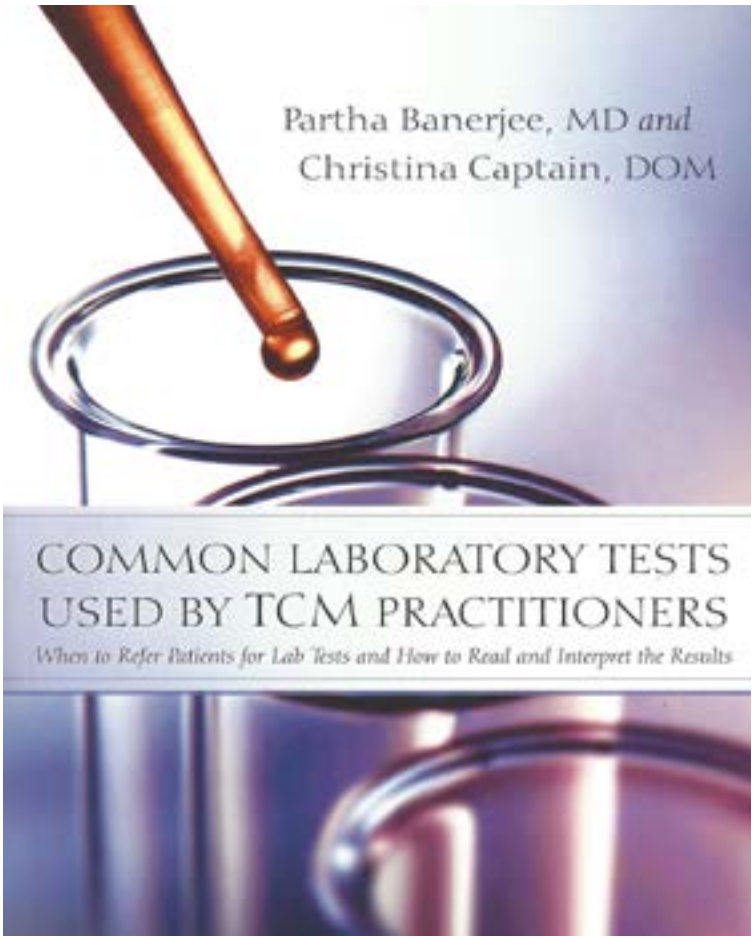
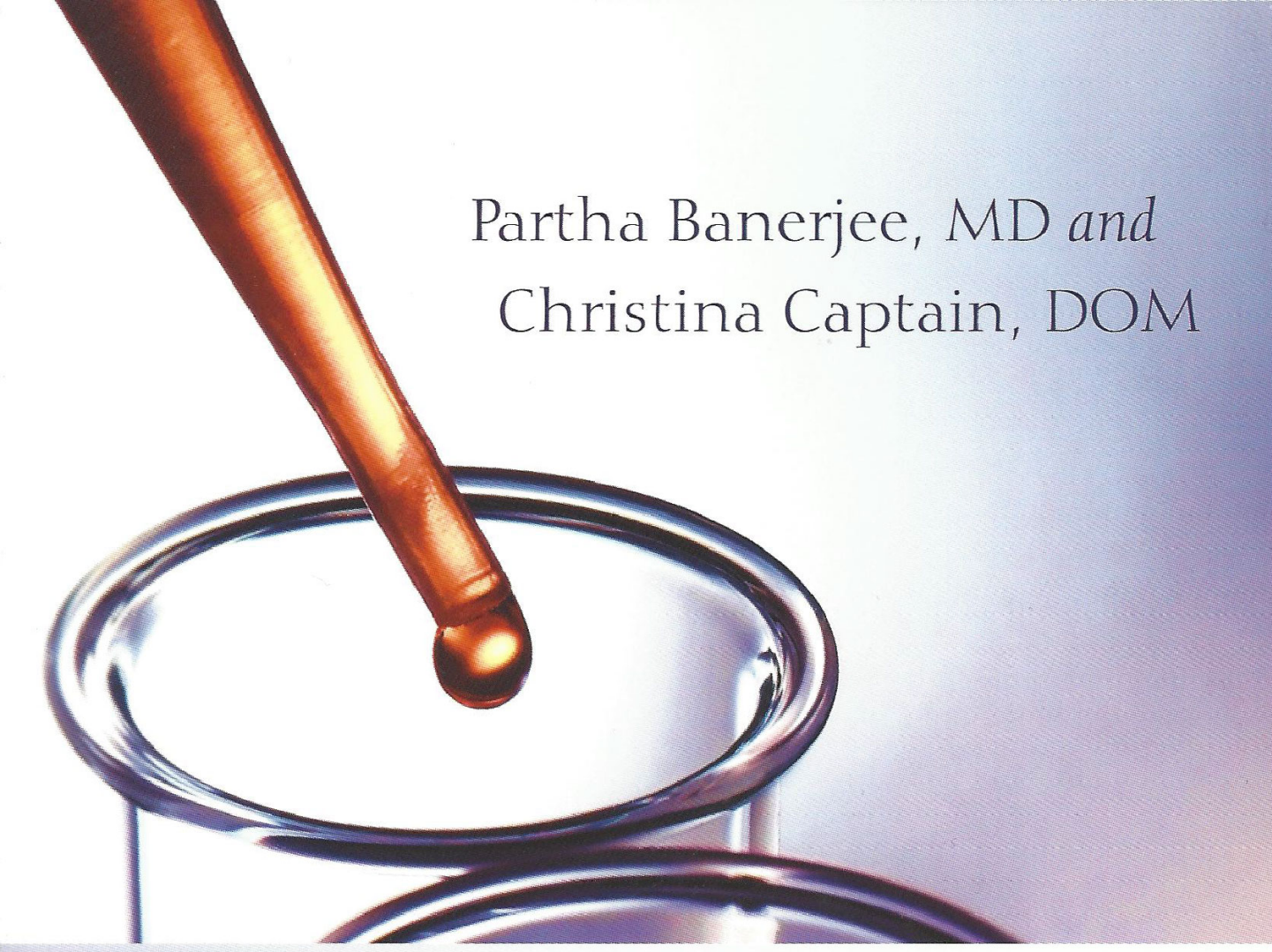
Banerjee, P./ Captain, C.

Common Laboratory Tests Used by TCM Practitioners





Partha Banerjee, MD *and*
Christina Captain, DOM

COMMON LABORATORY TESTS USED BY TCM PRACTITIONERS

When to Refer Patients for Lab Tests and How to Read and Interpret the Results

SINGING DRAGON

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THE KIDNEYS AND THE URINARY SYSTEM

BASIC SCIENCE

Kidney Functions

- Excrete nitrogenous wastes—primary function
- Maintain water balance
- Maintain electrolyte balance
- Maintain pH balance
- Perform endocrine functions, which include secreting:
  - renin
  - 1,25 vitamin D

    - erythropoietin
- Maintain blood pressure

These kidney functions are maintained by an adequate flow of blood through the kidney at all times. The rate at which blood is cleaned in the kidneys is called glomerular filtration rate (GFR), which normally is 120 ml/min. At the time of protein metabolism, the nitrogen is converted into ammonia, a toxic substance for the body. This ammonia is converted by the liver to a less noxious substance called blood urea nitrogen (BUN). The kidney excretes BUN along with creatinine, which is formed by the breakdown of muscle cells and uric acid. Of the endocrine functions, erythropoietin stimulates the bone marrow to form RBCs. Renin, along with other subsequent endocrine secretions, helps maintain volume and blood pressure, whereas 1,25 vitamin D helps calcium and bone metabolism and has many other protective roles. The nephron, or the functional kidney unit, makes an ultra-infiltrate of the blood at the glomerulus. Most of the essential substances are reabsorbed at the proximal convoluted tubule. At the loop of Henle, a variable percentage of water and electrolytes are reabsorbed depending on the needs of the body. Other substances such as potassium, hydrogen, and creatinine are also added to the urine by secretion into the nephron at the convoluted tubules. All of the above results in the excretion of about 1500 cc of urine every day. Normal urine should not contain any blood cells or protein, as they are never filtered (except very small amounts of protein, usually not detected by standard tests). Whenever there is impairment of the kidney function there is a simultaneous decrease in GFR, even before blood tests show any change. This makes GFR an excellent measure of kidney function.

BLOOD TESTS FOR KIDNEY FUNCTION

A common way to assess kidney function is to measure the concentration of substances the kidney usually excretes:

BUN

Normal: 6–20 mg/dL

Creatinine

Normal: 0.6–1.2 mg/dL

Any increase in these values suggests impairment of kidney function. BUN might be falsely elevated due to:

- Dehydration
- Bleeding in the GI tract

Very commonly, at the time of kidney failure, potassium values increase. Therefore, when BUN and creatinine are elevated, potassium values also should be assessed (and addressed if abnormal), as the safety window is very small.

Potassium

Normal: 3.5–5.5 mmol/L

With worsening of the kidney function, a few additional changes may be noted:

- Acidosis, as shown by decreased bicarbonate
- Increase of uric acid due to impaired excretion
- Decrease in calcium due to decrease of 1,25 vitamin D
- Anemia due to decrease in erythropoietin

In summary, abnormal blood values seen in kidney failure are:

- BUN—increased
- Creatinine—increased

Presence of blood and proteins is suggestive of infection but not confirmatory.

- Hematuria—presence of blood in the urine.
- Proteinuria—presence of protein in the urine (see below).

It is advisable for all practitioners to have and use dipstick urinalysis in their clinics. However, there will be occasions, although rare, when a microscopic examination will be necessary.

Examination of the centrifuged urine sediment may add the following information:

- The presence of casts suggests that the pathology is present in the kidney and not in the urinary bladder. The type of cast also helps in making some diagnosis.
- The presence of crystals suggests high uric acid and higher risks for urinary stones.
- Microscopic examination will also reconfirm the presence or absence of leukocytes and RBCs that were noted on dipstick examination.

Proteinuria

The degree of proteinuria has great diagnostic significance. If the dipstick shows that a large amount of protein is present, a 24-hour urine collection for quantitative measurement of protein should be done. Further diagnosis, such as nephrotic syndrome, may be made based on the amount of protein present.

WHAT IS NEPHROTIC SYNDROME?

In many diseases of the kidney, as the kidney function worsens, more and more protein is excreted in the urine.

The criterion for nephrotic syndrome is excretion of >3.5 g of protein in 24 hours. This leads to hypoproteinemia with the resultant low oncotic pressure leading to edema and hyperlipidemia.

ILLUSTRATIVE CASE FOR PRACTICE

This 38-year-old man was seen at the clinic for severe right-sided low back pain of one day duration. The pain starts in the back and radiates down to his groin. His urine has an unusual dark color. He does not remember injuring his back or lifting anything heavy in the last week. He has been feeling tired for the last six months and has been taking energy tonics and vitamin B12 injections.

PH: Nothing significant.

Family history (FH): Father had prostate cancer.

Social history (SH): Patient smokes a pack of 20 cigarettes per 24 hours.

PE: A well-nourished young male (with BMI of 23), who appears to be in moderate distress. Rest of the PE was within normal limits, except for low back pain and tenderness.

Vitals: Blood pressure 140/90 mmHg.

Question 1 What are your differential diagnoses?

A. Muscular pain.

B. Urinary tract problem, kidney stone or infection.

C. Joint pain involving the spine.

D. Acute pancreatitis.

The correct response is B.

An essential reference for the Traditional Chinese Medicine (TCM) classroom and clinic, this book teaches how to use and understand Western laboratory testing in the treatment and referral of patients.

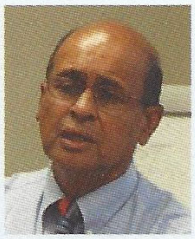
Co-written by a doctor of Western medicine and an acupuncture physician, the book focuses on symptoms that commonly present in TCM practice and offers example lab results and case studies throughout. By teaching TCM practitioners the terminology and methodology of lab testing, the book helps to bridge the gap between Eastern and Western schools of medicine and promote an integrative approach to improve the overall care of the patient.

"*Common Laboratory Tests Used by TCM Practitioners* should be in every practitioner's office, every school library, and part of all acupuncture programs. The patient expects it. Society needs it."

—William R. Morris, PhD, DOAM, President, AOMA Graduate School of Integrative Medicine, Austin, Texas

"Doctors Banerjee and Captain have written an extraordinary and thorough training manual on the use of common lab tests in a TCM practice. It is destined to become a standard text on the subject in our schools and clinics."

—Jake Paul Fratkin, OMD, LAc, author of Essential Chinese Formulas



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