

behaviors. The definition of health education that we have found most helpful is that behavior of physicians that assists patients in making positive health related decisions. One of the important implications of this definition is that the locus of control for making behavioral changes lies with the patient. It is the physician's role to facilitate this action.

The American Heart Association's Physicians Cholesterol Education Program² incorporates five important components of physician behavior that can facilitate change on the part of patients:

- Create an environment for learning
- Assess the needs of the patient
- Design a plan of action
- Implement the plan
- Evaluate outcomes

Since the Heart Association is currently sponsoring educational programs to acquaint physicians with new information on reducing risk factors for coronary artery disease and specifically cholesterol, we would suggest that physicians seek out the opportunity to participate in these workshops.

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Snake Oil

TO THE EDITOR: The snake has been a part of Western medicine since the time of the ancient Sumerians, 4,000 years ago. Ningishzida, their god of healing, was draped with twin snakes, an emblem still in fashion in medical circles today. Snake was an ingredient of a famous theriaca used by Andromachus, physician to Nero, and of a theriaca of Galen, which was in use until the efforts of William Heberden to ban it in 18th century England. It was still quite popular in colonial America, however, and only in the past century have snake and snake oil become synonymous with quackery.

Another kind of oil has come into fashion recently: fish oil has been elevated to the front rank of medical therapeutics because of convincing clinical and laboratory research that documents effects on platelets, white blood cells, and blood vessel walls. Clinical benefits in treating inflammatory disorders, cardiovascular disease, and even cancers are now subjects of serious research. These effects are known to be related to the presence in fish oil of ω -3 essential fatty acids, which are precursors of prostaglandin hormones. It is well known that the biology of both plants and animals commonly adapts to cold temperature by producing more of the ω -3 unsaturated fatty acids with one more double bond than the ω -6 fatty acids.

Since snakes are cold-blooded animals, it seemed plausible to me that they might contain ω -3 essential fatty acids. Finding no listing of snake oil in the analytical tables, I sent three specimens of snake to a laboratory for analysis by chromatography and flame ionization (analysis by Dr George

TABLE 1.—Fatty Acid Fractions in Snake Oils, % Concentration

Source	ω -3			ω -6			
	ALA	EPA	DHA	LA	GLA	DGLA	ArA
Chinese snake oil	0.001	19.6	0.001	4.4	0.001	0.001	2.4
Black rattlesnake	1.4	4.1	0.1	9.7	0.7	2.8	4.7
Red rattlesnake	0.5	0.6	5.4	20.8	0.06	0.1	12.8

ALA= α -linolenic acid, ArA=arachidonic acid, DGLA=dihomo γ -linolenic acid, DHA=docosahexaenoic acid, EPA=eicosapentaenoic acid, GLA= γ -linolenic acid, LA=linolenic acid

Miroff, Monroe Medical Laboratory, Southfields, New York). Table 1 shows the major fatty acids found in snake oil from Chinese snake oil purchased over the counter, subcutaneous fat of a black rattlesnake from southern California (*Crotalus viridis*), and subcutaneous fat of a red rattlesnake from Arizona (*Crotalus tigris*).

Chinese snake oil contains almost 20% eicosapentaenoic acid (EPA), about triple the concentration in the American rattlesnakes. I understand the Chinese product includes snake oil from water snakes that feed on fish. This almost certainly would increase the content of EPA in their tissues. In human subjects fed cod liver oil, there was a sevenfold increase of EPA in neutrophils and monocytes. It was also found that arachidonic and docosahexaenoic acids did not increase and that leukotrienes decreased; hence the inference that anti-inflammatory action was due to EPA and that it may work by inhibiting the leukotriene B₄-mediated output of neutrophils.¹

As a concentrated source of EPA, snake oil is a credible anti-inflammatory agent and might indeed confer therapeutic benefits. Since essential fatty acids are known to absorb transdermally, it is not far-fetched to think that inflamed skin and joints could benefit by the actual anti-inflammatory action of locally applied oil just as the Chinese physicians and our medical quacks have claimed.

It is not unusual that an ancient remedy or a folk medicine turns out to have some merit. What is unusual is that this particular therapy, snake oil, has long been our favorite symbol of quackery. I find it humbling that the science of today invests the quackery of yesterday with new credibility. Perhaps our ancestors were wiser than we could appreciate when they wrapped a snake around the staff of Aesculapius.

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More on Dismemberment

TO THE EDITOR: Your editorial, "On Dismemberment of the Corpus of Medicine," in the May issue¹ makes an extremely important point.

First of all, it is important to understand why this is happening, and Alvin Toffler has stated, "After 10,000 years of agrarian life, or 'first wave' civilization, we created a smoke-stack society, we and our grandparents, which was in fact based on mass production, mass distribution, mass education, mass entertainment, mass recreation, and mass destruction. The industrial revolution launched a 'second wave' of social transformation. Today we are feeling the impact of history's third great wave of change. And what is happening