

## Live Healthy and Be Well!

“Obtaining medical evidence using the scientific method”

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For a change, I hope to base the next few columns (after this one) on some information I have come across about some basic things that seem to confer health benefits and may even prevent disease. Much of this is based on a good book I read recently by Dr. Sanjiv Chopra titled *The Big 5* - which presents “...five simple things you can do to live a longer, healthier life.” We will start to see in coming columns beneficial effects that have been attributed to drinking coffee, eating nuts, Vitamin D3, daily exercise, and frequent meditation.

But, before starting with some of these topics, we should outline the basics of how physicians go about figuring whether some action or event “causes” something else to happen. Before we can say that “A causes B,” proper experiments are designed to rule out the effects that random chance, or mere coincidence, is involved in the process. Until we can state there is less than a 5% probability (p) that random chance is at work (and  $p < 5.01\%$  is not good enough), we cannot say that there is a significant difference between treatments. Even then, science is always careful about using the word “cause,” but often talks about things being “positively related” with strong evidence to point to a certain outcome.

The best experiments are designed to be double-blind (neither experimenter nor subject knows who gets treatment or placebo), placebo controlled (the treatment is balanced with a control group getting no treatment), and have a random assignment of subjects to prevent bias. Even then, and even with a chance probability of less than 5%, these studies are subject to criticism and debate, and must be able to be replicated with reliable results to be credible. They may then be published in respected academic journals and contribute to the scientific and medical community.

Sometimes, two events can be related in such a way that it seems blatantly obvious that “A” MUST cause “B” to happen. We see it all the time. It is just common sense. We have never seen that not to be the case. An example might be that “smoking causes lung cancer.” Seems obvious to us now, right? But just know that many studies were conducted and comparisons made before those conclusions were drawn. Even now it is more likely to be stated that “smoking greatly increases your risk of lung cancer,” instead of using the word “cause.”

We all know or have heard of cases where a person who never smoked gets lung cancer, or “...my grandpa smoked two packs a day for 75 years and never got lung cancer.” There are always exceptions to the rule and we try the best we can to rule out the effects of random chance and coincidence. It is very difficult to design a study that is controlled enough to completely rule out other factors. Such as in the lung cancer example – we cannot make people smoke, so we compare disease rates in smokers and non-smokers. But, how do we know that it is not something else that either group does, or does not do, that contributes to their condition?

Let's say that we want to find out if a new medicine can be effective in treating breast cancer. We would need to randomly assign patients with approximately the same stage and grade of breast cancer (using the same technique to stage and grade the tumors) into two groups – treatment and control. The treatment group would receive the new medicine injection on schedule, in the same location of the body, at approximately the same time of day, for the same number of days as the control group. The control group would also receive an injection of the same amount (and same color, consistency, etc.) of some inert substance (placebo), and on the same schedule and standards of the treatment group. A very important factor is that neither the person running the experiment nor the subjects get to know which group they are in – lest they be treated differently and those expectations *confound* the experiment.

After the defined period of treatment ends, certain measures would be made which were all previously agreed on before the study began. Post treatment size, grade, and stage - all using the same standards and measuring instruments - need to be made. Preferably, if possible, the same CT scanners, MRIs, and ultrasound machines – using the same technicians, would be used to make these measurements for comparisons to see if the tumors have reduced in size or grown, and just how much. If the treatment group's results are such that there is a significant difference in tumor response, with the influence of random chance less than 5%, it may be said that this drug is effective in treating breast cancer. It can then be submitted to the medical community, be subject to criticism and review, and hopefully be duplicated again by others with reliable findings. In this way, the body of evidence grows, and we get new techniques in our fight against diseases.

However, there are some studies that prove to be very valuable that may not conform to the above techniques, but can still greatly contribute to our knowledge. One such famous study was the *Framingham Heart Study* which began in 1948. It followed 5,209 people between the ages of 30 and 62 who were recruited from Framingham, Massachusetts. Since the beginning, it has followed these patients, and now their children and grandchildren (to study effects of family history and genetics) and provided much light on the effects of various behaviors on heart disease – such as smoking, obesity, diet, exercise, and medicines such as aspirin. Although not a randomly assigned, double blind, placebo controlled trial – these studies help us identify risk factors that contribute to disease – although we are not scientifically permitted to draw conclusions of causation.

I wanted to present this information so that in coming articles we may discuss some things that have been found to be beneficial to health and wellness, and what conclusions we may correctly draw from those findings.

~~The worm within us!~~

We really do enjoy hearing from you with any questions, concerns, or ideas for future columns and/or health and wellness related issues for the *Georgia Mountain Laurel*. Please send an email to [rabundoctor@gmail.com](mailto:rabundoctor@gmail.com), or call us at 706-782-3572, and we will be sure to consider your input. This and previous articles can be now be found on the web at [www.rabundoctor.com](http://www.rabundoctor.com) in an archived format. If you use Twitter, then follow us for health tips and wellness advice

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~~As always, I want to address your topics of concern and answer your questions. Please feel free to submit health and wellness related questions or issues to the following email address: [rabundoctor@gmail.com](mailto:rabundoctor@gmail.com). While I cannot promise each one will be answered individually, I can promise that your anonymity will be respected, and I will use this input to guide the content of future columns. Live healthy and well!~~