

Some months went by before Barbara Massey heard that doctor's voice again.. He called to tell her that Mrs. Williams had just left for a vacation in Las Vegas and was having the time of her life. Medical tests had shown she had extremely low thyroid function and a severe urinary tract infection.

Once these were treated, the "dementia" vanished.

"I'll never make that mistake again," the doctor said.

It surprises most people to discover that physical ailments can and do cause severe mental problems. This is probably the most overlooked fact in the practices of psychiatry and psychology. A 1982 study reported in the Journal of the American Medical Association showed that of 215 consecutive patients admitted to a San Francisco hospital with mental problems, 41% had physical disorders that were misdiagnosed as psychiatric. A 1983 article in Schizophrenia Bulletin concluded that 83% of people diagnosed with schizophrenia have physical ailments instead.

Many other studies support this. An October 1977 research article by Hall and Popkin in *The Female Patient* reported that 97 of 100 patients with pronounced visual hallucinations were discovered to have medical problems creating them.

And the medical exams done on these patients were not particularly exhaustive in nature nor did they use in-depth biochemical analysis (blood, hair, urine) available today. This leads one to believe that, with more thorough examination, the percentages of misdiagnosis would have been even higher.

The Sherlock Holmes of Neurology: Dr. Sydney Walker

Probably no American physician understood this phenomena of misdiagnosis better than Dr. Sydney Walker, a board certified neuropsychiatrist from Southern California.

When Walker was doing his early medical training in the 1960's, he went to the school library in search of a text on this subject. He couldn't find it. Taking the matter to the head of the psychiatric residents, he asked, "Where is the book in the library on the medical causes of psychiatric symptoms?"

"There isn't one," came the reply.

"Then I'll write one," Walker retorted.

Incredibly, his 1967 book *Psychiatric Signs and Symptoms Due to Medical Problems* was the first volume written on this subject in the United States. One other book was written by a European. Even though this phenomena accounts, by some studies, for nearly half the admissions into psychiatric hospitals.

Perhaps more amazing is the fact that virtually no other books have been written on this subject since. (Exceptions include Walker's 1996 *A Dose of Sanity* and the 1997 book *Preventing Misdiagnosis of Women* by Elizabeth Klonoff and Hope Landrine.)

To fully understand Dr. Walker's work, I went to watch him work in spring of 1999. I feel very fortunate. Dr. Walker passed away eight months later and it appears he did not turn over his practice to a successor. His great wealth of knowledge has left us.

To ensure that his wonderful investigative technique is not lost forever, I am writing down here what I saw him do. Certainly his staff and others who worked with him could give a better description of his technique, but we have been unable to find any of them.

Knowledge: The Key to Insanity's Door

Before discussing his exam, we have to consider the man sitting across from the patient. Dr. Walker's primary tool was knowledge. Just browsing his now-rare *Psychiatric Signs and Symptoms Due to Medical Problems* gives one a peek at the remarkable collection of data this man had amassed. His life was devoted to the study of any and all physical abnormalities that effect behavior and mental function.

Thus where most doctors might limit their search to checking for thyroid problems or brain tumors, Dr. Walker's seasoned eye looked for liver ailments, kidney problems, metabolic conditions, viral infections, and countless other rare and not-so-rare disorders. Signs and symptoms were his guideposts. He closely studied everything about the patient and listened intently regarding the symptoms the patient presented, large and small. He made a point of keeping up with his studies. His recent books reflected a continuous research of medical literature and books. I remember calling his office to schedule a patient and being told a certain afternoon was "his library time."

Along with his knowledge came a dogged attitude. Unlike most physicians in psychiatric hospitals who give a cursory exam, then declare the person schizophrenic or whatever, Dr. Walker KNEW the person was physically ill. He knew it from experience. And he made it his mission to find it.

He looked with disdain on doctors who used psychiatric diagnoses – "labels," he called them – as though they were proven physical diseases. "They're a bunch of frauds," he told me, "and I don't subscribe to any of it."

He called his work "neuronal reductivism." (I may be simplifying it but that was the main phrase he used.) After years of research, he concluded that an intact nervous system should function normally unless something is impacting it. His great asset was his grasp of all the ways in which neurons could be affected.

The Exam

The Interview: The exam began with a 1 to 2-hour interview. The patient he saw when I was there was a 26-year-old woman with a history of "manic depression."

"There's no magic in any of this," he told her, referring to the vague, unmeasurable "mental illness" ascribed to the young woman. "There are reasons why you feel the way you do, and we're going to find them."

He proceeded to ask her what her mental symptoms were. When did these start? Describe them in detail. Then he asked about her physical symptoms and went into depth on them. For example, if she said headache, he asked how severe, where, what time of day, did it happen after meals, etc.

The combined collection of physical and mental phenomena gave him a general concept of what potential ailments she might have. (A limited number of disorders led to that particular combination of symptoms.) To narrow it further he had her go through a typical day, describing how she felt when she woke up, drank coffee, had breakfast, etc.

A good sample of this extensive 24-hour day questionnaire is given in Dr. Walker's book *A Dose of Sanity*, Chapter Seven (pp. 170-171 of the paperback).

He asked further questions about her medical history, her track record of cold, flu, strep infections, and others.

Now he had a lot of information to work with. He began to formulate hunches, though he kept them to himself. He began asking questions to verify or disprove his hunches. For example, her answers indicated a blood sugar problem (a critical problem since the brain runs on glucose). Dr. Walker asked if her wounds healed slowly. "Yes, my mother was commenting on that," came the reply.

From her answers he began to suspect post-streptococcal sensitivity, a condition of unusual mental phenomena occurring after strep infection. He told her this. He said, "Now one particular symptom is almost a sure indicator of this. Did you have a lot of nosebleeds as a child?"

"Yes," came the answer.

The interview continued in this light, with Dr. Walker going down various avenues of questioning to support or disprove various hunches the symptoms led him to.

The Physical Examination: The physical exam lasted 15-20 minutes. It became clear that Dr. Walker was a purist, doing everything by the book, taking no shortcuts. He tested sense of smell, poked here and there, brushed a feather on her skin, tested arms, eyes, feet, gait. He had blood pressure checked on both arms, which I had never seen in my three years of working in a hospital in my college days.

In short it was a full exam of bodily systems, taking little for granted.

As he inspected her fingernails, he offhandedly remarked to his assistant, "Chews fingernails. Lead candidate." I asked what this meant, and she said people who chew their fingernail commonly have lead in the blood (which can adversely affect behavior). They pick it up from their fingers. Sure enough, the woman was found to have a lead level in her blood.

The EEG: The woman was hooked up with a portable EEG. Electrodes were glued to her head and she was instructed to keep notes of her activities, mood changes, etc. for the next 20 hours or so. She was then tested with the EEG under various stimuli such as strobe lights, etc.

The Lab Tests: The morning after the exam she went to a lab for testing. Eight vials of blood were drawn and she did a 5-hour glucose tolerance test. Other blood was drawn in the afternoon. Urine was taken as well.

Please Note: Some parts of the remainder of this report contain considerable "medicalese." Professionals will find it of interest as it shows the exact technical steps taken. Non-professionals can still decipher much of it and can learn from the level of in-depth effort that was taken.

Dr. Walker's findings on the patient appear after this lab test section.

The following tests were done:

- 1. Glucose, fasting
- 2. Glucose
- 3. Sodium
- 4. Potassium
- 5. Chloride
- 6. BUN
- 7. Creatinine
- 8. BUN/Creatinine
- 9. Uric acid
- 10. Calcium
- 11. Phosphorous
- 12. Magnesium, Serum
- 13. Total Protein
- 14. Albumin
- 15. Globulin
- 16. A/G Ratio
- 17. Bilirubin, Total
- 18. Alk. Phos., Total
- 19. GGTP
- 20. AST (SGOT)
- 21. ALT (SGPT)
- 22. LDH
- 23. Iron
- 24. Cholesterol
- 25. Triglycerides
- 26. HDL Cholesterol
- 27. LDL Cholesterol
- 28. Chol./HDL Risk Ratio
- 29. T-4, Thyroxine
- 30. T-3 Uptake
 - T7 (Calculation) T-7 (Calc.)
- 31. TSH, Serum TSH
- 32. 5-hour Glucose Tolerance
- 33. CBC w/ Diff.
- 34. ESR Westergren

- 35. Mono Screen
- 36. Febrile Agglutins Typhoid H Typhoid O Paratyphoid A Paratyphoid B Brucella Antibody Proteus OX-19
- 37. Streptococcal AB. QT
- 38. Cortisol, A.M.
- 39. Cortisol, P.M.
- 40. Thyroglobulin AB
- 41. Thyroid Peroxidase
- 42. Lead, Blood
- 43. Carboxyhemoglobin
- 44. Urinalysis w/Microscopic

After the lab work was completed, the patient returned to Dr. Walker's office where the EEG apparatus was removed. She was told to return to his office a week later.

Conclusions

The woman met with Dr. Walker with an air of great anticipation. His main findings were as follows:

- 1. She had hyperinsulism, that is, an abnormal drop in blood sugar, which can manifest itself in many ways, including anxiety, sleeping problems, and fatigue all symptoms the woman was experiencing.
- 2. A low morning cortisol level. Cortisol is an adrenal hormone, classified as a steroid. One effect of a low level is nausea, which was a frequent complaint of the woman. A later visit to an endocrinologist showed the cortisol drop was created by the hyperinsulinism in #1 above.
- 3. Lead in the blood (as Dr. Walker predicted). Though in a "normal" blood range, Dr. Walker said lead shouldn't be showing up at all. The woman's father worked in an electroplating plant and may have brought home dust. The woman was instructed to not chew her nails and to wash her hands regularly.
- 4. Carbon monoxide levels. Again, though in a "normal" blood range, Dr. Walker said the level likely dropped during the interval of her flying to California and could have been in a high range at home. He said she should have zero. He recommended having her furnace checked.
- 5. Poor blood flow to the arms (thoracic outlet syndrome). Remedied by swimming.

Note: Dr. Walker's suspicion about strep sensitivity was off by a hair. The patient barely tested in the normal range for strep. And for those who may be interested, the price of the service, including lab and EEG, totaled about \$1900.00.

The following is the full medical report by Dr. Walker, giving all procedures done and areas examined. For futher information on details of the "Extraordinary Walker Exam," see his book A Dose of Sanity

IDENTIFYING INFORMATION AND REASON FOR THE STUDY

This is a 26-year-old white right-handed female referred for an evaluation regarding her ongoing behavioral problems.

PRESENT ILLNESS

The patient states that she had no problems until approximately age 12. At that time she found herself unable to think straight, was indecisive, and felt like she was "on cloud nine." She also had episodic anxiety, dizziness, abdominal stress, and headaches. Over the course of the next 14 years the patient has been evaluated and treated with a variety of psychotropic drugs to include: Lithium, Depakote, and Paxil. She has had three psychiatric hospitalizations. The latest was in February of

1999, where she was maintained for approximately 3 weeks and discharged on Depakote and Paxil.

At the present time, the patient's typical 24-hour day is described as going to bed between 10 PM and 11 PM. It takes her about 1 hour to fall asleep. She is a light, restless sleeper. There is no bruxism or sleep walking. There is occasional snoring and she is up 1 time at night for nocturia. She sleeps on a regular bed. Her bedroom is above the gas furnace in the basement. She is up at 7 AM or 8 AM and does not feel refreshed. She does not eat a breakfast but does have a cup of coffee with cream. This improves her sense of well being. Her morning hours are spent doing housework and generally being bored. She has an hour nap and awakens feeling fatigued. She does watch television occasionally. She eats lunch at noon which consists of a tuna sandwich or a salad with juice. She does not eat desert. She feels somewhat improved after this lunch. Afternoons are spent with approximately 1 hour of exercise walking the dog. She does not snack or nap. She continues to do some additional domestic chores prior to her mother coming home at 4:30 PM. Supper is at 5 PM or 6 PM of spaghetti, salad, a hamburger, bread and water. She feels fatigued after this supper. The evenings are spent socializing on Tuesdays, Thursdays and Saturdays at church. Other nights she socializes with her family.

The patient denies any recent weight loss or gain. There is no history of postprandial sweating. She is aware of generalized itching, burning urination and slow wound healing. She has had urinary tract and vaginal infections in the past. A grandmother and great aunt had adult onset diabetes. A grandfather and great uncle had alcohol sensitivity. The patient is aware of a low tolerance to alcohol.

She denies any episodes of loss of consciousness or head trauma. There is no micropsia or macropsia. She has had episodes of generalized body tremors that lasted 20 to 30 seconds. She related these to her anxiety, panic attacks. She has had no previous EEGs or contrast studies.

The headaches have been around for a number of years but she is unsure of when they started. Her last headache was yesterday in the afternoon which was a dull discomfort over the right frontal region usually associated with some dizziness and occasionally nausea. Her headaches are worse with the use of aspirin. They can be precipitated with not eating and questionably improved with eating. These headaches occur approximately 2 times a week. The patient is also aware of a consistent headache during her premenstrual period which is relieved following the onset of menses. She is presently premenstrual.

The dizziness is described as recent with changing positions from lying to sitting and lasts about 10 to 15 seconds but is not associated with vomiting or nausea.

Developmental History

The patient was a product of a normal 9-month gestation during which time mother gained 25 to 30 pounds. She was under a doctor's care and had no preclampsia, high blood pressure, protein in her urine, no tobacco, alcohol or medications during her pregnancy. The labor was spontaneous and lasted 7 to 8 hours. Her birth weight was 8 pounds 5 ounces. The patient presented head first, moved all extremities and cried spontaneously. The patient was bottle fed and had colic. She sat at 6 months, stood at 10 months, walked at 12 months, unsure of when she declared her right-handedness, toilet trained at 18 months. She did not practice pica. She did not have a pre-school experience and kindergarten was poor. She had some difficulty in grade school with the label of slow. She graduated from high school and took 1 year of nurse assistant training. She has worked in that field since that time. She is presently unemployed because of her illness.

Inoculation History

DPT X 3, Polio X 3, measles and mumps inoculations. No high temperatures or frank febrile convulsions. Negative tine test.

Past Medical History

The patient had chicken pox, no rheumatic fever or scarlet fever. She did have repeated strep infections, however. She did have one recent hospitalization for pneumonia and psychiatric problems. The pneumonia was considered viral. She was told she has a cardiac arrhythmia. There is

no kidney disease, liver disease, tuberculosis, gout, arthritis, or venereal disease. She is unsure about sugar in her urine. There is no high blood pressure and she is allergic to milk.

Family History

Details about the father is unknown. Mother is 42 years old, right-handed and has been in a psychiatric hospital since the delivery of the patient followed by a postpartum depression. There is no history of heart disease, liver disease, kidney disease, bone or joint disease. A great-grandfather had tuberculosis. A grandfather was hospitalized for mental illness since 1959. A grandmother has carcinoma of the cervix and breast cancer.

Social History

The patient lives in a house with her step-mother and father. There is a gas heater down in the basement. She has a dog in good health. She does not use tobacco or alcohol now. She discontinued the use of tobacco 2 years ago. Her habit was $\frac{1}{2}$ to 1 pack of cigarettes a day which she did for 2 years. Her hobbies are reading.

REVIEW OF SYSTEMS

Head: There is a history of headaches. There is no history of loss of consciousness, head trauma or seizures.

Eyes: The patient has worn glasses for 14 years. It has been 6 months since last refraction. There is no double or blurred vision, or field cuts. Patient does see rings around lights. The patient's color vision appears normal. There is history of eye infections and photophobia, but no history of eye trauma.

Ears: There is no history of infections. There is evidence of deafness and hypersensitivity to sounds. There is no ringing or diplacusis, but she does have episodes of dizziness. Patient does experience motion sickness and gets car sick.

Nose: The patient has no difficulty breathing or smelling. There is no history of infections, discharge, or trauma. There is history of nose bleeds.

Mouth: The patient has her own teeth. There is no chewing difficulty, mouth soreness, tongue biting, jaw clicking or trauma. There are silver/mercury tooth fillings.

Neck: There is no limitation of movement, pain or swallowing difficulties. No hoarseness or fullness.

Chest: There is no history of chronic cough, hemoptysis, dyspnea, pneumonia, or asthma. There is possible hyperventilation.

Heart: There is no history of cyanosis, ankle swelling,' exertional dyspnea or fainting. Patient does experience chest pain and does have evidence of tachycardia. When sleeping, the patient uses 3 pillows.

Abdomen: There is no diarrhea or vomiting. There is some nausea and constipation. No black or bloody stools, excessive belching or flatus. Patient does have recurrent abdominal pain.

GU: There is history of urinary tract infections and vaginal infections. No hematuria, pyuria, or dysuria. There is nocturia and frequency. Menarche was reached at age 13. Menstrual cycles of 28 days. Gravida 0, para 0, AB O. Last menstrual cycle was March 15, 1999.

Extremities: There is no limitation of movement or cramping. There is no weakness, discoloration, or swelling. There is evidence of uncontrolled movements with panic attacks.

Skin: The patient is not able to tan; she burns. There is itching and slow wound healing. There is no evidence of abnormal hair growth.

Endocrine-Metabolic: There is no heat or cold intolerance, no salt or sugar craving. There has been no recent weight loss or gain. The patient does not experience postprandial sweating but does have excessive thirst. There is a specific food preference for spaghetti.

Toxic: Patient experiences metallic taste but no exposure to insecticides and has no adverse reaction to drugs.

GENERAL PHYSICAL EXAMINATION

The patient appeared as a well-hydrated, well-nourished white female in no acute distress. Her height was 164 cm. Her weight was 197 lbs.

Vital Signs: Blood pressure on the right was 132/76; blood pressure on the left was 114/70. Pulse was 63, and temperature was 98.4 degrees.

Head: Normocephalic. No evidence of exostosis, tenderness or bruits.

Eyes: Sclerae, conjunctivae and cornea were clear. There was no inflammation or discharge. Eyelids were of normal texture and station and eyebrows were of normal distribution. There is a mild proptosis of the eyes bilaterally.

Ears: External configuration was normal; external canals with cerumen bilaterally. Tympanic membranes were glistening bilaterally. No adenopothy or discharge.

Nose: Both nostrils were patent. There was no sepal deviation, polyps, or discharge.

Mouth: Teeth were in good repair, no gingival ulceration, or inflammation. Tongue was of scalloped texture and posterior pharynx was clear. There are multiple silver/mercury amalgams in the upper and lower jaw.

Neck: Supple. Trachea was in the midline. Carotids were palpable bilaterally at 1+, greater on the left than on the right. No thrills or bruits were noted and no masses were felt.

Chest: Symmetrical. There was normal female breast tissue without dimpling masses or discharge, and no axillary adenopothy. Patient has not had a mammogram.

Lungs: Clear to auscultation and percussion. No rales or rhochi were noted.

Heart: PMI was diffuse. No heaves or thrills were noted and no murmurs were heard.

Abdomen: Slightly obese, non-tender and non-rigid. No rebound or masses were felt.

Rectal: Deferred.

GU: There was no CVA tenderness. Pelvic was deferred, patient had a PAP smear within the last 6 months.

Extremities: There was no limitation of movement, straight leg raising to 90 degrees. Addson maneuver was positive bilaterally. Point tenderness from the posterior neck at C2 and T5 was sensitive without radiation.

Skin: Warm, clear, and moist. Evidence of nail-biting bilaterally, spoon nails bilaterally, transverse ridging in the nails bilaterally, and an acne form eruption over the face and back. There was no excoriation, slow wound healing, or abnormal hair growth.

NEUROLOGICAL EXAMINATION

MENTAL STATUS -

General Appearance and Behavior

The patient arrived on time for her appointment; she was neatly dressed and carefully groomed. She participated actively and earnestly in the review of information. She was oriented to the time, place, and person.

Memory

She denies any memory difficulty. Memory was intact to remote, intermediate and recent material.

Speech

The patient spoke in well-modulated tones with some difficulty pronouncing her S's. She performed the lingual and labial sounds adequately.

Mood

The patient is prone to being sad and feeling hopeless and weeps uncontrollably. The patient does have sleeping difficulty. She has considered suicide, however, there is no history of gestures.

Thought Content

The patient is preoccupied with herself and her symptoms. There are no hallucinations: visual, auditory or olfactory.

Intelligence

The patient is a high school graduate who has had one year of nursing assistant school. She was concrete on all 4 proverbs tested.

Judgment

The patient answered a hypothetical question appropriately and appears to be exercising normal adult judgment.

CRANIAL NERVES -

I. Olfactory

Patient was intact to smell of cloves.

II. Optic

Visual acuity: O.D. 20/200. O.S. 20/200. No extinction to bimanual visual stimuli. No field cuts to confrontation. Funduscopic examination revealed optic pallor greater on O.D. than O.S., sharp margins and generous cupping bilaterally. The arteriovenous ratio was 1-6. Maculae were normal. No evidence of exudates or hemorrhages.

III. Oculomotor, IV. Trochlear and V. Abducens

Pupils: O.D. 6 mm. O.S. 6 mm. They reacted poorly to light directly and consensual. Reaction to near vision was good. Medius rectus and mild proptosis. No nystagmus. Extraocular muscles were full.

VI. Trigeminal

Corneals were suppressed bilaterally (she has worn contact lenses). Perception to sharp stick was intact in all three divisions bilaterally. Jaw Jerk was fine. Masseters and pterygoids showed good strength bilaterally.

VII. Facial Nerves

No weakness, atrophy, fasciculation or asymmetry. Chevostick was negative.

VIII. Acoustic

The patient heard a watch ticking at 5 cm. on the right and 5 cm. on the left. Weber was to the midline. Rene showed air conduction greater than bone conduction bilaterally.

IX. Accessory Nerve

Sternocleidomastoid and trapezius showed good strength right and left.

X. Hypoglossal Nerve

Tongue protruded and was scalloped. There was no evidence of weakness, tremor fasciculation.

REFLEXES -

Pectoralis, biceps, triceps, brachioradialis and finger flexion were 0-1+ and symmetrical. Abductors, patella, suprapatellar and Achilles were 0-1+ and symmetrical.

Upper Motor Neuron

There was evidence of Oppenheim, Gordon, Chaddock, and Babinski and no Hoffman.

Cortical Reflexes

There was no snout, grasp, suck or palmomental. There was no extinction to bimanual tactile stimuli, no perseveration.

Superficial Reflexes Abdominals were absent bilaterally.

Sensory

Sharp to pin prick, sensitive to light touch. Intact to position and vibration. No stereognosis. Evidence of graphesthesia on the left.

Cerebellar

Finger to nose, heel to shin, rapid alternating movements, check reflex, tandem gait and augmented tandem gait were performed well. Augmented Romberg was negative. Lingual and labial sounds were performed well.

ExtraDvramidal

No gabellar and cogwheeling. The patient showed normal pendular movements with reflex stimulation of lower extremities and normal accessory movements with walking.

Motor

There was no atrophy, fasciculation or weakness, proximally or distally, right or left. There was no drifting of outstretched arms.

Gait

The patient's gait was normal.

ASSOCIATED NEUROPHYSIOLOGIC DATA

The EEG was non-focal; dysrhythmic, with alteration of the wave forms during the three-minute hyperventilation and five-hour glucose tolerance test.

ASSOCIATED BIOCHEMICAL DATA

Reveals five-hour glucose tolerance test with a 2½- hour low of 57 and a 3 hour low of 61. Serum lead level of 1.0, level of carbon monoxide 0.7, and AM cortisol of 5.0; the normal is 6.2 to 29. The PM cortisol is 3.4; the normal is 3.0 to 17.3. Borderline antistreptolycin titer of 197; it should be less than 200 to be significant. A proteus OX19 with a titer of 20, it should be 1 to 20; this is borderline.

SUMMARY AND CONCLUSIONS:

This now 26-year-old female has a 14-year history of behavioral difficulties, treated with a variety of psychotropic drugs and anticonvulsant medications. The patient has had an ongoing sleep problem, bites her nails, is aware of hyperventilation, and has a poor eating habit.

General Physical Examination

Reveals a positive Addson maneuver, neoform rash, and transverse ridging of the nail beds with nail biting.

Neurological Examination

Reveals a concrete response on all proverbs tested. Fractory there bilaterally at 20/200. Absent corneal reflexes, absent abdominal reflexes, graphesthesia on the left.

Associated Biochemical Data

Reveals a 2 ¹/₂ - 3-hour low in the five-hour glucose tolerance test. A borderline antistreptolycin titer. Equivocal prodious OXA titer. Evidence of lead and carbon monoxide. The EEG was non-focal, but abnormal consistent with a toxic metabolic post-infectious basis.

IMPRESSION

- 1. Cortical lability, moderate.
- 2. Hyperinsulinism, probably influencing #1.
- 3. Hyperventilation syndrome episodic, probably influencing #1.
- 4. Lead acute and chronic exposure, probably influencing #1.
- 5. Carbon monoxide exposure acute and chronic, probably influencing #1.
- 6. Possible adrenaline insufficiency, probably influencing #1 and #2.
- 7. Thoracic outlet syndrome.

RECOMMENDATION

- 1. Identify and eliminate sources of lead and carbon monoxide.
- 2. Stabilize metabolic parameters by avoidance of refined carbohydrates.
- 3. Consultation with a endocrinologist for the characterization of steroid metabolism.
- 4. Physical therapy for the thoracic outlet syndrome.
- 5. Re-breathe into a brown paper bag for episodes of hyperventilation.
- 6. Evaluation of abnormal parameters in 3 to 6 months.

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