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The Role of Nutrition in Rehabilitation and Sports Medicine

Interview with Dr. Luke Bucci, Part I

By G. Douglas Andersen, DC, DACBSP, CCN

This is the first part of a three-part interview with Luke Bucci, PhD, CCN, based on his landmark work, Nutrition Applied to Injury Rehabilitation and Sports Medicine, CRC Press. His 284-page book contains 1,400 references (40 pages worth) from the world literature. The book should be required reading for every DC. In fact, I think it should be a required text in chiropractic school. Furthermore, any diplomate in sports, nutrition, orthopedics, or even neurology who doesn't have this book in their library is making a big mistake. Where many books in the nutrition field are obsolete by the time they are published, this book is so cutting edge it should be well worthwhile for as long as it took the author to write it -- six years.

I hope this series is as interesting and informative to the readers as it has been for myself. Part II of the interview will appear in the July 17, 1995 issue of "DC"; part III in the 8-15 issue.

Protein

Dr. Andersen: In your book you state that if an injured patient is consuming the RDA levels of protein, which is approximately a half gram per pound, after three weeks they may fall into negative nitrogen balance, and their ability to heal may be compromised.

Dr. Bucci: Yes, very much so. That, of course, is for fairly extensive trauma like a femur fracture or a serious automobile accident.

Dr. Andersen: Chiropractors treat a lot of auto accident patients. How much protein would you recommend for a patient with motor vehicle accident soft tissue injuries that would require at least six weeks of care?

Dr. Bucci: The same thing that you would recommend for weight lifters who are trying to gain muscle mass. I think you need to get up to at least double the RDA, around 2 gm of protein per kilogram of body weight.

Dr. Andersen: That's a lot of protein. If people can't get enough protein in their diet, should they consume amino acids or protein powder?

Dr. Bucci: I think that the free-form amino acid supplements are rather expensive for what you get. You can do the same thing for about one-tenth the cost with protein powder. As long as your digestive system is in fairly good shape, it will take care of the protein.

Dr. Andersen: When a patient feels better and does not need more chiropractic treatment, it doesn't necessarily mean that at the cellular level healing is complete. Do you recommend that patients reduce their protein intake as soon as they are out of pain, or do you advise they keep an elevated level of protein for an extended period of time?

Dr. Bucci: That depends on the severity of the injury and other deficiencies. It's really difficult to give a ballpark recommendation, but the body is remodeling for up to a year after an injury. You don't need huge amounts of protein to help push the remodeling. You really need it during that synthetic, reparative phase of healing, which happens in the next two or three months. If there is bone tissue involved, you might want to go four to six months. If there has been joint damage, you probably do want to go at least four to six months.

Dr. Andersen: In your book you state the amount of protein an injured patient consumes is more important than the type. Would you explain this statement?

Dr. Bucci: During an increased metabolic state, the amino acid fluxes increase. In other words, the body is breaking down amino acids and converting them into the ones it needs for collagen and protein synthesis at an injured site. Whatever type of protein you eat will get used, even if it is not the exact composition of the proteins that are actually synthesized.

Dr. Andersen: Do the extra protein calories you recommend for an injured person come in addition to their pre-injury caloric intake, or are they substituted for calories from other sources (carbohydrates or fats)?

Dr. Bucci: That's a good question, because it's not clear cut. I think it's important to at least add it, and that's what I would prefer people do.

Dr. Andersen: So basically, when someone comes into the chiropractor's office suffering from whiplash, you have them eating an extra 200 or 300 calories a day from protein, and they just eat extra calories for a

month or so until they start feeling better.

Dr. Bucci: I think that's the easiest way to do it. Also, it works best to use pure protein because you don't have a lot of extra fat or carbohydrate calories which can quickly get put on as body fat compared to the protein calories. Adding 500 calories a day to get 300 protein calories for a month or so is not enough to make a patient obese, but they may gain weight.

Minerals

Dr. Andersen: In our protein discussion, we touched on the length of time bone tissue takes to heal. Some chiropractors recommend that when their patients have a fracture they consume extra protein. What do you know about the research of supplementing calcium for fractures? Is this a good recommendation?

Dr. Bucci: That kind of research was done in the 1940s and 1950s, and they gave up trying to do it. They found that some people benefitted greatly, but your average ambulatory person before the injury didn't benefit. But that was only with calcium. They did not look at the other trace minerals which I feel are more important than calcium. So, that's the point I was trying to get across: that bone cannot heal or repair or maintain if it is deficient in any mineral. The trace minerals are more easily deficient, so just throwing calcium at a fracture will not accelerate healing.

Dr. Andersen: What do you think about magnesium for both bone density and also for a patient who has acute muscle spasm?

Dr. Bucci: Well, I think that magnesium is probably the second most overlooked nutrient. I think it is more important for the bone than calcium. You can have all the calcium in the world, but if you don't have enough magnesium, bone mass will not form properly, if at all.

Dr. Andersen: What ratio would you recommend doctors dose calcium and magnesium?

Dr. Bucci: I think we need to get to a 1:1 calcium to magnesium ratio. 2:1 calcium to magnesium is what everybody is hung up on because that's what bone has, but I think 1:1 is what has worked in some studies and even 1:2 calcium to magnesium.

Dr. Andersen: Are you saying that if a woman is taking 1000 mg of calcium for insurance that she should be taking 1000 mg of magnesium a day?

Dr. Bucci: I think she should be taking 500 mg of calcium and 500 mg of magnesium. If you look at the rest of the world, they have much less osteoporosis and they rarely get 400 mg of calcium a day, just the 200 to 400 range, but they don't get osteoporosis. You ask, well why? When Americans do that they get osteoporosis.

GDA: We eat lots of protein.

Dr. Bucci: That's one factor, because it robs the trace minerals. That means that other countries have much higher trace mineral intakes. For example, in India, where they don't have as much osteoporosis in certain areas and where they do get fed properly, they have 10 times the manganese intake we do. I like to look at building bones and minerals as a chain. The chain is only as strong as its weakest link. Say you have a chain that is 100 links long. Well, 50 of them are calcium, 40 of them are magnesium, then you have five or six for zinc, a few for manganese, a few for copper, and one or two for boron. You can see that if any single mineral is deficient, the whole chain is no good. Even with everything else being perfectly fine. That's why if you don't have enough calcium the chain won't be very good either. You need everything in conjunction, and emphasizing just calcium alone is not the full picture.

Dr. Andersen: What about magnesium for muscle spasms on a short-term basis?

Dr. Bucci: That I think is something that is overlooked even though it is medically well accepted. It seems to work very well clinically especially in people who sweat excessively or in people who just seem to have muscle spasms in general. I haven't seen a lot of postinjury studies that have looked at increasing magnesium to see if it helps. I think it will.

Dr. Andersen: What about manganese for injuries? A lot of the companies that support the chiropractic profession have injury formulas that contain quite a bit of manganese. Should DCs continue to recommend manganese for healing?

Dr. Bucci: I think it's a very good idea because manganese is involved in running the enzymes that make proteoglycans and they must be synthesized before any collagen can. They're the real framework.

Dr. Andersen: Is there a best form of manganese?

Dr. Bucci: The manganese ascorbate is probably the best because manganese is similar to iron. Therefore, vitamin C will improve its uptake and that is well studied.

Dr. Andersen: What about manganese sulfate? That seems to be the most popular form in the supplements.

Dr. Bucci: That's probably one of the worst. Early research showed that manganese helps produce proteoglycans which are sulfated, so they (nutrition companies) figure they can give manganese and sulfate. However, the absorption or manganese sulfate is poor. It's kind of like ferrous sulfate. It interacts with calcium, fiber, and iron adversely. Manganese chelates do not have these interactions.

Dr. Andersen: How much manganese would you recommend for a whiplash or disc patient? Are manganese ascorbate and sulfate dosed the same way?

Dr. Bucci: I think you need to take a good 10 mg a day of manganese from manganese ascorbate, or probably 50 to 100 mg a day of manganese sulfate.

Dr. Andersen: Are there any contraindications to manganese? I have read that people who work in manganese mines have an increased risk factor for getting Parkinson's disease. Have you heard that?

Dr. Bucci: Yes, but that is only for different valences of manganese like hexavalents and pentavalents. So, manganese has many chemical charges. Those other types of non-nutrient manganese are the ones causing that environmental exposure. The divalent manganese has never been shown to cause that problem.

Dr. Andersen: What about zinc?

Dr. Bucci: Zinc is, interestingly, probably the best-studied trace mineral. Again, it's one of those things that is so important that if you don't have enough, you have problems.

Dr. Andersen: If you have enough, do you need more when you're injured?

Dr. Bucci: It does not seem to help at all if you take additional zinc.

Dr. Andersen: So, you want to make sure that the patient is getting 15 to 20 mg a day, but there is no reason to give an injured patient 100 mg of zinc based on your literature review?

Dr. Bucci: No, not at this time. Almost all the studies tend to use zinc sulfate, which I have some problems with. It is very irritating. You can't go very high with it. It does interact and have side effects.

Dr. Andersen: What form of zinc do you think is the best?

Dr. Bucci: Any kind of amino acid chelate should work just fine. Zinc monomethionate looks promising.

Dr. Andersen: What about picolinate?

Dr. Bucci: That seems to be okay. I don't think it is any better than any other form.

Dr. Andersen: How much copper should an injured patient have?

Dr. Bucci: I believe a little more. In fact, maybe a lot more. Copper is very interesting. If you look at how many copper compounds have been synthesized and looked at as analgesics and anti-inflammatories, it is astounding. It is thousands. There have been some that have been used injectably in Europe with amazing results. If you use copper salicylate you have an even better aspirin. You can get to a copper toxicity, which is one limiting factor for these things, so if people feel better they'll take too much for too long and they may end up with too much copper. It's a double-edged sword, but I think we can safely increase the dosage to about 10 mg a day after an injury and then cut it out.

Dr. Andersen: 10 mg a day for how long? Up to a couple months?

Dr. Bucci: Yes.

Dr. Andersen: If a patient is taking 10 mg a day of copper, should you increase the amount of zinc they take?

Dr. Bucci: Yes. I think you should take the zinc up to 50 mg per day, and I think if they're both organic amino acid chelates that they shouldn't interact too much. All the literature on mineral interactions that's adverse has been done with inorganic salts, and you don't see that kind of interaction as much when you go to the organics.

Dr. Andersen: So, the bottom line on zinc and copper is you don't really need to give a whole lot of zinc unless you're giving a whole lot of copper.

Dr. Bucci: That's the way I feel. That's why I usually have them take a 5:1 ratio of zinc to copper.

Dr. Andersen: Some authorities say that you need to be pushing the iron when a patient is injured. I just read an article by a respected DC who recommended iron for injured patients. What is your opinion?

Dr. Bucci: I think they should not have any extra iron at all, zero, none, because it is a pro-oxidant and it doesn't influence healing. Even people who have an iron-deficiency anemia still heal readily. So, there is no need to supplement iron for healing. The only time iron should be supplemented is for an anemia of iron deficiency.

Dr. Andersen: Isn't iron involved in the synthesis of connective tissue?

Dr. Bucci: It is a vital co-factor for some of the enzymes involved in collagen maturation and synthesis, so yes, but interestingly, those enzymes also rely on vitamin C.

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