritin, G, GIP, haptoglobin, * Hb, * HCT, HDL-C, HCO_3^- , cholesterol, CHS, K, complement - (C_3), ascorbic acid, LDL-C, lipids, lym, MAL, MCH, Mg, Na, P, plasma volume, * PT, prothrombin, T₄, TAG, TBG, trypsinogen, UBBC, urea, vitamin - (A, B₁, B₂, B₆, B₁₂, C, D, E, K, * beta-carotene, folate), Zn

■ *Urine* ↑ Bence Jones protein, chloride, K, 5-HIAA, Na, oxalate, phosphate

↓ albumin, Ca, chloride, K, 5-HIAA, PABA, Mg, Na, pH, vitamin - (C)

■ *Stool* ↑ Ca, volume, * fat

↓ chymotrypsin

■ *Gastric Fluid* ↑ alpha-1-antichymotrypsin

Note: functional tests positive (xylose test, lactose test, lactulose-ramnose test, Schilling's test, beta-carotene test, alpha-1-antitrypsin intestinal clearance test)

folate malabsorption

↓ folate, Hb, HCT

intestinal malabsorption

↓ albumin, ALP, beta-carotene, proteins, Ca, ceruloplasmin, Cu, Fe, G, GIP, Hb, HDL-C, cholesterol, CHS, K, LDL-C, Mg, PT, TAG, TBG, urea, vitamin - (A, B₂, B₆, B₁₂, C, D, E, carotene, folate), Zn

■ *Stool* ↑ volume, fat

iron malabsorption

↓ RBC, Fe, Hb, HCT

methionine malabsorption

■ *Urine* ↑ phenylalanine, alpha-hydroxybutyric acid, methionine, tyrosine

Malnutrition

↑ alpha-1-antichymotrypsin, AST, beta-aminoisobutyric acid, epinephrine, globulins, ICD, IgG, immunoreactive trypsin (later), uric acid, plasma volume, PT, GH, FFA

↓ AAT, AGP, * albumin, ALP, alpha-aminonitrogen, ALT, A2MG, AMS, Apo B, AST, beta globulins, proteins, B-lym, Ca, carbohydrate-deficient transferrin (false), ceruloplasmin, CK, Cr, Cu, cystine, estradiol, estriol, RBC, factor VIII, * Fe, FSH, * G, globulins, HDL-C, Hb, HCT, cholesterol, CHS, * IFN, immunoglobulins, IgA (later), IgG (later), IgM (later), IL-1, ILGF-I, immunoreactive trypsin (early), Ci-INH, insulin, K, complement - (C1q , C1s , C2 , C3 , C4 , total), cortisol, WBC, LD, LDL-C, LH, lipase, lym, methionine, Mg (+RBC), * P, pH,

- plasmocytes, PL, plasma volume, * **prealbumin**, PRL, RTC, Se, somatomedin C, T₃, T₄, TAG, TBG, TIBC, T-lym, * **transferrin**, * **transthyretin**, triiodothyronine resin uptake, tryptophan, tyrosine, * **urea**, valine, vitamin – (A, B₆, B₁₂, folate), Zn
- **Urine** ↑ ammonia, beta-aminoisobutyric acid, N-formiminoglutamic acid, 3-methylhistidine, Na, volume
 - ↓ Cu, ESR, estriol, hydroxyproline, 17-OHCS, 17-KGS, creatinine, pH, volume, vitamin C
 - **Sweat** ↓ chloride, Na
 - **Stool** ↑ fat
 - **Gastric Fluid** ↓ AMS, lipase, trypsin
- Mastocytosis**
- ↑ **bas**, histamine, **mastocytes**
 - ↓ RBC, WBC
 - **Gastric Fluid** ↑ BAO, HCl
 - ↓ pH
 - **Urine** ↑ histamine
 - ↓ 5-HIAA
- Megacolon, Toxic**
- ↑ ESR, WBC, PMN
 - **Stool** ↑ blood, RBC, Hb
- Meningitis**
- ↑ ADH, albumin, alpha-2-globulins, AST, proteins, CK, CRP, ESR, G, glutamine, creatinine, cryofibrinogen, lactoferrin, LD, WBC, neu, trypsin, urea
 - ↓ fibrinogen, G, Hb, HCT, chloride, complement – (C₃, C₄), WBC, Na
 - **Urine** ↑ albumin, RBC, G, GFR, volume, VMA
 - **Cerebrospinal Fluid** ↑ AAT, adenylate kinase, AFP, albumin, A₂MG, arginine, **bacteria** (+ culture), beta-glucuronidase, **proteins**, CRP, CK, eos, phenylalanine, G, globulins, glutamine, glycine, hCG, hydroxyproline, chloride, cholesterol, CHS, ICD, IgG, IgM, interferon, isoleucine, glutamic acid, LA, LD, LD – (4, 5), WBC, leucine, **lym**, lysine, **lysozyme**, macrophages, methionine, mono, **neu**, ornithine, P, PG, plasmocytes, PMN, proline, RF, taurine, **pressure**, tryptophan, tyrosine, valine, VMA
 - ↓ G, globulins, chloride, Mg, pH
- acute purulent meningitis**
- **Cerebrospinal Fluid** ↑ **bacteria** (+ culture), **proteins**, WBC, RBC, Na, PMN, **pressure**
 - ↓ G, chloride, pH
- aseptic meningitis**
- ↑ anti-enterovirus Ab, **lym**, WBC
 - **Cerebrospinal Fluid** ↑ **proteins**, phenylalanine, glycine, leucine, WBC, **lym**, mono, PMN, proline, **pressure**, RBC, valine
 - **Cerebrospinal Fluid** ↓ G
- bacterial meningitis**
- ↑ ADH, alpha-2-globulins, AST, * **bacteria** (culture), CK, CRP, ESR, G, creatinine, cryofibrinogen, LD, WBC, neu, urea
 - ↓ **chloride**, Hb, HCT, complement – (C₃, C₄), WBC (infants, elderly), Na

- **Cerebrospinal Fluid** ↑ adenylate kinase, albumin, alpha-1-antichymotrypsin, A2MG, arginine, * **bacteria** (+ culture), * **proteins**, CRP, CK, defensin, eos, phenylalanine, G, globulins, **glutamine**, glycine, hydroxyproline, chloride, ICD, IgG, IgM, immunoglobulins, isoleucine, glutamic acid, LA, LD, LD4, LD5, lactoferrin, leucine, * **WBC**, lym, lysine, lysozyme, methionine, neu, ornithine, PMN, proline, RF, taurine, **pressure**, tryptophan, tyrosine, valine
 - ↓ * G, globulins, chloride
 - **Urine** ↑ * **bacteria** (+ culture), GFR, Na
- carcinomatous meningitis**
- ↑ albumin, proteins, WBC
 - ↓ G
 - **Cerebrospinal Fluid** ↑ AFP, beta-glucuronidase, proteins, phenylalanine, **glutamine**, glycine, hCG, isoleucine, glutamic acid, leucine, lysine, proline, taurine, **pressure**, RBC, tryptophan, tyrosine, valine
 - ↓ G
- chemical meningitis**
- **Cerebrospinal Fluid** ↑ lym, proteins, WBC
- chronic meningitis**
- **Cerebrospinal Fluid** ↑ **bacteria** (+ culture), **proteins**, lym, **pressure**, WBC
 - ↓ G
- cryptococcal meningitis**
- ↑ cryptococcal Ag
 - **Cerebrospinal Fluid** ↑ **proteins**, lym, PMN, WBC
 - ↓ G
- meningitis in amebiasis**
- **Cerebrospinal Fluid** ↑ lym, **pressure**, WBC, PMN, **proteins**, RBC
 - ↓ G
- meningitis in anthrax**
- **Cerebrospinal Fluid** ↑ bacilli, **proteins**, RBC, PMN
 - ↓ G
- meningitis in brucellosis**
- **Cerebrospinal Fluid** ↑ **proteins**, lym
 - ↓ G, chloride
- meningitis in coccidioidomycosis**
- **Cerebrospinal Fluid** ↑ **proteins**, WBC, **pressure**
- meningitis in cysticercosis**
- **Cerebrospinal Fluid** ↑ **proteins**, WBC, **pressure**
 - ↓ G
- meningitis in herpes simplex virus infection**
- **Cerebrospinal Fluid** ↑ **proteins**, WBC, lym
- meningitis in herpes zoster virus infection**
- **Cerebrospinal Fluid** ↑ **proteins**, WBC
- meningitis in leptospirosis**
- **Cerebrospinal Fluid** ↑ **proteins**, WBC, lym, mono, PMN
- meningitis in Lyme disease**
- **Cerebrospinal Fluid** ↑ * **antibody against B. burgdorferi**, **proteins**, IgG, lym, WBC

meningitis in measles

- **Cerebrospinal Fluid** ↑ proteins, WBC, lym, mono, pressure

meningitis in mumps

- **Cerebrospinal Fluid** ↑ proteins, G, IgG, IgM, WBC, lym, mono, PMN, pressure
- ↓ G

meningitis in rabies

- **Cerebrospinal Fluid** ↑ proteins, lym, WBC, PMN

meningitis in sarcoidosis

- **Cerebrospinal Fluid** ↑ ACE, proteins, IgG, WBC, lym, lysozyme, mono, plasmocytes, pressure
- ↓ G

meningitis in syphilis

- ↑ * syphilis antibodies, * VDRL
- **Cerebrospinal Fluid** ↑ proteins, gamma globulin, lym, WBC, pressure, * treponemal DNA (PCR), * VDRL
- ↓ G, lym

meningitis in toxoplasmosis

- **Cerebrospinal Fluid** ↑ proteins, eos, WBC, mono, pressure

meningococcal meningitis

- ↑ IL-8, WBC
- ↓ fibrinogen
- **Urine** ↑ albumin, RBC, G
- **Cerebrospinal Fluid** ↑ proteins, * WBC, PMN
- ↓ G, chloride

Mollaret's meningitis

- ↑ WBC
- **Cerebrospinal Fluid** ↑ lym, * PMN (early), * proteins
- ↓ G

mycotic meningitis

- ↑ plasmocytes
- **Cerebrospinal Fluid** ↑ proteins, eos, LA, WBC, lym, lysozyme, macrophages, mono, plasmocytes, RBC, pressure
- ↓ G

ricketsial meningitis

- **Cerebrospinal Fluid** ↑ eos, WBC

serous meningitis

- **Cerebrospinal Fluid** ↑ proteins, chloride, mono, Na, pressure

tuberculous meningitis

- ↑ ADH, ESR, globulins, uric acid, lym, WBC, mono, RF
- ↓ proteins, chloride, Na, * mycobacterial antigen, * anti-mycobacteria Ab
- **Urine** ↑ uric acid
- **Cerebrospinal Fluid** ↑ proteins, * bacteria (+ culture), * mycobacterial DNA (PCR), eos, uric acid, LA, LD, WBC, lym, lysozyme, macrophages, mono, P, plasmocytes, RBC, tryptophan, pressure
- ↓ G, chloride, Mg

viral meningitis

- ↓ complement – (C4)
- **Cerebrospinal Fluid** ↑ proteins, eos, interferon, LD, LD2, LD3, WBC, lym, mono, plasmocytes, pressure

- acute anterior poliovirus meningitis

■ **Cerebrospinal Fluid** ↑ AST, proteins, LD, LD2, LD3, WBC, lym, PMN

- acute viral meningitis

■ **Cerebrospinal Fluid** ↑ * anti-CMV, * anti-EBV, * anti-enterovirus antibody, * anti-HSV, * anti-St. Louis encephalitis virus Ab, * anti-VZV, * HSV antigen, * IgM

Meningocele

↑ AFP

■ **Amniotic Fluid** ↑ AFP

Meningoencephalitis

amebic meningoencephalitis

↑ ALT, WBC, neu

■ **Cerebrospinal Fluid** ↑ * amebas, RBC, WBC, lym, lysine, neu, PMN, proteins, pressure

↓ G

meningoencephalitis in mumps

■ **Cerebrospinal Fluid** ↑ WBC

↓ G, WBC

Meningoradiculitis, Garin-Bujadoux-Bannwarth

■ **Cerebrospinal Fluid** ↑ phenylalanine, glutamine, glycine, isoleucine, glutamic acid, leucine, lysine, ornithine, proline, valine

Menisectomy

■ **Synovial Fluid** ↑ crystals - (calcium pyrophosphate)

Menopause

↑ FSH, LH, MCV, P, N-telopeptides

↓ Apo B, * estradiol, estriol, estrogens, HDL-C, 17-OH progesterone

■ **Urine** ↑ FSH

↓ estriol, estrogens, 17-KS

Menstruation

↑ aldosterone, CA 125, ESR, fibrinogen, cholesterol, WBC, Mg, osteocalcin
↓ Fe, ferritin, fibrinogen, osteocalcin, PLT, transferrin satur.

■ **Urine** ↑ proteins (early), RBC (false), Hb (false), porphyrins

↓ estrogens (early), pregnanediol, chloride (early), Na (early), volume (early)

Metaplasia, Agnogenic Myeloid

↑ ALP (WBC), * anisocytes, bas, eos, teardrop RBC, nucleated RBC, * PLT, poikilocytes, PT, RTC, uric acid, vitamin B₁₂, WBC

↓ Hb, HCT, PLT, WBC

Methemoglobinemia

↑ RBC, RBC Heinz bodies, MAC, * MHb

Microangiopathy

↓ PLT

Mole, Hydatidiform

↑ euglobulin lysis time, ESR, HbF, WBC, TM - (hCG), progesterone

↓ AFP, RBC, Hb, HCT, placental lactogen (hPL)

■ **Urine** ↑ hCG

↓ pregnanediol

Mucopolysaccharidoses

mucopolysaccharidosis I (Hurler's sy)

↓ alpha-L-iduronidase

■ **Urine** ↑ dermatan sulfate, heparan sulfate, * mucopolysaccharides

- mucopolysaccharidosis II (Hunter's sy)**
 ↓ iduronate sulfatase
 ■ **Urine** ↑ dermatan sulfate, heparan sulfate, mucopolysaccharides
- mucopolysaccharidosis III (Sanfilippo's sy)**
 ↓ sulfamidase, alpha-hexosaminidase
 ■ **Urine** ↑ heparan sulfate, mucopolysaccharides
- mucopolysaccharidosis IV (Morquio's sy)**
 ↓ beta-galactosidase, N-acetylgalactosamine-6-sulfatase
 ■ **Urine** ↑ * keratan sulfate
- mucopolysaccharidosis VI (Maroteaux-Lamy sy)**
 ↓ arylsulfatase B
 ■ **Urine** ↑ * dermatan sulfate
- mucopolysaccharidosis VII (Sly's sy)**
 ↓ beta-glucuronidase
 ■ **Urine** ↑ dermatan sulfate, heparan sulfate, chondroitin 4,6-sulfate
- Myasthenia Gravis**
 ↑ ACH, albumin, AMA, ANA, * anti-ACHR (binding, blocking, modulating), anti-ds-DNA, anti-thymus Ab, antithyroid Ab, anti-thyroglobulin Ab, APA, ASMA, CEA, CO₂, HLA – (A1, A3, B7, B8, DR2, DR3), IgA, IgG, creatinine, creatine, LE cells, MCH, MCV, norepinephrine, * anti-striational Ab to skeletal muscle, pCO₂, RF, T₃, T₃ uptake, T₄
 ↓ Hb, HCT, complement – (total), creatinine, lym, Mb, O₂ satur., pO₂
 ■ **Urine** ↑ catecholamines, creatinine
- Myelitis, Acute**
 ↑ WBC
 ■ **Cerebrospinal Fluid** ↑ proteins, lym
 ↓ WBC
- Myelofibrosis**
 ↑ ACP, anisocytes, ALP, ALP (WBC), bas, elliptocytes, eos, RBC, glutathione (RBC), HBD, cryofibrinogen, uric acid, LD, LD₅, WBC, lysozyme, megakaryocytes, mono, myelocytes, neu, PT, poikilocytes, RTC, PLT, UBBC, vitamin B₁₂
 ↓ ALP (WBC), bas, RBC (later), Hb, HCT, folate, WBC (later), neu, osmotic fragility, PLT (later)
 ■ **Urine** ↑ uric acid
- Myocarditis**
 ↑ ALT, ANA, anti-enterovirus Ab, antimyocardial Ab, antiviral Ab, ASLO, AST, CK, CK-MB, CRP, ESR, fibrinogen, IgM, LD, WBC, lym, myosin
 ↓ cholesterol
- bacterial myocarditis**
 ↑ ALT, AST
- rheumatic myocarditis**
 ↑ ALT, AST
- viral myocarditis**
 ↑ ALT, AST, CK, CK-MB, CRP, ESR, IgM, LD, WBC, lym, troponin T (early)
- Myoglobinuria, Paroxysmal**
 ↑ aldolase, aldosterone, ALT, AMS, AST, CK, CK-MB, K, LD
 ■ **Urine** ↑ Hb, * Mb, casts – (Hb, Mb)

Myopathy, Inflammatory

- ↑ aldolase, anti-decorin Ab, anti-Sm Ab, anti-Ro/La/SS Ab, antithyroid Ab, B-lym, CK, gamma globulins, IL-2, IL-2-alpha, LD, mono, uric acid, T-lym
- ↓ carnitine, gamma globulins

Myositis

- ↑ ALP, ALT, antisynthetase Ab, AST, CK, CK-MB, LD, WBC, neu

Myotonia

atrophic myotonia

- ↑ ALT, AST

congenital myotonia

- ↑ ALT, AST

Myxedema

- ↑ ADH, epinephrine, albumin, alpha-aminonitrogen, ALP, ALT, * anti-microsomal Ab, * antithyroglobulin Ab, antithyroid Ab, * antithyroperoxidase Ab, anti-TSH-receptor Ab, AST, Apo A-I, Apo B, bas, beta-carotene, beta-lipoprotein, Bil, conjugated Bil, proteins, Ca, * CK, CK-MM, EPO, ESR, G, HCO₃⁻, HLA - (DR₃, DR₅), * cholesterol, * IDL-C, IL-6, catecholamines, creatine, creatinine, uric acid, LD, macrocytes, Mb, MCV, Mg, norepinephrine, pCO₂, prealbumin, PRL, TAG, * TBG, * thyroxine autoantibodies, * TSH, urea, VLDL-C
- ↓ ALP, ACE, ALP, EPO, RBC, Fe, ferritin, fibronectin, FT₃, * FT₄, * FTI, G, Hb, HCT, HDL-C, chloride, CHS, iodine, Na, osmolality, osteocalcin, pepsinogen, SHBG, GH, T₃, * T₄, TIBC, tyrosine, vitamin - (A, B₂, B₁₂, folate)
- **Urine** ↑ proteins, conjugated Bil, 17-OHCS, 17-KS, catecholamines, creatinine, Na
- ↓ Ca, Cu, 17-OHCS, 17-KS, creatine, P
- **Cerebrospinal Fluid** ↑ proteins
- **Pericardial Fluid** ↑ volume
- **Peritoneal Fluid** ↓ proteins
- **Pleural Fluid** ↓ proteins
- **Synovial Fluid** ↑ crystals - (calcium pyrophosphate), WBC, viscosity, volume
- **Sweat** ↓ chloride, Na

Nanismus Hypophysialis

- ↓ ALP, IGF-I, GH

Narcolepsy

- ↑ HLA - (DR₂)

Necrosis

- ↑ AFP, alpha-1-antichymotrypsin, alpha-1-globulins, alpha-2-globulins, ALP, ALT, ammonia, AMS, AST, beta-glucuronidase, conjugated Bil, unconjugated Bil, ceruloplasmin, CK, CRP, Fe, ESR, gamma globulins, GMD, GMT, haptoglobin, hexosaminidase, K, creatinine, LD, LD₁, LD₂, WBC, Mg, Na, OCT, osmolality, TIBC, transferrin, urea
- ↓ albumin, AMS, proteins, Hb, cholesterol, Mg, pH, transferrin
- **Urine** ↑ amino acids, AMS, beta-2-glycoprotein I, proteins, RBC, Hb, hexosaminidase, WBC, volume, fat, casts - (epithelial, RBC)
- ↓ creatinine, specific gravity, volume, osmolality, urea
- **Pleural Fluid** ↑ LD

adrenal cortical necrosis

- **Urine** ↑ RBC, Hb

intestine necrosis

- ↑ CK-BB, ESR
- **Urine** ↑ AMS
- **Pleural Fluid** ↑ LD

liver necrosis

- ↑ ACP, ADH, AFP, alpha-1-glycoprotein, aldolase, ALP, ALT, amino acids, AST, ammonia, beta-glucuronidase, Bil, conjugated Bil, unconjugated Bil, BSP retention, CEA, FDP, Fe, ferritin, ESR fibrinogen, gamma globulins, globulins, GMD, GMT, haptoglobin, Hb (free), HBsAg, hexosaminidase, cholesterol, ICD, IgA, IgM, complement – (C₃), LAP, LD, LD – (3, 5), lecithin (RBC), WBC, lipids, lym, Mg, neu, 5-NT, OCT, P, phosphoglucomutase, PL (RBC), PT, pyruvate, RTC, TAG, TIBC, transferrin, vitamin B₁₂
- ↓ albumin, alpha-2-globulins, AMS, AT III, beta globulins, beta-glucuronidase, carotene, proteins, ESR, fibrinogen, G, G tolerance, globulins, haptoglobin, Hb, HCT, cholesterol, CHS, WBC, lipase, lym, neu, osmotic fragility (RBC), plasminogen, somatomedin C, transferrin, PLT, urea, vitamin – (A, folate), Zn
- **Urine** ↑ amino acids, proteins, estrogens, coproporphyrin, N-formiminoglutamic acid, tyrosine crystals, UBG
- ↓ sulphate
- **Cerebrospinal Fluid** ↑ amino acids
- **Stool** ↑ UBG

pancreas necrosis

- **Urine** ↑ AMS (early stage), ESR
- ↓ AMS (later stage)

renal necrosis

– cortical renal necrosis

- ↑ AST, ESR, LD, LD₁, LD₂, WBC
- ↓ Hb, HCO₃⁻, pH
- **Urine** ↑ proteins, RBC, WBC, casts – (RBC)

– tubular renal necrosis

- ↑ K, CK, creatinine, Na, osmolality, urea
- ↓ Mg
- **Urine** ↑ beta-2-glycoprotein I, RBC, Hb, hexosaminidase, Na, myoglobin, volume, fat, casts – (epithelial, granular)
- ↓ creatinine, specific gravity, volume, osmolality, urea

skeletal muscle necrosis

- ↑ carnitine, ESR, LD

tissue necrosis

- ↑ alpha-1-antichymotrypsin, alpha-1-globulins, ceruloplasmin, CRP, haptoglobin, Mg, Ni

Neonates, Premature

- ↓ Ca, Cu, euglobulin lysis time, Fe, phenylalanine, Se, vitamin – (E, folate)
- **Urine** ↑ cystathionine, galactose, 17-KS

Nephrectomy

- ↓ angiotensin II, aldosterone, PRA

Nephritis

- ↑ AGBMA, alpha-aminonitrogen, alpha-1-globulins, beta-carotene, CEA, CIC, CRP, eos, Fe, ESR, G, **haptoglobin**, chloride, cholesterol, IgA, IgE, IgG, K, **creatinine**, creatine, **uric acid**, **WBC**, lipids, MAC (later stage), microcytes, mucoproteins, Na, neu, P, PRL, **urea**
- ↓ **albumin**, ALP, RBC, Hb, HCT, HCO_3^- ; chloride, K, complement - (C3, C4, C6), LD, Mg, Na, neu, plasma volume, osmolality, pCO_2 , pH, urea, PLT, vitamin - (A)
- **Urine** ↑ amino acids, **proteins**, eos, RBC, G, Hb, pus, HCO_3^- ; K, blood, LD, **WBC**, volume, fat, casts - (RBC, **granular**, **hyaline**, **WBC**, lipid)
↓ Ca, GMT, chloride, **uric acid**, specific gravity, Na, volume, P, pH, urea

interstitial nephritis

- acute interstitial nephritis

- ↑ CRP, * eos, ESR, chloride, * IgE, IgG, K, **creatinine**, **WBC**, MAC, neu, **urea**
- ↓ **albumin**, RBC, Hb, HCT, HCO_3^- ; chloride, K, complement - (C3, C6), Mg, Na, pCO_2 , pH
- **Urine** ↑ amino acids, **proteins**, * eos, RBC, G, Hb, pus, HCO_3^- ; **blood**, beta-2-glycoprotein I, hexosaminidase, Na, myoglobin, **WBC**, lym, volume, PO_4^- ; fat, casts - (RBC, granular, epithelial, **WBC**, lipid)
↓ Ca, chloride, uric acid, **specific gravity**, Na, volume, osmolality, P, pH, **urea**

- chronic interstitial nephritis

- ↑ AGBMA, beta-carotene, CRP, cholesterol, IgE, K, MAC, **urea**
- ↓ albumin, Hb, HCT, K, Mg, vitamin - (A)
- **Urine** ↑ **proteins**, eos, G, pus, **WBC**, fat, casts - (**WBC**, lipid)
↓ Ca, GMT, chloride, specific gravity, volume, P, urea

lupus nephritis

- ↑ **anti-ss-DNA Ab**, antifibronectin, antilaminin, anti-nucleosome, anti-ribosome protein-P, anti-RNA-polymerase I, anti-Ro/SSA, anti-Sm Ab, CIC, **WBC**, **urea**
- ↓ albumin, complement - (C2, C3, C4), C1-INH, **WBC**
- **Urine** ↑ amino acids, **proteins**, G, RBC, Hb, **blood**, **WBC**, pus, casts - (epithelial, RBC, granular, hyaline, lipid, mixed)
↓ K, creatinine, **uric acid**, volume, urea

postradiation nephritis

- ↑ alpha-1-globulins, CEA, PRL, urea
- ↓ ALP, RBC, Hb, HCT, Mg, neu, plasma volume, **PLT**
- **Urine** ↑ proteins

salt-losing nephritis

- ↓ aldosterone, RBC, Hb, HCT, chloride, Na
- **Urine** ↑ albumin, chloride, Na
↓ specific gravity

Nephrocalcinosis

- ↑ Ca, chloride, MAC, urea
- **Urine** ↑ proteins, Ca, RBC, **WBC**, volume, P, casts - (**WBC**)

Nephrolithiasis

- ↑ Ca, creatinine, cystine, uric acid, PTH, urea
- **Urine** ↑ bacteria (+ culture), proteins, Ca, cystine, RBC, frequency, Hb, pus, **blood**, crystals, uric acid, **WBC**, specific gravity, oxalate, pH, casts, uromucoid, urea
↓ pH

Nephropathy

analgesic nephropathy

- ↑ creatinine, urea
- ↓ Hb, HCT
- **Urine** ↑ proteins, hexosaminidase, WBC

chronic lead nephropathy

- ↑ AMS, MAC, RTC, WBC
- **Urine** ↑ amino acids, proteins
- **Synovial Fluid** ↑ monosodium urate crystals

diabetic nephropathy

- ↑ amylin, G, chloride, K, creatinine, MAC, cystatine C, HbA_{1c}, urea
- ↓ albumin, renin, creatinine clearance
- **Urine** ↑ albumin, **proteins** (quantitatively, uric acid), microalbumins, casts – (**granular, hyaline, waxy**)

hypercalcemic nephropathy

- ↑ Ca, urea
- ↑ proteins, Ca, RBC, WBC, casts – (RBC, WBC), volume (early)
- **Urine** ↑ GFR (later), volume (later)

salt-losing nephropathy

- ↑ PRA
- ↓ chloride, osmolality
- **Urine** ↑ volume

sickle cell nephropathy

- ↑ K
- ↓ K
- **Urine** ↑ Hb, RBC, **blood**
- ↓ **specific gravity, osmolality**

urate nephropathy

- ↑ creatinine, uric acid
- **Urine** ↑ proteins, blood

Nephrosclerosis, Malignant

- ↑ **aldosterone, lipids, PRA, urea**
- ↓ albumin, RBC, Hb, HCT, K
- **Urine** ↑ **proteins, RBC, Hb, blood, LD**, casts – (RBC, lipid, waxy)
- ↓ K, urea

Nephrosis

- ↑ AFP, aldosterone, alpha-1-globulins, A₂MG, beta globulins, ceruloplasmin, Cu, fibrinogen, ESR, gamma globulins, GMT, haptoglobin, chloride, cholesterol, CHS, lipids, PRA, TAG, urea
- ↓ AAT, **albumin, alpha-2-globulins**, alpha-aminonitrogen, beta globulins, **proteins**, Ca, CBG, **ceruloplasmin**, Cu, Fe, fibrinogen, FT4, gamma globulins, HDL-C, HCO₃⁻, mucoproteins, pH, T₃, T₄, TBG, thyroglobulin, TIBC, **transferrin**
- **Urine** ↑ alpha-aminonitrogen, * **proteins**, lysozyme, specific gravity, casts – (**epithelial, lipid, waxy**)
- ↓ Ca, 17-KS, P
- **Cerebrospinal Fluid** ↑ chloride
- **Pleural Fluid** ↑ LA
- **Sweat** ↓ chloride, Na

Neuropathy

diabetic neuropathy

- ↑ GPs, HbA_{1c}
- **Urine** ↑ proteins
- **Cerebrospinal Fluid** ↑ proteins

motor neuropathy

- ↑ Ab against Ga1Nac-GD1a, anti-GM1 ganglioside Ab, anti-GD1a Ab, anti-MAG Ab

- multifocal motor neuropathy

- ↑ anti-GM1 Ab (IgM)
- **Cerebrospinal Fluid** ↑ proteins

sensory neuropathy

- ↑ Ab against Purkinje cells, anti-GD1b Ab, anti-MAG Ab

Neutropenia

idiopathic neutropenia

- ↑ antineutrophil Ab, mono
- ↓ WBC, neu

immune neutropenia

- ↑ antineutrophil Ab
- ↓ WBC, neu

periodic neutropenia

- ↑ eos, mono
- ↓ WBC, * neu

Obesity

- ↑ ALT, androstenedione, AST, beta-endorphins, BHBA, cAMP, C-peptide, estrogens, estrone, G, glucagon, glycerol, GMT, **cholesterol**, CHS, **ILGF-I**, insulin, IRI, isoleucine, 17-KS, **uric acid**, ketobodies, cortisol, LDL-C, leucine, **lipids**, osteocalcin, PTH, TAG, VIP, vitamin - (D), VLDL-C, FFA
- ↓ AFP, euglobulin lysis time, fructosamine, FSH, G, HDL-C, IGFBP-1, LH, SHBG, GH, testosterone, vitamin - (C)
- **Urine** ↑ G, 17-OHCS, 17-KGS, 17-KS

Obstruction

biliary duct obstruction

- ↑ ACP, alpha-1-globulins, alpha-2-globulins, aldolase, **ALP**, ALP (biliary ways isoenzyme), ALT, AMS, ANA, Apo B-100, ASMA, **AST**, beta globulins, **Bil**, **conjugated Bil**, unconjugated Bil, BSP retention, CEA, CRP, clotting time, elastase, fibrinogen, GMD, GMT, **haptoglobin**, hexosaminidase, chenodeoxycholic acid, cholic acid, **cholesterol**, ICD, IgA, LAP, LD, LD₅, lecithin (RBC), lipase, LPS, mucoproteins, 5-nucleotidase, OCT, PL, PT, TAG
- ↓ factor II, lipase, osmotic fragility (RBC), vitamin - (A, B₂, K)
- **Urine** ↑ **conjugated Bil**, bile acids, LAP, pH, pregnanediol, UBG (infection)
- ↓ Na, volume, UBG
- **Stool** ↑ fat
- ↓ Bil, UBG

fetal intestinal obstruction

- **Amniotic Fluid** ↑ AFP

intestinal obstruction

- ↑ ALP, AMS, AMS (P), AST, unconjugated Bil, CK, G, Hb (later), HCT (later), HCO_3^- , chloride, creatinine, creatine, LD, WBC, lipase, Na, neu, P, pCO_2 , pH, PMN, urea
- ↓ albumin, cholesterol, chloride, K, WBC, Na, pCO_2 , pH, vitamin - (B_2)
- **Urine** ↑ AMS, proteins, Na, specific gravity
- ↓ volume
- **Peritoneal Fluid** ↑ AMS, bacteria, RBC, proteins, TAG

intracranial obstruction

- **Cerebrospinal Fluid** ↑ proteins, pressure

intrahepatic obstruction

- ↑ ALP, ALP (WBC), ALT, Apo B, AST, conjugated Bil, unconjugated Bil, GMD, GMT, cholesterol, ICD, LDL-C, 5-nucleotidase, PT, PL, TAG
- **Urine** ↑ Bil
- ↓ UBG
- **Stool** ↓ Bil, UBG

lymphatic obstruction

- **Peritoneal Fluid** ↑ proteins, TAG

pancreatic duct obstruction

- ↑ AMS, lipase, lipids
- ↓ AMS
- **Stool** ↓ chymotrypsin, trypsin

pyloric obstruction

- ↑ HCO_3^- , pH
- ↓ chloride, K, Na
- **Urine** ↑ pH
- ↓ Na
- **Gastric Fluid** ↑ LA, volume

spinal cord channel obstruction

- **Cerebrospinal Fluid** ↑ fibrinogen, pressure

superior vena cava obstruction

- **Cerebrospinal Fluid** ↑ pressure

urinary tract obstruction

- ↑ EPO, RBC, K, creatinine, urea
- ↓ LD, osmolality
- **Urine** ↑ bacteria (+ culture), RBC, Hb, pus, volume
- ↓ pus, creatinine, WBC, volume, osmolality, pH, casts

Occlusion, Renal Artery

- **Urine** ↑ RBC, Hb, Mb
- ↓ urea

Omphalocele

- ↑ AFP
- **Amniotic Fluid** ↑ AFP

Oophorectomy, Bilateral

- ↑ PRL

Orchidectomy

- ↑ LH
- ↓ testosterone
- **Urine** ↑ hydroxyproline

Orchitis

- ↑ FSH, ESR, creatinine, WBC
- **Urine** ↑ proteins, RBC, FSH

- **Seminal Fluid** ↑ spermatozoa count
- Osteitis Fibrosa Cystica**
 - ↑ ALP, Ca, urea
 - ↓ P, pCO₂
- Osteoarthritis**
 - ↑ ESR, WBC, osteocalcin, RF
 - ↓ osteocalcin
 - **Synovial Fluid** ↑ C₃, clot formation, RBC, crystals – (hydroxyapatite, calcium pyrophosphate), WBC, mono, **viscosity**, volume
- Osteoarthritis**
 - ↑ CRP, hyaluronate, keratan sulfate
 - **Urine** ↑ deoxypyridinoline, glycosaminoglycans, pyridinoline
 - **Synovial Fluid** ↑ hydroxyapatite crystals, viscosity, **volume**
- Osteochondritis Dissecans**
 - **Synovial Fluid** ↑ clot formation, WBC, **viscosity**, **volume**
- Osteochondromatosis**
 - **Synovial Fluid** ↑ WBC, **viscosity**, volume
- Osteodystrophy, Renal**
 - ↑ ALP, Ca, **osteocalcin**, P, PTH
 - ↓ Ca, vitamin – (D)
 - **Urine** ↑ hydroxyproline
 - ↓ Ca
- Osteogenesis Imperfecta**
 - ↑ ACP, ALP, **osteocalcin**
- Osteomalacia**
 - ↑ ALP, Ca, cAMP, **osteocalcin**, PTH, vitamin D
 - ↓ Ca, Ca²⁺, **osteocalcin**, P, vitamin – (D)
 - **Urine** ↑ **amino acids**, Ca, cAMP, G, hydroxyproline – (total, free), P
 - ↓ Ca, Ca²⁺, hydroxyproline, P
- Osteomyelitis**
 - ↑ aldolase, alpha-2-globulins, **ALP**, **ALT**, * **bacteria** (culture), **CRP**, **elastase** (PMN), * **ESR**, **ferritin**, * **WBC**, **mono**, * **mucoproteins**, **neu**, **RF**, **PLT**
 - ↓ albumin, **cholesterol**, **Hb**, **HCT**, immunoglobulins, P
 - **Urine** ↑ total hydroxyproline
- cranial osteomyelitis**
 - **Cerebrospinal Fluid** ↑ WBC
- Osteopetrosis**
 - ↑ ACP, lym, **nucleated RBC**
 - ↓ **Hb**, **HCT**
- Osteoporosis**
 - ↑ ACP, ACP (prostatic), * **ALP**, * **ALP** (bone isoenzyme), androstenedione (F), * **deoxypyridinoline**, **ESR**, **FSH**, * **hydroxyproline**, creatinine, uric acid, **WBC**, * **osteocalcin**, **PICP**, **PT**, **PTH**, **pyridinoline**, **TSH**, vitamin – (D₂)
 - ↓ albumin, Ca, fluoride, **Hb**, **HCT**, **osteocalcin**, P, vitamin – (D)
 - **Urine** ↑ * **Ca**, **chloride**, hydroxyproline – (* **total**, * **free**), * **P**, telopeptide fragments
- primary postmenopausal osteoporosis**
 - ↑ ALP, **osteocalcin**
 - ↓ **osteocalcin**, **PTH**, vitamin – (D)
 - **Urine** ↑ Ca, hydroxyproline – (total, free)

primary senile osteoporosis

- ↑ ALP, androstenedione (F), osteocalcin, PTH, vitamin – (D₂)
- **Urine** ↑ Ca²⁺, hydroxyproline – (total, free)

Otitis

- ↑ CRP, ESR, WBC, neu
- **Cerebrospinal Fluid** ↑ WBC

Otorrhea, CSF

- **Cerebrospinal Fluid** ↑ pressure

Ovulation

- ↑ FSH, LH, progesterone
- ↓ estrogen
- **Urine** ↑ pregnanediol

Oxalosis, Primary

- ↑ * oxalic acid, urea
- **Urine** ↑ glycolic acid, glyoxylic acid, crystals – (calcium oxalate), * oxalic acid

Pacemaker, Atrial

- ↑ ANF, cGMP, NT-pro-ANP

Pancreatectomy

- ↑ G
- ↓ AMS, C-peptide, glucagon, chymotrypsin
- **Urine** ↑ AMS

Pancreatitis

acute pancreatitis

- ↑ AAT, ACA, aldolase, ALP, ALT, A₂MG, * AMS (3–6 hrs after, peak at 20–30 hrs, decrease 24–96 hrs), * AMS-P isoenzyme, AMS-S isoenzyme, anti-Mycoplasma pneumoniae Ab, AST, Bil, unconjugated Bil, conjugated Bil, Ca, CA 15-3, CA 19-9, CA 125, CEA, CK, * CRP, * elastase (lasts 8 days), epinephrine, phospholipase A₂, * ESR, * G, globulins, glucagon, glucocorticoids, alpha-glucosidase, * GMT, Hb, * HCT, cholesterol, chylomicrons, chymotrypsin, immunoreactive trypsin, calcitonin, catecholamines, * creatinine, LA, LAP, LD, LD₅, LDL-C, * lipase (3–6 hrs after, peak at 18–24 hrs, decrease 7–14 days), lipids, LPs, * WBC, MAC, MAL, MD, * methemalbumin, neu, 5-NT, pancreatic polypeptide, PCT, PTH, * TAG, * trypsin, trypsinogen, urea, VLDL-C
- ↓ AAT, albumin, alpha-2-globulins, A₂MG, amino acids, AMS, AT III, * Ca, * Ca²⁺, Hb, HCT, cholesterol, insulin, * K, complement – (C₃), lipoprotein lipase, Mg, Na, O₂ satur., osmolality, P, pO₂
- **Urine** ↑ amino acids, * AMS, Bil, G, 17-OHCS, 17-KGS, catecholamines, tetrahydrodeoxycortisol, trypsinogen-2
- ↓ Mg, volume
- **Stool** ↑ fat
- **Cerebrospinal Fluid** ↑ AMS
- **Peritoneal Fluid** ↑ ACP, albumin, * AMS, arylsulfatase, proteins, RBC, beta-glucuronidase, lipase, WBC, methemalbumin, volume
- ↓ AAT
- **Pleural Fluid** ↑ albumin, AMS, proteins, eos, RBC, LD, WBC, lipase, neu, specific gravity, TM – (CEA)
- ↓ pH
- **Saliva** ↑ GMT

acute hemorrhagic pancreatitis

↑ aldolase, AMS, G, WBC

↓ AMS

■ **Urine** ↑ * AMS, G, 17-OHCS, tetrahydrodeoxycortisol, **trypsinogen-2**

chronic pancreatitis (relapsing)

↑ ACA, ALP, ALT, A2M, AMS, AST, beta-carotene, **Bil**, CCK-PZ, elastase, ESR, G, GMT, **cholesterol**, calcitonin, **lipase**, **WBC**, lipids, neu, **PL**, TAG, TM – (CA 15-3, CA 19-9, CA 125, CEA), PLT, TAG, trypsin, **VLDL-C**

↓ **albumin**, AMS (advanced), Apo A-IV, **proteins**, Ca, Ca²⁺, RBC, **elastase**, Fe, G, G tolerance, **glucagon**, Hb, immunoreactive trypsin, lipoprotein lipase, **Mg**, Na, osmolality, trypsin, * **trypsinogen**, vitamin – (carotene, A, B₁₂, D, E)

■ **Urine** ↑ AMS, G

↓ AMS, Mg

■ **Stool** ↑ proteins, volume, FA, lipids, * **fat**

↓ **chymotrypsin**, elastase-1

■ **Peritoneal Fluid** ↑ * AMS, **proteins**

■ **Pleural Fluid** ↑ AMS, proteins, eos, RBC, LD, WBC, neu, specific gravity

↓ G, pH

■ **Duodenal Fluid** ↑ HCO₃⁻, AMS, trypsin

■ **Sweat** ↑ Na

■ **Saliva** ↓ HCO₃⁻

Pancytopenia

↑ LD, lym (relat)

↓ **Hb**, haptoglobin, **HCT**, lym, RBC, RTC, PLT, **WBC**

Panhypopituitarism

↑ conjugated Bil

↓ * **ACTH**, * **FSH**, G, cortisol, * **LH**, Na, * **osmolality**, PRL, progesterone, * **GH**, T4, * **TSH**

■ **Urine** ↓ FSH, 17-KGS, 17-KS, LH

Panleukopenia, Autoimmune

↓ bas, lym, WBC, neu

Paralysis

familial periodic paralysis

↑ **AST**, **CK**, ketones, LA, **WBC**, Na, neu, pyruvate

↓ eos, * **K** (attack), **P**, **uric acid**

■ **Urine** ↑ aldosterone, proteins, FSH, HCG, 17-KS, uric acid

↓ G, chloride, **K** (attack), Na

■ **Cerebrospinal Fluid** ↓ **K**

progressive paralysis

↑ **gamma globulins**, VDRL

■ **Urine** ↓ **creatinine**

■ **Cerebrospinal Fluid** ↑ proteins, lym, PMN

Paraproteinemia

↑ **beta globulins**, **proteins**, CIC, CMV, fibrinogen, * **gamma globulins** (M-gradient, gamma/beta area), HIV, HLA – (B₅), **IgG**, toxoplasma, viscosity

↓ TT

■ **Urine** ↑ proteins, Bence Jones protein

■ **Synovial Fluid** ↑ cryoprotein

Parotitis

- ↑ AMS, AMS (S-isoenzyme), lipase
- **Urine** ↑ AMS
- **Saliva** ↑ proteins, chloride, IgA, IgG, Na
- ↓ P

Pellagra

- ↑ Cu
- ↓ RBC, Hb, HCT, * niacin, tryptophan, vitamin – (B₆)
- **Urine** ↑ porphyrins
- ↓ nicotinamide

Pemphigoid, Bullous

- ↑ epidermal autoantibodies, eos, IgE, * pemphigoid Ab, WBC

Pemphigus, Vulgar

- ↑ alpha-1-globulins, alpha-2-globulins, ANA, anti-skin Ab, eos, epidermal squamous cell autoantibodies, eos, ESR, fibrinogen, globulins, HLA – (A10, DR4), IgE, IgM, K, cryoglobulins, WBC, * pemphigus Ab, plasma volume, selectin E
- ↓ albumin, proteins, Ca, eos, RBC, HCT, chloride, IgG, complement – (total), Na
- **Urine** ↓ volume

Pentosuria

- **Urine** ↑ * L-Xylulose

Perforation

intestinal perforation

- ↑ ALP, AMS, elastase (PMN), ESR, WBC, lipase
- **Urine** ↑ AMS
- **Peritoneal Fluid** ↑ ammonia, AMS, proteins, LD, * WBC

peptic ulcer perforation

- ↑ ACE, alpha-1-globulins, alpha-2-globulins, AMS, Ca, CEA, ESR, gastrin, cryofibrinogen, WBC, pepsinogen, pH, TIBC, urea
- ↓ albumin, proteins, Fe, G, G tolerance, Hb, HCT, chloride, K, lipase, MCH, MCHC, MCV, Na, norepinephrine
- **Urine** ↑ AMS
- **Peritoneal Fluid** ↑ ammonia, AMS, proteins, LD, WBC
- **Gastric Fluid** ↑ lysolecithin, pH
- ↓ pH

spontaneous esophagus perforation

- Pleural Fluid** ↑ * gastric content

Periarthritis, Cerebral

- Cerebrospinal Fluid** ↑ proteins, eos, lym, mono

Pericarditis

- ↑ ammonia, ANA, anti-DNA, anti-Mycoplasma pneumoniae Ab, anti-myocardial Ab, anti-RNA, AST, CK, CK-MM, CRP, ESR, WBC
- ↓ albumin, lym
- **Pericardial Fluid** ↑ bacteria (+ culture), RBC, WBC, volume
- ↓ G
- **Urine** ↑ proteins

bacterial pericarditis

- ↑ ammonia, ANA, anti-DNA, antimyocardial Ab, anti-RNA, AST, CK, CRP, ESR, WBC
- ↓ albumin, lym

- **Pericardial Fluid** ↑ RBC, WBC, volume
- ↓ G
- constrictive pericarditis**
- ↑ ALT
- ↓ albumin, lym
- **Urine** ↑ protein
- idiopathic pericarditis**
- ↑ ANA, anti-DNA, antimyocardial Ab, anti-RNA
- **Pericardial Fluid** ↑ RBC
- purulent pericarditis**
- ↑ ALT, CRP, ESR, WBC
- **Pericardial Fluid** ↑ RBC, WBC, volume
- traumatic pericarditis**
- **Pericardial Fluid** ↑ RBC, WBC, volume
- tuberculous pericarditis**
- ↑ lym
- **Pericardial Fluid** ↑ RBC, WBC, lym, volume
- uremic pericarditis**
- **Pericardial Fluid** ↑ RBC, volume
- Peritonitis**
- ↑ aldosterone, ALP, AMS, CA 125, CRP, ESR, Hb, HCT, catecholamines, lipase, WBC, Na, neu, urea
- ↓ albumin, proteins, osmolality, plasma volume, K, WBC, Na
- **Urine** ↑ aldosterone, AMS, catecholamines
- ↓ volume
- **Peritoneal Fluid** ↑ AMS, bacteria (+ culture), proteins, pus, eos, RBC, blood, LA, LD, * WBC, lym, neu, PMN, specific gravity, volume
- ↓ G, pH
- **Pleural Fluid** ↑ RBC
- bacterial peritonitis**
- ↑ ALP, AMS, * bacteria (culture), CA 125, ESR, WBC
- **Peritoneal Fluid** ↑ * bacteria (+ culture), LA, LD, * WBC, * neu, * PMN, * proteins, specific gravity, volume
- ↓ G, * pH
- granulomatous peritonitis**
- **Peritoneal Fluid** ↑ proteins
- tuberculous peritonitis**
- **Peritoneal Fluid** ↑ lym, specific gravity
- ↓ G
- Pharyngitis, Acute**
- ↑ ASLO, CRP, ESR, mucoproteins, WBC
- Phenylketonuria**
- ↑ * phenylalanine, Mn
- ↓ Mn, Se, serotonin (untreated), tyrosine
- **Urine** ↑ amino acids, phenylalanine, acetic acid, lactic acid, phenyl-lactic acid, phenylpyruvic acid
- ↓ 5-HIAA, pH
- **Cerebrospinal Fluid** ↑ phenylalanine
- Phlegmon**
- ↑ alpha-1-globulins, proteins, ESR, WBC

Pityriasis Rosea

↑ eos, WBC

Plasmapheresis

↓ coagulation time, CHS, PLT, proteins

Pleuritis

exudative pleuritis

↑ CA 125, CRP, fibrinogen, ESR, WBC, lym

↓ proteins

■ **Pleural Fluid** ↑ adenosine deaminase, AMS, ANA, bacteria (+ culture), proteins, eos, RBC, G, blood, creatinine, LD, LE cells, lipids, lym, specific gravity, pH, PMN, RF

↓ G, cholesterol, WBC, pH

lupus pleuritis

↑ ESR

■ **Pleural Fluid** ↑ LD

rheumatoid pleuritis

↑ ESR

↓ G

■ **Pleural Fluid** ↑ adenosine deaminase, proteins, fibronectin, LD, lym, RF, turbidity

↓ G

Pneumoconiosis

↑ ACE, ANA, Ca, RBC, gamma globulins, Hb, pCO₂, RAC, RF, WBC

↓ Hb, HCT, pO₂, pCO₂, satur. O₂

■ **Urine** ↑ beryllium, Ca

neuroencephalography

■ **Cerebrospinal Fluid** ↑ WBC

Pneumonia

↑ AAT, ADH, albumin, aldolase, alpha-1-globulins, ALP, AMS, ANA, c-ANCA, ASLO, AST, bacteria (culture), Bil, CEA, ceruloplasmin, CRP, D-dimers, fibrinogen, phospholipase A₂, ESR, haptoglobin, cold agglutinins, complement - (C₃), uric acid, LA, lactoferrin, LD, LD₃, WBC, lym, mucoproteins, neu, NSE, orosomuroid, pCO₂, pH, RAL, SCCA, TPA

↓ albumin, alpha-aminonitrogen, proteins, CO₂, Hb, HCT, chloride, cholesterol, IgA, complement - (C₃, C₄), WBC, Na, neu, O₂ satur., P, pCO₂, pO₂, prealbumin, transferrin, PLT

■ **Sputum** ↑ bacteria (+ culture), pus, blood, * WBC, macrophages, volume, PMN, viscosity, color changes

■ **Pleural Fluid** ↑ eos, WBC, PMN, RBC, neu, RF

↓ C₃, C₄, G, pH

■ **Bronchoalveolar Lavage Fluid** ↑ mastocytes, PMN, T-lym

■ **Urine** ↑ alpha-aminonitrogen, proteins, ketones, creatinine, uric acid, WBC, UBG, casts - (granular, hyaline)

↓ chloride

■ **Cerebrospinal Fluid** ↓ chloride

aspiration pneumonia

↑ WBC

↓ pCO₂

atypical pneumonia

- ↑ Ab against Influenza virus, ANA, anti-*Mycoplasma pneumoniae* Ab, cold agglutinins, ESR, LD, WBC, mucoproteins, syphilis Ab (false), VDRL (false)

bacterial pneumonia

- ↑ CEA, CRP, D-dimers, fibrinogen, phospholipase A2, ESR, LD, WBC, mucoproteins, neu
- ↓ complement - (C₃), pCO₂
- *Sputum* ↑ bacteria (+ culture), pus, blood, * WBC, macrophages, volume, PMN, viscosity, color changes

eosinophilic pneumonia

- ↑ eos
- *Bronchoalveolar Lavage Fluid* ↑ mastocytes, PMN, T-lym (CD4+, CD8+)

Mycoplasmal pneumonia

- ↑ * Ab against *Mycoplasma pneumoniae* (IgG, IgM), * bacteria (+ culture), CRP, ESR, WBC, cold agglutinins, * mycoplasma antigen

pneumonia caused by Legionella

- ↑ ALT, AST, ESR, WBC, neu, urea
- ↓ Na, P
- *Urine* ↑ proteins, blood
- *Cerebrospinal Fluid* ↑ proteins, PMN

pneumonia caused by Pneumococci

- ↑ AST, complement - (C₃), VDRL (false)
- ↓ pCO₂, WBC

pneumonia caused by Pneumocystis carinii

- ↑ RAL
- ↓ pCO₂, pO₂

pneumonia caused by Str. pneumoniae

- ↑ * bacteria (culture), ESR, WBC
- ↓ pCO₂
- *Sputum* ↑ * bacteria (+ culture)

pneumonia caused by Staphylococci

- ↑ * bacteria (culture), ESR, WBC
- ↓ WBC, pCO₂
- *Sputum* ↑ * bacteria (+ culture), * PMN

viral pneumonia

- ↑ ADH, ALP, AST, CO₂, LD5, lym, WBC, neu, pCO₂
- ↓ Hb, HCT, pCO₂, pO₂, WBC, lym, neu, T-lym
- *Pleural Fluid* ↑ proteins, CEA, eos, LD, specific gravity
- ↓ G, pH

Pneumothorax

- ↑ ADH, pCO₂
- ↓ chloride, Na, pH, pO₂
- *Bronchoalveolar Lavage Fluid* ↑ RBC
- *Pleural Fluid* ↑ eos

Polyangiitis, Microscopic

- ↑ ANCA, c-ANCA, p-ANCA

Polyarteritis Nodosa

- ↑ AGBMA, albumin, alpha-1-globulins, **alpha-2-globulins**, ALT, ANA, ANCA, c-ANCA, p-ANCA, anti-ds-DNA Ab, anti-MPO, antineutrophil Ab, **beta globulins**, CIC, CK, CRP, eos, ESR, Fe, gamma globulins, globulins, HBsAg, **cholesterol**, **cold agglutinins**, IFN-alpha, IgD, IgE, IL-2, immunoglobulins, complement - (C₃, C₄, total), **creatinine**, **cryoglobulins**, LE cells, WBC, **lym**, MAC+RAL, **mono**, neu, RF, TIBC, TNF-alpha, **PLT**, **urea**
- ↓ **albumin**, RBC, Hb, HCT, complement - (C₃, C₄, total), MCH, MCHC, MCV, neu, transferrin satur.
- **Urine** ↑ **albumin**, **proteins**, RBC, Hb, **blood**, creatinine, **fat bodies**, casts - (RBC, cellular, granular, hyaline)
 - ↓ volume
- **Pleural Fluid** ↑ eos
- **Stool** ↑ blood
- **Synovial Fluid** ↑ WBC, PMN, volume
 - ↓ viscosity

Polychondritis

- ↑ alpha globulins, ANA, ANCA, c-ANCA, ESR, gamma globulins, WBC, RF
- ↓ RBC, Hb, HCT
- **Urine** ↑ proteins, RBC, Hb
- **Synovial Fluid** ↑ PMN
 - ↓ viscosity

Polycythemia

chronic relative polycythemia

- ↑ ALP (WBC), EPO, * RBC, * Hb, * HCT, **cholesterol**, * **uric acid**, LD, * WBC, * RTC, * PLT, transferrin, transferrin receptor, * **viscosity**
- ↓ ESR, blood volume, plasma volume
- **Urine** ↑ RBC, Hb

polycythemia vera

- ↑ ACP, PLT aggregation, aldolase, * ALP (WBC), * **anisocytes**, AST, bas, basophilic stippling (RBC), Bil, unconjugated Bil, Ca, elliptocytes, eos, FDP, * RBC, * Hb, * HCT, **histamine**, nucleated RBC, cold agglutinins, IgG, IgM, K, **uric acid**, cryoglobulins, LD, * WBC, lysozyme, macrocytes, MCV, * **microcytes**, neu, **blood volume**, * RBC mass, **RBC osmotic resistance**, plasma volume, PMN, pO₂, * **poikilocytes**, pyroglobulins, RTC, O₂ satur, TT, TIBC, * PLT, transferrin, transcobalamin I, III, UBBC, **vitamin B₁₂ binding capacity**, * **viscosity**, vitamin - (B₆, B₁₂)
- ↓ AT III, * EPO, factor - (V), Fe, ferritin, **fibrinogen**, ESR, MCH, MCHC, MCV, O₂ satur., plasma volume, PTT, **RBC osmotic fragility**, RTC, sideroblasts, siderocytes, transferrin satur.
- **Urine** ↑ **albumin**, RBC, Hb, **histamine**, **uric acid**, **lysozyme**, UBG
 - ↓ EPO

secondary polycythemia

- ↑ ALP (WBC), Bil, EPO, RBC, Hb, **histamine**, HCT, **cholesterol**, **uric acid**, LD, MCH, MCV, Mhb, **blood volume**, pO₂, RTC, transferrin, viscosity
- ↓ ESR, Fe, MCH, MCHC, MCV, pO₂, O₂ satur.
- **Urine** ↑ EPO, coproporphyrin
- **Stool** ↑ urobilin

- Polydipsia**
- ↓ ADH, Na, osmolality
 - **Urine** ↑ volume
 - ↓ osmolality, specific gravity
- Polyglobulia**
- ↑ RBC, HCT, Hb, NBB
 - ↓ ESR, clot retraction
- Polymyalgia, Rheumatic**
- ↑ **alpha-1-globulins, alpha-2-globulins, ALP, ALT, AMA, ANA, AST, CRP, fibrinogen, ESR, gamma globulins, IgM, cryoglobulins, WBC, 5-nucleotidase, RF, PLT**
 - ↓ **albumin, RBC, Hb, HCT, complement – (C₃)**
 - **Synovial Fluid** ↑ WBC, PMN, volume
 - ↓ viscosity
- Polymyositis**
- ↑ **AHBD, aldolase, alpha-2-globulins, ALT, ANA, anti-ds-DNA, anti-ss-DNA, anti-aminoacyl-tRNA synthetase Ab – (anti-EJ, anti-OJ, * anti-PL-7, anti-PL-12), * anti-histidyl-tRNA synthetase Ab, * anti-Jo-1, anti-Jo-2, anticardiolipin Ab, anti-Ku, anti-Mi-2, anti-p 56, anti-PM-1, anti-RNP, anti-Scl 70, anti-SRP, anti-Ro/SSA, anti-La, Ha/SSB, anti-SRP, antisynthetase Ab, ASMA, AST, beta globulins, CK, CK-MB, CK-MM, eos, * ESR, gamma globulins, * HCV, HLA – (B8, DQA1, DR3, DR5, DR7, DRw6, DRw52, DRw53), LD, LE cells, WBC, Mb, non-histone ANA, pCO₂, PM-1 Ab, RF, thymus ANA**
 - ↓ RBC, Hb, HCT
 - **Urine** ↑ creatine, Mb
 - ↓ creatinine
 - **Synovial Fluid** ↑ WBC, PMN
 - ↓ viscosity
- Polyneuritis, Acute**
- ↓ transketolase
 - **Cerebrospinal Fluid** ↑ proteins, eos, * WBC, lym, mono
 - **Urine** ↑ VMA
- Polyneuropathy**
- chronic immune demyelinating polyneuropathy**
 - ↑ Ab against GalNAc-GD1a, anti-GD1a Ab, anti-heparan sulfate Ab (IgM), anti-sulfatide Ab, anti-tubulin Ab (IgG, IgM)
 - **Cerebrospinal Fluid** ↑ proteins
 - peripheral polyneuropathy**
 - ↑ ANCA, c-ANCA, Ab against *Borrelia* (IgG, IgM), anti-myelin Ab, anti-sulfatide Ab, B-lym, HIV, E selectin
 - ↓ vitamin – (B₁, E)
 - **Cerebrospinal Fluid** ↑ A2MG, mono, MBP
- Polyp, Rectal**
- ↑ CEA
 - ↓ Fe
 - **Stool** ↑ blood
- Polytrauma**
- ↑ AAT, ADH, PLT adhesion, AGP, aldolase, alpha-1-antichymotrypsin, ALT, A2MG, AMS, AST, Bil, unconjugated Bil, CEA, ceruloplasmin, CK, CK-MM, CRP, Cu, D-dimers, elastase, FDP, fibrinogen, G, gluca-

- gon, haptoglobin, HCT, IL - (1, 6), K, complement - (Ba, Bb, C3, C3a, C5a, CH50), **creatinine**, creatine, LD, LD 5, lipase, **WBC**, Mb, MD, Mg, myosin, Na, **neu**, PCT, PGE, TNF, **PLT**, urea
- ↓ albumin, alpha-2-globulins, Cr, **eos**, **proteins**, RBC, **Fe**, **fibrinogen** (early), fibronectin, Hb, HDL-C, HCT, cholesterol, complement - (C1r, C1s, C2, C3, C5, C6, C7, C8, C9, **CH50**), LDL-C, LH, lym, Mn, T3, T-lym, Zn
 - **Urine** ↑ AMS, proteins, Cr, RBC, Hb, hexosaminidase, catecholamines, ketones, creatine, creatinine, blood, WBC, Mb, 3-methylhistidine, casts - (lipid)
 - **Peritoneal Fluid** ↑ AMS, proteins, RBC, blood, WBC, volume
 - **Stool** ↑ blood
 - **Synovial Fluid** ↑ clot formation, RBC, crystals - (calcium pyrophosphate), PMN, red colour, **volume**
 - **Cerebrospinal Fluid** ↑ adenylate kinase, proteins, CK, G, LA, macrophages, MBP, PG, **pressure**
 - ↓ cAMP, pH
 - **Pericardial Fluid** ↑ RBC, blood, volume
 - **Bronchoalveolar Lavage Fluid** ↑ RBC
 - **Pleural Fluid** ↑ proteins, eos, RBC, LA, volume
- abdominal polytrauma**
- ↑ AMS, PCT, WBC
 - ↓ RBC, HCT
 - **Urine** ↑ AMS
 - **Peritoneal Fluid** ↑ AMS, proteins, RBC, WBC
 - **Stool** ↑ blood
- chest polytrauma**
- ↑ CK, PCT, PRL
 - **Bronchoalveolar Lavage Fluid** ↑ RBC
 - **Pleural Fluid** ↑ proteins, eos, RBC, LA, volume
 - **Sputum** ↑ blood
- CNS polytrauma**
- ↑ ACE, ADH, AMS, Apo E, CK, CK-MM, IgM, NSE, pCO₂, prealbumin, protein S-100, transferrin
 - ↓ pO₂, PLT
 - **Urine** ↑ AMS, G
 - **Cerebrospinal Fluid** ↑ adenylate kinase, proteins, CK, G, IgM, LA, macrophages, MBP, PG, prealbumin, **pressure**, protein S-100, transferrin
 - ↓ cAMP, pH
- electrical polytrauma**
- ↑ AST, CK, CK-MB, LD 5, WBC
 - **Urine** ↑ albumin, Hb, Mb
 - **Cerebrospinal Fluid** ↑ blood
- heart polytrauma**
- ↑ myosin
 - **Pericardial Fluid** ↑ RBC
- joint polytrauma**
- **Synovial Fluid** ↑ RBC, crystals - (calcium pyrophosphate), PMN, **volume**

kidney polytrauma

↑ FDP

- **Urine** ↑ proteins, RBC, Hb, hexosaminidase, blood, WBC

liver polytrauma

↑ ALT, AST, Bil, LD

- **Peritoneal Fluid** ↑ blood, volume

muscular polytrauma

↑ aldolase, CK, creatine, creatinine, Mb, Mg, myosin, urea

- **Urine** ↑ creatine, creatinine, Mb, casts – (lipid)

pancreas polytrauma

↑ AMS

- **Urine** ↑ AMS

■ **Peritoneal Fluid** ↑ AMS, proteins, RBC, volume

thermic polytrauma

↑ **PLT adhesion**, albumin (early stage), aldolase, alpha-1-globulins, alpha-2-globulins, ALT, AMS, AST, proteins (early), CK, CRP, RBC, factor – (V, VIII), FDP, ferritin, fibrinogen (later), glucagon, haptoglobin, Hb, HCT, chloride, IgE, K, carboxy-Hb (inhalation), complement – (C3a, C5a), creatinine, LD 5, WBC, Na, neu, norepinephrine, osmolality, RBC osmotic fragility, P, pCO₂, PLT, schistocytes, urea, viscosity, VLDL-C

↓ albumin (later stage), AMS, proteins (later), Ca, Ca²⁺, Cr, Cu, eos, FDP, fibrinogen (acute), G, Hb, HCT, chloride, cholesterol, CHS, IgA, IgG, IgM, K, complement – (C1r, C1s, C2, C3, C4, C5, C6, C7, C8, C9, CH50), LDL-C, lym, Mg, Mn, Na, osmolality, plasma volume, RBC osmotic resistance, pH, pO₂, TAG, Zn

- **Urine** ↑ amino acids, AMS, RBC, G, Hb, hemosiderin, hexosaminidase, total hydroxyproline, 17-KGS, WBC, lysozyme, Mb, 3-methyl-histidine

↓ vitamin C

Porphyria

acquired porphyria

↑ Ca, protoporphyrin (RBC)

- **Urine** ↑ ALA, PBG, porphyrins

■ **Stool** ↑ porphyrins

acute intermittent porphyria

↑ ADH, * ALA, ALT, Apo B, Ca, Fe, ferritin, hexosaminidase, cholesterol, coproporphyrin I, LDL-C, WBC, * PBG, pre-beta-LP, porphyrins, T4, TAG, TBG, urea, uroporphyrinogen I synthase (RBC), uroporphyrin I

↓ AMS, chloride, complement – (C3), uric acid, Mg, Na, porphyrins, * delta-ALA-dehydratase, * PBG-deaminase (RBC), triiodothyronine resin uptake

- **Urine** ↑ * ALA, coproporphyrin I, * PBG, * porphyrins, uroporphyrin I, VMA

■ **Stool** ↑ coproporphyrins, protoporphyrins, uroporphyrins

ALA-dehydratase deficiency

- **Urine** ↑ * ALA, * coproporphyrins

congenital erythropoietic porphyria

↑ unconjugated Bil, Ca, HbF, coproporphyrins (RBC), RTC, * uroporphyrins (RBC)

- ↓ RBC, Hb, HCT, **uroporphyrinogen III cosynthetase** (RBC), triiodothyronine resin uptake
 - **Urine** ↑ coproporphyrin I, * **porphyrins**, **uroporphyrin I**
 - **Stool** ↑ * **coproporphyrin I**, * **porphyrins**, protoporphyrin, uroporphyrin
- erythropoietic protoporphyria**
 - ↑ ALP, AST, conjugated Bil, **coproporphyrins**, WBC, **porphyrins**, * **protoporphyrin** (RBC), **uroporphyrins**, zinc protoporphyrin
 - ↓ RBC, Hb, HCT
 - **Urine** ↑ coproporphyrins, protoporphyrin, uroporphyrin
 - **Stool** ↑ * **coproporphyrin**, **protoporphyrin**
- hepato-erythropoietic porphyria**
 - ↑ ALT, Apo B, AST, GMT, **protoporphyrin** (RBC)
 - ↓ Hb, HCT, * **uroporphyrinogen decarboxylase**
 - **Urine** ↑ **uroporphyrin I**, **uroporphyrin III**
 - **Stool** ↑ coproporphyrin I, coproporphyrin III
- hereditary coproporphyria**
 - ↑ * **ALA**, * **coproporphyrin**, LDL-C, WBC, * **PBG**
 - ↓ * **coproporphyrinogen III oxidase** (RBC), triiodothyronine resin uptake
 - **Urine** ↑ **ALA** (attack), * **coproporphyrin III** (attack), **PBG** (attack), porphyrins, uroporphyrin
 - **Stool** ↑ * **coproporphyrin III**, **PBG**, porphyrins, protoporphyrin, uroporphyrin
- porphyria cutanea tarda**
 - ↑ ALA, ALT, Apo B, Fe, **coproporphyrin**, LDL-C, porphyrins, **protoporphyrins**, transferrin satur., **uroporphyrin I, III**, uroporphyrinogen I synthase
 - ↓ **uro-decarboxylase**
 - **Urine** ↑ * **ALA**, * **coproporphyrin III**, **porphyrins**, * **uroporphyrin**, uroporphyrinogen, uroporphyrinogen decarboxylase II (RBC), VMA
 - **Stool** ↑ **coproporphyrin**, **uroporphyrin**
- secondary coproporphyria**
 - ↑ ALT, AST, GMT, Fe, transferrin satur.
 - ↓ CHS, Fe, sTfR
- **hepatic secondary coproporphyria**
 - ↓ ALT, AST, GMT, CHS, Fe, sTfR
- **secondary coproporphyria in anemia**
 - ↑ Bil, conjugated Bil, BSP
 - ↓ CHS, Fe, RTC, sTfR
 - Note: positive functional tests (phenobarbital, nicotinic acid)
- **secondary coproporphyria in malignant tumors**
 - ↑ AFP, B2M, PSA, thymidine kinase
- variegate porphyria**
 - ↑ ALA, Apo B, LDL-C, **PBG**, uroporphyrinogen I synthase (RBC)
 - **Urine** ↑ * **ALA** (attack), **coproporphyrin III**, * **PBG** (attack), **porphyrins**, protoporphyrin, **uroporphyrin**
 - **Stool** ↑ * **coproporphyrin III**, **PBG**, * **protoporphyrin IX**, uroporphyrin
- Postmaturity**
 - ↑ **squalene**

- ↓ **estriol, hPL**
- **Amniotic Fluid** ↓ volume
- Preeclampsia**
- ↑ * **alpha-aminonitrogen**, * **ALP**, * **ALT**, antiphospholipid Ab, antiplatelet Ab, * **AST**, beta globulins, Bil, D-dimers, * **FDP**, * **fibronectin**, chloride, ICD, * **creatinine**, * **uric acid**, lupus anticoagulant, LA, LAP, * **LD**, **WBC**, PT, PTT, * **thromboxane A2**
 - ↓ **albumin**, aldosterone, alpha-aminonitrogen, **A2MG**, **AMS**, AT III, **proteins**, **DOC**, **RBC**, **estriol**, **haptoglobin**, **Hb**, **hPL**, **HCT**, **CHS**, **IgD**, **IgG**, **ketones**, **uric acid**, **Mg**, plasma volume, plasminogen, **progesterone**, **PLT**
 - **Urine** ↑ alpha-aminonitrogen, **albumin**, * **proteins** (+ quantitatively), **RBC**, **ketones**, **uric acid**, **Na**, casts – (**RBC**, granular, hyaline)
 - ↓ **Ca**, **estriol**, **GFR**, **Na**, * **volume**, **pregnanediol**
 - **Amniotic Fluid** ↑ **creatinine**
 - ↓ **AFP**, volume
 - **Cerebrospinal Fluid** ↑ **proteins**, **RBC**
 - **Synovial Fluid** ↑ **crystals** – (urate)

Pregnancy

- ↑ **AAT**, **ACP**, **ACTH**, **AFP**, **Al**, **aldosterone**, alpha-aminonitrogen, alpha-1-globulins, alpha-2-globulins, alpha-2 pregnancy associated glycoprotein, **ALP**, **ALP** (**WBC**), **ALT**, **A2MG**, **AMS**, **ANF**, androstenedione, **Apo** – (**A-I**, (**a**), **B**, **E**), **AST**, beta-endorphins, **beta globulins**, **beta-carotene**, **Bil**, conjugated **Bil**, unconjugated **Bil**, **CA 15-3**, **CA 27-29**, **CA 125**, **CA 549**, carbohydrate-deficient transferrin, **CBG**, **ceruloplasmin**, **CK**, **CK-MB**, **CRP**, **Cu**, 11-deoxycortisol, **DOC**, **DPD**, **EPO**, **estradiol**, **estrone**, factor – (**VIII**, **X**), **FDP**, **Fe**, **fibrinogen**, **ESR**, osmotic fragility, **G**, **glucagon**, **GMT**, **haptoglobin**, **HbF**, * **hCG**, **hexosaminidase**, **hexosaminidase A**, cold agglutinins, **cholesterol**, ICD, **IGFBP-1**, plasminogen activator inhibitor, **C1-esterase inhibitor**, **insulin**, **calcitonin**, carbonic anhydrase, ketobodies, complement – (**C3**), **cortisol**, **creatinine**, **acetoacetic acid**, **LA**, **LAP**, **LDL-C**, **WBC**, lipids, macrocytes, **MAL+RAL**, **MCA**, **Mn**, neu, **blood volume**, **PT**, **pH**, **PL**, plasminogen, **PRA**, **PRL**, **progesterone**, **PTH**, **PRA**, **RTC**, **SHBG**, somatostatin, syphilis Ab (false), pregnancy specific beta-1-glycoprotein, **T3**, **T4**, **TAG**, **TBG**, testosterone, **TIBC**, **transferrin**, **PLI**, **TSH**, **TT**, **UBBC**, **VDRL** (false posit.), **vitamin** – (**A**, **D2**, **E**), **FFA**
- ↓ **ACE**, **albumin**, **ALT**, **AST**, AT III, **proteins**, **Ca**, **Ca²⁺**, **CK**, **CBG**, **Cr**, **enkephalins**, **RBC**, factor – (**XII**, **XIII**), **Fe**, **ferritin**, **fibrinogen**, **FSH**, **G**, gamma globulins, glycated albumin, **haptoglobin**, **Hb**, **GHb**, **HCT**, **HCO₃⁻**, **IgA**, **IgE**, **creatinine**, **uric acid**, **LD**, **lipase**, **Mg**, **Mn**, osmolality, **P_aCO₂**, **pH**, **protein C**, pseudocholinesterase, **Se**, **transferrin satur.**, triiodothyronine resin uptake, **PLT**, **urea**, **vitamin** – (**A**, **B₁**, **B₂**, **B₆**, **B₁₂**, **beta-carotene**, **C**, **folate**), **Zn**
- **Urine** ↑ alpha-aminonitrogen, **ALP**, **proteins**, **cystine**, **DALA**, **estrogens**, **G**, **glycine**, **Hb**, * **hCG**, **histidine**, **hydroxyproline**, **17-OHCS**, **17-KGS**, **17-KS**, **cortisol**, **5-HIAA**, **lactose**, **LD**, **WBC**, **porphyrins**, **pregnanediol**, **Se**, **T3**, **taurine**, **threonine**, **tyrosine**, **RBC casts**, **valine**, volume
- ↓ **FSH**, **P**, **Se**
- **Cerebrospinal Fluid** ↑ **leucine**

- ectopic pregnancy**
- ↑ ACTH, AMS, * hCG, WBC
 - ↓ hCG, * progesterone
 - *Urine* ↑ AMS, * hCG
 - ↓ hCG
- 1st trimester pregnancy**
- ↑ angiotensin II, CA 125, fructosamine, FT4, hCG, IgG, PTH, T4, TSH
 - ↓ AGP, albumin, CK, G, creatinine, uric acid, osmolality, osteocalcin, **proteins**, urea
 - *Urine* ↑ cystathionine, cystine, phenylalanine, creatinine, leucine, tyrosine, valine
- 3rd trimester pregnancy**
- ↑ AAP, AAT, ALP, ALT, AST, beta-glucuronidase, Cu, factor VIII, FDP, Fe, fibrinogen, fructosamine, ESR, gc-globulin, cholesterol, plasminogen activator inhibitor, LA, LAP, melatonin, 5-nucleotidase, plasma volume, oxytocin, **plasminogen**, 17-OH progesterone, PTH, TAG, TIBC, **transferrin**, thyroglobulin, urea, VLDL-C
 - ↓ proteins, Fe, FT3, FT4, G, GMT, CHS, IgA, IgG, ILGF-I, vitamin - (B₁₂)
 - *Urine* ↑ estrogens, galactose, total hydroxyproline, **cortisol**, **volume**, reducing sugars
- multiple pregnancy**
- ↑ AFP, estriol, hCG, hPL
 - *Urine* ↑ estriol, hCG
 - *Amniotic Fluid* ↑ AFP, volume
- Prematurity**
- ↑ G
 - *Amniotic Fluid* ↑ creatinine
- Proctitis**
- ↑ CRP, ESR, WBC, mucoproteins
 - *Stool* ↑ blood
- Proctocolitis, Idiopathic**
- *Stool* ↑ chloride, Na
- Prostatectomy**
- ↑ PSA
- Prostatitis**
- ↑ ACP, * CRP, ESR, fibrinogen, * WBC, mucoproteins, PAP, PSA
 - *Urine* ↑ * bacteria (+ culture), RBC, Hb, pus, * WBC, blood
- Prostheses, Heart Valve**
- ↑ LD, RTC
 - ↓ haptoglobin, Hb, HCT, schistocytes, * PLT
 - *Urine* ↑ Hb, hemosiderin
- Proteinosis, Pulmonary Alveolar**
- ↑ CEA, RBC, Hb, LD, WBC
 - ↓ pO₂
 - *Bronchoalveolar Lavage Fluid* ↑ albumin, CEA, phospholipids, proteins, * surfactant protein A antibodies
 - ↓ LD
 - *Sputum* ↑ macrophages, * surfactant protein A antibodies
- Proteinuria, Orthostatic**
- *Urine* ↑ proteins, WBC, casts - (granular, hyaline)

Pseudoaldosteronism Due to Ingestion of Licorice

↓ K, PRA

■ *Urine* ↓ aldosterone, glycyrrhetic acid

Pseudocyst of Pancreas

↑ ALP, AMS, Bil, conjugated Bil, G, lipase, TM – (CA 15-3, CA 72-4, CA 125, TPA)

■ *Urine* ↑ AMS

■ *Peritoneal Fluid* ↑ AMS

■ *Pleural Fluid* ↑ AMS, LD

Pseudogout

↑ PTH, WBC

■ *Synovial Fluid* ↑ calcium pyrophosphate crystals, WBC, volume

Pseudohypoaldosteronism

↓ P

■ *Sweat* ↑ chloride, Na

Pseudohypoparathyroidism

↑ cAMP, calcitonin, P, PTH

↓ ALP, Ca, Ca²⁺, PRL, T₄, vitamin – (D₃)

■ *Urine* ↑ cAMP

↓ Ca, cAMP, P

Pseudomyxoma Peritonei

■ *Peritoneal Fluid* ↑ proteins

Psoriasis Vulgaris

↑ ANA, CIC, eos, phospholipase A₂, HLA – (A₁₃, B₁₇, B₂₇, Cw6), h-sICAM-1, IL – (6, 8), uric acid

↓ folate

■ *Synovial Fluid* ↑ crystals – (urate)

Puberty

delayed puberty

↓ ILGF-I

male delayed puberty

↓ HDL-C, testosterone

precocious puberty

– male precocious puberty

↑ ACTH, FSH, ILGF-I, LH, PRL, testosterone

↓ ALP, SHBG

■ *Urine* ↑ FSH, 17-KS, LH, PRL

– female precocious puberty

↑ androstenedione, estradiol, FSH, ILGF-I, LH, PRL, progesterone

↓ ALP

■ *Urine* ↑ estrogens, FSH, 17-ketosteroids, LH, pregnanediol, PRL

Puncture, Lumbar

■ *Cerebrospinal Fluid* ↑ RBC, WBC

Purpura

allergic purpura

↑ ASLO, eos, ESR, capillary fragility, IgA, creatinine, neu, TIBC, urea, WBC
↓ albumin, Hb, HCT, RBC, MCH (RBC), MCHC (RBC), MCV (RBC), PLT, transferrin satur.

■ *Urine* ↑ albumin, proteins, casts – (RBC c., granular c.), RBC

■ *Stool* ↑ blood

autoimmune idiopathic thrombocytopenic purpura

- ↑ **antiplatelet Ab**, **BT**, euglobulin lysis time, G6PD (RBC), **WBC**, lym, mono, MPV, blood volume, **RTC**, **PLT**
- ↓ **PLT** aggregation, **RBC**, **Fe**, **Hb**, **HCT**, **WBC**, * **PLT**

Henoch-Schönlein purpura

- ↑ **ANCA**, p-**ANCA**, **ASLO**, **CIC**, **ESR**, fibronectin, **IgA**, cryoglobulins, **WBC**, **RF**
- ↓ eos, factor XIII, complement – (C2, C3, C4), **WBC**, neu
- **Urine** ↑ **proteins**, eos, **RBC**, **Hb**, blood, **LD**, **WBC**, casts – (RBC, granular, hyaline, **WBC**)
- ↓ specific gravity, **Na**, volume, **pH**
- **Stool** ↑ blood
- **Synovial Fluid** ↑ **WBC**, **PMN**

thrombotic thrombocytopenic purpura

- ↑ **ALT**, **ANA**, **APTT**, **AST**, **RBC basophilic stippling**, **Bil**, **conjugated Bil**, **unconjugated Bil**, **BT**, euglobulin lysis time, **FDP**, fibrinogen, **nucleated RBC**, **Hb**, creatinine, **LD**, **WBC**, megakaryocytes, mono, neu, **PT**, **RTC**, spherocytes, **schistocytes**, **TGT**, thrombomodulin, **urea**
- ↓ **RBC**, **haptoglobin**, **Hb** (later), **HCT**, complement – (C3), **WBC**, * **PLT**
- **Urine** ↑ **proteins**, **RBC**, **Hb**, **pus**, creatinine, **blood**, **urea**, casts – (granular)
- ↓ volume

Pyelitis

- ↑ **CRP**, **ESR**, **kreatinin**, **WBC**
- ↓ albumin
- **Urine** ↑ bacteria (+ culture), **proteins**, **RBC**, **G**, **Hb**, **pus**, **blood**, **WBC**, specific gravity, casts – (epithelial, **RBC**, granular, hyaline, **WBC**)

Pyelonephritis

acute pyelonephritis

- ↑ alpha-1-globulins, alpha-2-globulins, conjugated **Bil**, **CRP**, **elastase**, **ESR**, gamma globulins, **haptoglobin**, chloride, **IgA**, **IgM**, **creatinine**, uric acid, **LA**, **LD5**, **WBC**, lysozyme, **MAC**, **Na**, procalcitonin, osmolality, **urea**
- ↓ albumin, estriol, **K**, osmolality, **PT**, **PLT**
- **Urine** ↑ **AAP**, albumin, **bacteria** (+ culture), **B2M**, **proteins**, **RBC**, **G**, **Hb**, **pus**, **K**, **blood**, **WBC**, **LD4**, **LD5**, lysozyme, **specific gravity**, **N-acetylglucosaminidase**, nitrites, **pH**, casts – (epithelial, **RBC**, granular, hyaline, **WBC**)
- ↓ estriol, **G**, **GFR**, **K**, **creatinine**, specific gravity, volume, osmolality, **urea**

chronic pyelonephritis

- ↑ alpha-1-globulins, alpha-2-globulins, conjugated **Bil**, **CRP**, **elastase**, **ESR**, gamma globulins, **haptoglobin**, chloride, **IgA**, **IgG**, **IgM**, **creatinine**, uric acid, **LA**, **WBC**, lysozyme, **MAC**, osmolality, **urea**
- ↓ albumin, estriol, **K**, **Mg**, **pH**
- **Urine** ↑ **AAP**, albumin, **bacteria** (+ culture), **B2M**, **proteins**, **RBC**, **G**, **Hb**, **pus**, **K**, **blood**, **WBC**, **hexosaminidase**, **pus**, **K**, **blood**, **LD4**, **LD5**, **WBC**, nitrites, volume, osmolality, fat, casts – (epithelial, **RBC**, granular, hyaline, **WBC**)
- ↓ estriol, **G**, **GFR**, **K**, **creatinine**, **specific gravity**, volume, osmolality, **urea**

Pylephlebitis, Septic

- ↑ ALT, AST, Bil, PMN, WBC
- ↓ Hb, HCT

Pylorostenosis

- ↑ unconjugated Bil, gastrin
- *Gastric Fluid* ↑ LA

Pyoderma, Streptococcal

- ↑ ALT, ASLO, ESR, WBC

Pyometra

- ↑ ESR, WBC

Pyonephrosis

- *Urine* ↑ pus

Pyopneumothorax

- ↑ ESR, uric acid, neu, WBC
- *Sputum* ↑ * bacteria (+ culture), * pus, blood, volume, viscosity
- *Pleural Fluid* ↑ proteins, RBC, LA, LD, WBC, neu, PMN

Pyosalpinx

- ↑ ESR, WBC
- *Urine* ↑ pus

Pyoureter

- ↑ ESR, WBC
- *Urine* ↑ bacteria, protein

Pyropoikilocytosis, Hereditary

- ↑ pyknocytes, RBC osmotic fragility
- ↓ Hb, HCT, MCV

Rachitis

- ↑ ALP, lipase, P, PTH
- ↓ Ca, Ca²⁺, P, vitamin – (* D₂, D₃)
- *Urine* ↑ alpha-aminonitrogen, amino acids, cAMP, G, glycine, hydroxyproline – (total, free), chloride, P
- ↓ Ca, Ca²⁺, P
- *Gastric Fluid* ↓ pH

Reaction

acute phase reaction

- ↑ AAT, alpha-1-antichymotrypsin, alpha-2-antiplasmin, alpha-1-globulins, alpha-2-globulins, A₂MG, Apo E, AT III, ceruloplasmin, CRP, factor – (VII, VIII), fibrinogen, haptoglobin, hemopexin, C₁-esterase inhibitor, complement – (C₁, C₂, C₃, C₄, C₉, CH₅₀), Lp(a), orosomucoid, plasminogen

graft-versus-host reaction

- ↑ B₂M, IL – (2, 6), 5-nucleotidase, TNF-alpha
- ↓ PLT

leukemoid reaction

- ↑ ALP (WBC), nucleated RBC, * WBC, PL

posttransfusion reaction

- ↑ antineutrophil Ab, Bil, nucleated RBC, WBC, leukocyte antibodies, neu, spherocytes
- ↓ RBC, haptoglobin, HCT, methalbumin, PLT
- *Urine* ↑ Hb, hemosiderin
- ↓ volume

Rejection

transplanted heart rejection

↑ ESR, LD, LD₁, WBC

transplanted kidney rejection

↑ B₂M, Ca, CRP, elastase, EPO, FDP, fibrinogen, GMT, GST, h-sVCAM-1, chloride, IL – (2, 6), creatinine, LCA, LD, WBC, lym, lysozyme, MAC, Na, PRA, SAA, schistocytes, TNF-alpha, urea

↓ complement – (C₃, C₄), C1-INH, pH, PLT

■ **Urine** ↑ beta-alanine, proteins, IL – (2, 6), lysozyme, TNF-alpha, casts – (cellular, epithelial, granular, hyaline, waxy)

↓ FDP, hexosaminidase, volume, osmolality

transplanted liver rejection

↑ ALP, ALT, AST, Bil, conjugated Bil, GMT, GST, creatinine, Na, WBC

■ **Urine** ↑ proteins

Resection

small intestine resection

↑ gastrin

↓ Ca, Mg, vitamin – (B₂, B₁₂, folate)

■ **Urine** ↑ oxalate

↓ 5-HIAA

■ **Stool** ↑ fat

■ **Synovial Fluid** ↑ crystals – (calcium oxalate)

stomach resection

↑ gastrin

↓ Ca, pepsinogen

Resistance, Antiinsulin

↑ antiinsulin Ab, insulin

Response, Allergic

delayed allergic response

↑ C₃, fibrinogen, gamma globulins, haptoglobin, alpha-1-proteinase inhibitor

↓ albumin, haptoglobin

■ **Cerebrospinal Fluid** ↑ plasmocytes

immediate allergic response

↑ C₃, fibrinogen, haptoglobin, alpha-1-proteinase inhibitor

↓ albumin, transferrin

Resuscitation, Cardio-Pulmo-Cerebral

↑ CK-MB, LA, MAC+RAC, Mb, pCO₂

↓ BE, pH, pO₂

Retardation

growth retardation

↓ ALP, vitamin – (A), Zn

intrauterine growth retardation

↓ estriol, hPL

■ **Amniotic Fluid** ↓ volume

Reticulocytosis

↑ anisocytes, RBC basophilic stippling, RTC

Rhabdomyolysis

↑ aldolase, AST, Ca, CK, K, creatinine, Mb, Mg, P

↓ Ca

Rhinitis, Allergic

↑ eos, IgE

Rhinorrhea, CSF

■ **Cerebrospinal Fluid** ↓ pressure

Rupture

aortic aneurysm rupture

↑ AMS

■ **Peritoneal Fluid** ↑ RBC

bladder rupture

■ **Peritoneal Fluid** ↑ creatinine, urea

esophageal rupture into pleural cavity

↑ AMS

■ **Pleural Fluid** ↑ AMS, LD, WBC, PMN

↓ G, pH

tubar pregnancy rupture

↑ AMS, WBC, lipase

■ **Urine** ↑ AMS

■ **Peritoneal Fluid** ↑ AMS

Salpingitis

↑ ESR, WBC, neu

■ **Urine** ↑ RBC, Hb

Sarcoidosis

↑ * ACE, albumin, alpha-1-globulins, alpha-2-globulins, ALP, ALP isoenzymes, ALT, AMS, ANA, anti-EBV, AST, beta globulins, B2M, proteins, * Ca, Ca²⁺, CIC, CO₂, eos, ESR, fibrinogen, * gamma globulins, globulins, GMT, hydroxyproline, IgA, IgD, IgE, IgG, IgM, immunoglobulins, complement - (C3, total), uric acid, creatinine, cryoglobulins, LAP, LD, WBC, lysozyme, mono, 5-NT, P, pCO₂, pH, PRL, RF, vitamin - (D2, D3)

↓ ADH, albumin, RBC, Hb, HCT, chloride, LH, WBC, lym, O₂ satur., P, pCO₂, pO₂, PTH, PLT, T-lym (CD4+)

■ **Urine** ↑ proteins, Ca, Ca²⁺, total hydroxyproline, lysozyme, volume, oxalate
↓ P

■ **Sputum** ↑ lym

↓ alveolar macrophages

■ **Cerebrospinal Fluid** ↑ ACE, proteins, IgG, WBC, lym, lysozyme, mono, plasmocytes, pressure

↓ G

■ **Bronchoalveolar Lavage Fluid** ↑ lym, eos, neu, macrophages, T-lym (CD4+)

↓ macrophages

■ **Pleural Fluid** ↑ adenosine deaminase, eos, lym

↓ alveolar macrophages

■ **Synovial Fluid** ↑ crystals - (hydroxyapatite), WBC, PMN

↓ viscosity

■ **Stool** ↓ Ca

CNS sarcoidosis

■ **Cerebrospinal Fluid** ↑ proteins, eos, IgG, lym, lysozyme, mono, plasmocytes, pressure

↓ G

Schizophrenia

↑ aldolase, HLA – (A28), serotonin

Scleroderma

↑ **ACA, ACE, AHA, AMA, ANA, ANCA, p-ANCA, * anticentromere Ab, anti-ds-DNA, anti-ss-DNA, anti-DNP, antiendothelial Ab, anti-HSP 90, antichromosomal Ab, anticardiolipin Ab, anticollagen Ab, anti-Ku, anti-NOR 90, * antinucleolar Ab, anti-p 56, anti-PM/Scl, anti-RNA-polymerase, anti-RNP, * anti-Scl-70 (anti-DNA-topoisomerase I Ab), anti-SSA, anti-SSB, CIC, eos, ESR, gamma globulins, HLA – (DQ5, DQ7, DR1, DR2, DR3, DR5, DR8, DRW52), cold agglutinins, IgG, IgM, cryofibrinogen, cryoglobulins, LE cells, lym, PRA, anti-U-nucleolar RNP, anti-U3-nucleolar RNP, RF, urea, VRDL (false)**

↓ RBC, Hb, HCT, complement – (C3, C7), microcytes, neu, T-lym, vitamin – (B₁₂, folate)

■ **Urine** ↑ proteins, blood, casts
↓ volume

■ **Stool** ↑ fat

■ **Synovial Fluid** ↑ crystals – (hydroxyapatite), WBC, mono, PMN, viscosity, **volume**

↓ viscosity

Sclerosis

amyotrophic lateral sclerosis

↑ **antibodies against gangliosides, Ab against cytoskeleton, CK, SOD, GPs**

■ **Urine** ↑ polyamines

■ **Cerebrospinal Fluid** ↑ **proteins, * neurofilaments**

Note: molecular biology – glutamate receptor polymorphism

multiple sclerosis

↑ **PLT adhesion, * anti-MBP autoantibodies, Apo-E, CRP, HLA – (A3, B7, B18, B27, DR2, DR3, Dw2), h-sICAM-1, inositol, oligoclonal proteins (immunoglobulins), pCO₂**

↓ ceruloplasmin, Cu, PL

■ **Cerebrospinal Fluid** ↑ **albumin (CSF/serum), alpha-2-glycoprotein, B2M, proteins, CK, eos, gamma globulins, HLA – (DR2), cholesterol, CHS, IgA (index), * IgG (index), IgA, * IgG, * IgG/albumin, IgM, acid proteinases, LA, WBC, lym, * MBP, mononuclears, * oligoclonal proteins (immunoglobulins), plasmocytes, somatostatin, tryptophan**

↓ arginine, tryptophan

■ **Stool** ↑ fat

Note: molecular biology – gene polymorphism CTLA4, TNF-alpha. MRZ reaction (measles, rubeolla, zoster antibody index)

Scurvy

↑ **Bil, haptoglobin, RTC**

↓ **ALP, RBC, Hb, HCT, PT, vitamin C, vitamin C (WBC)**

■ **Urine** ↑ RBC, Hb, casts – (RBC)

↓ vitamin C

■ **Gastric Fluid** ↑ blood

■ **Stool** ↑ blood

■ **Synovial Fluid** ↑ RBC

Sepsis, Neonatal

- ↑ * **bacteria** (culture), Bil, conjugated Bil, unconjugated Bil, CRP, ESR, WBC
- ↓ Hb, HCT, RBC, WBC, PLT
- **Urine** ↑ albumin, lactose, reducing sugars, casts
- **Cerebrospinal Fluid** ↑ * **bacteria** (+ culture), * **WBC**

Shock

- ↑ ADH, epinephrine, albumin, * **alpha-1-globulins**, ALP, ALT, amino acids, anion gap, AST, beta globulins, BHBA, Bil, CK, CK-BB, CK-MM, D-dimers, * **elastase**, elastase (PMN), eos, RBC, FDP, * **phospholipase A2**, ESR, G, glycine, HCT, HCO_3^- ; IFN-gamma, IgA, IgE, IgG, IgM, IL - (* **1-beta**, * **2**, * **6**), plasminogen activator inhibitor, K, catecholamines, **ketobodies**, complement - (* C3a, C4a, C5a), * **uric acid**, * **creatinine**, * **LA**, lactoferrin, LD, WBC, * **MAC**, Mb, methionine, neu, norepinephrine, NSE, * **osmolality**, * **PAF**, pCO_2 , PCT, PGE₂, pH, * **PMN**, RAL, TT, tyrosine, **urea**
- ↓ * **albumin**, aldosterone, A2MG, arginine, AT III, bas, * **proteins**, Ca, Ca²⁺, CBG, eos (later), RBC (later), factor B, factor - (XII), fibrinogen, ESR, G, gamma globulins, G6PD (RBC), Hb, HCT, HCO_3^- (later), * **cholesterol**, * **CHS**, IgA (later), IgG (later), IgM (later), K, complement - (C3, C4), **WBC** (severe), LH, lym, Na, neu, P, pH, pCO_2 , pO_2 , protein C, RTC, PLT
- **Urine** ↑ amino acids, AMS, **proteins**, RBC, G, Hb, pus, LD, Mb, specific gravity, metanephrines, osmolality, VMA
- ↓ creatinine, osmolality, **urea**, volume, specific gravity, VMA

anaphylactic shock

- ↑ * **eos**, RBC, * **IgE**, catecholamines, * **uric acid**, **tryptase**
- ↓ bas, eos, factor B, pO_2 , ESR, neu, PLT

cardiogenic shock

- ↑ ALT, anion gap, ANP, * **CK**, * **CK-MB**, * **cTnT**, catecholamines, uric acid, **MAC**, * **Mb**, troponin I
- ↓ pH, pO_2

electrical shock

- ↑ catecholamines, CK, CK-MB, LD 5, WBC
- **Urine** ↑ Mb

hypovolemic shock

- ↑ anion gap, K, catecholamines, creatinine, LD, Na
- ↓ Hb, HCT, pH, pO_2 , RTC, PLT
- **Urine** ↑ specific gravity, osmolality
- ↓ creatinine

renal shock

- **Urine** ↑ G, casts - (lipid)

septic shock

- ↑ epinephrine, alanine, alpha-1-globulins, ALP, ALP (WBC), ALT, anion gap, ASLO, AST, **beta globulins**, Bil, CK, CRP, Cu, D-dimers, * **elastase**, * **elastase** (PMN), * **FDP**, phospholipase A2, * **ESR**, G, **globulins**, **glycine**, IFN-gamma, **IgA**, IgD, IgG, IgM, IL - (* **1-beta**, * **6**, * **8**), insulin, plasminogen activator inhibitor, **catecholamines**, complement - (C3a, C4a, C5a), **creatinine**, **uric acid**, **LA**, lactoferrin, LD,

- lipids, * WBC, lym, MAC, methionine, mono, neu, NSE, 5-NT, osmolality, PAF, PCT, PGE₂, pH (early), phenylalanine, * PMN, PT, RAL (early), E selectin, TAG, taurine, tryptophan, TT, tyrosine, urea
- ↓ albumin, aldosterone, A₂MG, Apo - (A1, B), arginine, AT III, Ca, Ca⁺⁺, CBG, factor - (II, XII), Fe, fibrinogen, G, G tolerance, gamma globulins, G6PD (RBC), Hb, HCT, HCO₃⁻, HDL-C, cholesterol, CHS, IgA, IgG, IgM, complement - (C₃, C₄, total), WBC, lipids, lym, Mg, Mg (PMN), neu, P, pCO₂ (early), pO₂, protein C, PLT, RTC, TBG, TIBC
- Urine ↑ proteins, RBC, G, Hb, catecholamines, 17-OHCS, 17-KGS, casts - (RBC)
- ↓ osmolality
- toxic shock**
 - ↑ ALT, AST, CK, catecholamines, creatinine, WBC, urea
 - ↓ Ca, PLT
- toxic shock (gram-negative, coliform bacteria)
 - ↑ ALP, AMS, * AST, Bil, CRP, elastase, G, K, catecholamines, * WBC, * MAC, pCO₂, * urea
 - ↓ eos, G, MAL, Na, pH, pO₂
 - Urine ↑ proteins
 - ↓ volume
- toxic shock (Staphylococcus aureus, streptococci, group A)
 - ↑ ALT, * AST, * Bil, * CK, CRP, * ESR, GMT, catecholamines, * creatinine, * WBC, * LD, * MAC, PCT, * PT, PTT, SAA, * urea
 - ↓ albumin, proteins, Ca, Ca⁺⁺, RBC, Hb, HCT, K, Na, P, pH, PLT
 - Urine ↑ proteins, RBC, pus
- traumatic shock**
 - ↑ catecholamines, LA, LD 5
 - Urine ↑ AMS
- Shunt, Portocaval**
 - ↑ unconjugated Bil, FDP
- Sialoadenitis**
 - ↑ AMS, AMS (S)
- Sialolithiasis**
 - ↑ AMS, AMS (S)
- Silicosis**
 - pulmonary silicosis**
 - ↑ ACE, ANA, gamma globulins, WBC, pCO₂, RAC, RF
 - ↓ pO₂, satur. O₂
 - silicotuberculosis**
 - ↑ lym, WBC
- Sinusitis**
 - ↑ ESR, bas, WBC
 - Cerebrospinal Fluid ↑ WBC
- Smoking**
 - ↑ Apo B-100, PLT aggregation, androstenedione, * CEA, ceruloplasmin, * COHb, Cu, RBC, estradiol, estrone, G, cholesterol, cortisol, * cotinine, * LDL-C, WBC, macrocytes, MCV, MHb, Pb, PRL (M), P-selectin, SHBG, TSH, FFA, vWf
 - ↓ ACE, Apo A-I, HDL-C, melatonin, plasma volume, PRL (F), Se, T₃, thrombomodulin, vitamin - (B₆, B₁₂, beta-carotene, C, folate)

- *Urine* ↑ Cd, 17-KGS, * **cotinine**, 5-HIAA, VMA
↓ 17-KS, **creatinine/thiocyanate index**, Se
 - **Bronchoalveolar Lavage Fluid** ↑ neu
 - **Pleural Fluid** ↑ neu
 - **Seminal Fluid** ↓ volume
 - **Sputum** ↑ volume
 - **Saliva** ↑ **thiocyanate**
- Spina Bifida**
- ↑ * **AFP**, * **ACHE**, **A2MG**, **Bil**
 - **Amniotic Fluid** ↑ * **AFP**, volume
- Splenectomy**
- ↑ acanthocytes, bas, **GHb**, **RBC Heinz bodies**, * **RBC Howell-Jolly bodies**, **WBC**, * **lym**, macrocytes, **mono**, * **RBC osmotic resistance**, * **RTC**, siderocytes, target cells, * **PLT**, **viscosity**
 - ↓ **IgM**, **Hb**, **RBC osmotic fragility**
- Splenomegaly**
- ↑ plasma volume
 - ↓ **fibronectin**, **Hb**, **WBC**, **neu**, **PLT**
- Spondylitis**
- ankylosing spondylitis**
- ↑ alpha-2-globulins, **ALP**, * **ANA**, beta globulins, * **CIC**, * **CK**, * **CRP**, **Cu**, **ESR**, **HLA** - (* **B27**), * **IgA**, * **IgG**, * **IgM**, **LE cells**, **mucoproteins**, **RF**
 - ↓ **RBC**, **Hb**, **HCT**, complement - (**C3**, **C7**)
 - **Cerebrospinal Fluid** ↑ proteins
 - **Synovial Fluid** ↑ **C3**, **WBC**, **PMN**
 - ↓ **viscosity**
- psoriatic spondylitis**
- ↑ **HLA-B27**
- Sprue, Tropical**
- ↑ **ALT**, **MCV**, **motilin**, **PT**
 - ↓ **albumin**, **proteins**, **ceruloplasmin**, **Cu**, **Hb**, **HCT**, **Mg**, **vitamin** - (**A**, **B₂**, **B₁₂**, **folate**), **Zn**
 - *Urine* ↑ 5-HIAA
 - *Stool* ↑ fat
- Starvation**
- ↑ **acetone**, **acetoacetate**, **aldosterone**, **amino acids**, **ANF**, beta globulins, **BHBA**, **Bil**, unconjugated **Bil**, **Ca**, gamma globulins, **GIP**, **glucagon**, **glycine**, **isoleucine**, **K** (early), **ketobodies**, **uric acid**, **leucine**, **MAC**, **fatty acids**, **Na**, **rT₃**, **secretin**, **GH**, **urea**, **FFA**
 - ↓ **ACE**, **albumin**, **ALP**, **AMS**, **proteins**, **Ca**, **C-peptide**, **EPO**, **Fe**, **folate**, **G**, **Hb**, **HDL-C**, **HCT**, **HCO₃⁻**, **cholesterol**, **ILGF-I**, **insulin**, **K** (later), **LDL-C**, **LH**, **lipids**, **Mg**, **osmolality**, **P**, **pH**, **T₃**, **TAG**, **TIBC**, **urea**
 - *Urine* ↑ **acetone**, **Ca**, **chloride**, **K**, **ketones**, **creatine**, **creatinine**, **uric acid**, **Mg**, **Na**, volume, **VMA**
 - ↓ **chloride**, **K**, **creatinine**, **uric acid**, **osmolality**, **pH**
 - **Cerebrospinal Fluid** ↑ **leucine**
 - **Synovial Fluid** ↑ crystals - (**urate**)
- Status Epilepticus**
- ↑ **CK**, **K**
 - *Urine* ↑ **Mb**

Steatorrhea

- ↑ PT, somatostatin
- ↓ **proteins**, * **Ca**, * **Fe**, **cholesterol**, * **Mg**, vitamin – (* **beta-carotene**, **C**, **D**, * **E**, * **folate**), * **Zn**
 - **Urine** ↑ * **oxalate**, reducing sugars
 - ↓ **Ca**, lactose, **P**
 - **Stool** ↑ volume, * **fat**

Stenosis, Renal Artery

- ↑ aldosterone, RBC, MAL, creatinine, * **PRA** (level sampling), urea
- ↓ * **K**
- **Urine** ↑ hexosaminidase, **proteins**, specific gravity, volume
- ↓ **Na**

Sterility, Male

- ↑ estradiol/testosterone, vitamin – (A)

Stomatitis

angular stomatitis

- ↓ vitamin B₂

stomatitis aphosa

- ↑ HLA – (B12)

Stomatocytosis, Hereditary

- ↑ * **stomatocytes**

Storm, thyroid

- ↑ ALT, AST, Ca, G, GMT, WBC
- ↓ K, pCO₂

Strangulation, Intestinal

- ↑ AMS, AST, CK, LD, lipase, P
- **Urine** ↑ AMS
- **Peritoneal Fluid** ↑ ammonia, AMS

Stress

- ↑ AAT, ACTH, ADH, **epinephrine**, aldosterone, **alpha-1-globulins**, **alpha-2-globulins**, ALP (WBC), beta-endorphins, proteins, **ceruloplasmin**, CRP, elastase, RBC, factor – (VIII), FDP, fibrinogen, **G**, **glucagon**, glucocorticoids, glycerol, haptoglobin, **GHb**, **cholesterol**, insulin, iodine, **catecholamines**, **acetoacetic acid**, **ketobodies**, **uric acid**, **cortisol**, LDL-C, LH, lipids, lym, neu, norepinephrine, PRL, secretin, **GH**, **TAG**, **PLT**, **TSH**, **urea**, **VLDL-C**, **FFA**
- ↓ **albumin**, aldosterone, Apo B, Cr, eos, G tolerance, **HDL-C**, K, LDL-C, LH, lym, Mb, Mn, Na, osmolality, oxytocin, pCO₂, Se, TBG, testosterone, vitamin – (B₂, C), **Zn**
 - **Urine** ↑ ADH, epinephrine, proteins, G, **catecholamines**, 17-OHCS, 17-KGS, 17-KS, catecholamines, **cortisol**, uric acid, **metanephrines**, norepinephrine, tetrahydrodeoxycortisol, casts – (**granular**, **hyaline**), **VMA**
- ↓ Na, Se, vitamin C

Stroke

heat stroke

- ↑ **albumin**, aldosterone, alpha-1-glycoprotein, ALT, AST, **Bil**, BSP retention, BT, clotting time, CK, CK-BB, CK-MM, factor VIII, FDP, G, **Hb**, HCT, **chloride**, K, ketones, **creatinine**, uric acid, LA, LD, lym, **WBC**, MDA, Na, neu, GH, MAC (later), Mb, mono, P, Pb, PT, RAL (early), urea

- ↓ Ca, * Ca₂₊, proteins, carotene, * chloride, fibrinogen, G, K, * Na, P, plasma volume, PLT, PT
 - *Urine* ↑ proteins, ketones, Mb
 - ↓ volume
- sun stroke
 - ↑ FDP
- Strumectomy
 - ↑ proteins, cholesterol, TSH
 - ↓ Ca, Ca²⁺
- Suction, Gastrointestinal
 - ↑ HCO₃⁻
 - ↓ chloride, K, MAL, Mg, Na, P
 - *Urine* ↑ pH
 - ↓ chloride
- Surgery
 - ↑ epinephrine, AGP, aldolase, alpha-1-globulins, AMS, AST, beta-endorphins, CK, CK-MB, CRP, elastase, FDP, ESR, G, GIP, glucagon, HCT, plasminogen activator inhibitor, cortisol, LA, LD – (1, 5), WBC, lipase, norepinephrine, PCT, PRL, GH, taurine, PLT, urea
 - ↓ proteins, Cr, cystine, Fe, fibrinogen, HDL-C, K, Mn, protein C, protein S, TBG, Zn
 - *Urine* ↑ 17-KGS, osmolality, Zn
- abdominal surgery
 - ↑ AMS, AST, CK, lipase, TSH, urea
 - ↓ glycine, isoleucine, glutamic acid, leucine, lysine, ornithine, T₃, T₄, tryptophan
- CNS surgery
 - ↑ protein S-100
 - ↓ ADH
 - *Cerebrospinal Fluid* ↑ MBP
- heart surgery
 - ↑ AMS, antimyocardial Ab, AST, CK, CK-MB, FDP, myosin, TSH
 - ↓ ALP, T₃, T₄
- lung surgery
 - ↑ FDP, euglobulin lysis time, TSH
 - ↓ T₃, T₄
- prostate surgery
 - ↑ CK, PAP
 - *Urine* ↑ Hb
- spinal canal surgery
 - *Cerebrospinal Fluid* ↑ fibrinogen
- Sweating
 - ↑ chloride, Na, osmolality
 - ↓ chloride, K, Mg, Na
 - *Urine* ↑ specific gravity
 - ↓ chloride, Na
- Syndrome
 - adrenogenital syndrome
 - ↑ * aldosterone, * DHEA, DOC, * FSH, LH, * testosterone
 - ↓ * aldosterone, Ca, estradiol, estriol, * chloride, * Na, osmolality, progesterone

- **Urine** ↑ 17-ketosteroids, 17-OH ketosteroids, pregnanetriol, 17-OH progesterone, pregnanetriol
 - ↓ * aldosterone, estriol, * cortisol, 17-OH corticosteroids
- Alagille syndrome**
 - ↑ ALP, ALT, AMS, AST, Bil, Bil conjugated, ESR, GMT, cholic acid, LAP, lipase, lipids, PT, PL, TAG, bile acids
 - ↓ RBC, Hb, HCT, prothrombin
 - **Urine** ↑ conjugated Bil, UBG
- Alport's syndrome**
 - ↑ * C₃, * immunoglobulins, cholesterol, proline, urea, creatinine
 - ↓ PLT
 - **Urine** ↑ * proteins, * RBC, Hb, * blood
- autoimmune lymphoproliferative syndrome**
 - ↑ ANA, * anticardiolipin Ab, * B-cells, gamma globulins, IL-10, RF, * T-cells
 - ↓ Hb, HCT, neu
- Bassen-Kornzweig syndrome**
 - ↑ acanthocytes
 - ↓ beta-carotene, beta-lipoprotein, cholesterol
 - **Stool** ↑ fat
- Beckwith-Wiedemann syndrome**
 - ↑ HCT, RBC
 - ↓ Ca, G
- Behcet's syndrome**
 - ↑ CIC, * CRP, * ESR, HLA - (B₅, B₅₁), * IgA, complement - (C₃, C₄), WBC, lymphocytotoxic Ab
 - ↓ * Hb, * HCT
 - **Cerebrospinal Fluid** ↑ proteins, WBC
- Bernard-Soulier syndrome**
 - ↑ BT, MPV
 - ↓ PLT adhesion, * PLT
 - Note: molecular biology - GPIb/IX
- Blackfan-Diamond syndrome**
 - ↓ neu
- breast-milk jaundice syndrome**
 - ↑ Bil, unconjugated Bil
 - **Urine** ↑ conjugated Bil
- Buckley's syndrome**
 - ↑ IgE
- carbohydrate deficient glycoprotein syndrome 1a**
 - ↓ GPs, sialic acid, galactose, N-acetylgalactosamine, N-acetylglucosaminyltransferase
- cerebellar syndrome**
 - ↑ Ab against Purkinje cells, anti-Hu Ab
 - **Cerebrospinal Fluid** ↑ anti-Hu Ab
- Chediak-Higashi syndrome**
 - ↑ BT
 - ↓ * WBC, * neu, elastase (PMN), phagocytic activity, PCT, PLT
- chronic fatigue syndrome**
 - ↑ ALT, lym

Churg-Strauss syndrome

- ↑ ANCA, p-ANCA, c-ANCA, anti-MPO, * eos, * ESR, IgA, * IgE, WBC, RF
- ↓ * RBC, * Hb, * HCT

chylomicron syndrome

- ↑ chylomicrons
- ↓ Apo C-II, lipoprotein lipase

CIDP-like syndrome (chronic inflammatory demyelinating polyneuropathy)

- ↑ anti-tubulin Ab

CREST syndrome

- ↑ * ACA, AMA, anti-ds-DNA Ab, anti-p16, anti-Scl 70 Ab, HLA-DR3, RF
- *Synovial Fluid* ↑ crystals – (hydroxyapatite)

Crigler-Najjar syndrome

- ↑ ALT, Bil, conjugated Bil, * unconjugated Bil, delta Bil, GMT
- ↓ * UDPGT
- *Urine* ↑ conjugated bilirubin
- ↓ UBG
- *Stool* ↑ UBG

crush syndrome

- ↑ aldolase, ALT, AST, CK, * K, * Mb, urea
- ↓ Na
- *Urine* ↑ RBC, Hb, Mb, casts – (Hb, Mb)
- ↓ volume

Cushing's syndrome

- ↑ * ACTH, aldosterone, alpha-2-globulins, alanine, ALP, androstenedione, Apo B, Apo B-100, beta-LPs, Ca, CO₂, DHEAS, DOC, 18-OH DOC, RBC, factor VIII, * G, glucagon, Hb, HbA_{1c}, HCO₃⁻, HCT, HDL-C, chloride, cholesterol, IDL-C, * insulin, IRI, ketobodies, * cortisol, creatine, LDL-C, WBC, MAC, MAL, Na, neu, pCO₂, pH, PL, PRA, PRL, pregnenolone, progesterone, testosterone, TAG, urea, VLDL-C
- ↓ ACTH, aldosterone, amino acids, angiotensin II, bas, Ca, CK, eos, gamma globulins, glucose tolerance, Hb, HCT, HDL-C, IGFBP-1, chloride, * K, uric acid, lym, neu, P, PGE₂, pH, PRA, GH, testosterone, TBG, volume, Zn
- *Urine* ↑ Ca, G, * 17-OHCS, K, 17-KGS, * 17-KS, creatine, * free cortisol, pregnanetriol, volume
- ↓ Na
- *Saliva* ↑ cortisol

- Cushing's syndrome due to ectopic ACTH production

- ↑ * ACTH, androstenedione, DHEA, corticoids, corticosterone, free cortisol, WBC, MAL, pH
- ↓ K
- *Urine* ↑ 17-OHCS, 17-KS, free cortisol, corticoids

- iatrogenic Cushing's syndrome

- ↑ ACTH, cortisol

defibrination syndrome

- ↓ fibrinogen

DiGeorge syndrome

- ↑ B-lym, lym, IgE
- ↓ Ca, gamma globulins, IgA, IgG, IgM, lym, * PTH, thymuline, * T-lym

distress syndrome

- adult respiratory distress syndrome (ARDS)

- ↑ elastase, HCO_3^- , uric acid, LA, WBC, MAC, pH (early), RAC, RAL (early), TAG, thrombomodulin
- ↓ ACE, complement - (C4), Hb, HCT, K, pH, * pCO_2 (early), * pO_2 , protein C, protein S, selectin L, * PLT
- **Urine** ↓ volume
- **Bronchoalveolar Lavage Fluid** ↑ eos, IL-8, neu, PMN, selectin - (E, L, P)

- fetal distress syndrome

- ↓ estriol, hPL
- **Urine** ↓ estriol
- **Amniotic Fluid** ↑ AFP, meconium

- neonatal respiratory distress syndrome

- ↑ HCO_3^- (early), pH (early), pCO_2 (later), RAC
- ↓ AAT, Ca, HCO_3^- (later), Hb, HCT, G, * lecithin-phosphatidylcholine, pCO_2 (early), pH (later), PL, plasminogen, RBC, pO_2

Down syndrome

- ↑ ALP (WBC), A2MG, antithyroglobulin Ab, globulins, HbF, hCG, uric acid, WBC, neu, TAG
- ↓ ACP, * AFP, estriol, ILGF-I, serotonin, testosterone, free estriol
- **Urine** ↑ beta-aminoisobutyric acid, cystine
- ↓ 5-HIAA

Dressler's syndrome

- ↑ antimyocardial Ab, ESR, CRP

Dubin-Johnson syndrome

- ↑ * ALP, ALT, AST, * Bil, * conjugated Bil, unconjugated Bil, PT
- **Urine** ↑ Bil, conjugated Bil, * coproporphyrin I, leukotrienes, UBG
- ↓ coproporphyrin - (I, III), coproporphyrin III/coproporphyrin I index, UBG
- **Stool** ↓ UBG

dumping syndrome

- ↑ AMS, * G (early), glucagon, * serotonin
- ↓ RBC, Fe, G (later), G tolerance, Hb, HCT, * K, MCH, MCHC, MCV, plasma volume, vitamin B₁₂
- **Urine** ↑ G, serotonin, 5-HIAA
- **Stool** ↑ fat

empty sella syndrome

- ↑ ACTH, PRL
- ↓ ACTH, PRL

eosinophilia-myalgia syndrome

- ↑ aldolase, ALT, AST, CK, * eos, ESR, GMT, WBC, LD

euhyroid sick syndrome

- ↑ FTI, reverse T₃, T₃ uptake
- ↓ FTI, T₃, T₄

Evans' syndrome

- ↓ PLT, specific Ab

Fanconi's syndrome

- ↑ aldosterone, ALP, * chloride, * MAC, MAL, P, PTH, PRA
- ↓ Ca, RBC, * HCO_3^- , K, * uric acid, Na, * P, PLT, vitamin D₃

- *Urine* ↑ albumin, * amino acids, ammonia, * proteins, B₂M, * Ca, * G, HCO₃, * K, uric acid, volume, * P, * pH
- Felty's syndrome**
 - ↑ * ANA, ANCA, p-ANCA, atypical-ANCA, B₂M, C₃, C₄, * CIC, LE cells, * RF
 - ↓ * RBC, * Hb, HCT, * WBC, * neu, PLT
- Forbes-Albright syndrome**
 - ↑ PRL
- galactorrhea-amenorrhea syndrome**
 - ↓ progesterone, PRL
- GBS syndrome (gay bowel syndrome)**
 - ↑ Ab against GalNac-GD1a
- Goodpasture's syndrome**
 - ↑ * AGBMA, * ANCA, * p-ANCA, * CIC, eos, HLA – (DR2), * creatinine, * MAC+RAL, urea
 - ↓ RBC, Fe, Hb, HCT
 - *Urine* ↑ proteins, * RBC (dysmorphic), Hb, hexosaminidase, casts – (cellular, * RBC, granular)
 - *Bronchoalveolar Lavage Fluid* ↑ RBC, * hemosiderin, * macrophages
 - *Sputum* ↑ blood, macrophages, hemosiderin
- gray-platelet syndrome**
 - ↑ BT
 - ↓ PLT
- Guillain-Barré syndrome**
 - ↑ ADH, anti-GQ1b Ab, anti-heparan sulfate Ab, antibodies against *Campylobacter jejuni*, antibodies against neurofilamenta, anti-*Mycoplasma pneumoniae* Ab, myelin-specific Ab, anti-CMV Ab, * CRP, * IgE, immunoglobulins, WBC, E selectin, pCO₂
 - *Cerebrospinal Fluid* ↑ * adenylate kinase, antibodies against *Campylobacter jejuni*, antibodies against neurofilamenta, anti-*Mycoplasma pneumoniae* Ab, myelin-specific Ab, anti-CMV Ab, * proteins, CK, gamma globulins, * CHS, * IgG, lym, * MBP, mono, plas-mocytes, pressure
 - ↓ WBC
- Guillain-Barré like syndrome**
 - ↑ anti-GD1a Ab
- Hamman-Rich syndrome**
 - ↑ ANA, ESR
 - ↓ pCO₂, pO₂
- Hand-Schueller-Christian syndrome**
 - ↑ ALT, nucleated RBC
 - ↓ WBC
- HELLP syndrome (hemolysis, elevated liver enzymes, low platelets)**
 - ↑ ALT, Bil, LD
 - ↓ PLT
- hemolytic-uremic syndrome**
 - ↑ anisocytes, Bil, * unconjugated Bil, * FDP, ESR, * creatinine, LD, NSE, WBC, RTC, spherocytes, schistocytes, urea
 - ↓ RBC, * haptoglobin, * Hb, HCT, complement – (* C₃), * PLT
 - *Urine* ↑ * proteins, * RBC, Hb, pus, blood, casts – (RBC, * granular)
 - ↓ volume

hepatorenal syndrome

- ↑ ALT, K (later), **creatinine, urea**
- ↓ albumin, K (intracellular), Na
- **Urine** ↑ **proteins, osmolality, RBC, specific gravity, casts** – (hyaline, granular)
- ↓ GFR, Na, **volume, pH**

Hermansky-Pudlak syndrome

- ↑ BT
- ↓ PLT

hypereosinophilic syndrome

- ↑ ALT, AST, * eos, **eosinophil kationic protein, WBC**
- ↓ Hb, HCT, uric acid, PLT

hyper-IgE syndrome

- ↑ * eos, * IgE
- **Sputum** ↑ eos

hyper-IgM syndrome

- ↑ IgD, * IgM
- ↓ Hb, * IgA, * IgG, * IgE, neu, PLT

insulin autoimmune syndrome

- ↑ * antiinsulin Ab, C-peptide, insulin
- ↓ G

irritable bowel syndrome

- ↑ CCK-PZ, motilin, somatostatin
- ↓ vitamin – (B₂)
- **Stool** ↑ mucus

Joseph's syndrome

- **Urine** ↑ proline, hydroxyproline, glycine

Kawasaki syndrome

- ↑ AAT, ALT, atypical-ANCA, antiendothelial Ab, AST, C₃, **CRP, ESR, immunoglobulins, IgE, WBC, lym, PLT**
- ↓ RBC, Hb, HCT
- **Urine** ↑ proteins, pus, mono
- **Cerebrospinal Fluid** ↑ WBC, mono
- **Synovial Fluid** ↑ WBC

Kimmelstiel-Wilson syndrome

- ↑ urea
- ↓ **proteins**
- **Urine** ↑ **albumin, * proteins, blood, RBC, casts** – (epithelial, fatty, granular, hyaline)

Klinefelter's syndrome

- ↑ * FSH, * LH
- ↓ estradiol, **testosterone**
- **Urine** ↑ FSH, hydroxyproline – (total, free), LH
- ↓ 17-ketosteroids
- **Seminal Fluid** ↓ spermatozoa count
- **Sweat** ↑ chloride, Na

Leigh's syndrome

- **Cerebrospinal Fluid** ↑ enkephalins

Lesch-Nyhan syndrome

- ↑ * **uric acid**
- **Urine** ↑ RBC, Hb, blood, hypoxanthine, crystals – (urate), * **uric acid**

Liddle's syndrome

- ↑ Na, pH
- ↓ * aldosterone, K, MAL, PRA
- *Urine* ↑ K

lymphoproliferative syndrome linked to X-chromosome

- ↑ lym

Marfan's syndrome

- ↓ beta-glucuronidase, mucoproteins
- *Urine* ↑ homocystine, hydroxyproline – (total, free)

Meigs' syndrome

- *Peritoneal Fluid* ↑ proteins

MEN syndrome (type I)

- ↑ ACTH, Ca, calcitonin, gastrin, glucagon, insulin, cortisol, PP, PRL, PTH, GH, serotonin, serotonin (PLT), somatostatin, VIP

MEN syndrome (type IIa)

- ↑ ACTH, * epinephrine, Ca, * dopamine, * calcitonin, * catecholamines, norepinephrine, serotonin, serotonin (PLT), * PTH, PRA
- *Urine* ↑ G, HVA, catecholamines, metanephrine, VMA, free epinephrine, free norepinephrine
- Note: chromosome 10q13 mutation (ret proto-oncogene)

MEN syndrome (type IIb)

- ↑ ACTH, * epinephrine, Ca, * dopamine, calcitonin, catecholamines, norepinephrine, PRA, serotonin, serotonin (PLT)
- *Urine* ↑ G, catecholamines, HVA, metanephrine, VMA, free epinephrine, free norepinephrine
- Note: tyrosine-kinase domain mutation

Menkes' syndrome

- ↓ ceruloplasmin, * Cu
- *Urine* ↑ Cu
- *Amniotic Fluid* ↑ Cu

Mikulicz syndrome

- ↑ AMS, WBC

milk-alkali syndrome

- ↑ * Ca, * MAL, P, pH, urea
- ↓ ALP, * chloride, K, Na, * PTH
- *Urine* ↓ Ca, P
- *Synovial Fluid* ↑ crystals – (hydroxyapatite)

Miller-Fisher syndrome

- ↑ anti-GQ1b Ab

motor neuron syndrome

- ↑ anti-GM1 ganglioside Ab, anti-GD1a Ab

Nelson's syndrome

- *Cerebrospinal Fluid* ↑ endorphins

neonatal thick blood syndrome

- ↑ Bil, * HCT
- ↓ G, PLT

nephritic syndrome

– acute nephritic syndrome

- ↑ AGBMA, antideoxyribonuclease, antihyaluronidase, antistreptokinase, ASLO, IgA, IgG, WBC, urea
- ↓ RBC, Hb, HCT, complement – (C3, C4, CH50)

- **Urine** ↑ proteins, RBC, Hb, pus, WBC, tubular cells, casts – (RBC, granular, Hb, WBC, waxy)
- **chronic nephritic syndrome**
 - ↑ creatinine, MAC, P, urea
 - ↓ RBC, Hb, HCT
 - **Urine** ↑ proteins, RBC, Hb, blood, casts – (RBC, granular, hyaline, waxy)
- nephrotic syndrome**
 - ↑ AAT, AFP, PLT aggregation, **aldosterone**, ALP, alpha-1-globulins, * **alpha-2-globulins**, alpha-2-lipoproteins, A2MG, Apo B, bas, * **beta globulins**, beta-carotene, **beta-lipoproteins**, ceruloplasmin, CK, CRP, elastase, eos, RBC, factor – (V, VII, VIII, X), FDP, Fe, **fibrinogen**, fibrinopeptide A, ESR, GMT, **haptoglobin**, HbA_{1c}, HBsAg, HDL-C, chloride, * **cholesterol**, CHS, chylomicrons, IDL-C, IgA, IgE, IgG, IgM, complement – (C₃), **creatinine**, cryoglobulins, **uric acid**, LAP, LD, LD₅, * LDL-C, WBC, * **lipids**, beta-LP, LPs, MAL, Na, neu, P, * **PL**, protein C, T₃, T₃ uptake, * TAG, triiodothyronine resin uptake, PLT, urea, VDRL (false), VLDL-C
 - ↓ AAT, ADH, AGP, * **albumin**, **alpha-1-globulins**, alpha-2-antiplasmin, **amino acids**, Apo – (A-I, C-II), AT III, ASLO, AT III, * **proteins**, B₂M, Ca, ceruloplasmin, Cu, EPO, RBC, factors – (IX, XI, XII), Fe, ferritin, FT₄, * **gamma globulins**, globulins, Hb, HDL-C, hemopexin, HCT, chloride, cholesterol, **IgA**, **IgG**, **IgM**, immunoglobulins, K, complement – (C₃, C₄), cortisol, **lipoprotein lipase**, lym, Mg, Na, Ni, osmolality, plasma volume prealbumin, prekallikrein, protein C, protein S, SHBG, T₃, T₄, TBG, TIBC, transferrin, urea, urokinase, vitamin – (D₂, D₃), Zn
 - **Urine** ↑ albumin, aldosterone, alpha-1-globulins, * **proteins**, beta globulins, B₂M, Ca, Cu, RBC, Hb, hexosaminidase, IgA, immunoglobulins, K, **blood**, LD, WBC, lipids, lysozyme, Mg, specific gravity, transferrin, * **fat bodies**, casts – (**epithelial**, RBC, **granular**, hyaline, **lipid**, WBC, waxy)
 - ↓ Ca, GFR, 17-OHCS, 17-KGS, 17-KS, Na
 - **Peritoneal Fluid** ↑ RBC, WBC
 - ↓ **proteins**
 - **Pleural Fluid** ↑ pH
 - ↓ **proteins**, LD, specific gravity
 - **Stool** ↑ Ca
 - **Sweat** ↑ chloride, Na
- KT3-induced cytokinerelated syndrome**
 - ↑ IFN-gamma, IL-2, TNF
- paraneoplastic syndrome**
 - ↑ **Ab against Purkinje cells**, * ACTH, * ADH, ALP, * Ca, EPO, RBC, FSH, * **gastrin**, Hb, * hCG, HCT, cholesterol, * **calcitonin**, cryofibrinogen, LH, LPs, * MSH, PRA, * PRL, * PTH, serotonin, * **somatomedin**, STH, TSH
 - ↓ G, osmolality
- pickwickian syndrome**
 - ↑ RBC, Hb, pCO₂, RAC
 - ↓ pH, pO₂

Plummer-Vinson syndrome

↓ RBC, Fe, Hb, HCT, MCH, MCHC, MCV

POEMS syndrome (polyneuropathy, organomegaly, endocrinopathy, M-protein, skin changes)

↑ IgA, IgG, IL – (1-beta, 6), MMP – (1, 2, 3, 9), TNF-alpha, VEGF, TIMP

■ **Cerebrospinal Fluid** ↑ proteins

postantrectomy syndrome

■ **Gastric Fluid** ↑ pH

↓ HCl

postcardiotomy syndrome

■ **Pleural Fluid** ↑ RBC, WBC

postcholecystectomy syndrome

↑ ALT, ASAL, AST, lipase

postcommissurotomy syndrome

↑ * AST, à CRP, à ESR, WBC

posthepatectomy syndrome

↑ ammonia

postpericardectomy syndrome

■ **Pericardial Fluid** ↑ RBC

postradiation syndrome

↑ alpha-1-globulins, alpha-2-globulins, ALT, AMS, AST, beta-aminoisobutyric acid, Bil, CEA, eos, factor – (VIII), ferritin, fibrinogen, globulins, uric acid, LAP, LD, WBC, lym, MHb, neu, OCT, properdin, PT, urea

↓ ALP, bas, DNA (free), RBC, Hb, HCT, CHS, uric acid, WBC, lym, Mg, neu, PLT, taurine

■ **Urine** ↑ proteins, Bil, creatine, LAP, lysozyme

- acute postradiation syndrome

↑ * alpha-1-globulins, alpha-2-globulins

↓ RBC, * Hb, WBC, * lym, * PLT

■ **Urine** ↑ Bil

- chronic postradiation syndrome (occupational)

↑ RBC, WBC, lym

↓ bas, Hb, HCT, Mg, neu, PLT

- mild postradiation syndrome

↑ neu (early)

↓ WBC, lym, Mg, PLT

primary antiphospholipid syndrome

↑ Ab against beta-2 GP I, * ACLA, AHA, ANA, anti-DNA, * anticardiolipin Ab, anti-nRNP, anti-Ro/SSA, APLA, * lupus anticoagulant factor, PT, PTT, VDRL (false)

↓ PLT

Raynaud's syndrome

↑ ACA, PLT aggregation, * anticardiolipin Ab, * cold agglutinins, * cryoglobulins, * viscosity

Reaven's (metabolic) syndrome

↑ * G, fibrinogen, cholesterol, insulin, * IRI, * uric acid, LPs, * TAG, VLDL-C

↓ HDL-C

■ **Urine** ↑ albumin

Reiter's syndrome

- ↑ CIC, * CRP, * ESR, globulins, HLA - (* B27), * IgA, WBC, neu, * RF
- ↓ RBC, Hb, HCT
- **Urine** ↑ bacteria (culture), WBC
- **Synovial Fluid** ↑ * proteins, clot formation, * C3 complement, pus, WBC, * PMN, volume
- ↓ viscosity

Reye's syndrome

- ↑ alanine, ALP, * ALT, amino acids, * ammonia, * AST, Bil, * CK, CK-MB, GD, glutamine, LA, LD, lysine, fatty acids, Na, osmolality, P, * PT, pyruvate, * RAL-MAC, urea, FFA
- ↓ Apo B, CO₂, * G, K, LDL-C, Na, osmolality, P, pH, pCO₂, PT
- **Urine** ↑ alpha-aminoadipic acid
- **Cerebrospinal Fluid** ↑ glutamine, pressure
- ↓ G, proteins

Rotor's syndrome

- ↑ ALT, * Bil, * conjugated Bil, unconjugated Bil
- **Urine** ↑ conjugated Bil, coproporphyrin - (* I, * III), * UBG
- ↓ UBG, coproporphyrin III/coproporphyrin I index
- **Stool** ↓ UBG

Sezary's syndrome

- ↑ ALP, ALT
- ↓ albumin

Sheehan's syndrome

- ↓ * ACTH, RBC, estradiol, * G, FSH, LH, GH, Hb, HCT, WBC, TSH, * PRL
- **Urine** ↓ 17-KS, 17-OHCS

SIADH (Syndrome of Inappropriate ADH Secretion)

- ↑ ADH, aldosterone, angiotensin, RBC, uric acid, MAL, Mg, PG, PRA
- ↓ * albumin, * chloride, K, creatinine, uric acid, LD, Mg, * Na, * osmolality, PRA, proteins, urea
- **Urine** ↑ * ADH, K, kallikrein, specific gravity, Mg, * Na, volume, * osmolality, PG

Sjögren's syndrome

- ↑ anticardiolipin Ab, alpha globulins, AMS, * ANA, * ANCA, p-ANCA, * anti-ds-DNA, anti-ss-DNA, * antiphospholipid Ab, antigamma globulin Ab, antimicrosomal Ab, anti-p 56, anti-poly(ADP-ribose), anti-RNP, anti-Scl 70, anti-Sm, * anti-Ro/SSA, * anti-La, Ha/SSB, antithyroglobulin Ab, antithyroid Ab, APA, CIC, CRP, eos, * ESR, * gamma globulins, HLA - (B8, DQ1, DR2, * DR3, DR4, DR52, Drw52, Dw3), IgA, IgG, IgM, cryoglobulins, LE cells, non-histone ANA, anti-Golgi complex Ab, antinuclear antigen Ab, anti-salivary duct Ab, * RF, * viscosity
- ↓ RBC, Hb, HCT, complement - (C3, C4, C6), * WBC, * PLT
- **Urine** ↑ proteins, volume
- **Saliva** ↑ B2M, chloride, IgA, * IgG, lysozyme, Na, * RF
- ↓ P
- **Synovial Fluid** ↑ WBC, * lym, PMN

sleep apnea syndrome

- ↑ RBC, Hb, * MAC, * pCO₂, * RAC
- ↓ pH, pO₂

Stein-Leventhal syndrome

- ↑ * **androstenedione**, * **3-alpha-androstanediol glucuronide**, * **DHEA**, * **estradiol**, **estrone**, **FSH**, **insulin**, * **LH**, **PRL**, **testosterone**, * **free testosterone**
- ↓ **estradiol**, **estriol**, * **FSH**, **progesterone**, **SHBG**
- **Urine** ↑ **estrogens**, **17-ketosteroids**, **LH**, **pregnanetriol**, **testosterone**
↓ **estriol**, **FSH**

Stevens-Johnson syndrome

- ↑ **anti-Mycoplasma pneumoniae Ab**

systemic capillary leak syndrome

- ↑ **Hb**, **light chains**, **WBC**
- ↓ **albumin**

testicular feminization syndrome

- ↑ **FSH**, **LH**, **SHBG**, **testosterone**
- **Urine** ↑ **FSH**, **LH**

Turner's syndrome

- ↑ **antithyroglobulin Ab**, * **FSH**, **cholesterol**, * **LH**
- ↓ **aldosterone**, * **estradiol**, **estriol**, * **estrogens**, **progesterone**
- **Urine** ↑ **Cr**, **FSH**, **LH**
↓ **aldosterone**, **estriol**, **17-KS**
- **Amniotic Fluid** ↑ **AFP**
- **Stool** ↑ **blood**

Waterhouse-Friederichsen syndrome

- ↑ **K**, **WBC**, **urea**
- ↓ **G**, * **chloride**, * **cortisol**, **Na**

WDHH syndrome (watery diarrhea, hypokalemia, hypochlorhydria)

- ↑ **VIP**
- ↓ **K**, **Cl**

Weil's syndrome

- ↑ **ALP**, **ALT**, **AST**, **Bil**, **conjugated Bil**, **ESR**, **WBC**, **PLT**, **urea**
- ↓ **Hb**, **HCT**, **prothrombin**, **PLT**
- **Urine** ↑ **proteins**, **RBC**, **pus**, **blood**, **WBC**, **casts** – (**hyaline**, **granular**)
↓ **volume**

Werner's syndrome

- ↑ **Apo B**, **cholesterol**, **LDL-C**, **TAG**

Wiskott-Aldrich syndrome

- ↑ **B-lym**, **BT**, * **IgA**, * **IgE**, **IgG**, **T-lym (CD4+, CD8+)**
- ↓ **B-lym**, **IgG**, **IgM**, * **lym**, * **MPV**, * **PLT**, **T-lym**

Zollinger-Ellison syndrome

- ↑ **ACTH**, * **gastrin**, **glucagon**, **GH-RH**, **insulin**, * **calcitonin**, **TM** – (**NSE**), **pepsinogen**, **PP**, **PTH**, **secretin**, **VIP**
- ↓ **albumin**, **K**, **vitamin** – (**B₁₂**)
- **Gastric Fluid** ↑ * **BAO**, * **basal secretion**, **HCl**, **MAO**, **volume**, **PAO**
↓ * **pH**
- **Urine** ↑ **gastrin**
- **Stool** ↑ **fat**, **volume**
↓ **pH**

Synovitis

crystal induced synovitis

- **Synovial Fluid** ↑ **clot formation**, **WBC**, **PMN**, **volume**
↓ **viscosity**

- idiopathic eosinophilic synovitis
 - *Synovial Fluid* ↑ eos, Charcot-Leyden crystals
- villonodular synovitis
 - *Synovial Fluid* ↑ RBC, clot formation, WBC, lym, macrophages, viscosity, volume
- Tachycardia, Atrial Paroxysmal
 - ↑ * ANF, cGMP, NT-pro-ANP, * WBC
- Tetany
 - ↑ pH
 - ↓ * Ca, * Ca²⁺, chloride, MAL, Mg, P, pO₂
- Therapy
 - electroconvulsive therapy
 - ↑ epinephrine, ALT, beta-endorphins, catecholamines
 - *Cerebrospinal Fluid* ↑ GMT
 - malignant tumor therapy
 - ↑ uric acid
- Thoracentesis
 - ↓ albumin (repeated)
- thrombasthenia, Hereditary Glanzmann's
 - ↑ * BT, IL-6, PT, TGT
 - ↓ PLT adhesion, * PLT aggregation, * clot retraction, platelet factor 3
- Thrombocytopenia
 - ↑ Ab against beta-2 GP I, antibodies against PLT (autoimmune thrombocytopenia, idiopathic t., post-transfusion t.), antibodies induced by drugs, antibodies induced by pregnancy, ACLA, heparin associated Ab, BT, clot retraction
 - ↓ PLT
 - *Urine* ↑ RBC, Hb
 - *Sputum* ↑ blood
 - *Synovial Fluid* ↑ RBC
- Thrombocytosis
 - primary thrombocytosis
 - ↑ * ACP, * PLT aggregation, ALP (WBC), Ca, K, uric acid, * LD, * WBC, * neu, * PLT, viscosity
 - ↓ * ALP (WBC), RBC, Hb, * HCT, pO₂
 - *Synovial Fluid* ↑ RBC
 - secondary thrombocytosis
 - ↑ ACP, bas, K, LD, PLT
- Thrombophlebitis
 - cerebral thrombophlebitis
 - ↑ ESR, WBC
 - *Cerebrospinal Fluid* ↑ WBC, pressure
 - septic thrombophlebitis
 - ↑ ACP, * alpha-1-globulins, AST, bacteria (culture), * CRP, * ESR, * fibrinogen, * WBC, MAC, neu, RAL, urea
 - ↓ pH, pO₂
 - *Cerebrospinal Fluid* ↑ protein
- Thrombosis
 - ↑ Ab against beta-2 GP I, ACLA, ACP, ALT, APLA, D-dimers, FDP, homocysteine, factor V Leiden, WBC, prothrombinogen, neu

↓ * AT III, protein C, prostacyclin

■ *Urine* ↑ 5-HIT

acute thrombosis

↑ protein S, factor VIII, vWF, PAI

carotid thrombosis

■ *Urine* ↑ hexosaminidase

cerebral vein thrombosis

↑ Ab against beta-2 GP I, TAG

■ *Cerebrospinal Fluid* ↑ proteins, CK, WBC, lym, RBC, pressure

deep venous thrombosis (lower extremity)

↑ Ab against beta-2 GP I, factor VIII, fibrinopeptide A, plasminogen activator inhibitor

↓ protein C, protein S

mesenteric vein thrombosis

↑ AMS, lipase

■ *Peritoneal Fluid* ↑ AMS

■ *Stool* ↑ blood

renal vein thrombosis

↑ FDP, chloride, WBC, lipids, MAC

↓ albumin, RBC, G, Hb, HCT, osmolality, pH, PLT

■ *Urine* ↑ proteins, RBC, G, Hb, pus, blood, osmolality, casts - (RBC)

↓ volume

Thyroidectomy

↓ T₄, TSH, thyroglobulin

Thyroiditis

autoimmune chronic thyroiditis (Hashimoto's thyroiditis)

↑ ANA, antiadrenal Ab, * antimicrosomal Ab, antithyroglobulin Ab, antithyroidal Ab, * antithyroperoxidase Ab, thyroxine autoantibodies, APA, ESR, FT₄, HLA - (Bw35, B37, DR5), IgA, IgM, LATS, WBC, antithyroid components Ab, anti-TSH receptor Ab, T₃, * T₄ (early), TSH, thyroglobulin

↓ iodine, complement - (C₃), FT₄, T₃, T₄ (later), TSH

lymphocytic thyroiditis

↑ AAT, AMA, ANA, antiadrenal Ab, antimicrosomal Ab, antithyroglobulin Ab, antithyroid Ab (later), antithyroperoxidase Ab, APA, thyroxine autoantibodies, FT₃, FT₄, ESR, cholesterol, IgA, IgM, calcitonin, complement - (C₃), LATS, WBC, neu, antibodies against thyroid components, anti-TSH-receptor Ab, T₃ (early), T₄ (early), TSH (later), thyroglobulin

↓ RBC, FT₄, Hb, HCT, iodine, complement - (C₃), WBC, T₃, T₄ (later), TSH (early)

subacute thyroiditis (Quervain's t.)

↑ ALP, antimicrosomal Ab, antithyroglobulin Ab, antithyroidal Ab, antithyroperoxidase Ab, AST, beta-carotene, CK, FT₃, FT₄ (early), * ESR, glycoproteins, GMT, HLA - (* B35), cholesterol, IgD, IgM, complement - (C₃), LATS, LD, WBC, T₃, T₃ uptake, T₄ (early), TSH (recovery phase), thyroglobulin

↓ AAT, RBC, G, Hb, HCT, IgA, complement - (C₃), WBC, Na, T₄, TSH (early)

Thyrotoxicosis

- ↑ ACE, epinephrine, ALP, ALT, AMA, anti-ds-DNA, antithyroglobulin Ab, * antithyroid Ab, AST, Ca, Ca²⁺, ceruloplasmin, Cu, ferritin, * FTI, * FT4, G, CHS, iodine, catecholamines, creatine, ketobodies, acetoacetic acid, WBC, LATS, lym, neu, norepinephrine, plasma volume, SHBG, thyroglobulin, * T₃, * T₄
- ↓ albumin, AMS, proteins, cholesterol, Hb, IgA, K, WBC, neu, PICP, PTH, TBG, TIBC, * TSH, vitamin - (D)
 - Urine ↑ Ca, creatine, G, 17-OHCS
 - ↓ 17-KS
 - Gastric Fluid ↑ pH
 - ↓ HCl
 - Stool ↑ Ca, fat

Tonsillitis

- ↑ ASLO, CRP, ESR, WBC, mucoproteins

Transfusion

exchange blood transfusion

- ↑ Ca, folic acid, K, MAC, Na
- ↓ G, HbA_{1c}, PLT

fetal-maternal transfusion (maternal blood)

- ↑ * fetal RBC, nucleated RBC, RTC
- ↓ Fe, Hb, HCT

incompatible blood transfusion

- ↑ * Bil, euglobulin lysis time, * FDP, WBC
- ↓ * Hb, * HCT
- Urine ↑ RBC, Hb, casts - (hemoglobin)

massive blood transfusion

- ↑ APTT, * BT, * FDP, Fe, folic acid, * K, * LD₂, LD₃, LD₄, MAL, MAL+RAL, * PT
- ↓ alpha-2-globulins, Ca, factor VIII, fibrinogen, HbA_{1c}, K, proaccelerin, PLT
- Urine ↑ RBC, casts - (hemoglobin)

maternal-fetal transfusion (fetal blood)

- ↑ unconjugated Bil, Hb, HCT

multiple blood transfusion

- ↑ APTT, Fe, fibrinogen, folic acid, lupus inhibitor, PT, VDRL (false posit.)
- ↓ alpha-2-globulins, HbA_{1c}, Mg, PLT
- Urine ↑ hemosiderin

old blood transfusion

- ↑ * unconjugated Bil, * K, * LD, P
- ↓ haptoglobin

plasma transfusion

- ↑ PT

Transplantation

heart transplantation

- ↑ antimyocardial Ab, ESR, LD, LD₁, WBC

kidney transplantation

- ↑ AMS, B₂M, Ca, RBC, FDP, GMT, K, LDL-C, RF
- ↓ HDL-C, Mg
- Urine ↑ AAP, volume

- liver transplantation
 - ↑ ALP, ALT, AST, Bil, conjugated Bil, GMT
- pancreas transplantation
 - ↑ C-peptide
- skin transplantation
 - ↑ RF
- Transudation
 - ↑ aldosterone
 - ↓ albumin
- Trauma
 - blunt trauma of abdomen
 - *Peritoneal Fluid* ↑ * AMS, * RBC, * WBC
 - ↓ RBC
 - penetrating trauma of abdomen
 - ↑ PCT, WBC
 - *Peritoneal Fluid* ↑ ALP, AMS, bacteria (+ culture), proteins, * RBC, TAG, * WBC
 - trauma of aspiration
 - *Synovial Fluid* ↑ RBC
 - *Pleural Fluid* ↑ RBC
 - *Peritoneal Fluid* ↑ RBC
 - *Cerebrospinal Fluid* ↑ RBC
 - trauma of chest
 - ↑ PCT
 - *Peritoneal Fluid* ↑ proteins, TAG
 - trauma of head
 - ↑ NSE
 - *Cerebrospinal Fluid* ↑ proteins, * IgM, * prealbumin
- Trisomy
 - 13 (Patau's syndrome)
 - ↑ AFP, HbF
 - ↓ AFP
 - 18
 - ↑ conjugated Bil
 - ↓ AFP, hCG, estriol
- Tumor Lysis
 - ↑ K, creatinine, uric acid, MAC, P, urea
 - ↓ Ca
 - *Urine* ↑ LAP
 - ↓ volume
- Tumors
 - ↑ AAT, ACA, AD, PLT adhesion, albumin, aldolase, **alpha-1- antichymotrypsin**, **alpha-1-globulins**, **alpha-2-globulins**, alpha-2 pregnancy associated glycoprotein, ALP, A2MG, AMA, ANA, anti-La/SSB, ASAL, ASMA, AST, beta globulins, proteins, **Bil**, **unconjugated Bil**, **Ca**, **Ca²⁺**, **ceruloplasmin**, Cu, CK, CK-MB, CK-MM, estradiol, FDP, ferritin, **ESR**, G, **gamma globulins**, glycated Hb, **haptoglobin**, Hb, hemopexin, h-sVCAM-1, IgG, IgM, C1-INH, plasminogen activator inhibitor, complement – (C3, C4), cortisol, cryofibrinogen, **cryoglobulins**, **uric acid**, **LA**, **LD**, **LD – (2, 3, 4, 5)**, **WBC**, lupus inhibitor, MAC, mac-

rocytes, MD, microcytes, mucoproteins, Na, TM – (AFP, B2M, CEA, hCG, TPA), **orosomuroid**, osteocalcin, PAPP-A, **parathyroid hormone-related protein**, plasmocytes, PP, pyruvic acid, RF, TNF, PLT, UBBC, urea, VDRL (false posit.)

- ↓ **albumin**, ALT, **proteins**, Ca, ceruloplasmin, Cu, **RBC**, Fe, fibrinogen, G, globulins, **Hb**, **HCT**, cholesterol, CHS, IgA, IgE, IgG, IgM, inter-alpha-trypsin inhibitor, complement – (CH₅₀), cortisol, uric acid, MCV, P, **PT**, pO₂, prealbumin, **transferrin satur.**, Se, GH, **TIBC**, transferrin, **PLT**, vitamin – (B₁, B₂, B₁₂, C, folate), Zn
- **Urine** ↑ alpha-aminonitrogen, G, Hb, coproporphyrin III, 17-OHCS, crystals – (urate), beta-aminoisobutyric acid, PBG, porphyrins, **urea**, uroporphyrin, VMA, Zn
- ↓ vitamin C
- **Cerebrospinal Fluid** ↑ adenylate kinase, AFP, beta-glucuronidase, **proteins**, phenylalanine, **glutamine**, glycine, hCG, isoleucine, glutamic acid, leucine, lysine, MBP, P, proline, taurine, pressure, RBC, tryptophan, tyrosine, valine
- ↓ G
- **Pleural Fluid** ↑ albumin, A2MG, **blood**, proteins, CK, eos, **RBC**, FDP, haptoglobin, hemopexin, IgA, IgG, **LD**, **lym**, mononuclear cells, mucopolysaccharides, **neu**, volume, **WBC**
- ↓ alpha globulins, C₃, C₄, pH
- **Pericardial Fluid** ↑ **lym**
- ↓ G
- **Peritoneal Fluid** ↑ ALP, AMS, bacteria (+ culture), **proteins**, cholesterol, fibronectin, RBC, LA, specific gravity, TAG, TM – (CEA), WBC
- ↓ LA
- **Sputum** ↑ **blood**
- **Stool** ↑ **blood**
- **Synovial Fluid** ↑ **volume**

adenoma

– adenoma of hypophysis

- ↑ ACTH, G, GH, LH, TM – (PTH), PRL
- ↓ cortisol

– adrenocortical adenoma

- ↑ ADH, aldosterone, 11-deoxycortisol, EPO, GH-RH, G, Na, hCG, **ILGF-II**, **cortisol**, MAL, cholesterol
- ↓ ACTH, PRA, K, chloride
- **Urine** ↑ aldosterone, estrogens, 17-OHCS, 17-KGS, 17-KS, 18-OH cortisol, **free cortisol**

– pancreatic adenoma

- ↑ ALP, Bil, G, TM – (CA 19-9, CA 50, CEA, DU-PAN-2, SPAN-1, PCAA), pancreatic oncofetal antigen
- **Peritoneal Fluid** ↑ **proteins**, TAG

– thyroid adenoma

- ↑ antimicrosomal Ab, T₃, T₄, **thyroglobulin**
- **Urine** ↑ 5-HIAA

adrenal tumors

- ↑ ADH, **aldosterone**, **androgens**, **androstenedione**, 11-deoxycortisol, DHEA, EPO, estriol, **estrogens**, RBC, G, GH-RH, **ILGF-II**, **cortisol**, MAL, cholesterol, TM – (ACTH, ADH, hCG, NSE, VIP), PRA, pregnenolone, 17-OH progesterone, progesterone, testosterone

- ↓ ACTH, G, K, chloride, PRA
- **Urine** ↑ aldosterone, estriol, estrogens, 17-OHCS, 17-KGS, 17-KS, cortisol, pregnanetriol, free cortisol
- ↓ FSH
- adrenal medulla tumors
- ↑ epinephrine
- bladder tumors
- ↑ ADA, beta-lipotropin, Ca, CK, CK-MB, CK-MM, endorphins, enkephalins, TM - (ACTH, beta-lipotropin, * BTA, CEA, CK-BB, galactosyltransferase, Tennessee antigen, TPA)
- **Urine** ↑ arylsulfatase A, RBC, FDP, fibrinogen, frequency, Hb, pus, blood, LAP, LD, NMP22, WBC
- bone marrow tumors
- ↑ eos, neu, nucleated RBC, schistocytes, teardrop RBC, WBC
- ↓ fibrinogen, PLT, WBC
- bone tumors
- ↑ ACP, ALP, ALP (bone isoenzyme), Ca, Cu, deoxyipyridinoline, WBC, TM - (ALP, CEA), P, pyridinoline, N-telopeptides
- **Urine** ↑ Ca, hydroxyproline
- ↓ Ca
- **Synovial Fluid** ↑ RBC, volume
- osteosarcoma
- ↑ ACP, alpha-2-globulins, ALP, Zn
- breast tumors
- ↑ ACP, aldolase, ALP, ALT, AMS, AMS (P), ANA, beta-glucuronidase, * Ca, ceruloplasmin, CK, CK-BB, CK-MB, CK-MM, CRP, Cu, EGF-R, endorphins, enkephalins, ferritin, glycolipids, HER-2 growth factor, CHS, calcitonin, caseine, lym, mono, * nucleated RBC, WBC, TM - (ACTH, AFP, alpha-lactalbumin, ALP, arylsulfatase B, AST, BCM, B2M, beta-lipotropin, * CA 15-3, CA 19-5, CA 27.29, CA 50, CA 72-4, CA 125, CA 242, CA 549, * CEA, c-erb-B-amplification, CK-BB, esterase, estrogen/glucocorticoid/progesterone receptors, ferritin, hCG, hPL, calcitonin, sialic acid, M2-PK, MCA, PSA, PTH, sialyltransferase, TPA), PL, procathepsin D, prostacyclin
- **Urine** ↑ beta-2-glycoprotein I, Ca, hCG
- ↓ pregnanediol
- **Cerebrospinal Fluid** ↑ TM - (* CEA)
- **Peritoneal Fluid** ↑ proteins, TM - (CEA)
- **Pleural Fluid** ↑ TM - (CA 125), CEA, orosomucoid
- carcinoid
- ↑ ACTH, ADH, ALT, bradykinin, CRH, endorphins, enkephalins, gastrin, GH-RH, glucagon, histamine, calcitonin, kallikrein, catecholamines, WBC, methionine, neurophysin, TM - (beta-lipotropin, CEA, hCG, * 5-HIAA, * NSE), oxytocin, P, gastrin-releasing peptide, PG, PP, * serotonin, somatostatin, GH, substance K, substance P, VIP
- ↓ albumin, amino acids, isoleucine, lysine, niacin, ornithine, tryptophan, tyrosine, valine, vitamin - (A)
- **Urine** ↑ * 5-HIAA, 5-OH-tryptophan, proline, * serotonin, VMA
- ↓ niacin
- **Stool** ↑ fat
- **Synovial Fluid** ↑ WBC, PMN

carcinomatosis

- ↑ albumin, CEA, LD
- ↓ G, Hb
- **Cerebrospinal Fluid** ↑ AFP, * proteins
- ↓ G
- **Peritoneal Fluid** ↑ WBC
- ↓ G

cerebral tumors

- ↑ aldolase, ALT, CK, TM – (NSE)
- **Cerebrospinal Fluid** ↑ proteins, CK, IDH, IgG, IgM, WBC, lym, lysozyme, MBP, tumor cells, P, pressure
- ↓ G

cervix uteri tumors

- ↑ ALP, Cu, lym, TM – (beta-glucuronidase, CA 27-29, * SCCA)
- **Urine** ↑ gonadotropin peptide

chorionepithelioma

- ↑ ALT, AST, estrogens, fibrinogen, ESR, GMT, WBC, TM – (AFP, CEA, * hCG), progesterone, T₄
- ↓ RBC, Hb, HCT, hPL
- **Urine** ↑ hCG, pregnanediol
- **Cerebrospinal Fluid** ↑ hCG

CNS tumors

- ↑ ADH, aldolase, AST, CK, ICD, LD 5, TM – (NSE)
- ↓ Na
- **Urine** ↑ G
- **Cerebrospinal Fluid** ↑ proteins, CK, G, cholesterol, CHS, IDH, IgG, IgM, LA, LD, WBC, lym, lysozyme, MBP, mono, tumor cells, P, plas-mocytes, pressure
- ↓ G, WBC

colorectum tumors

- ↑ ALP, aldolase, beta-glucuronidase, AMS, AMS (P, S), arylsulfatase A, B₂M, CK, CK-BB, CK-MB, CK-MM, endorphins, enkephalins, ESR, hCG, WBC, TM – (ACTH, ADH, AFP, aldolase, AMS, arylsulfatase B, beta-glucosidase, beta-lipotropin, CA 15-3, * CA 19-9, CA 27.29, CA 50, CA 72-4, CA 195, CA 242, CA 549, * CEA, * CASA, CK-BB, galactosyltransferase, h-sICAM-1, LD, M2-PK, beta-oncofetal antigen, ribonuclease, sialyltransferase, Tennessee antigen, TAG 72, TPA, * TPS), PP
- ↓ RBC, Hb, HCT, K
- **Urine** ↑ arylsulfatase A, hCG, pus
- **Stool** ↑ blood, Hb, RBC, mucus
- **Peritoneal Fluid** ↑ proteins, TAG, TM – (CEA)
- **Pleural Fluid** ↑ AMS

embryonic tumors

- ↑ TM – (AFP, hCG)
- **Urine** ↑ hCG

endometrium tumors

- ↑ GH-RH, TM – (CA 125)
- **Urine** ↑ gonadotropin peptide
- **Peritoneal Fluid** ↑ CA 125

esophageal tumors

↑ AMS, Ca, WBC, TM – (CEA, M2-PK, SCCA)

■ **Stool** ↑ blood

feminizing tumors

↑ estradiol

↓ FSH, LH, progesterone

gallbladder tumors

↑ alpha-1-globulins, ALP, ALT, AST, Bil, conjugated Bil, CK, CRP, clotting time, elastase, endorphins, enkephalins, fibrinogen, GMD, GMT, haptoglobin, cholesterol, IgA, LAP, 5-nucleotidase, PL, PT, TAG, TM – (ACTH, beta-lipotropin, CA 19-9, CA 27-29, CEA, TPA)

↓ RBC, Hb, HCT, factor II, vitamin – (B₂)

■ **Urine** ↑ conjugated Bil, pH

↓ Na, volume, UBG

■ **Stool** ↑ blood

↓ Bil, UBG

gastrointestinal tract tumors

↑ ADH, aldolase, ALP, CK, CK-BB, CRP, Cu, IgA, WBC, neu, TM – (ALP, CA 19-5, CA 19-9, CA 50, CA 72-4, CA 125, CA 242, * CEA, c-erb-B-2-amplification, CK-BB, DU-PAN-2, galactosyltransferase, sialic acid, PSA, SCCA, Tennessee antigen)

↓ G, Se, transferrin satur.

■ **Urine** ↑ 5-HIAA

■ **Peritoneal Fluid** ↑ proteins, TAG, TM – (CEA)

■ **Pleural Fluid** ↑ TM – (CA 125, CEA)

■ **Stool** ↑ blood

hemangioma

↓ PLT

■ **Synovial Fluid** ↑ RBC

hypophysis tumors

↑ ACTH, CRH, GH-RH, PRL, GH

↓ ADH, ILGF-I

■ **Urine** ↑ 17-OH corticosteroids, cortisol, 17-KS, specific gravity

intracranial tumors

– astrocytoma

■ **Cerebrospinal Fluid** ↑ enolase, fibronectin

– dysgerminoma

■ **Cerebrospinal Fluid** ↑ AFP, hCG, MBP

– ganglioblastoma

↑ epinephrine, CK, catecholamines, norepinephrine, VIP

■ **Urine** ↑ catecholamines, HVA, normetanephrine, VMA

– ganglioneuroma

↑ epinephrine, CK, dopamine, catecholamines, TM – (CEA, NSE, VIP), norepinephrine

■ **Urine** ↑ HVA, catecholamines, cystathionine, norepinephrine, normetanephrine, VMA

– neuroblastoma

↑ epinephrine, ILGF-II, LATS, * catecholamines, * dopamine, TM – (CEA, ferritin, * NSE, VIP), protein S-100, norepinephrine

↓ RBC, Hb, HCT, WBC, PLT

■ **Urine** ↑ cystathionine, * HVA, catecholamines, metanephrines, norepinephrine, normetanephrine, * VMA

- paraganglioma

↑ epinephrine, catecholamines, norepinephrine

■ *Urine* ↑ catecholamines

Kaposi's sarcoma

↑ HLA - (DR5), IL-6

kidney tumors

↑ ALP, ALT, amylin, ANA, AST, Ca, **endorphins, enkephalins**, RBC, EPO, ESR, glucagon, IL-6, WBC, TM - (ACTH, AFP, beta-lipotropin, CA 27-29, CA 50, CEA, * M2-PK, NSE, PRL, PSA, PTH, GH), PGE, PRA, PLT, PT

↓ albumin

■ *Urine* ↑ ALP, proteins, RBC, Hb, blood, LAP, LD

- hypernephroma

↑ alpha-2-globulins, ALP, ALT, AST, Bil, Ca, Ca²⁺, RBC, EPO, ESR, HCT, PT, PGE, PRA, PRL, PSA, PLT, PTH

↓ albumin, RBC, Hb, HCT

■ *Urine* ↑ RBC, Hb, blood

- nephroblastoma

↑ EPO, ILGF-II

■ *Urine* ↑ RBC, Hb, LAP

larynx tumors

↑ ACTH, beta-lipotropin, endorphins, enkephalins, TM - (* SCCA)

■ *Urine* ↑ 5-HIAA

left heart atrium myxoma

↑ AST, CRP, ESR, gamma globulins, IgG, LD, WBC, poikilocytes, RTC

↓ RBC, Hb, HCT, PLT

leiomyoma

↑ EPO

liver tumors

↑ ACTH, **aldolase**, ALP, ALT, ASMA, AST, beta-glucuronidase, Bil, conjugated Bil, unconjugated Bil, B2M, Ca, CK-MB, CK-MM, RBC, EPO, estrogens, ferritin, ESR, GMT, hPL, cholesterol, ICD, IgA, ILGF-II, calcitonin, cryofibrinogen, LAP, LD, LDL-C, WBC, Na, neu, TM - (* AFP, aldolase, alcohol dehydrogenase, ALP, CA 15-3, CA 19-9, CA 27-29, CA 125, CEA, ferritin, GMT, hCG, hexokinase, LAP, LD, 5-nucleotidase, placental lactogen, PTH, pyruvate kinase, TPA), OCT, prothrombin, SD, TAG, UBBC, vitamin B₁₂, bile acids

AAT, AMS, RBC, fibrinogen, G, Hb, HCT, cholesterol, IgM, ILGF-I, Mg

■ *Urine* ↑ cystathionine, ethanolamine, hCG

■ *Peritoneal Fluid* ↑ * blood, RBC, sTM - (CEA)

lung tumors

↑ ACTH, ACP, ADH, **aldolase**, ALP, ALT, AMS, AMS (S), ANA, proteins, Ca, CIC, CK, CK-BB, CK-MB, CK-MM, CRH, CRP, Cu, elastase, eos, RBC, ferritin, fibrinogen, **gastrin**, GH-RH, glucagon, hPL, insulin, calcitonin, LD, lipase, WBC, * nucleated RBC, TM - (ACTH, ADH, AFP, aldolase, ALP, B2M, bombezin, CA 15-3, CA 19-9, CA 27-29, CA 50, CA 72-4, CA 125 - small-cell, epithelial, CA 549, * CEA - small-cell, epithelial, CK-BB, c-myc-translocation, CYFRA 21-1, DU-PAN-2, ferritin, hCG, hPL, calcitonin, **chromogranin A, B** - small-cell, sialic acid, L-dopa-decarboxylase, M2-PK, MCA, MSH, **neurophysins**, NSE - small-cell, **oxytocin**, PRL, PSA, PTH, ribonuclease, SCCA

- epithelial, sialyltransferase, TPA – small-cell, thymidine kinase – small-cell, VIP), gastrin-releasing peptide, PTH, serotonin, somatostatin, GH
- ↓ ACE, fibrinogen, Hb, HCT, Na, RBC
- *Urine* ↑ alpha-aminonitrogen, amino acids, AMS, Ca, G, hCG
- *Pleural Fluid* ↑ albumin, A2MG, AMS, beta-glucuronidase, **blood, proteins**, TM – (CA 125), CEA, eos, RBC, FDP, haptoglobin, hemopexin, IgA, IgG, LD, lym, WBC, mononuclear cells, mucopolysaccharides, neu, volume, orosomucoid
- ↓ alpha globulins, C3, C4, G, pH
- *Peritoneal Fluid* ↑ TM – (CEA)
- *Sputum* ↑ **blood, * malignant cells**
- *Bronchoalveolar Lavage Fluid* ↑ * malignant cells
- non-small cell bronchogenic tumor
 - ↑ B2M, CEA
- small cell bronchogenic tumor
 - ↑ ADH, CK-BB, CRH, **endorphins, enkephalins**, fibrinogen, GH-RH, TM – (ACTH, ADH, bombesin, * CEA, CRP, elastase, hCG, cortisol, neurophysins, * NSE, placental lactogen, thymidine kinase, VIP), **oxytocin**, PRL
 - ↓ WBC
 - *Urine* ↑ 5-HIAA
 - *Pleural Fluid* ↑ proteins, eos
 - ↓ alpha globulins
 - *Sputum* ↑ * malignant cells
 - *Bronchoalveolar Lavage Fluid* ↑ * malignant cells
- lymphosarcoma
 - ↑ alpha-2-globulins, IgM, cryoglobulins, lym
 - *Urine* ↑ uric acid
 - *Cerebrospinal Fluid* ↑ LD
- malignant lymphoma
 - ↑ ADH, aldolase, ANA, conjugated Bil, unconjugated Bil, Ca, CK, CK-MB, CK-MM, CK-BB, Cu, eos, Fas-ligand, gamma globulins, hPL, **cold agglutinins**, chylomicrons, IDL-C, IgG, IgM, IL-6, creatinine, **cryoglobulins**, uric acid, sialic acid, LA, LD, LD – (2, 3, 4), WBC, **mono**, neu, TM – (AFP, ALP, BCL-2, B2M, CD 30+, CEA, CK-BB, c-myc-translocation, **ferritin, fibronectin**, immunoglobulins, LD, sialic acid, **thymidine kinase**), paraproteins, placental lactogen, PRL, pyroglobulins, **terminal deoxynucleotidyl transferase**, PLT, vitamin – (D2), VLDL-C
 - ↓ ALP, Hb, Ca-esterase inhibitor, folate, lym, neu, PLT, vitamin D2, Zn
 - *Urine* ↑ Bence Jones protein, **proteins**, Ca, RBC, casts
 - *Cerebrospinal Fluid* ↑ enolase, LD
 - ↓ G
 - *Pericardial Fluid* ↑ volume
 - *Peritoneal Fluid* ↑ eos, volume, **proteins**, TAG
 - *Pleural Fluid* ↑ B2M, lym
- Burkitt's malignant lymphoma
 - ↑ ALT, anti-EBV, B2M, Ca, CRP, elastase, gamma globulins, IgG, WBC
 - ↓ IgM, lym

- cutaneous T-cell malignant lymphoma

↑ * lym, * Sézary cells, WBC

- Hodgkin's malignant lymphoma

↑ ACE, Al, alpha-1-globulins, alpha-2-globulins, ALP, ALP (WBC), ALT, AST, baso, Bil, beta globulins, B2M, BSP retention, Ca, ceruloplasmin, CO₂, CRP, Cu, eos, ferritin, ESR, nucleated RBC, fibrinogen, fucose, gamma globulins, globulins, GMT, haptoglobin, hexokinase, HBsAg, HLA - (A1, DP3, DP4), h-sICAM-1, hydroxyproline, chylomicrons, IgA, IgE, IgG, IgM, uric acid, complement - (total), creatinine, cryofibrinogen, cryoglobulins, uric acid, LA, LAP (WBC), LD, LD - (2, 3, 4), WBC, lym, lysozyme, mono, mucoproteins, neu, 5-NT, TM - (AFP, ALP, CEA, ferritin), osmotic fragility (RBC), paraproteins, pCO₂, prealbumin, pyruvate, RF, RTC, PLT, vitamin B₁₂ binding capacity, vitamin - (B₁), VLDL-C, Zn

↓ ACE, albumin, ALP, ALP (WBC), beta globulins, proteins, BT, EPO, RBC, Fe, gamma globulins, Hb, HCT, cholesterol (RBC), IgA, IgG, complement - (C₃), uric acid, WBC, lym, PLT, TIBC, transferrin satur., T-cells, Zn

■ Urine ↑ hydroxyproline, lysozyme, PBG, porphyrins

■ Cerebrospinal Fluid ↑ B2M, enolase, eos

■ Peritoneal Fluid ↑ eos, volume, proteins, TAG

■ Pleural Fluid ↑ AMS, proteins, eos, lym

- lymphocytic malignant lymphoma

■ Peritoneal Fluid ↑ proteins

- non-Hodgkin's malignant lymphoma

↑ AAT, ACP, ACP (prostatic), aldolase, ALP, ALP (WBC), alpha-2-globulins, ALT, AST, B2M, Bil, BSP retention, Ca, Cu, ESR, ferritin, fucose, gamma globulins, GMT, haptoglobin, hexokinase, cold agglutinins, chylomicrons, immunoglobulins, IgG, IgM, creatinine, cryoglobulins, uric acid, LA, LD, WBC, lym, mono, Na, 5-NT, pyruvate, RF, TM - (ferritin, CA 125, CEA, LD), UBBC, urea, vitamin - (B₁₂, D₃), VLDL-C

↓ ACE, ACP (WBC), albumin, ALP, ALP (WBC), beta globulins, proteins, RBC, Fe, gamma globulins, globulins, Hb, HCT, cholesterol, immunoglobulins, WBC, MCH, MCHC, MCV, RTC, PLT, TIBC, transferrin satur., vitamin - (D₃), Zn

■ Urine ↑ Ca, uric acid, 5-HIAA

■ Cerebrospinal Fluid ↑ B2M

■ Pleural Fluid ↑ proteins

maskulinizing tumors

↑ estradiol, FSH, LH, progesterone

■ Urine ↑ 17-ketosteroids

mastocytosis, systemic

↑ APTT, eos, bas, * histamine, tryptase, WBC

↓ Hb, HCT, PLT, WBC

■ Urine ↑ * histamine, * histamine metabolites

■ Gastric Fluid ↑ HCl

↓ pH

melanoma

↑ aldolase, ALT, ANA, eos, h-sICAM-1, MAC, WBC, neu, TM - (melanoma-associated Ag, B2M, CEA, hCG, sialic acid, NSE, * intracellular S-100 protein, SCCA, thymidine kinase)

- ↓ IgD, MLA
 - **Urine** ↑ hCG, melanin
 - **Cerebrospinal Fluid** ↓ G
- mesothelioma**
- **Pleural Fluid** ↑ eos, hyaluronic acid
 - **Bronchoalveolar Lavage Fluid** ↑ mesothelial cells
 - **Peritoneal Fluid** ↑ hyaluronic acid, volume
- myelodysplastic syndrome**
- ↑ BT, EPO, WBC, **macrocytes**, MCV, **mono**, poikilocytes, schistocytes, transferrin receptor
 - ↓ RBC, Hb, HCT, WBC, neu, pyruvate kinase, RTC, PLT
- ovary tumors**
- ↑ ALP, ALT, AMS, AMS (S), ANA, **androstenedione**, B2M, Ca²⁺, CK-BB, CK-MB, CK-MM, RBC, estriol, **estrogens**, gastrin, ILGF-II, mono, TM - (AFP - germinative cells, ALP-placental, antigen of ovarian carcinoma, CA 15-3 - epithelial cells, CA 19-5, CA 19-9 - epithelial cells, CA 27:29, CA 50, CA 72-4 - epithelial cells, * CA 125 - epithelial cells, CA 549, * CASA, CEA, CK-BB, c-erb-B-2-amplification, DU-PAN-2, galactosyltransferase, glycosyltransferase, hCG - germinative cells, hPL, MCA, PRL, procollagen, ribonuclease, TPA - epithelial cells), progesterone, 17-OH progesterone, PTH, testosterone
 - **Urine** ↑ AMS, estriol, estrogens, gonadotropin peptide, hCG, 17-KS, pregnanetriol
 - ↓ FSH, **pregnanediol**
 - **Peritoneal Fluid** ↑ AMS, * **proteins** (adenocarcinoma), TM - (CA 125, CEA)
 - **Pleural Fluid** ↑ AMS, TM - (CA 125), orosomuroid
- feminizing arrhenoblastoma**
- ↓ **pregnanediol**
 - **Urine** ↑ pregnanediol
 - ↓ FSH
- masculinizing arrhenoblastoma**
- ↑ * **testosterone**
 - **Urine** ↑ androsterone, 17-KS, testosterone
 - ↓ FSH
- pancreatic tumors**
- ↑ ADH, aldolase, ALP, ALT, AMS, AMS (P, S), beta-glucuronidase, Bil, conjugated Bil, Ca, Ca²⁺, CRP, euglobulin lysis time, elastase, **endorphins**, **enkephalins**, ferritin, fibrinogen, **GH-RH**, GMT, h-sICAM-1, cholesterol, chymotrypsin, ILGF-II, **calcitonin**, glutamic acid, LAP, lipase, WBC, TM - (ACTH, ADH, AFP, AMS, **beta-lipotropin**, CA 15-3, CA 19-5, CA 19-9, CA 27:29, CA 50, CA 72-4, CA 125, CA 195, CA 242, CEA, DU-PAN-2, ferritin, galactosyltransferase II-isoenzyme, hCG, calcitonin, chromogranin A, B, LAP, NSE, pancreatic oncofetal antigen, SPAN-1, TPA, VIP), pancreatic ribonuclease, PTH, somatostatin, GH, thrombomodulin
 - ↓ AMS (later), **fibrinogen**, glucagon, immunoreactive trypsin, lipase (later), trypsin, vitamin - (E)
 - **Urine** ↑ AMS, conjugated Bil, G, hCG, UBG
 - Stool** ↑ blood, fat
 - **Peritoneal Fluid** ↑ AMS, **proteins**, TAG, TM - (CEA)
 - **Pleural Fluid** ↑ AMS, orosomuroid

- glucagonoma
 - ↑ G, * glucagon, * insulin, PP
 - ↓ Hb, HCT
- insulinoma
 - ↑ C-peptide, immunoreactive proinsulin, * insulin, IRI, PP, * proinsulin
 - ↓ * G
- pancreatic head tumors
 - ↑ * ALP, * Bil, * conjugated Bil, * PT, * cholesterol
 - *Urine* ↓ UBG
 - *Stool* ↓ UBG
- pheochromocytoma
 - ↑ epinephrine, aldosterone, Ca, dopamine, endorphins, enkephalins, RBC, EPO, G, gastrin, GH-RH, glucagon, HbA_{1c}, hPL, * catecholamines, cholesterol, calcitonin, LDL-C, WBC, TM - (ACTH, beta-lipotropin, NSE, VIP), * norepinephrine, PRA, somatostatin, FFA
 - ↓ RBC, K, HCT, P
 - *Urine* ↑ proteins, G, * catecholamines, HVA, * metanephrines, urea, VMA, free epinephrine, free norepinephrine
- placental tumors
 - ↑ hCG
 - *Urine* ↑ hCG
- pleural tumors
 - ↑ CA 125
 - *Pleural Fluid* ↑ ALP, eos
- prolactinoma
 - ↑ * PRL
 - ↓ FSH, LH, testosterone
 - *Seminal Fluid* ↓ spermatozoa
- prostate tumors
 - ↑ ADA, ADH, aldolase, ALP, ALT, AMS, AMS (S), beta-lipotropin, CK, CK-BB, CK-MB, CK-MM, euglobulin lysis time, endorphins, enkephalins, cholesterol, IGFBP-2, LD 5, * nucleated RBC, TM - (* ACP, ACTH, ALP, CA 15-3, CA 50, CA 549, CEA, CK-BB, GMT, sialic acid, * prostatic ACP, * PSA, TPA), PT, plasmin, prostacyclin, urea
 - ↓ fibrinogen, Hb, HCT, testosterone
 - *Urine* ↑ RBC, Hb, pus, blood, LAP, LD, WBC
 - *Pleural Fluid* ↑ AMS
- renin secreting tumors
 - ↑ aldosterone, HCT, Na, PRA
 - ↓ K
- reticulosarcoma
 - ↑ alpha-2-globulins, beta globulins, gamma globulins, cold agglutinins
- retinoblastoma
 - ↑ TM - (NSE)
- sarcoma
 - ↑ alpha-2-globulins, Ca, CK-MB, MAC, TM - (ALP)
 - *Urine* ↑ Bence Jones protein
- seminoma
 - ↑ ALP, FSH, LD1, TM - (AFP, ALP, CEA, * hCG, hPL, NSE, LD)
 - *Urine* ↑ hCG

somatostatinoma

- ↑ ACTH, G, gastrin, glucagon, insulin, calcitonin, PG, **somatostatin**, substance P, VIP
- ↓ G, chloride

spinal cord tumors

- ↑ TM - (CA 125)
- **Cerebrospinal Fluid** ↑ * **proteins**

stomach tumors

- ↑ aldolase, ALT, **APA**, CK-MB, CK-MM, Cu, echinocytes, **ESR**, **gastrin**, hCG, hexosaminidase, h-sICAM-1, chymotrypsin, insulin, WBC, lym, mono, TM - (AFP, aldolase, beta-glucuronidase, **CA 19-9**, **CA 27-29**, **CA 50**, **CA 72-4**, **CA 125**, **CA 195**, **CA 242**, **CEA**, hCG, chromogranin A, B, M2-PK, pancreas-associated antigen, **TPA**), PP
- ↓ albumin, RBC, G, Hb, HCT, **pepsinogen**, transferrin satur., vitamin - (**B₁₂**)
- **Urine** ↑ hCG, pepsinogen I
- **Stool** ↑ Hb, RBC, **blood**
- **Peritoneal Fluid** ↑ volume, **proteins**, TAG, TM - (CEA)
- **Pleural Fluid** ↑ **AMS**
- **Gastric Fluid** ↑ beta-glucuronidase, CEA, fetal sulfoglycoprotein antigen, mucus, **blood**, **LA**, **volume**, **pH**
- ↓ BAO, MAO, HCl

sympathoblastoma

- **Urine** ↑ **VMA**

teratoma

- ↑ **LD₁**, TM - (AFP, hCG)
- **Urine** ↑ hCG

testis tumors

- ↑ aldolase, ALP, **ALP** (placental), androstenedione, anti-human papilloma virus Ab, beta-lipotropin, Ca, CK, endorphins, enkephalins, estriol, **estrogens**, ferritin, LD, TM - (ACTH, * **AFP**, **ALP**, **CEA**, **CK-BB**, ferritin, * **hCG**, hPL, **LD**, * **M2-PK**, SP-1, **TPA**), testosterone
- ↓ FSH, LH, testosterone
- **Urine** ↑ **estriol**, **estrogens**, **17-ketosteroids**
- ↓ FSH

thymus tumors

- ↑ ACTH, ADH, beta-lipotropin, endorphins, enkephalins
- ↓ WBC

thyroid gland tumors

- ↑ antimicrosomal Ab, antithyroglobulin Ab, antithyroidal Ab, thyroxine autoantibodies, **endorphins**, **enkephalins**, **histaminase**, iodine, nucleated RBC, LD, TM - (ACTH, AFP, **beta-lipotropin**, **CA 50**, **CEA** - follicular, medullar, hCG, * **calcitonin** - medullar, **NSE**, **TPA** - medullar, thyroglobulin - follicular), gastrin-releasing peptide, PP, somatostatin, substance P, T₃, T₄, **TSH**, * **thyroglobulin**, **VIP**
- **Urine** ↑ 5-HIAA

uterus tumors

- ↑ beta-lipotropin, CK, endorphins, enkephalins, **EPO**, RBC, TM - (ACTH, **CA 15-3**, **CA 27-29**, **CA 125**, **CEA**, **CK-BB**, beta-glucuronidase, hPL, **SCCA**, **TPA**)
- **Urine** ↑ pus, **LAP**

VIPoma	<ul style="list-style-type: none"> ↑ Ca, G, MAC, PP, * VIP ↓ chloride, K, P, pH ■ <i>Gastric Fluid</i> ↓ HCl ■ <i>Stool</i> ↑ HCO₃⁻, * volume
Tumors, Malignant, Metastases Into	<ul style="list-style-type: none"> ↑ ALP, ALT, Bil, ESR, GMT, uric acid, LA, LD, WBC ↓ CK, LH, osteocalcin, PT, GH ■ <i>Urine</i> ↑ RBC
bone	<ul style="list-style-type: none"> ↑ ACP, ALP, Ca, fibrinogen, HbF, TM - (ALP, PSA), osteocalcin, P ↓ gamma globulins, P, PTH ■ <i>Urine</i> ↑ Bence Jones protein, Ca, free hydroxyproline, TM - (hydroxyproline), P ↓ Ca
- osteoblastic bone tumor metastases	<ul style="list-style-type: none"> ↑ ACP, ALP, Ca, P ↓ Ca, P ■ <i>Urine</i> ↓ Ca
- osteolytic bone tumor metastases	<ul style="list-style-type: none"> ↑ ACP, ALP, Ca, P ■ <i>Urine</i> ↑ Ca
central nervous system	<ul style="list-style-type: none"> ■ <i>Cerebrospinal Fluid</i> ↑ A₂MG, CEA, CK, enolase, fibronectin, LA, LD, MBP, WBC ↓ G
gastrointestinal tract	<ul style="list-style-type: none"> ↑ eos ■ <i>Peritoneal Fluid</i> ↑ AMS, volume ↓ pH
liver	<ul style="list-style-type: none"> ↑ aldolase, ALP, arylsulfatase, AST, conjugated Bil, unconjugated Bil, GMT, guanine deaminase, h-sICAM-1, LD, 5-nucleotidase, OCT ↓ pseudocholinesterase
lung	<ul style="list-style-type: none"> ↑ Ca, CA 549, eos
pancreas	<ul style="list-style-type: none"> ↑ Ca ■ <i>Peritoneal Fluid</i> ↑ pH
prostate	<ul style="list-style-type: none"> ↑ ACP, CA 549, LD 5, plasmin, plasminogen ↓ fibrinogen
Tyrosinemia	<ul style="list-style-type: none"> ↑ AFP, conjugated Bil, unconjugated Bil, phenylalanine, methionine, * tyrosine ↓ delta-aminolevulinic dehydratase, Hb, HCT, PLT, serotonin, WBC ■ <i>Urine</i> ↑ tyramine, * tyrosine, acetic acid, delta-aminolevulinic acid, lactic acid, phenylalanine, p-OH-phenylpyruvic acid, p-OH-phenyl-lactic acid, * succinylacetone ↓ 5-HIAA ■ <i>Amniotic Fluid</i> ↑ succinylacetone

Undernutrition

- ↓ **albumin**, ALP, ESR, gamma globulins, Hb, cholesterol, CHS, **lym**, **transferrin**, urea
- **Gastric Fluid** ↓ pH

Uremia

- ↑ ACTH, * **Al**, alpha-aminonitrogen, * **ALP**, **AMS**, * **ANA**, * **ANCA**, **ANF**, **ammonia**, Apo B, beta-endorphins, BHBA, * **B2M**, **BNP**, **BT**, Ca, * **Ca₂₊** (stage dependent), CA 19-9, CEA, CK, CK-MB, CK-BB, **C-peptide**, * **cystatine C**, echinocytes, estriol, Fe, fluoride, fructosamine, **gastrin**, fibrinogen, G, **glucagon**, glycerol, glycated albumin, cGMP, HbF, histamine, hydroxyproline, * **chloride**, **cholesterol**, **chymotrypsin**, ILGF-I, IGFBP-3, **insulin**, * **K**, **calcitonin**, catecholamines, cortisol, * **creatinine**, * **uric acid**, LA, LD, LDL-C, LH, LPs, WBC, MAC, Mg, Na, neu, Ni, NT-pro-ANP, * **osteocalcin**, plasma volume, NSE, **osmolality**, P, PP, PT, PRA, PRL, * **PTH**, pyruvate, schistocytes, Se, secretin, somatostatin, GH, * **TAG**, thrombomodulin, **trypsin**, cTnT, TT, PLT, * **urea**, vitamin – (A, B₁₂, D, E), VLDL-C
- ↓ PLT adhesion, PLT aggregation, * **albumin**, aldosterone, AST, **proteins**, Ca, * **Ca²⁺** (stage dependent), RBC, * **EPO**, factors – (II, VII, IX, X, XIII), * **Fe**, G, **haptoglobin**, Hb, HCT, **GHb**, HDL-C, HCO₃⁻, cholesterol, K, complement – (C3, C5, C6, C7, C8), cortisol, glutamic acid, LCAT, WBC, **lym**, Na, **pH**, PRA, prekallikrein, progesterone, Se, serotonin, T3, T4, TAG, **testosterone**, transferrin, transferrin receptor, PLT, vitamin – (B₁, B₆, D₃, folate), Zn
- **Urine** ↑ **AMS**, * **proteins**, * **RBC**, G, **pus**, K, * **blood**, WBC, Na, casts – (cellular, granular, hyaline, waxy), VMA
- ↓ * **specific gravity**, Mg, * **volume** (later), oxalate, pH, Se urea, VMA
- **Cerebrospinal Fluid** ↑ **proteins**, G, **pressure**, WBC, urea
- **Pericardial Fluid** ↑ RBC, volume
- **Pleural Fluid** ↑ **proteins**, eos, RBC, **lym**
- **Gastric Fluid** ↑ pH
- ↓ HCl
- **Stool** ↑ **blood**
- **Seminal Fluid** ↓ spermatozoa count
- **Synovial Fluid** ↑ **crystals** – (hydroxyapatite, urate)
- **Sweat** ↑ **chloride**, Na

Urethritis

- **Urine** ↑ RBC, Hb, **pus**, WBC

Urolithiasis

- ↑ * **Ca**, * **uric acid**, * **PTH**
- ↓ **Fe**, * **P**
- **Urine** ↑ Ca, **proteins**, cystine, RBC, Hb, **pus**, **blood**, creatinine, crystals, oxalate, WBC, pH, urea
- ↓ **volume**, pH

calcium urolithiasis

- ↑ Ca, cAMP
- **Urine** ↑ cAMP

Urticaria

- ↑ **eos**, eosinophilic cationic protein, WBC
- ↓ **bas**
- **Synovial Fluid** ↑ eos

Uveitis, Acute Anterior

- ↑ HLA – (B27)

Note: molecular biology – polymorphism CTLA-4

Vaccination

- ↑ VDRL (false)
- **Cerebrospinal Fluid** ↑ eos

Vagotomy

- ↑ gastrin
- ↓ somatostatin
- **Gastric Fluid** ↑ pH
- ↓ HCl

Varicocele

- **Seminal Fluid** ↓ alpha-glucosidase, spermatozoa count

Vasculitis

- ↑ AAT, ALT, * ANA, * ANCA, c-ANCA, p-ANCA, antiendothelial Ab, anti-MPO, APLA, AST, B2M, CIC, CK, CRP, elastase, eos, phospholipase A2, * ESR, * gamma globulins, HBsAg, h-sVCAM-1, * IFN-gamma, IgA, IgG, IL-1, creatinine, * cryoglobulins, WBC, lym, lymphocytotoxic Ab, neu, RF, schistocytes, * TNF-alpha, PLT, urea
- ↓ ACE, albumin, RBC, Hb, HCT, complement – (C3, C4, CH50), WBC, PLT
- **Urine** ↑ proteins, Hb, blood, RBC, casts – (RBC)
- **Cerebrospinal Fluid** ↑ CK, WBC, MBP
- **Peritoneal Fluid** ↑ eos
- **Sputum** ↑ blood
- **Synovial Fluid** ↑ clot formation, WBC, PMN, volume
- ↓ viscosity

allergic vasculitis

- ↑ eos, ESR, cryoglobulins, WBC, RF
- **Urine** ↑ protein

necrotizing vasculitis

- ↑ ANA, ANCA, CRP, eos, ESR, gamma globulins, HBsAg, immunoglobulins, WBC, neu, RF
- ↓ RBC, Hb, HCT, complement – (C3, C4, CH50)

urticarial vasculitis

- ↑ eos, ESR
- ↓ complement – (C3)

Vasculopathies

- ↑ BT, Rumpel–Leede test positive

Vasectomy

- ↑ * antispermatozoal Ab
- **Seminal Fluid** ↑ * antispermatozoal Ab
- ↓ alpha-glucosidase, spermatozoa count

Virilism

- ↑ DHEA, testosterone, free testosterone (F)
- **Urine** ↑ 17-OHCS

Vitiligo

- ↑ ANA
- **Gastric Fluid** ↑ pH
- ↓ HCl

Vomiting

- ↑ * **acetone, proteins**, Ca, CO₂, RBC, * **HCO₃⁻**; K, * **acetoacetic acid, ketobodies, creatinine**, WBC, MAC, * **MAL**, Na, neu, osmolality, pCO₂, PT, * **pH**, RAC, * **urea**
- ↓ * **chloride**, K, Na, osmolality, **plasma volume, P**
- **Urine** ↑ acetone, ammonia, K, ketones, specific gravity, pH
- ↓ **chloride**, K, Na, pH

Vulvovaginitis

- ↑ WBC, PMN
- **Urine** ↑ **bacteria** (+ culture), **fungi**, WBC, PMN, pH
- **Vaginal Fluid** ↑ * **bacteria** (+ culture), * **fungi**, pH

Xanthelasma

- ↑ cholesterol

Xanthinuria

- ↑ hypoxanthine, xanthine
- ↓ * **uric acid**
- **Urine** ↑ hypoxanthine, xanthine, xanthine calculi
- ↓ **uric acid**

Xanthochromatosis

- **Synovial Fluid** ↑ macrophages

Xanthoma

- ↑ **cholesterol, LDL-C, lipids, TAG**
- ↓ HDL-C

Xerophthalmia

- ↓ vitamin - (A)