THE PHYSICIAN'S CONCISE GUIDE

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Relative Risk — Absolute Deception

Why "Studies" are Misleading—Studies ***Aren't*** Science

Dedicated to advancing and publicizing breakthrough discoveries in the health sciences

There is simply no one better in the 21st century at developing practical health-related solutions based on the world's leading medical and nutritional science. **"Science — Not opinion" is Brian's trademark.** When Brian is through explaining a topic it is "case closed!" When he says it, you "can take the information to the bank!"

Unlike most of his peers' recommendations, Brian's health and nutritional recommendations have stood the test of time. **Brian has never had to reverse or significantly alter any of his medical reports—reports that have tackled everything from the dangers of soy, to the wrongly popularized need for fiber in the diet, to his warning about the potential harm of supplementing with copious amounts of omega-3**. In 1995 he published the report "Fiber Fiction" and finally, eleven years later, others in research are acknowledging the silliness of recommending fiber in the diet of a human being. Brian's latest crusade is to warn of the dangers of excess omega-3 (in particular, fish oil) and how it will lead to increased cases of skin cancer. The list goes on and on…

Brian received an appointment as an Adjunct Professor at Texas Southern University in the Department of Pharmacy and Health Sciences (1998-1999). **The former president of the University said of his discoveries: "...His nutritional discoveries and practical applications through *Life-Systems* Engineering are unprecedented."** Brian earned his Bachelor of Science degree in Electrical Engineering from Massachusetts Institute of Technology (MIT) in 1979. Brian founded the field of *Life-Systems* Engineering Science in 1995. This field is defined as *The New Science of Maximizing Desired Results by Working Cooperatively with the Natural Processes of Living Systems*. To many, Brian is THE MOST TRUSTED AUTHORITY ON HEALTH AND NUTRITION IN THE WORLD.

Brian continues to be a featured guest on hundreds of radio and television shows both nationally and internationally. His sheer number of accomplishments during the last decade of the 20th century and into the 21st century are unprecedented and uniquely designate him as the #1 authority in the world of what really works and why. Forget listening to the popular press or most popular so-called health magazines. Their editors simply don't understand the complicated science that they write about — they merely "parrot" what everyone else says without independent scientific verification. Their recommendations often have no basis in reality of how the body works, based on its physiology.

Brian has dedicated his life to provide the truth — which is almost always opposite to what everyone says. Here's why Brian is the #1 man in America to listen to when it comes to your health.

This report was developed to assist physicians and health care professionals in their evaluation of treatment protocols. It also serves as a response to the following question:

How Can Professor Peskin Be Right and Everyone Else Wrong?

I am frequently asked, "How can you be right, and everyone else wrong?" This is a valid question. First, everyone else is not "wrong." There are others who understand and report on the pharmaceutical companies' statistical misrepresentations, but they are typically overlooked by the media. I am not alone in exposing the fallacies behind many pharmaceutical and nutraceutical "successes." In particular, world-renowned physician, mathematician and statistician John P.A. Ioannidis, MD, DSc, is a prominent colleague who has been questioning the "massaged" pharmaceutical statistics for many years.

I am right in my scientific conclusions because, like Dr. Ioannidis, I follow the science and only use studies to confirm where the sciences of human physiology and biochemistry lead. I also understand the science of statistics and am not easily fooled by its often-improper use by those more interested in finance than accuracy. But physicians and health researchers are overworked and have precious little time to do their own research and analysis of the latest "breakthrough" study. They need to be able to rely upon studies published in the professional journals.

Sharon Begley's insightful *Newsweek* article, "**Why Almost Everything You Hear About Medicine is Wrong**," which cites Dr. Ioannidis' findings, was published in the January 31, 2011 edition on pages 8-9. Prepared to be shocked:

- "**But what if <u>wrong answers</u> aren't the exception but <u>the rule</u>**? More and more scholars who scrutinize health research are now making that claim.

- "…[T]he very **framework of medical investigation may be off-kilter**, leading time and again to **findings** that are **at best unproved and at worst <u>dangerously wrong</u>**.

- "The result is a system that **<u>leads patients and physicians astray</u>**—spurring often costly regimens that won't help and may even **harm you**.

- "As the new chief of *Stanford University's Prevention Research Center*, Ioannidis is cementing his role as one of *medicine's top mythbusters*. '**People are being hurt and even dying' because of false medical claims**, he says: not quackery, but **errors in medical research**.

- "But if Ioannidis is right, ***most biomedical studies are wrong***. [Note: Dr. Ioannidis is very right!][1]

- "***In just the last two months, two pillars of preventive medicine fell***.

- "A major study concluded there's no good evidence that statins (drugs like Lipitor and Crestor) help people with no history of heart disease. The study, by the Cochrane Collaboration, a global consortium of biomedical experts, was based on an evaluation of 14 individual trials with 34,272 patients. **Cost of statins**: more than $**20 billion per year**, ***of which half may be unnecessary***. [Note: This evaluation did not even consider the negative side-effects unnecessarily experienced by the unsuspecting patients.]

- "'**Negative results sit in a file drawer, or the trial keeps going in hopes the results turn positive**.' **With billions of dollars on the line, companies are loath to declare a new drug ineffective**. As a result of the lag in publishing negative studies, **patients receive a treatment that is actually ineffective**. That made Ioannidis wonder, how many biomedical studies are wrong?

- "His answer, in a 2005 paper: 'the majority.' From clinical trials of new drugs to cutting-edge genetics, biomedical **research is riddled with incorrect findings**, he argued. Ioannidis deployed an abstruse mathematical argument to prove this, which some critics have questioned. [Note: I found his proof unquestionably correct.]

- "Stanford, the epitome of the establishment, hired him [Dr. Ioannidis] in August to run the preventive-medicine center. 'The core of medicine is getting evidence that guides decision making for patients and doctors,' says Ralph Horwitz, chairman of the department of

1. When I was working on my undergraduate thesis at M.I.T., I derived a different result than one reported in a top science journal. Naturally I thought I was wrong, but I wasn't wrong. To my surprise, my thesis adviser told me that 95% of the published journal articles are WRONG. As a young student, I was shocked and appalled! When it comes to the next "miracle" product, you should approach the journals with a healthy dose of skepticism

medicine at Stanford. 'John has been the foremost innovative thinker about biomedical evidence, so he was a natural for us.'

"Ioannidis's first targets were **shoddy statistics used in early genome studies**. [Note: See the report, "Good News: It's Not Genetic" at www.brianpeskin.com.]

- "'When you do thousands of tests, statistics says you'll have some ***false winners***,' says Ioannidis.

- "Drug companies ***make a mint on such dicey statistics***. By testing an approved drug for other uses, they get ***hits by chance...***

- "Even when a **claim is disproved, it hangs around** like a deadbeat renter you can't evict."

(Emphasis added.)

I warned you in advance that you'd be shocked to discover this deception. Now, I will give you the tools so that you will never be fooled again.

Deceptive Statistics Mislead Patients…

- Recently, a physician colleague told me that there were over fifteen thousand — that's correct, 15,000 — studies showing fish oil's effectiveness. My first response was laughter.

- The next day, a close friend of my wife told her she needed to take calcium because it decreased risk of colon cancer by 40%. She went on to explain that because she was taking it, and my wife was not, that she had a 40% lower risk of contracting colon cancer. Again, I started laughing…

- Later in the week, another physician colleague told me statins decrease the chance of a heart attack by over 30%. You've likely guessed it… more uncontrollable laughter. We shall soon discover why, but first let's explore the reasons for the absurd number of repetitive studies.

Studies Aren't Science!

Startling Revelation: The number of studies is inversely proportional to the effectiveness of what is being studied.

There should not be a need to keep repeating studies unless the substance being studied doesn't work; if you do this, you are **trying to get random chance to back up your study, rather than science confirming its effectiveness.** This is precisely the reason why there may be 1,000 studies showing a positive result and 950 showing a negative result, yet the "positives" are considered to prevail. Physicians will actually say this slight preponderance "proves it works." This is dreadfully WRONG and shows an enormous lack of scientific reasoning by the health and medical professions, because they have no idea of where the *science* is leading them. Experimental results MUST CONFIRM science's prediction, not be counter to it. How we become misled is described below.

Is Gravity Confirmed on a Weekly Basis?

How many experiments have been recently done confirming gravity? None. It was proven hundreds of years ago, and a small number of scientists confirmed its mathematical effects, resulting in proven theorems such as that showing the relation between how much distance is traveled versus the length of time an object drops when released from the top of a tall structure. Case closed. Contrast this to fish oil's reported 15,000 studies. Consider why so many studies need to be done IF it really works. When you hear terms like "1,000 studies show…" simply ask, "why so many?" You are being deceived.

When a study or, better yet, an experiment (which has just one highly controlled variable), is conducted, the result is either significant in EFFECTIVENESS — working very well on the vast majority of patients — or it isn't. Then, if you want to double check, another group performs the same experiment ONCE more, to confirm it. That's it. (As an example of both high effectiveness and high significance see www.brianpeskin.com for the IOWA Study.)

Before any experiment is conducted, one should have a good idea of what the result will be based on established physiology and biochemistry. This was conveyed to me while a student at Massachusetts Institute of Technology (MIT). The experiment should merely CONFIRM the SCIENCE.

As a prime example, take fish oil. The simple reason for so many "studies" is that it simply doesn't work as we are led to believe. Fish oil doesn't work because it can't work. It can't work because there are no significant metabolic pathways that omega-3 EFA derivatives influence that could possibly give those supposed "extraordinary" results (see www.brianpeskin.com for "Fish Oil Fallacies" report). A quick review of physiology (see "Fish Oil Fallacies" at www.brianpeskin.com) tells us why it can't work — humans don't live in frigid cold waters like most fish do. EPA/DHA oxidize (turn rancid and spoil) automatically at room temperature and oxidize even more rapidly at body temperature.

Physicians are in an Unfortunate Situation

Physicians want to help their patients. As a result, they are often quick to dismiss failure or harmful side effects in order to give something to a suffering patient. As a recent example, physicians often told patients that side effects such as muscle weakness, cognitive impairment, decreased sexual desire, etc., did not occur from statin use. After 10 years of steadfastly denying that these harmful side effects existed, physicians recently had no choice but to acknowledge them.

Clear thinking is required of today's medical researchers; unfortunately, it doesn't often occur.

"The scientists of today think deeply instead of clearly. One must be sane to think clearly, but one can think deeply and be quite insane."

Nicola Tesla

Finance Masquerades as Science….The Ultimate Tragedy

To compound the problem, finance often masquerades as science. Nutritional companies and pharmaceutical companies often mislead both physicians and their patients while chasing profits. Instead of measuring the outcome directly, such as fewer heart attacks or less cancer, "surrogates" are used. A surrogate is a substitute measure *assumed* to be associated with the desired outcome. This consistent mistake often leads to the tragedy of more failure. For example, doctors and researchers concentrate on lowering cholesterol rather than studying the ultimate objective of decreased heart attacks. There is an assumed relationship. However, this is not backed up by the science: while drug companies have done a wonderful job of discovering cholesterol-lowering drugs, this has unfortunately not translated into fewer heart attacks. Yet this practice is so prevalent that it has become "conventional wisdom" that you are supposed to reduce your (LDL) cholesterol!

Without being overly cynical, this is done because the latest "wonder" drug likely has an effect on the surrogate, without regard to its DIRECT impact on the problem at hand. Consequently, the drug-company-led studies focus on their drug's ability to alter the surrogate.

"Effectiveness" is Interpreted Quite Differently Than Any True Scientist Would

If I were told that taking a drug affords me 40% less risk, then I would *assume* that taking that drug would reduce my risk of contracting said disease by 40% compared to someone not taking the drug. WRONG. You can't tell the

size of the effect unless you know the subject population size. **This "40% reduction" that you *think* you have achieved would be what is called an "absolute" risk, but all the pharmaceutical studies use "relative" risk when *reporting* statistics.** The difference is staggering, and it is virtually guaranteed that the real difference, the ONLY one that matters, is FAR LESS than the reported percentage. This is illustrated in the example below.

Absolute Risk vs Relative ("Endpoint") Risk — A Case Study in Tortured Logic

Question: What is the difference between 2 successes in 1,000,000 (drug) vs. 1 success in 1,000,000 (placebo)?

Drug		Placebo
2 patient successes out of 1,000,000 patients treated	**vs**	1 patient success out of 1,000,000 patients treated

Answer: The absolute result is 0.0002% vs. 0.0001%, or effectively 0% success in both cases—ABSOLUTE FAILURE...

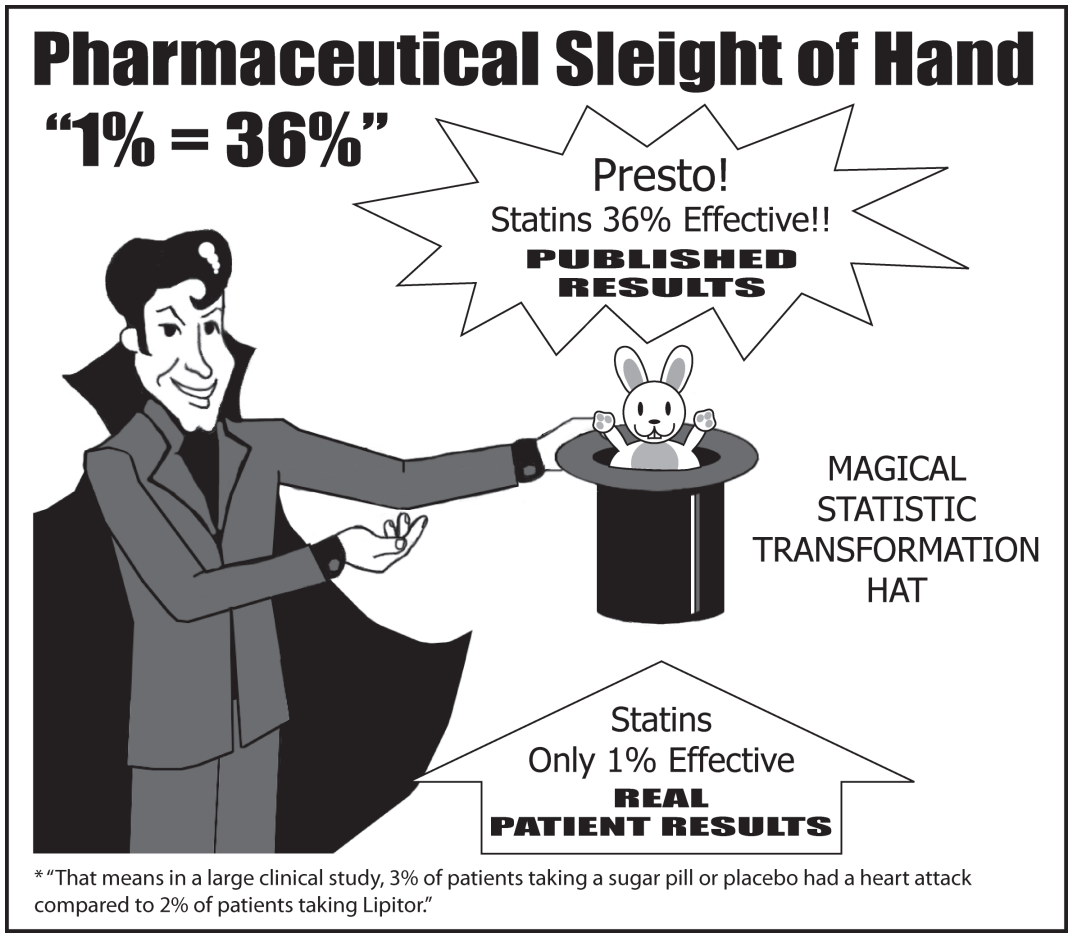
That is, unless you are part of the pharmaceutical or nutraceutical industry, whereby 0% success MAGICALLY BECOMES 50% success.

Here's how they deceive you: The calculation they will use is this: Ignoring the total number of patients tested, they will say that there is a 50% difference in effectiveness of the results (2 to 1). They have deleted the sample size of 1,000,000 patients. This calculation of 50% is termed "relative" risk because the sample size was deleted and only the "endpoints" — the *successes* in each group — are used. There is only one "small" problem with this method of reporting the drug's supposed success—it's absurd!

Absolute Risk MUST Include Sample Size

No honest scientist or physician would claim a 50% improvement with this drug, because the SAMPLE SIZE is not included.

In the following statin example, 1% "*magically becomes* 36%," misleading you as to the true, accurate measure of difference in heart attack risk. The TRUE EFFECTIVENESS is the difference in results in ABSOLUTE MEASURES that INCLUDE SAMPLE SIZE: 3% effectiveness of the statin minus 2% effectiveness of a placebo equals 1% effectiveness in absolute terms. That's right, a shockingly low 1% is reported as a much more significant 36%!



Shockingly, there is a one percent (1%) **difference in effectiveness between the results with Lipitor and the results with a placebo.** If you were given this information, would you take this drug? Of course not. That is, IF you knew and understood the TRUTH.

This miniscule 1% difference is termed *absolute risk* and correctly takes into account the sample size. This leads to NNT (number needed to treat) and shows why it is critical when evaluating the effectiveness of a protocol.

NNT (Number Needed to Treat) is Paramount — Not Misleading "Endpoint" Statistics

Many physicians are misled because they have no idea the pharmaceutical companies are allowed to manipulate statistics. Pharmaceutical companies shockingly, yet legally, get to remove the sample size. Again, when is one patient event *in a million* (drug) *compared to* two patient events *in a million* (placebo) equal to *50% improvement* instead of the statistically correct 1 in 1,000,000 or 0.0001%? Answer: with the fanciful "*pharmaceutical endpoint method*," also termed "relative risk," as Professor of Medicine Stanton Glantz so aptly put in his book. (Glantz SA. Primer of Biostatistics. 5th ed. New York, NY: McGraw-Hill, 2002, 149-156.)

You will often see the statement, "Lipitor reduces the risk of heart attack by 36% ... in patients with multiple risk factors for heart disease," quoted in drug ads, such as the one on television a few years back featuring Dr. Robert Jarvik, inventor of the Jarvik artificial heart. In newspaper ads, the 36% comes with an asterisk (*) saying, "That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor." The difference between the treated and non-treated groups is a miniscule 1%, hardly worth getting excited about UNLESS you are a pharmaceutical or nutraceutical company that has already invested hundreds of millions of dollars in this drug and must ultimately sell this FAILURE to the desperate masses.

In the case of statins, the NNT is 100 (the reciprocal of the absolute risk, i.e. 1/1% = 1/.01 = NNT of 100). No, this "100" isn't a perfect score you aspire to on a college exam; quite the contrary, it is an awful score. It means that to see a positive effect in just one patient, one hundred patients have to be treated, and often treated for many years at that. Therefore, *99 out of 100 patients will see no positive effect* — a **99% FAILURE RATE**! Many medical researchers are convinced that the real NNT for statins in a standard *mixed* population, such as the typical patient a physician treats for CAD, may be closer to 250. Even assuming the lower 100 NNT figure, this is even more problematic for statins' performance because 10% to 15% of statin patients experience negative side effects, including sexual dysfunction, muscle

aches – prominently mentioned on Lipitor's label – and significant cognitive problems, including loss of memory. Be aware that neither the NNT nor any of the risk statistics looks at negative side effects. This is an entirely separate issue.

Dr. Nortin M. Hadler, Professor of Medicine at the University of North Carolina at Chapel Hill and a long-time drug industry critic, states, "Anything over an NNT of 50 is worse than a lottery ticket; there may be no winners." (Carey J., "Lipitor: for many people, cholesterol drugs may not do any good," *BusinessWeek*. January 17, 2008:52-59.) Even Las Vegas has games with a chance of winning greater than 1% or 2%. Shouldn't drugs or nutraceuticals have a higher standard?

Grasping the Magnitude of the Problem

Decades old antibiotics commonly have an NNT = 1.1. When 11 people are given antibiotics, ten patients are cured of the problem for which the antibiotics were prescribed. Contrast this with statins, where 100 patients are given the drug and one person is helped; NNT = 100.

The higher the NNT, the LESS effective the drug.

If you remember only one point from this report, it should be that the intelligence of the answer is directly related to the intelligence of the question. Don't let yourself be misled with shoddy statistics that don't include the critical sample size.

One Last Critically Important Thought

When you receive news of the next "miracle" supplement, aside from requiring SPECIFIC METABOLIC PATHWAYS and state-of-the-art physiologic science supporting these claims, ask yourself:

1. Why is this needed TODAY when it wasn't needed years ago?

Take fish oil supplements. People living in 1950 certainly *consumed significantly less fish oil supplements than we do today*; there was only a very small market for it. The supposed benefits of fish were not publicized in 1950, and fish oil supplementation (being highly susceptible to spoilage) was simply not as common as it is today. Therefore, we should have seen gross pathological disorders due to the deficiency of DHA/EPA found in those supplements, which of course we did not.

- Were there tremendous neurological impairments in the brain, eyes, and central nervous system due to low DHA levels? **No**, and there should have been if the supposition were true.

2. Will taking the supplement stop or reverse conditions it is supposed to prevent?

Regarding fish oil and its huge (supra-physiologic) amount of DHA/EPA, it should both prevent Alzheimer's AND stop the progression of Alzheimer's in patients with low DHA levels. Does it?

No, in 2010, fish oil FAILED miserably to prevent Alzheimer's (see www.brianpeskin.com, "Fish Oil Fallacy" Special Medical Report). Fish oil FAILED to either prevent or to slow the progression of Alzheimer's. Since the same metabolic pathways are used to both *prevent* and to *slow progression* of any disease, you CANNOT make the absurd claim, as was made in front of hundreds of physicians, that fish oil prevents Alzheimer's, but once you have it, fish oil won't slow its progression. Logic maintains that it is more difficult for a substance to prevent a disease (the ultimate "cure") than for a substance to slow progression of that disease. It is illogical to state that it will prevent but NOT slow progression. Scientific logic must prevail.

1. Look at the dosage the supplement provides vs. the amount of food that would need to be eaten to provide it. While we are discussing fish, do you realize that suggested amounts from the manufacturers themselves provide DHA up to 120 times what your body would *naturally produce* on its own, and up to 500 times the amount of EPA that your body would *naturally produce* on its own. Ask what are the effects of this tremendous overdosing?

2. Never rely on mere "associations" from "studies" masquerading as experiments (where one controlled variable only is changed). This is

why one medical and nutritional recommendation after another gets REVERSED, like women taking *synthetic* HRT for its supposed heart protection and cancer protection, when in fact the opposite was true. (Often you never see the retraction.)

Advanced information for health care professionals (not required for the lay public, but included for a more complete understanding of this subject)

What is a "p"-value?"

Statistics is mathematics and therefore extremely detailed. However, the essential concepts you need to know so that you aren't misled again are relatively simple:

1. The first value looked at by physicians and others (and mistakenly too often assumed to be the only important value) is the "p value " or 1 — (p-value), meaning this experimental result occurred by chance alone, i.e., the drug doesn't really work. When the study or experiment is repeated many times using the same general group of people, this same "successful result" recurs that is entirely due to chance alone. *The item of interest (drug or nutraceutical) really didn't work at all*, but we think it did work.

2. Typically, the p-value is set to 0.95 (at a 95% confidence level you get an inherent 5% allowed possible error rate) for the result to be considered "statistically significant." If p = 0.95 then the study would be termed a 95% confidence level study (although a bit more information is required). A 0.99 (1% error rate) or 0.995 p-value (0.5% error rate) would be even better because there would be much less of a random chance effect behaving as though the drug worked when it really didn't, thereby fooling both the physician and patient. With p=95%, even if the drug didn't work, there is a 5% chance that you would get these pseudo-positive results 5% of the time, making it *appear like the drug did work*. This 5% means 1 out of 20 times you are FOOLED into thinking FAILURE is SUCCESS.

Once again, a 95% p-value means that if this experiment were carried out in the same population sample 100 separate times, then this same result

would be included at least 95% of the time; this pseudo-positive result would occur entirely randomly 5 times, although the drug was a complete FAILURE.

It's Easy to Mislead Everyone…

All a company has to do is to conduct many studies and then purposely select only those that randomly show a "positive" result. Don't mention the failures, and presto, you have a "successful" drug! All you need is lots and lots of money.

- The p-value is NOT a measure of the size or magnitude of the effect of the drug. That is a completely different issue and has to do with the means (difference of the averages between both groups). Many physicians and patients don't understand this critical fact and mistakenly think that a p-value alone is all that is needed. Wrong.

- It is true that the MINIMUM p-value should be at least 95%; however, even IF the study has a "significant" effect, then one must ask this next critical question:

How Strong is the Effect? A Little or A Lot?
You need to ask "*What is the magnitude of the positive effect?*" A positive effect can range from a very small negligible effect to a tremendous effect.

What is considered a significant amount or a significant effect?

If more than 51% (the majority) of a group doesn't respond IN ABSOLUTE NUMBERS (NOT relative measures) to the drug, then I am not impressed, and you shouldn't be, either. Typically today, if just 20% of the treated

group obtains any positive effect (regardless of how little), it is considered a huge success. But **this really means 80% FAILURE**.

I am disgusted when substantial failure is transformed, by statistical sleight-of-hand, into a so-called success. To put this into a real-world perspective, an 80% FAILURE rate, whereby buildings collapsed or televisions blew up in your face when turned on, would be unacceptable. I hope you would concur.

Before I personally would trumpet a drug's success, at least 80% of the subjects IN ABSOLUTE NUMBERS must benefit. Recall that there *are* examples of such high levels of success with drugs: insulin lowers everyone's blood sugars; thyroid hormone decreases everyone's TSH level; the proper antibiotics stop every infection.

Is the Item Measured Significant, or a Worthless "Surrogate"?

Low NNT is a necessary, but not an entirely sufficient condition to be able to claim victory. Is there a DIRECT cause/effect relationship? This is absolutely required or once more, you are being misled.

To Reiterate: Worthless Surrogates — NOT the Desired Result Itself — Are Often Used…The Deception Continues…

Even though statins lower LDL-cholesterol, heart disease is not significantly reduced. The tragic truth was only recently accepted. This still hasn't stopped the pharmaceutical companies and physicians from saying that lowered LDL-cholesterol is all that counts. They are WRONG, and patients are paying with their lives.

Therefore, one CANNOT blindly assume that the "disease" is solved when a worthless "SURROGATE" is used INSTEAD of measuring the result itself, such as *how many heart attacks occur with and without statins* (the answer is the same amount, or even more, occur WITH STATINS). This means that statins are ineffective at stopping heart disease.

A recent example: The JUPITER FAILURE Hailed as A Success

Of course, from the above, it goes without saying that there must first be a direct cause/effect relationship to the disease. If you treat 100 patients with

a drug and all 100 improve, the drug's number needed to treat (NNT) is 1 (100 patients/100 successes). If you treat 100 patients and only 1 patient responds positively the NNT would be 100 (100 patients treated/1 positive response). This is an awful result and equivalent to a 99% failure rate. Dr. Nortin M. Hadler, Professor of Medicine at the University of North Carolina at Chapel Hill states: "Anything over an *NNT of 50 is worse than a lottery ticket*…"

Of significant importance is the fact that the 2008 JUPITER study was used to try and gloss over the fact that numerous attempts to prove the "cholesterol theory" (the lower the patient's low density cholesterol [LDL-C], the greater the prevention of CVD), by attempting to make the case that the real mode of action of statin drugs was C-reactive protein (CRP) reduction, have failed. However, there is one tragic flaw: CRP is not a reliable prognostic indicator of cardiovascular events; there are better markers. An article entitled *Largest-Ever Meta-Analysis Finds CRP Is Unlikely to Be Causal for CVD*, reports that scientists of the Cambridge-based Emerging Risk Factors Collaboration (ERFC) found:

> "[A]lthough CRP concentration was linearly associated with CHD (coronary heart disease), stroke, and vascular mortality, as well as nonvascular mortality, statistical adjustment for conventional cardiovascular risk factors resulted in considerable weakening of associations."

An Example of How They Fool You

In the Jupiter Study, **the NNT of 240 for statins, in preventing any stroke (99.58% failure disguised as a hazard ratio of 0.52; p = 0.002), was not stated**.

This means that the JUPITER Study had an **undisclosed** NNT of 240 (**99.6% FAILURE**) for preventing any stroke – instead, a hazard ratio (an estimate

of *relative risk*) of 0.52 (appearing as a 52% success) was published, thus **making the trial appear much more successful than it actually was**.

What *appears* more impressive? A 0.04 success rate / **99.6% FAILURE** rate or a 52% success rate / smaller 48% FAILURE rate? Physicians are deceived and so are their patients.

- **<u>Always</u> ask for the SAMPLE SIZE, since without it you cannot draw any meaningful conclusions.**

- **<u>Always</u> ask for the ABSOLUTE RISK DIFFERENCE BETWEEN BOTH GROUPS, since without it you cannot draw any meaningful conclusions.**