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# ***THE UPLINK***

Merging Contemporary Chiropractic Neurology and Nutritional Biochemistry in the Tradition of Applied Kinesiology

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## **ASSESSING CITRIC ACID CYCLE FUNCTION**

The procedure for this issue of *THE UPLINK* is an “oldie-but-goodie” – something that we have been teaching since around 1986. The citric acid cycle (CAC) is also called the Krebs’ cycle and the tricarboxylic acid cycle. The CAC and the electron transport chain (ETC) make up the process of oxidative phosphorylation – the production of ATP.

The CAC and ETC depend on various nutritional factors that many patients lack, especially those on a typical American diet. The ETC requires coenzyme Q<sub>10</sub>, iron, and copper. The most important CAC nutrients include: B-1, B-2, B-3, B-5, manganese, lipoic acid, biotin, and magnesium. In addition to reviewing CAC assessment procedures for these nutrients, we have added some important adjunctive information based on CAC evaluation that will be useful in your practice.

## **WHY NUTRIENTS MAY NOT BE ENOUGH**

Prior to evaluating the CAC, we must consider some of the factors that disrupt normal CAC. These factors will be addressed in the normal course of treatment when following the *A(K) Clinical Protocol*.

The two most important factors that can “short-circuit” or disrupt the CAC are heavy metal toxicity and immune system activation.

## **HEAVY METALS BLOCK THE CAC**

Sulfur has a great affinity for attaching to metals. Heavy metals will bind to any available sulfur group in the body, including those of the “accessory nutrient”, lipoic acid (which is also called by its chemical name thioctic acid). The body synthesizes lipoic acid and should be readily able to produce as much as it needs as long as the patient is not sulfur deficient. (See Issue #15 of *THE UPLINK*.)

In the presence of heavy metal excess, the toxic metals will bind to lipoic acid and make it unavailable for its CAC duties. The CAC will be short-circuited (truncated or uncoupled) at one of the two areas where it is dependent on lipoic acid. Mercury and arsenic are well documented to attach to and inactivate lipoic acid, but we have seen many different heavy metals interfere with lipoic acid availability and hence, block the CAC and the production of energy (ATP.) This is the source of fatigue in patients with heavy metal toxicity.

## **IMMUNE CHEMICALS BLOCK THE CAC**

In the presence of immune system stress and/or toxicity, cytokines (e.g., IL-2, TNF) induce the production of nitric oxide (NO). NO inhibits the aconitase enzyme in the CAC and uncouples the process of oxidative phosphorylation.

The cytokines that induce NO (and hence, the lowered CAC activity) will be increased in both acute and chronic infections as well in response to both airborne and food allergies. That is why you get so tired when you are fighting an infection or when you are in the throes of an allergic reaction.

Besides leading to lowered ATP, both heavy metal toxicity and immune activation lead to a build up of lactic acid, pyruvic acid, and other organic acids which are CAC intermediaries. These can be measured by urine organic acid profiles.

## **PROCEDURE SUMMARY**

The major waste product given off when the CAC is operating properly is carbon dioxide (CO<sub>2</sub>). We can increase CO<sub>2</sub> titres in patients by having them rebreathe their own air in a paper bag for 6-8 breaths. A strengthening response suggests that the patient needs more CO<sub>2</sub>. The main source of CO<sub>2</sub> is the CAC. A second source is vitamin B-6 dependent decarboxylase reactions. (See next page.)

Before performing the rebreathing assessment, first clear the patient of any allergic and inflammatory reactions. This will be done as a matter of course in Steps 5, 6, and 7 of the *Quintessential Applications: A(K) Clinical Protocol*. Step 12 is:

**Does Re-Breathing (increasing CO<sub>2</sub>) Strengthen?**

If Yes:

**. Check CAC Factors:**

Thiamine (**B-1**), Riboflavin (**B-2**), Niacinamide (**B-3**), Manganese, Pantothenic Acid (**B-5**), Lipoic Acid (Thioctic Acid); "B" and "G"

**2. If CAC Factors Don't Strengthen—Check Biotin**

(Rarely, Magnesium or Phosphorus)

**3. If None of the Above Strengthen – Check B-6 or**

Pyridoxal-5-Phosphate (**P-5-P**)

At this time, also test the patient for ETC nutrients coenzyme Q<sub>10</sub>, iron, and copper to allow for complete oxidative phosphorylation and production of ATP. Supplement as indicated, having first considered heavy metal toxicity and immune system activation.

■ **WHY STEP 12?** CAC assessment is Step 12 in “*Quintessential Applications: A(K) Clinical Protocol*.” You might ask “Why such an important metabolic pathway so far down on the list?” We check the CAC after we have corrected for any inflammatory (Step 5), allergy (Step 6) and immune processes (Steps 9, 10, & 11). This is because the inflammatory processes of immune activation inhibit the CAC as described on the previous page. Correction of immune system problems often allows for proper CAC function without the need of any additional nutritional supplements.

This was learned during years of making observations about which techniques corrected other techniques. For example, if you find an allergic response in a patient, check for CAC activity by rebreathing in a paper bag. If rebreathing strengthens the patient, correct the allergy response and then recheck a weak muscle with rebreathing. When the CAC problem is secondary to the immune system problem, rebreathing will no longer strengthen the weak muscle. This is a very common finding. If rebreathing still strengthens, then continue with the CAC assessment as described previously. It is these types of thought processes that are discussed on the audio CDs in *This Month's Special Offer* below.

■ **THIRTY YEARS OF THOUGHT PROCESSES** are the foundation for *Quintessential Applications: A(K) Clinical Protocol*. The entire *A(K) Clinical Protocol* is organized on neurological and biochemical hierarchies similar to those described above. These thought processes are revealed in a new set of CD Audio recordings based on Dr. Schmitt's 2005 ICAK paper entitled “**The Neurological Rationale for a Comprehensive Clinical Protocol Using Applied Kinesiology Techniques.**” This paper and these recordings give insights to the organization of Dr. Schmitt's 30 years of clinical experience that is the basis for *A(K) Clinical Protocol*. In this four CD set, Dr. Schmitt goes through the paper and adds comments and highlights that are not included in the paper itself. See *This Issue's Special Offer* below.

**THIS ISSUE'S SPECIAL OFFER!**

**“The Neurological Rationale for a Comprehensive Clinical Protocol Using Applied Kinesiology Techniques.”**

Audio recording of Dr. Schmitt's paper (with commentary) on the thought processes behind *Quintessential Applications: A(K) Clinical Protocol*

**\$75.00** (Normally \$95)

*Includes Shipping & Handling*

Call (919) 545-8829 or Fax order form to (919) 419-9049

Offer ends October 10, 2005

■ **CAC SUMMARY NOTES FREE ON-LINE:** Visit [www.theuplink.com](http://www.theuplink.com) and look under “Guides” for a printable version of the citric acid cycle including which nutrients work at which parts of the cycle.

■ **THE QUINTESSENTIAL NEUROLOGICALLY-BASED COMPREHENSIVE AK COURSE** will begin in October, 2005 in Philadelphia. Dr. Schmitt, assisted by Dr. McCord, will teach the 15 session program entitled *Quintessential Applications* roughly once a month. This new course will be organized around the *A(K) Clinical Protocol* with the following goals:

- All techniques will have hands-on workshopping
- Each session will integrate the topics of that session with the entire *A(K) Clinical Protocol*
- One or more patients will be treated using the accumulated *A(K) Clinical Protocol* at each session
- Upon completion, the doctor will be able to implement 100% of the course material efficiently and effectively using the *A(K) Clinical Protocol*.

These seminars will change your clinical thinking processes in accordance with realities of neurology and nutritional biochemistry. *Space is limited. Register now!*

■ **HIDDEN GEMS IN LA: ONE-THIRD OF YOUR** patients will be benefited and your life will be made easier when you learn the new information that Dr. Schmitt will be teaching in this two-day seminar in Los Angeles on November 12-13, 2005. *“Hidden Gems: Finding Hidden Spinal Problems & Hidden Nutritional Problems”* will uncover hidden clues to structural problems such as pelvic Categories 1 & 3, the iliolumbar ligament, sacrospinous and sacrotuberous ligaments, disc wedging, and fixations. Chemically, activated vitamins and their roles in important metabolic pathways will be addressed. New explanations for aspartame and/or monosodium glutamate sensitivities will be given. Chiropractic continuing education for CA, AZ, OR, and NV has been applied for through Logan College Postgraduate Division and is pending at press time.

■ **SKI TAOS IN 2006:** The 5<sup>th</sup> Annual “WAT Ski Seminar” in Taos, NM is scheduled for February 2-4, 2006. Once again, Wally Schmitt, Andy Specht, & Tom Rogowskey (WAT) have a practical 3 day seminar planned with VERY LIMITED SEATING. Contact Michelle to hold your place at this seminar.

■ **SKI PARK CITY 2006:** THE 12<sup>TH</sup> ANNUAL “SKI WITH WALLY” SEMINAR will be in Utah for the first time ever! It is scheduled for March 9-11, 2006. The hotel is a ski-in / ski-out at the base of the Park City mountain. They require that RESERVATIONS BE MADE VERY EARLY. Contact Claudia Rabin-Manning of Trump Travel NOW at (800) 937-3878 if you wish to reserve hotel space for this seminar. The seminar topic and other details will be announced in the near future.

■ **REBREATHING AND VITAMIN B-6 (P-5-P):** Carbon dioxide is produced by the CAC and by decarboxylation reactions that require B-6 (P-5-P.) B-6 need is common, especially in deficiencies of certain neurotransmitters such as GABA (the topic of our next issue.) When rebreathing strengthens, consider CAC nutrients *and* B-6 including its coenzyme form, P-5-P.