



Insta-Americans:
**The Empowered (and Imperiled) Health Care
Consumer in the Age of Internet Medicine**

The Center for Medicine in the Public Interest

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I. Forward

One of the most difficult meetings I ever held at the FDA was with a group of parents (mostly moms) of teenagers who had committed suicide while taking SSRI antidepressants. In the wake of a very emotional advisory committee meeting, heavily covered by the media, these well-meaning and understandably devastated parents believed that these medicines were the cause of their horrible losses. I listened. Afterwards I wept. As a parent of two children, I cannot even begin to understand their agony.

But as much as they needed to believe that the medications were at fault, the science was never clear. Anecdotal events, even terrible ones, are not science. A recent survey published in the Journal of the American Medical Association found that 55 percent of doctors reported at least one parent refusing to vaccinate their child at all in the past year and 85 percent refusing one or more shots. Doctors surveyed cited that “internet searching enables parents to find horror stories about adverse effects from vaccines, including a mercury-laden preservative that, despite studies to the contrary, some people think is linked to a form of autism.”

All this begs the question: Is knowledge power? That depends on whether or not the knowledge is correct. And nowhere is that more true or more urgent than in the life of the 21st century digital health care consumer.

As candidates for the White House focus on health care reform, millions of Americans resolve to be healthier in 2008. And they are – *we are* -- in ever growing multitudes, turning to the internet for advice. But is the plethora of on-line information we’re finding during our intense surfing expeditions correct and appropriate? Who’s minding the store?

To determine what patients typically see when searching for information on prescription medications, CMPI took a snapshot of the first three pages of Google search results for Crestor, a commonly-used drug used for cholesterol and atherosclerosis and Avandia, a type-2 diabetes drug. With few exceptions, the information we found appeared legitimate but had no medical authority whatsoever. In many cases, we found lawyers posing as medical experts.

CMPI also looked at the real world consequences of what happens when decisions are based on incomplete, false or misleading information. Using SSRIs and vaccines as examples, CMPI found that basing decisions solely on online hysteria and fear could very well fuel a Precautionary Principle-based public health crisis.

The analysis of search results revealed that online real estate was dominated by Web sites paid for and sponsored by either class action law firms or legal marketing sites searching for plaintiff referrals. Other sites were sponsored by groups or individuals selling “alternatives.”

This trend is the result of the rise of what the Center for Medicine in the Public Interest (CMPI) calls the “Insta-American.” Never before has information flowed as freely or as swiftly as today. Today we expect *all* their information to come fast and free. We don’t like waiting in lines or plodding through complex reading. And as 60 million Baby Boomers begin to reach the age where health care becomes a primary concern, they are going to want what they’ve always wanted, everything – and right away. When it comes to health care, it’s all about immediacy of access to information.

This attitude is downright dangerous when it comes to our health because those filling the need for responsiveness are exploiting anxiety for their own self-interest, and they’re using the Web to do so. According to the Pew Internet and American Life Project, 113 million Americans search online for answers to their health questions. Three quarters of these individuals rarely, if ever, check the sources of the material they find. Compounding matters even further is that it is not clear if checking sources is enough. Even a highly sophisticated reader with some lay medical understanding can find the information presented online confusing.

The Web is home to many important sources of authoritative medical information including the National Institutes of Health, its related National Library of Medicine and medical specialty group web sites. However they are rarely the sites that show up or are seen first. A simple Google search for Avandia, a diabetes drug, and Crestor, a cholesterol medication, reveals the misleading state of online health information. In fact, nearly half of the first three pages of search results belonged to lawyers and attorney referral services seeking plaintiffs for class action law suits.

Other sources sold herbal “alternatives” or were run by individuals and organizations ideologically opposed to pharmaceuticals. Most often, these sites positioned themselves as neutral sources or expert advice. According to CMPI, sixty-five percent of search results are biased or unverified. No official regulatory pages appear in CMPI’s inventory of results. No pages from professional medical organizations were present either.

The Internet can be extremely useful in informing a patient’s discussions with their doctor. It can be a helpful tool to empower an individual in their medical decisions. But it is important to remember that not everything online is true. The Internet has made it easier than ever before for charlatans and quacks to spread fear and misinformation. Mark Twain wrote: “Beware of health books. You might die of a misprint.” The same can now be said of the Web.

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New York City
January 7, 2008

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II. Executive Summary

Americans are increasingly turning their Web browsers to Google for their information needs. Whether an individual wants to see family vacation photos or is simply looking for movie show times, it is becoming instinctual to look to the Internet. Research indicates that health information is no exception. Roughly eight million Americans search for health information online daily.¹ But what are the ramifications? Is this a good thing?

The Center for Medicine in the Public Interest (CMPI) began this report after hearing from physicians who indicated they were increasingly seeing patients who were fearful of medications based on information found online. In some cases, these physicians were facing enormous patient pressure due to incomplete understandings of the most recent data on medications. The decision of whether or not to use a prescription medication can be a life or death matter. This makes the quality of material patients are accessing of the utmost importance.

Recent research by the Pew Internet & American Life Project indicates that the Internet is a key source for health information. This trend is likely to grow. Currently, the search engine of choice is Google which by some estimates accounts for 65 percent of all online searches in the United States.² This places Google in an enormous position of power. Companies can be made or broken based on where their site falls on a Google search results page. Similarly, the results a Google search returns when looking for information on medications can greatly influence prescription patterns and patient decisions.

To determine what patients typically see when searching for information on prescriptions which are in the headlines, CMPI took a snapshot of the first three pages of Google search results. Research indicates that users tend to stop by the third page of search results.³ A 2005 Pew study, places the average depth of a search at 1.9 pages.⁴ Thus, this sample threshold of three pages (30 individual sites) allowed for a wide range of results without surpassing the limits of content which an average user would view.

CMPI found that the information prominently displayed in search engine results was not only misleading and confusing, but dangerous for patients. An analysis of search results revealed that online real estate was dominated by Web sites paid for and sponsored by either class action law firms or legal marketing sites searching for plaintiff referrals. Other sites were sponsored by groups or individuals selling “alternatives.” With few

¹ Susannah Fox. “Online Health Search 2006.” Pew Internet and American Life Project. Oct. 2006 (ii). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

² Enid Burns. “U.S. Search Engine Rankings” SearchEngineWatch.com. Apr. 2007. <<http://searchenginewatch.com/showPage.html?page=3626021>>

³ “Search users ‘stop at page three.’” BBC. Apr. 2006. <<http://news.bbc.co.uk/2/hi/technology/4900742.stm>>

⁴ Deborah Fallows. “Search Engine Users.” Pew Internet and American Life Project. Jan. 2005 (1). <http://www.pewinternet.org/pdfs/PIP_Searchengine_users.pdf>

exceptions, the information online was presented in a way that the sites appeared legitimate but had no medical authority whatsoever.

Patients who use Google to find important information about such drugs will be overwhelmed with negative information and will find little, if any, solid medical information to help them weigh the risks versus the benefits of using these medications. This is lamentable as both medications have been rigorously examined by the Food and Drug Administration as well as independent scientists and been shown to offer important health benefits to patients. They are safe and effective drugs which can improve quality of life and may even mean the difference between life and death for some patients.

The real world consequences of the overwhelmingly biased and misleading information found online are clearly seen in the case studies of selective serotonin reuptake inhibitors (SSRIs) and vaccines. Both are examples of important medications which have fallen victim to hysteria and fear. In the case of SSRIs, media coverage that this class of drugs increased teen suicides resulted in a decrease in teen antidepressant use. That same year, data provided by the Center for Disease Control and Prevention indicated an 18% increase in youth suicides.⁵ Similarly, unfounded accusations that thimerosal, a mercury-based preservative found in vaccines, causes autism may lead parents to choose not to vaccinate their children. This baseless fear could result in a public health crisis through the resurgence of what should be antiquated diseases like measles, mumps and rubella.⁶

As a culture, we are increasingly prone to want answers instantaneously. But, when it comes to our health, this may not be the wisest course of action. In most cases, there is no better resource than a trained physician who knows an individual's history when it comes to advice for medical decisions. Online information can add tremendous value for patients when used as a research tool for discussions with a doctor, but users should be aware of the sources of the information they find online and possible ulterior motives of site owners.

⁵ Benjamin Shain. "Suicide and Suicide Attempts in Adolescents." *Pediatrics*. Vol. 120 No. 3 Sept. 2007 (669-676).

<<http://pediatrics.aappublications.org/cgi/content/full/120/3/669?maxtoshow=&HITS=10&hits=10&RESURLTFORMAT=&fulltext=shain&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT>>

⁶ Sanford R. Kimmel, MD. "Vaccine Adverse Events: Separating Myth from Reality." *American Family Physician*. Vol. 66 No. 11 Dec. 2002. (2113-2120). <<http://www.aafp.org/afp/20021201/2113.pdf>>

III. Introduction

***Insta-Americans:* The Empowered (and Imperiled) Health Care Consumer in the Age of Internet Medicine**

Despite questionable sources, conflicting views, and overwhelming amounts of information, more and more Americans are turning to the internet for health and prescription drug information. In August 2006, the Pew Internet & American Life Project conducted a survey of 2,928 adults, which examined internet use and habits among Americans looking for medical advice and information. The results indicate that Americans are turning to online medical advice despite serious shortcomings in the quality of online information and problematic questions about the appropriateness of self-diagnosis and treatment.

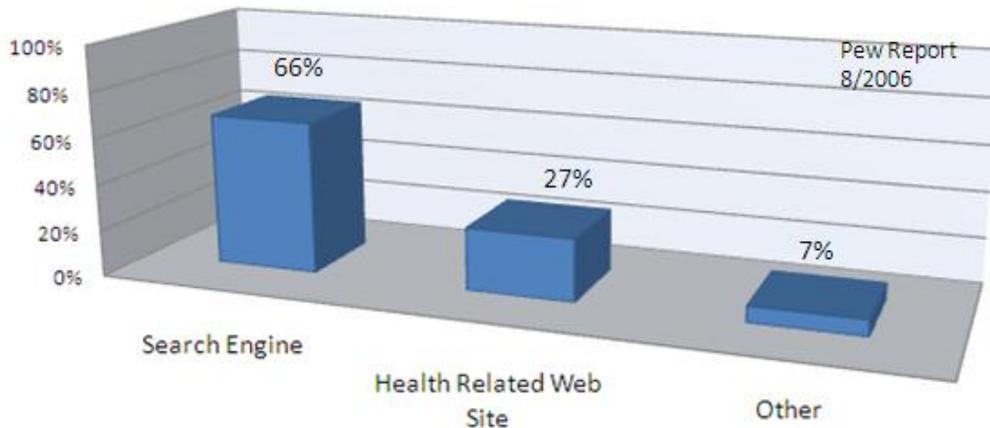
On a typical day, roughly eight million American adults search for information on at least one health topic.⁷ According to the Pew Internet & American Life Project, “This places health searches at about the same level of popularity... as paying bills online, reading blogs, or using the internet to lookup phone numbers or addresses.”⁸

This reliance on the internet as a health information tool is indicative of the evolving “*insta-American*.” The *insta-American* is a fast-growing segment of the population that doesn’t want to be slowed down by writing and mailing checks to pay bills, reading an entire newspaper to be informed, or plodding through the phonebook to find a number. These Americans want their information fast, hassle-free and on their own terms. Scheduling a doctor’s appointment weeks in advance and reading medical literature to investigate prescription drugs are tedious and time-consuming processes. For the *insta-American*, seeking out medical information is most likely to begin with Google.

⁷ Susannah Fox. “Online Health Search 2006.” Pew Internet and American Life Project. Oct. 2006 (ii). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

⁸ Susannah Fox. “Online Health Search 2006.” Pew Internet and American Life Project. Oct. 2006 (ii). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

Where did you begin your last online health inquiry?



One hundred and thirteen million Americans use the internet to search for medical advice.⁹ At the time of the Pew Internet & American Life 2006 survey, 70% of American adults said they had Internet access.¹⁰ Eighty percent of these Internet users say they've turned to the Internet to search for health information at some point.¹¹ This number can be expected to rise as the number of individuals with Internet access grows and seeking instant answers becomes a ubiquitous part of American life.

The information these users seek spans a wide range of health topics. Large percentages of Americans look for online information on specific diseases and treatments, prescriptions and over the counter drugs, and nutrition and fitness. Whether it be specific medical problems such as atherosclerosis or general diet tips, evidence indicates that Americans see the Internet as an encyclopedia of medical advice and expertise. These findings are true across all age and education demographics. *Insta-Americans* rely on the Internet for instantaneous health information.

⁹ Susannah Fox. "Online Health Search 2006." Pew Internet and American Life Project. Oct. 2006 (1). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

¹⁰ Susannah Fox. "Online Health Search 2006." Pew Internet and American Life Project. Oct. 2006 (2). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

¹¹ Susannah Fox. "Online Health Search 2006." Pew Internet and American Life Project. Oct. 2006 (4). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

Health Topics: 2006

Pew Report 8/2006

In all, 80% of internet users have looked online for at least one of 17 health topics. Certain subgroups reported significantly higher interest in some topics and are marked in bold/blue type. For example, when compared to online men, online women reported significantly more interest in information about specific diseases, certain treatments, diet, and mental health.

Health topic	All internet users (n=1990)	Online women (n=1116)	Online men (n=874)	18-29 (n=333)	30-49 (n=751)	50-64 (n=579)	65+ (n=277)	High school or less (n=614)	Some college (n=510)	College grad (n=853)
Specific disease or medical problem	64%	69%	58%	61%	67%	64%	54%	52%	65%	74%
Certain medical treatment	51	54	47	45	56	51	40	41	51	62
Diet, nutrition, vitamins	49	53	45	45	55	49	29	40	52	56
Exercise or fitness	44	46	41	55	47	35	24	35	47	51
Prescription or over-the-counter drugs	37	39	35	29	42	40	30	29	38	45

The information these users find online has impact. Seventy-five percent of consumers who responded to a recent survey by Prospectiv, an online advertising firm, viewed the Internet as “their most trusted and reliable resource for researching ailment and drug information.”¹² 35% of individuals participating in the recent Pew Internet and American Life survey said the information they found online affected a decision about whether to see a doctor.¹³

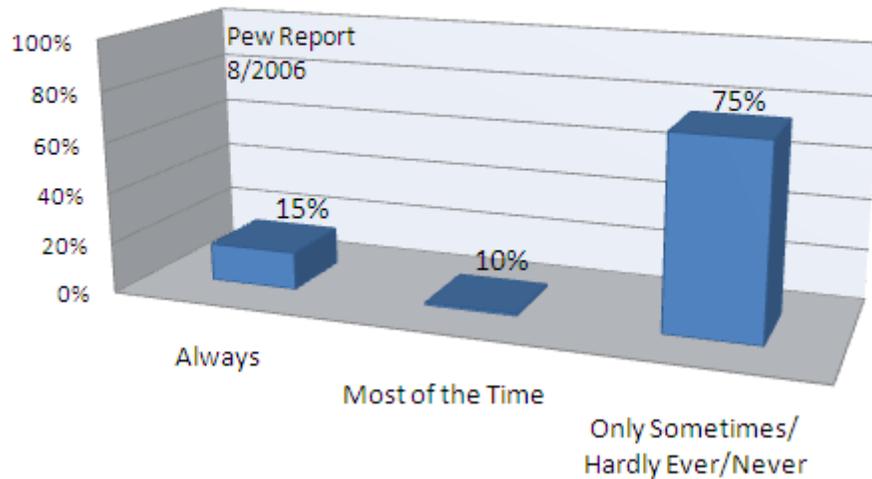
The problem inherent in these scenarios is that medical advice and information is being filtered and acted upon by a non-medically-trained Internet user. Of even greater concern is that the information available online is of variable quality. An untrained user who is making healthcare decisions based on the Google results will find material of questionable worth. And much like our email boxes are filled by “spam” urging us to collect millions from Nigeria or confirm our banking information from phony Ebay or Bank of America security sites, much of the medical “information” on the Web is designed to sell, deceive or frighten, rather than inform. In fact, research by the Center for Medicine in the Public Interest indicates that nearly 65% of the first three pages of Google search results on two safe and effective prescription medicines, Crestor and Avandia, came from sites which were biased or contained unverified information.¹⁴

¹² “75 Percent of Consumers Say Internet is Their First-Choice Resource for Drug Treatment Information, according to Prospectiv Survey.” *Prospectiv (Press Release)*. Jul. 2007.

¹³ Susannah Fox. “Online Health Search 2006.” *Pew Internet and American Life Project*. Oct. 2006 (8). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

¹⁴ See Appendix.

How often do you check the source/date of online health information?



These statistics are troubling because the majority of individuals researching health information online are not appropriately scrutinizing the information they find. The drive for instant answers is causing users to cut corners. Three-quarters of online health information seekers “only sometimes,” “hardly ever” or “never” check their sources.¹⁵ This is approximately 85 million Americans gathering advice without examining the pedigree of the guidance they find.¹⁶ These 85 million Americans are making decisions about healthcare without knowing whether or not the information they are using to make those decisions comes from a credible expert.

This practice of “do-it-yourself” online medical diagnosis *can* help arm patients and healthcare consumers with valuable research. But if this research is gathered in a vacuum, without the benefit of input from a credible physician, or certification of the information from an official organization like the Food and Drug Administration (FDA) or the American Heart Association, the results can be dangerous and disastrous. Case studies of the antidepressant controversy and vaccine fears are illustrative of the dangerous consequences which result from giving undue weight to questionable sources. Americans seeking online health information must be aware that the motives and intentions of those on the Internet are not always pure. Medical advice and research Web sites may be operating under special interests and politics which may not be immediately visible to the average online health information seeker.

Medical Information on the Internet: Insightful or Influenced?

¹⁵ Susannah Fox. “Online Health Search 2006.” *Pew Internet and American Life Project*. Oct. 2006 (iii). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

¹⁶ Susannah Fox. “Online Health Search 2006.” *Pew Internet and American Life Project*. Oct. 2006 (iii). <http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf>

There are many “good” sites online for medical information. Unfortunately, there are also many sites that are funded, run, and promoted by individuals and groups with interests which may not correlate with the best medical practices and research available. These groups and individuals may have more invested in their agendas than in the science behind the questionable “medical recommendations” they make.

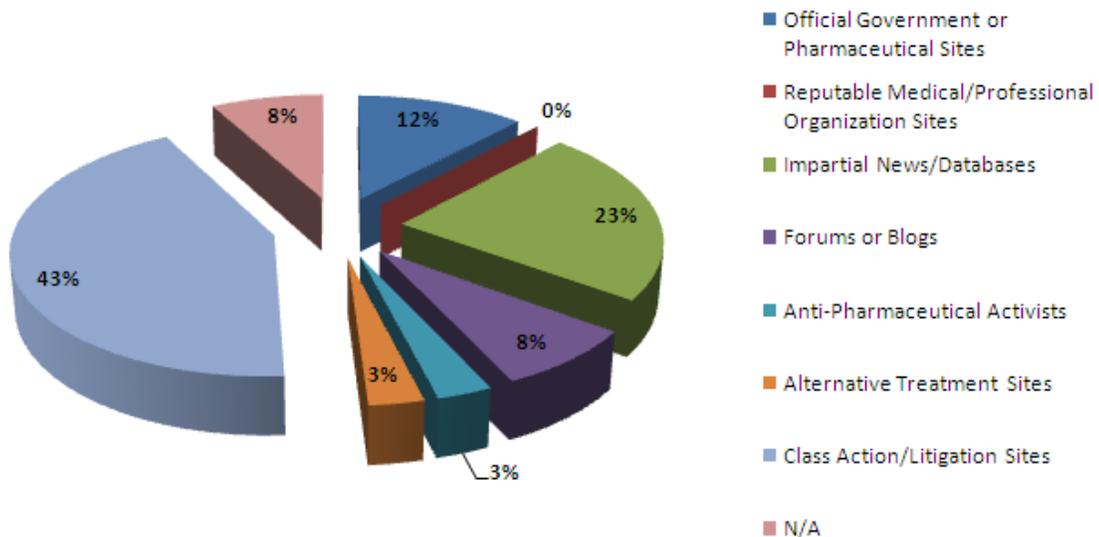
This makes it vital for online information seekers to identify the type of Web site they are viewing and to place the information they find in the appropriate context. Research by the Center for Medicine in the Public Interest indicates that the majority of sites which result from a typical online search of high-profile prescription related medical topics can be divided into seven groups:¹⁷

- Official Government or Pharmaceutical Sites – These sites are among the best sources for online information on medical topics. Information on prescriptions and diseases must pass the highest standards and scrutiny to be posted on these sites.
- Reputable Medical and Professional Organizations – Web sites like that of the American Heart Association or the American Cancer Society represent another good source of health information. They have earned a reputation of trust and credibility and often feature peer-reviewed medical journals or the recommendations and conclusions of medical professionals.
- Impartial News/Database Sites – Information pulled from news sites or medical information databases should be carefully evaluated. While the information found in these venues may be valuable, there is also the possibility that it may not reflect the conclusions of the medical community as a whole. Articles may contain information based on ability to attract readers as opposed to sound research. The site’s treatment of a story may be different than that of the professional medical community.
- Forums or Blogs – These sites contain the opinions any number of individuals. Those participating in these discussions may be patients, physicians, or even attorneys. There is simply no way to verify credibility of the source of the information found here.
- Anti-Pharmaceutical Activist Sites - There are a number of groups online who for various reasons pursue an anti-pharmaceutical agenda. Individuals searching for health information should pay extra care when evaluating inflammatory statements about medications. These attacks may be rooted in an ideological view rather than sound science.

¹⁷ See Appendix.

- Alternative Treatment Sites – Another class of sites which users should be wary of are sites which offer “alternative treatments.” Such sites may have financial interests in selling herbal remedies or other alternative forms of treatment. Opting for such remedies without consulting a trained physician may result in medical complications or let serious problems go unchecked.
- Class Action/Litigation Sites – A new technique in gathering parties for class action lawsuits is to create Web sites which patients will find when searching for medical advice. Such sites cannot be relied upon for balanced and accurate information.

Google Search Results for Crestor & Avandia Side Effects



The case studies of Crestor and Avandia show how biased or unverified information dominates the online environment. Forty-three percent of sites on the first three pages of search results for these topics belong to litigators who are soliciting clients.¹⁸ This is in striking contrast to reputable medical and professional organizations which do not appear in search results on these subjects. Share of the online dialogue in these cases is skewed towards individuals and organizations with clear interests in perpetuating fear.

The influence of such actors with questionable motivations works like a series of gears: each turns the other and amplifies the dubious material found online. A striking feature is that there is no consistent catalyst which drives the process. For example, in one case study plaintiff groups might drive the goals of researchers who use shoddy methodologies to produce questionable conclusions. In another, researchers may drive the goals of plaintiff groups. Discussions in online forums quickly become influenced and media

¹⁸ See Appendix.

coverage of the issue is affected as well. These developments all build upon each other. The result is a widespread dispersal of biased or inaccurate information throughout the online community.



Much of the information spread by these groups and available on advice and research sites is meant to inspire fear. These “findings of fear” are spread through “news feeds,” which are often sponsored by and run on numerous class action litigator Web sites targeting certain products. This material is meant to be seen by the public, legislators, and the media. Because online medical information is an important and widespread source for Internet users, these groups are often successful. In an interview with Star News Online, Dr. Randy Fink, an obstetrician/gynecologist in Miami, Florida, talks about the effect of questionable Internet sources on his patients:

"Every day, I spend time undoing damage done by patients reading faulty or misleading information from the Internet. I am fond of telling patients that the Internet is the world's biggest bathroom wall. It is a natural tendency to either over-interpret or under-interpret information about one's health, so there is no substitution

*for an objective opinion from a clinician who knows your personal history."*¹⁹

The Internet allows litigators and other players with health agendas to spread their opinions about specific drugs or treatments to millions of people every day. It is a cost effective means of reaching more people than was ever possible in a pre-Web age. But the consequences are not limited to patients like the ones in Dr. Fink's office.

The assault on medicines and medical advice muddies the waters for regulatory bodies like the FDA, causing them to second guess their own scientific studies and conclusions about the drugs targeted by activists and plaintiff attorneys. When legislators or administration officials are added to the mix, voicing their opinions based on incomplete or inaccurate data from the Internet, the confusion is compounded.

The confrontational nature of this Internet information, backed by questionable research, leads to a more cautious FDA, a more risk averse pharmaceutical community, and fewer new drugs being introduced and approved. As the case studies will show, overwhelming amounts of bad information can turn the public, the media, legislators, and regulators against good medications.

Using Online Health Information: Practical Steps and Guidelines for Evaluating Online Medical Advice

The two most important questions online medical information seekers should ask themselves are: 1.) How do I know this information is accurate? 2.) Where did this information come from?

Asking these questions and being aware that online information may be biased or inaccurate are the first steps towards using online health information productively.

There are a number of ways to investigate the accuracy and source of online information. The National Cancer Institute established an additional ten questions to guide consumers as they navigate the online health environment:²⁰

1. Who runs the site?

Reputable sites make clear who runs them. This information tends to be visible at the top and bottom of every page. Another possible location for this information is the "About This Site" page. Users should evaluate the motives and reputations of the owners of the site when assessing online information.

2. Who pays for the Web site?

¹⁹ Marisa Osario Colon. "Medical Web Advice." *Star News Online*. Sept. 4, 2007. <<http://www.starnewsonline.com/article/FP/20070904/HEALTHMATTERS/70904005/-1/health>>

²⁰ "How to Evaluate Health Information on the Internet: Questions and Answers." *National Cancer Institute*. Rev. Sept. 1, 2005. <<http://www.cancer.gov/cancertopics/factsheet/Information/internet>>

Web sites cost money. If the site's Web address ends in ".gov" it is a Federal Government-sponsored site. ".edu" indicates an educational organization, ".org" a non-commercial organization and ".com" a commercial organization. Does the owner of the site use advertising or sell a product to generate funds? If the site is non-commercial, who are the organization's funders?

3. What is the purpose of the Web site?

Most Web sites have a purpose and this purpose is related to who runs and pays for the site. This information is often available at an "About this Site" page. It is important that users consider possible motives of those running and/or paying for a site. These may not be directly stated.

4. What is the original source of the information on the Web site?

If the information contained on a site is original, users should ask what the credentials are of the author. Many sites however do not write their own material, the original source for the material should be clearly identified.

5. How is information on the Web site documented?

In addition to identifying the source of online health information, sites should include references which clearly identify what the material is based on. Reputable sites will also clearly separate opinion and advice from "evidence based" material.

6. How is information reviewed before it is posted on the Web site?

What are the credentials of the people who prepare and review the material which is posted online? Sites should identify the standard by which material is presented. Watch for third-party seals at the bottom of pages which may indicate the material complies with various guidelines for online health information. Investigate what these seals mean and understand the process by which the material posted is fact checked.

7. How current is the information on the Web site?

It is important that medical information be current. Individuals should pay special attention to the last time the material was reviewed. Reputable sites will clearly post this information.

8. How does the Web site choose links to other sites?

Does the site have a policy about placing outside links on their site? Does it review and endorse the content to which it is linking? Why? Does the site receive money for posting links to other sites?

9. What information about users does the Web site collect and why?

Most sites track how a user enters their site and what pages they view to determine what content generates the most interest. However, a number of sites require users to subscribe to gain access to materials. Users should examine a site's privacy policy and understand how their personal information will be used before subscribing to any content.

10. How does the Web site manage interaction with users?

Reputable sites always provide information for users to contact the owners if there is any problem with the online content. If the site hosts a chat or discussion area, the site should tell users what the terms are of this service and whether the service is moderated.

These questions should form the backbone of any online medical search and will help place the information found in the appropriate context. While it is important to remember that online medical information will never replace the counsel of a physician, accurate and reliable materials can be an excellent resource for a starting point in a discussion with one's doctor.

IV. Case Studies

The Internet & Inaccurate Information

Demonstrating the alarming environment of online health information are two case studies on prescription drugs which have occupied recent headlines. The first involves the cholesterol drug CRESTOR and the second, the diabetes drug, AVANDIA.

Case Study #1: CRESTOR® (rosuvastatin calcium)

CRESTOR: Background

CRESTOR is one of a class of drugs called statins. It is approved by the FDA to treat high cholesterol and slow the progression of atherosclerosis (hardening of the arteries), both which can lead to heart disease, the leading cause of death in the U.S.

Nearly 2,400 Americans die of cardiovascular disease each day, an average of one death every 36 seconds.²¹ Cardiovascular disease claims more lives each year than cancer, chronic lower respiratory diseases, accidents and diabetes mellitus combined.²² It is estimated that, in 2007, the direct and indirect cost of cardiovascular disease in the U.S. was \$431.8 billion.²³

Dozens of clinical trials and the FDA have concluded that CRESTOR is a safe and effective. Because CRESTOR is effective in both lowering cholesterol and slowing the progression of atherosclerosis, the potential benefits are enormous. In fact, just a 10 percent decrease in total cholesterol levels (population-wide) may result in an estimated 30 percent reduction in the incidence of coronary heart disease.²⁴

Heart disease, cholesterol and atherosclerosis (hardening of the arteries) are undertreated and, in many cases, preventable, diseases. Less than half of the people who qualify for any kind of lipid-modifying treatment for coronary heart disease are actually receiving it. And less than half of even the highest-risk persons, those with symptomatic coronary heart disease, are receiving a lipid-lowering treatment, such as CRESTOR.²⁵

The reasons for this under treatment vary, but as detailed earlier in this report, people go online for health information and some of the gap in treatment can be blamed simply on bad information. For example, a patient interested in taking CRESTOR or learning more about statins will typically first turn to Google. Unfortunately, what they find online may steer them away from asking their doctor about treatments, or even taking a medication prescribed by a physician. That could be a life or death decision.

To simulate a typical patient online search of CRESTOR, we entered “CRESTOR side effects” in the Google search engine. What we found was not medically sound advice which lists the benefits, and the risks, of the medication, but rather information that is not only misleading and confusing, but dangerous for patients.

CRESTOR: Search Engine Results

²¹ Minino AM, Heron MP, Smith BL. “Preliminary Data for 2004 National Vital Statistics Reports.” National Center for Health Statistics. (Hyattsville, MD) Vol. 54 No. 19 2006.

²² Minino AM, Heron MP, Smith BL. “Preliminary Data for 2004 National Vital Statistics Reports.” National Center for Health Statistics. (Hyattsville, MD) Vol. 54 No. 19 2006.

²³ “Heart Disease and Stroke Statistics.” American Heart Association. 2007. (9)

<http://www.americanheart.org/downloadable/heart/1166712318459HS_StatsInsideText.pdf>

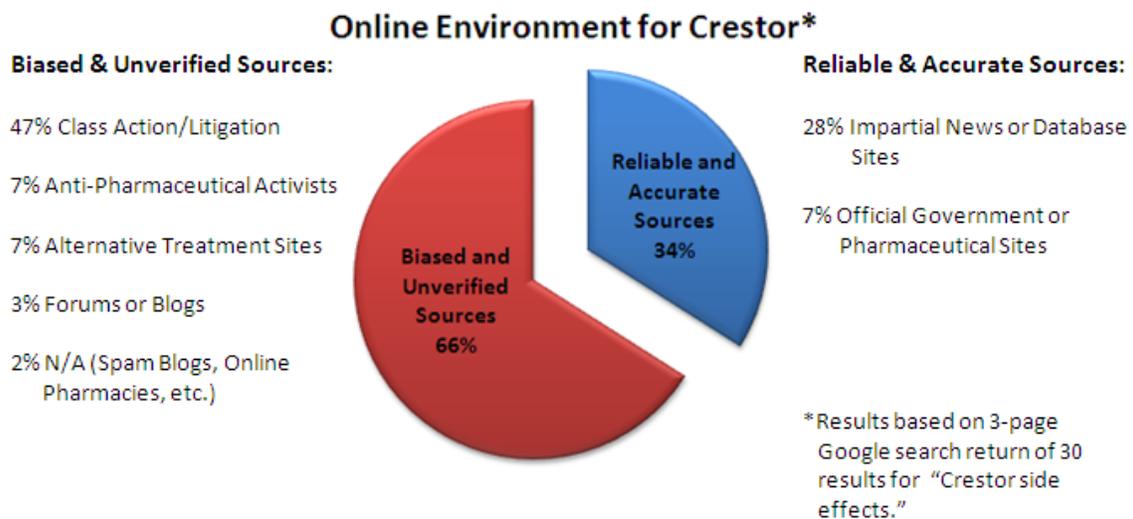
²⁴ “State Specific Cholesterol Screening Trends.” CDC Morbidity and Mortality Weekly. Vol. 49 No. 33 Aug. 25, 2000. <<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4933a2.htm>>

²⁵ Based on data from the “Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults” published in the Journal of the American Medical Association Vol. 106 No. 25 Dec. 2002.

Search engine results for “CRESTOR side effects” are dominated by parties that have either a competing commercial interest or a stated political agenda. Competing commercial interests, which include competitors, litigators, and other sites marketing alternative products, control 54 percent of the total CRESTOR online environment.²⁶ Advocacy groups (mostly pharmaceutical industry critics) control 7 percent of the online environment.²⁷ When these numbers are combined with discussion forums, where rumors often run rampant, and spam blogs, one sees that biased and unverified sources control over 65 percent of the online conversation on this topic.

This is in marked contrast to reliable and accurate sites, which only account for one-third of the first three pages of Google real estate. Notably, no government or professional medical association sites appear in these results. Instead, reliable and accurate search results come from pharmaceutical and news sites as well as medical information databases. The conspicuous absence of these important groups represents a clear gap in the online environment for this issue.

The makeup of the CRESTOR online environment clearly indicates that Americans who go online are finding mostly information which is intentionally biased, tainted, or misleading. As detailed earlier in this report, the agendas and motivations of each of the sites must be considered and the “information” they provide put into context.



CRESTOR: Common Sources of Misinformation

Much of the available information found online regarding CRESTOR can be characterized as the replication and repetition of a single complaint submitted to the Food and Drug Administration (FDA) by Public Citizen, an anti-pharmaceutical group. Dr. Sidney Wolfe, director of Public Citizen's Health Research Group has insisted that CRESTOR is unsafe.²⁸ CRESTOR remains listed by Public Citizen as “Do Not Use”

²⁶ See Appendix.

²⁷ See Appendix.

²⁸ See “Interview with Dr. Sidney Wolfe.” *CNN in the Money (Transcript)*. Jul. 17, 2004. <<http://transcripts.cnn.com/TRANSCRIPTS/040717/cnnitm.00.html>> and “Statement of Sidney Wolfe,

and is listed on the organization's "Worst Pill, Best Pill" Web site.²⁹ The FDA and data in clinical trials flatly contradicts Public Citizen's contention.³⁰ In fact, the FDA reevaluation of CRESTOR data (following a petition by Public Citizen) reconfirmed that CRESTOR is safe.³¹

The inflammatory information from Public Citizen continues to populate and dominate the Internet and is the information patients find when they go online for information.

CRESTOR: Conclusion

Most of the benefits and the extensive positive safety data on CRESTOR are not readily found online. Patients searching for information on this subject will find sites with various commercial interests instead of information that might be helpful in achieving optimal results, on both cholesterol and atherosclerosis, based on the combination of statin therapy and lifestyle change.

The influence of this agenda-driven information is hard to measure. It is clear that the online environment poses a serious concern. Many individuals whose cardiovascular health may benefit from CRESTOR may be dissuaded from taking a statin based on the material they find online. Even worse, patients who have been prescribed CRESTOR by their physician may choose not to take their medication after reading the misinformation being promulgated online by those who profit by creating fear.

Case Study #2: AVANDIA® (rosiglitazone maleate)

AVANDIA: Background

M.D. regarding the FDA's decision to leave Crestor on the market (HRG Publication #1730)." Public Citizen. Mar. 14, 2005. <<http://www.citizen.org/publications/release.cfm?ID=7371>> for examples.

²⁹ Public Citizen Worst Pills. Last accessed Jan. 7, 2008. <<http://www.worstpills.org/index.cfm?SRC=1>>

³⁰ "Rosuvastatin Calcium (marketed as Crestor) Information." U.S. Food and Drug Administration. Mar. 14, 2005. <<http://www.fda.gov/cder/drug/infopage/rosuvastatin/default.htm>>

³¹ Steven K Galson, MD, MPH. "Letter from FDA in response to citizen petition." Department of Health and Human Services. Mar. 11, 2005.

<http://www.fda.gov/cder/drug/infopage/rosuvastatin/crestor_CP.pdf>

The FDA approved AVANDIA in 1999 for treatment of Type 2 diabetes, a serious and life threatening disease that affects about 18 to 20 million Americans.³²

Having type 2 diabetes increases the risk of many serious complications, including: heart disease (cardiovascular disease), blindness (retinopathy), nerve damage (neuropathy), and kidney damage (nephropathy).³³

While diabetes occurs in people of all ages and races, some groups have a higher risk for developing type 2 diabetes than others. Type 2 diabetes is more common in African Americans, Latinos, Native Americans, and Asian Americans/Pacific Islanders, as well as the aged population.

The total annual economic cost of diabetes in 2002 was estimated to be \$132 billion. The per capita annual costs of health care for people with diabetes rose from \$10,071 in 1997 to \$13,243 in 2002, an increase of more than 30%. In contrast, health care costs for people without diabetes amounted to \$2,560 in 2002.³⁴ One out of every 10 health care dollars spent in the United States is spent on diabetes and its complications.³⁵

It is likely that if a patient had recently been diagnosed with type 2 diabetes or was researching what options were available to manage their diabetes and try to prevent future complications, they would first go online. In the case of AVANDIA, which has been scrutinized and deemed effective by the FDA³⁶, the information they found would not accurately portray the risks and benefits of a potentially lifesaving medication.

AVANDIA: Search Engine Results

As was the case with CRESTOR, the online environment for AVANDIA is dominated by sites containing biased and unverified information. Forty percent of the first three pages of search results on the issue are sites belonging to trial attorneys seeking to enroll clients in class action law suits.³⁷ Blogs, online discussion boards and spam sites represent an additional 15 percent of the online material available to consumers.³⁸

Neither government Web sites nor associations of medical professionals are easily found. None appeared in the first three pages of Google results for “AVANDIA side effects.”

³² Andrew C von Eschenbach, MD. “Statement of Andrew C von Eschenbach, MD Commissioner of Food and Drugs.” Department of Health and Human Services. June 6, 2007. (2)
<<http://oversight.house.gov/documents/20070606105302.pdf>>

³³ “Type 2 Diabetes.” American Diabetes Association. Last accessed Jan. 7, 2008.
<<http://www.diabetes.org/type-2-diabetes.jsp>>

³⁴ “Direct and Indirect Costs of Diabetes in America.” American Diabetes Association. Last accessed Jan. 7, 2007. < <http://www.diabetes.org/diabetes-statistics/cost-of-diabetes-in-us.jsp>>

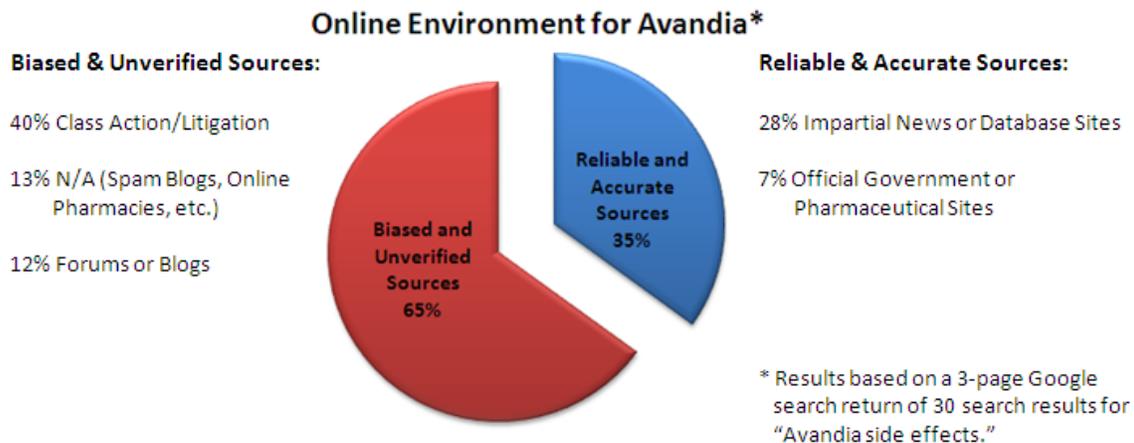
³⁵ “Direct and Indirect Costs of Diabetes in America.” American Diabetes Association. Last accessed Jan. 7, 2007. < <http://www.diabetes.org/diabetes-statistics/cost-of-diabetes-in-us.jsp>>

³⁶ “AVANDIA® (rosiglitazone maleate) Prescribing Information.” U.S. Food and Drug Administration/GlaxoSmithCline. Updated Nov. 19, 2007.
<<http://www.fda.gov/cder/drug/infopage/rosiglitazone/default.htm>>

³⁷ See Appendix.

³⁸ See Appendix.

Patients seeking information on AVANDIA online were left to turn to pharmaceutical sites, medical databases and news articles.



AVANDIA: Common Sources of Misinformation

Information found online regarding AVANDIA centers on an unfavorable article based on questionable methodologies, yet the information still dominates the online environment. In May 2007, Dr. Stephen Nissen submitted an article based on a six-day meta-analysis of publicly available studies on AVANDIA to the *New England Journal of Medicine*. Nissen's article was given special, expedited peer-review and was published that month. The piece was accompanied by an editorial commissioned from two longstanding critics of drug regulation, Drs. Bruce M. Psaty and Curt D. Furberg. It posted online the morning of May 21, *ahead* of its scheduled press embargo of 5 pm.

The respect afforded to the *New England Journal of Medicine* resulted in instant credibility. Relatively few questions were raised about the expedited peer review process or the fact that the study was compiled in six days. That single article elicited a flurry of Congressional action and exploded onto the radar of the media, both traditional and online.

Regardless of the agendas of those involved in publication of the article, the accusations leveled at the drug and the inflammatory language used by Dr. Nissen had dramatic results. Prescriptions for AVANDIA dropped 40 percent.³⁹ The online environment dramatically changed, leaving AVANDIA linked to cardiovascular disease and death in the majority of Internet information on the drug.

In a statement to the Committee on Oversight and Government Reform, United States House of Representatives, FDA Commissioner Andrew C. Von Eschenbach, M.D. advised, "It would be counterproductive indeed if patients stopped

³⁹ Robin Pagnamenta, "Avandia flop forces Glaxo rethink," *Times Online*. Aug. 13, 2007. <http://business.timesonline.co.uk/tol/business/industry_sectors/health/article2249837.ece>

taking rosiglitazone to avoid a small and potential increased heart risk, only to incur a much greater risk from their underlying diabetes.⁴⁰

Yet, that is exactly what has happened. Dr. Jon LeCroy, a senior pharmaceuticals analyst for the investment and research firm Natixis Bleichroeder, said that before Dr. Nissen's article in May 2007, about one million prescriptions were being written each month for AVANDIA. As of September 2007, AVANDIA prescriptions had declined about 60 percent, to 426,000 a month.⁴¹

Dr. LeCroy notes that there has not been a corresponding increase in the use of other drugs for diabetes, indicating that some patients who have stopped taking AVANDIA have not replaced it in their drug regimens. Actos, a drug similar to AVANDIA, has picked up 100,000 prescriptions a month, but that does not account for the drop of almost 600,000 in AVANDIA prescriptions.⁴²

AVANDIA: Conclusion

Nissen's article created a firestorm around the safety of AVANDIA, but at what cost? The spread of negative information was without editorial control once it reached the internet and the plaintiff attorney sites. Discussion boards filled with "personal experiences" masquerading as fact. Patients began making decisions based on incomplete reports (which themselves were based on a meta-analysis that wasn't properly peer-reviewed).

Medical information that had not gone through the normal scientific channels of approval quickly made its way into the media and Internet narratives. Within hours, the unscientifically-based information was widespread and had become "fact." That information continues to circulate and is responsible for most of what is found online when patients search for information on AVANDIA.

Diabetes is a leading cause of blindness, kidney failure, limb amputation, and a major contributor to coronary heart disease. Despite all of the scientific evidence that demonstrates AVANDIA effectively treats diabetes, patients may choose not to take the medication based on the information they find online, even though the benefits of the medication far outweigh the risks.

A sampling of comments from prescribing physicians underscores their fear, not their lack of scientific confidence, in prescribing AVANDIA:

"To put it very simply: If you don't change [prescribing AVANDIA] and

⁴⁰ Andrew C von Eschenbach, MD. "Statement of Andrew C von Eschenbach, MD Commissioner of Food and Drugs." Department of Health and Human Services. June 6, 2007. (17)
<<http://oversight.house.gov/documents/20070606105302.pdf>>

⁴¹ Stephanie Saul. "V.A. limits Glaxo drug widely used for diabetes." New York Times. Oct. 18, 2007.
<<http://query.nytimes.com/gst/fullpage.html?res=9C0CE4DF103EF93BA25753C1A9619C8B63>>

⁴² Stephanie Saul. "V.A. limits Glaxo drug widely used for diabetes." New York Times. Oct. 18, 2007.
<<http://query.nytimes.com/gst/fullpage.html?res=9C0CE4DF103EF93BA25753C1A9619C8B63>>

something happens, you are going to get sued!”⁴³

“Patients have already formed their own opinions based on press reports of this study. In many cases I have a tough time pushing a patient toward something they're already afraid of based on lay press awareness.”⁴⁴

⁴³ Private survey of endocrinologists conducted for Lazard, Inc. June 18, 2007

⁴⁴ Private survey of endocrinologists conducted for Lazard, Inc. June 18, 2007

Dangerous Decisions & the Consequences of Misinformation

The consequences of the spread of medical misinformation are potentially devastating. Case studies of the teen anti-depressant controversy and vaccine fears provide poignant illustrations of the real world implications of this phenomenon.

Case Study #3: Teen Suicide & SSRIs

SSRIs: Controversy

The most prominent critics of antidepressants are the anti-psychiatry groups such as the Church of Scientology, the Alliance for Human Research Protection as well as organizations such as Public Citizen. The basis of their allegations rests largely with anecdotes and “smoking guns” of rampant unreported suicides of children in clinical trials for Paxil.

In December 2004, The Wall Street Journal wrote that “drug-safety analyst Andrew Mosholder delivered a blunt message to his colleagues at the Food and Drug Administration: Young people taking antidepressants were more likely to become suicidal.”⁴⁵ Mosholder’s findings were criticized as being premature and based on unreliable data. The concern, above all, was that the FDA didn’t want to drive people away from the medications “when we weren’t sure that was the right thing to do, and it may be the wrong thing to do,” says Robert Temple, associate director for medical policy in the FDA’s drug-evaluation center.⁴⁶

Ultimately Dr. Mosholder’s study, which was never peer-reviewed or published until 2006, prompted massive national media coverage and became the basis for adding a black-box warning to the labeling of all selective serotonin reuptake inhibitors (SSRIs). The warning language states that “antidepressants increase the risk of... suicidal thinking and behavior ... in children and adolescents” with depression and other psychiatric disorders.⁴⁷ It also states that patients should be closely watched, and note whether the drug has shown enough evidence of efficacy to be approved for pediatric use.

SSRIs: Consequences

People looking for information online regarding the risks and benefits of antidepressants will be inundated with negative media coverage based on Mosholder’s study and the announcement of the black box warning. In the case of antidepressants, ensuring medical

⁴⁵ Anna Wilde Mathews. “Mood disorder: In debate over anti-depressants, FDA weighed risk of false alarm.” Wall Street Journal. May 25, 2004 (A1).

⁴⁶ Anna Wilde Mathews. “Mood disorder: In debate over anti-depressants, FDA weighed risk of false alarm.” Wall Street Journal. May 25, 2004 (A1).

⁴⁷ “Suicidality in children and adolescents being treated with anti-depressant medications.” U.S. Food and Drug Administration Public Health Advisory. Oct. 15, 2004.

<<http://www.fda.gov/cder/drug/antidepressants/SSRIPHA200410.htm>>

decisions are based on factual and scientific information can mean the difference between life and death.

As a result of the negative media coverage, both online and in traditional media, there was a sharp decrease in antidepressant prescriptions. At the same time, there was an increase in depression and suicide. While the findings show only an association and not a causal link between increased suicide rates and decreased antidepressant use, for the first time in history, we're seeing a decrease in antidepressant prescriptions since these new antidepressants were released in 1989.⁴⁸

Indeed, the link was never between SSRI use and suicides at all, but between SSRI use and suicidal thoughts, or behavior, or ideation which is rarely associated with suicidal actions or suicide itself. Yet, in the environment that the relative risks and benefits of using SSRIs to treat depression about children and adolescents took place - such fine distinctions were ignored.

When the black-box warning was issued, some scientists were “concerned that the available research findings do not support a warning that may be misinterpreted by some practitioners or parents to mean that antidepressant medications actually cause children and adolescents to commit suicide.”⁴⁹

This is precisely what happened. Many doctors became reluctant to prescribe SSRIs to children and many parents took their children off antidepressants.

Furthermore, contrary to expectations, other treatments, such as alternative medicines or psychotherapy, which have limited effects on childhood depression, did not increase to fill the gap.⁵⁰

The fact is that suicide rates among American youths dramatically increased from 2003 to 2004, coinciding with a steep drop in antidepressant use. The 14 percent increase in suicides among those 19 and younger is the biggest year-to-year increase seen since the Centers for Disease Control and Prevention started tracking the data in 1979.⁵¹ A similar

⁴⁸ Robert D. Gibbons, Ph.D., C. Hendricks Brown, Ph.D., Kwan Hur, Ph.D., Sue M. Marcus, Ph.D., Dulal K. Bhaumik, Ph.D., Joëlle A. Erkens, Pharm.D., Ph.D., Ron M.C. Herings, Pharm.D., Ph.D., and J. John Mann, M.D. “Early Evidence on the Effects of Regulators’ Suicidality Warnings on SSRI Prescriptions and Suicide in Children and Adolescents.” American Journal of Psychiatry. Vol. 164 No. 9 (1356-1363). < <http://ajp.psychiatryonline.org/cgi/reprint/164/9/1356>>

⁴⁹ David Fassler, MD. “Joint Testimony for the Record from the American Academy of Child and Adolescent Psychiatry and the American Psychiatric Association.” American Academy of Child and Adolescent Psychiatry. Mar. 1, 2005 (5). <http://www.aacap.org/galleries/LegislativeAction/AACAP_APA_Drugapprovalprocess.pdf>

⁵⁰ Will Boggs. “Teen antidepressant warning had ripple effect.” Reuters Health, Sept. 5 2007 <http://www.nlm.nih.gov/medlineplus/news/fullstory_55429.html>; “To Give or Not to Give Antidepressants to Young People.” Medican News Today. Oct. 12 2007. <<http://www.medicalnewstoday.com/printerfriendlynews.php?newsid+85397>>

⁵¹ Robert D. Gibbons, Ph.D., C. Hendricks Brown, Ph.D., Kwan Hur, Ph.D., Sue M. Marcus, Ph.D., Dulal K. Bhaumik, Ph.D., Joëlle A. Erkens, Pharm.D., Ph.D., Ron M.C. Herings, Pharm.D., Ph.D., and J. John Mann, M.D. “Early Evidence on the Effects of Regulators’ Suicidality Warnings on SSRI Prescriptions

jump in suicide – and decline in antidepressant use – was found in Europe over the same period of time.

As the study by Robert D. Gibbons, director of the Center for Health Statistics at the University of Illinois at Chicago has noted, "...we're also seeing record increases in suicide rates among children in both the U.S. and the Netherlands (that happen to occur at the same time)."⁵²

The sharp increase comes as a surprise to many people who follow suicide trends. According to a separate CDC study, suicide rates declined by 28.5 percent in people age 10-24 from 1990 to 2003.⁵³ Gibbons said the sharp drop coincides with the release of new antidepressants in 1989 and ends right before strong antidepressant warnings were issued.

The CDC study also found that while suicide rates generally declined from 2003 to 2004, there was a significant increase in rates for three age groups: girls age 10 to 14, girls age 15 to 19, and boys age 15 to 19. Preliminary data also shows an increase in youth suicides for 2005.

and Suicide in Children and Adolescents.” American Journal of Psychiatry. Vol. 164 No. 9 (1356-1363). < <http://ajp.psychiatryonline.org/cgi/reprint/164/9/1356>>

⁵² Robert D. Gibbons, Ph.D., C. Hendricks Brown, Ph.D., Kwan Hur, Ph.D., Sue M. Marcus, Ph.D., Dulal K. Bhaumik, Ph.D., Joëlle A. Erkens, Pharm.D., Ph.D., Ron M.C. Herings, Pharm.D., Ph.D., and J. John Mann, M.D. “Early Evidence on the Effects of Regulators’ Suicidality Warnings on SSRI Prescriptions and Suicide in Children and Adolescents.” American Journal of Psychiatry. Vol. 164 No. 9 (1356-1363). < <http://ajp.psychiatryonline.org/cgi/reprint/164/9/1356>>

⁵³ “Suicide Trends Among Youths and Young Adults Aged 10--24 Years --- United States, 1990—2004.” CDC Morbidity and Mortality Weekly. Vol. 56 No. 35 Sept. 7, 2007. <<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5635a2.htm>>

Case Study #4: Autism & Vaccines

Vaccines: Controversy

Paul Offit, MD is known for advancing the understanding of the genetics of rotavirus leading to the development of a rotavirus vaccine currently being developed by Merck and Co. Rotavirus kills nearly one million children annually. Instead of being applauded for his work, he was recently greeted by more than 100 protesters outside the US Centers for Disease Control and Prevention (CDC) in Atlanta, calling him the devil and threatening his life.⁵⁴

As reported by Nature magazine, “organized by a nonprofit called Moms Against Mercury, the mob was made up mostly of people who believe that thimerosal-a mercury-based vaccine preservative-is responsible for the dramatic rise in autism over the past two decades.” The controversy over thimerosal in vaccines reached its peak in 1999, but Offit says it has now "entered a darker place."⁵⁵

The coincidence of autism outset at the same time as vaccines is not evidence of a connection because the age when many vaccinations are given is also during the time that autism is most likely to develop, whether or not the child has received a vaccine. Although many parents report a strange change in behavior in their children just after they received a vaccine, the “annals of autism research make it clear that a subset of autistic children suddenly regressed at this age long before the... vaccine became available.”⁵⁶ Tying autism to vaccination also ignores the genetic component of autism, widely acknowledged by scientists of all stripes.

As we saw in the earlier case studies, much information found online can be traced back to a single organization, study or individual. In this case, much of the information found online is connected to J.B. Handley, the co-founder of Generation Rescue, an anti-vaccine advocate and the parent of a son with autism. Handley’s group purchases ads in the New York Times and USA Today, disperses information through www.generationrescue.com and aggressively attacks individuals with opposing views. According to a blogger on the www.autismspeaks.org website, “I have been harrassed [sic]... for challenging the mercury parents, too. I've been called really vile stuff, vulgar stuff and basically cruelly insulted by JB Handley himself. JB has tried to attack me by posting things about my child, who I don't give out details on any more for this reason.”⁵⁷

⁵⁴ Virginia Hughes. “Mercury rising: Parents of autistic children are mounting a vicious campaign against scientists who refute the link between vaccines and autism.” *Nature*. Vol. 13 No. 8 Aug. 1, 2007.

⁵⁵ Virginia Hughes. “Mercury rising: Parents of autistic children are mounting a vicious campaign against scientists who refute the link between vaccines and autism.” *Nature*. Vol. 13 No. 8 Aug. 1, 2007.

⁵⁶ Arthur Allen. “Inoculated into oblivion.” *Salon*. 13 April 2000.
<<http://archive.salon.com/health/feature/2000/04/13/shot/index.html>>

⁵⁷ “Nature Medicine Article – Mercury Rising.” *Autism Speaks (post on discussion board)*. Aug. 1, 2007.
<<http://www.autismspeaks.org/community/forums/showthread.php?t=1018&highlight=I+don%27t+give+out+details+on+any+more+for+this+reason>>

Researchers from University of Pittsburgh's Department of Family Medicine reviewed 78 websites that were critical of vaccines and found that the most common characteristic were "statements linking vaccinations with specific adverse reactions, especially idiopathic chronic diseases such as multiple sclerosis, autism, and diabetes. Fully 70 percent of websites linked to "other vaccine-critical websites; charges that vaccines contain contaminants, mercury, or "hot lots" that cause adverse events; claims that vaccines provide only temporary protection and that the diseases prevented are mild; appeals for responsible parenting through education and resisting the establishment; allegations of conspiracies and cover-ups to hide the truth about vaccine safety; and charges that civil liberties are violated through mandatory vaccination."⁵⁸

Despite all of the scientific evidence to the contrary, the Internet environment is dominated by the viewpoint that vaccines are dangerous. To anyone looking for an answer online, the evidence can seem overwhelming. It is all the more powerful because those who oppose vaccines have tapped into the desire of parents and relatives of children with autism to believe that the condition has a clear, and preventable, cause and is reversible. But, unfortunately, these contentions are untrue; autism is a disorder with complex genetic origins and is a lifelong condition, although most people with autism improve over time.

Vaccines: Consequences

For concerned parents, trying to find factual information on the benefits and risks of vaccines on the internet is nearly impossible. Even worse, the 'guidance' on vaccines that dominates the internet is to avoid them. This is not only misleading, but dangerous to public health.

The serious consequence of this misinformation is that parents may choose not to vaccinate their children. According to the Centers for Disease Control and Prevention, when vaccine rates fall, epidemics can occur because the disease-causing bacteria still exist in nature.⁵⁹

Not only does this put the child at risk, but it puts the entire country at risk for the resurgence of diseases like measles, mumps, polio, rubella, pertussis, and more.

The fear spread online has the potential to create a real danger in trying to prevent a nonexistent one.

⁵⁸ Richard K Zimmerman, MD, MPH; Robert M Wolfe, MD; Dwight E Fox, DMD; Jake R Fox, MA; Mary Patricia Nowalk, PhD, RD; Judith A Troy, MS; Lisa K Sharp, PhD. "Vaccine Criticism on the World Wide Web." *Journal of Medical Internet Research*. Vol. 7 No. 2 Jun. 29, 2005. <<http://www.jmir.org/2005/2/e17/>>

⁵⁹ "ABCs of Childhood Vaccines." CDC National Immunization Program (PowerPoint). Last accessed Jan. 7, 2007. <www.cdc.gov/vaccines/vac-gen/ABCs/downloads/2-ABCs-Risks.ppt>

V. Appendix

Google Search Results for Crestor & Avandia Side Effects

Type	Crestor #	Crestor %	Avandia #	Avandia %	Total #	Total %
Official Government/Pharmaceutical	5	17%	2	7%	7	12%
Reputable Medical/Professional Organization	0	0%	0	0%	0	0%
Impartial News/Database	5	17%	8.5	28%	13.5	23%
Total Sites Presenting Neutral or Official Information						35%
Forums or Blogs	1	3%	3.5	12%	4.5	8%
Anti-Pharmaceutical Activists	2	7%	0	0%	2	3%
Alternative Treatment	2	7%	0	0%	2	3%
Class Action/Litigation	14	47%	12	40%	26	43%
N/A*	1	2%	4	13%	5	8%
Total Sites Presenting Biased or Unverified Information						65%

Search Engine Results for “CRESTOR side effects” December 5, 2007

Rank	URL	Category	Description
1	www.spacedoc.net/CRESTOR.htm	Anti-Pharmaceutical Activist	Site is run by former astronaut Duane” Doc” Graveline. Graveline claims to have taken a statin and experienced “transient global amnesia.” Graveline is recognized as a strong critic of the use of statins to treat high cholesterol levels. He is currently trying to sell two books, titled, “Lipitor: Thief of Memory” and “Statin Drugs: Side Effects and the Misguided War on Cholesterol.”
2	www.CRESTOR.com/c/explore/sideeffects.aspx	Official Government or Pharmaceutical	Official AstraZeneca website
3	www.CRESTOR.com/c/explore/about.aspx	Official Government or Pharmaceutical	Official AstraZeneca website
4	www.askapatient.com/viewrating.asp?drug=21366&name=CRESTOR	Un-Moderated Forum/Blog	The website is a free-flowing discussion group without any moderator or medical authority. It is described as a “ place for people to share their personal experiences with medications.”
5	www.medicationsense.com/articles/may_aug_05/CRESTOR_headlines_053005.html	Alternative Treatment Anti-Pharmaceutical Activist	Site is run by Dr. Jay S. Cohen. Cohen is currently trying to sell books titled, “What You Must Know About Statin Drugs and Their Natural Alternatives” and “Over Dose: The Case Against the Drug Companies.”
6	www.emedicinehealth.com/rosuvastatin_CRESTOR/article_em.htm	Impartial News/Database	Site is part of the WebMD network.
7	www.healthy-heart-	Alternative	Site promotes and markets “heart supplements” and

	guide.com/CRESTOR-side-effects.html	Treatment	“natural” CRESTOR alternatives.
8	www.onlinelawyersource.com/CRESTOR/effects.html	Class Action/Litigation	Site is by eJustice, an internet marketing company which provides leads to lawyers who are looking for plaintiffs. “Submit your Defective Drugs claim details for a free, no obligation case review.”
9	www.adrugrecall.com/CRESTOR/effects.html	Class Action/Litigation	Site is by eJustice, an internet marketing company which provides leads to lawyers who are looking for plaintiffs. “Contact us today for a complimentary consultation with a qualified attorney near you.”
10	www.rxlist.com/cgi/generic/CRESTOR_ad.htm	Impartial News/Database	Site is part of the WebMD network.
11	http://cholesterol.emedtv.com/CRESTOR/CRESTOR-side-effects.html	Impartial News/Database	The eMedTV Web site was developed and is owned by Clinaero, Inc. Clinaero is a privately held software and services company focused in two areas – clinical trials and health information. Clinaero provides all funding for eMedTV.
12	www.coreynahman.com/CRESTOR_rosuvastatin.html	Impartial News/Database	Site is a registered trademark of Internet Drug News Inc. Internet Drug News is a news aggregate that posts all headlines related to the pharmaceutical industry.
13	www.patienthealthinternational.com/product/13.aspx	Official Government or Pharmaceutical	Site is affiliated with AstraZeneca.
14	www.CRESTORlawsuit.lawinfo.com/	Class Action/Litigation	Site does not reveal sponsor, but helps lawyers identify potential plaintiffs. “Do you take CRESTOR? Are you suffering from symptoms that could potentially be linked with your use of CRESTOR? If you are, contact one of our CRESTOR attorneys by clicking on any of the panels from the left and right sides of this page. You could potentially have a lawsuit claim.”
15	www.CRESTOR-side-effect.com/	Class Action/Litigation	Site is sponsored by Ennis & Ennis, PA, “a national law firm specializing in medication side effects.”
16	www.mercola.com/2005/jun/9/CRESTOR_effects.htm	Alternative Treatment Anti-Pharmaceutical Activist	Site is run by Joseph Mercola, an osteopathic physician and entrepreneur who advocates for natural medications. He is a known critic of using any prescription drugs or surgery to treat diseases. His website promotes and sells a variety of products. Mercola has received a pair of warnings from the FDA for marketing nutritional products in a manner which violated the Federal Food, Drug, and Cosmetic Act.
17	www.monheit.com/CRESTOR/faqs.shtml	Class Action/Litigation	Site is run by Monheit law, a Pennsylvania-based law firm.
18	www.injury.findlaw.com/CRESTOR/	Class Action/Litigation	FindLaw is the highest-trafficked legal Web site, pairing up plaintiffs and attorneys.
19	www.druginjurylaw.com/CRESTOR-information.php	Class Action/Litigation	Site is run by the law office of Thomas J. Lamb, P.A., a North Carolina-based law firm.
20	www.weitzlux.com/CRESTOR/sideeffects_40	Class Action/Litigation	Site run by Weitz & Luxenberg, “A nationally-recognized personal injury law firm, Weitz &

	2832.html		Luxenberg is committed to helping clients win cases, get the compensation to which they're entitled and continue with their lives. In just over 20 years, we've collected more than \$1.3 billion for plaintiffs.
21	www.astrazeneca-us.com/pi/CRESTOR.pdf	Official Government or Pharmaceutical	Official AstraZeneca site.
22	www.injury-law.freeadvice.com/drug-toxic-chemicals/CRESTOR-side-effects.htm	Class Action/Litigation	Site run by FreeAdvice.com, a unit of Advice Company, a publishing company.
23	www.braytonlaw.com/news/mednews/031105-CRESTOR.htm	Class Action/Litigation	Site run by Brayton Purcell LLP , a law firm with offices in California, Oregon and Utah.
24	www.yourlawyer.com/topics/overview/CRESTOR	Class Action/Litigation	Site run by Parker Waichman Alonso LLP, a law firm with offices in New York, New Jersey and Florida.
25	www.weitzlux.com/CRESTOR/sideeffects/tuftnewenglandmedicalstudy_1200.html	Class Action/Litigation	Site run by Weitz & Luxenberg, "A nationally-recognized personal injury law firm, Weitz & Luxenberg is committed to helping clients win cases, get the compensation to which they're entitled and continue with their lives. In just over 20 years, we've collected more than \$1.3 billion for plaintiffs.
26	www.dvdbygay.velocityblog.com/	N/A	This is a spam-blog.
27	www.1800theeagle.com/topics/CRESTOR.html	Class Action/Litigation	Site run by Goldberg & Osborne, an Arizona-based law firm.
28	www.astrazenecaclinicaltrials.com/Article/516495.aspx	Official Government or Pharmaceutical	Official AstraZeneca site.
29	http://CRESTORlawsuit.lawinfo.com/CRESTOR-side-effects.html	Class Action/Litigation	Site does not disclose sponsor.
30	www.drugs.com/CRESTOR.html	Impartial News/Database	The Drugs.com website is owned and operated by the Drugsite Trust. "The Drugs.com drug-information database is powered by four independent leading medical-information suppliers: Wolters Kluwer Health , Physicians' Desk Reference , Cerner Multum and Thomson Micromedex . Individual drug (or drug-class) information content compiled by these sources is delivered complete and unaltered by Drugs.com."

Search Engine Results for “AVANDIA side effects” December 12, 2007

Rank	URL	Category	Description
1	http://www.rxlist.com/cgi/generic/rosigl_ad.htm	Impartial News/Database	Index of prescription drug information. In WebMD’s network.
2	http://www.adrugrecall.com/AVANDIA/effects.html	Class Action/Litigation	Site is by eJustice, an internet marketing company which provides leads to lawyers who are looking for plaintiffs. “Contact us today for a complimentary consultation with a qualified attorney near you.”
3	http://www.AVANDIA-side-effects.com/	N/A	No content on site.
4	http://www.askapatient.com/viewrating.asp?drug=21071&name=AVANDIA	Un-Moderated Forum/Blog	The website is a free-flowing discussion group without any moderator or medical authority. It is described as a “ place for people to share their personal experiences with medications.”
5	http://www.resource4thepeople.com/defectivedrugs/AVANDIA.html	Class Action/Litigation	Site soliciting clients for Steigerwalt & Associates.
6	http://www.medicinenet.com/rosiglitazone-oral/article.htm	Impartial News/Database	Database of medical information. In WebMD’s network.
7	http://www.medicinenet.com/rosiglitazone/article.htm	Impartial News/Database	Database of medical information. In WebMD’s network.
8	http://www.yourlawyer.com/topics/overview/AVANDIA	Class Action/Litigation	Site run by Parker Waichman Alonso LLP, a law firm with offices in New York, New Jersey and Florida.
9	http://www.onlinelawresource.com/AVANDIA/effects.html	Class Action/Litigation	Site is by eJustice, an internet marketing company which provides leads to lawyers who are looking for plaintiffs. “Submit your Defective Drugs claim details for a free, no obligation case review.”
10	http://ezinearticles.com/?AVANDIA-Side-Effects--Diabetes,-PPH-and-Hypoglycemia&id=542675	Class Action/Litigation	Article posted by Steigerwalt & Associates to a free articles database. Article is designed to solicit clients.
11	http://www.AVANDIA.com/AVANDIA_medicine.html	Official Government or Pharmaceutical	Official Web site from GlaxoSmithKline.
12	http://www.AVANDIA.com/AVANDIA_side_effects.html	Official Government or Pharmaceutical	Official Web site from GlaxoSmithKline.
13	http://members.lycos.co.uk/karenbair/ba0cff/AVANDIA-side-effects.html	N/A	Spam blog.
14	http://www.newsinfern	Class	This site features no contact information and

	o.com/archives/2095	Action/Litigation	contains numerous advertisements for trial lawyers.
15	http://hypertext.saintfranciscis.edu/wp-content/uploads/2007/11/little.php?AVANDIA/AVANDIA-side-effects.html	N/A	Spam blog.
16	http://www.drugs.com/sfx/AVANDIA-side-effects.html	Impartial News/Database	The Drugs.com website is owned and operated by the Drugsite Trust. “The Drugs.com drug-information database is powered by four independent leading medical-information suppliers: Wolters Kluwer Health , Physicians’ Desk Reference , Cerner Multum and Thomson Micromedex . Individual drug (or drug-class) information content compiled by these sources is delivered complete and unaltered by Drugs.com.”
17	http://www.drugs.com/forum/drug-information/AVANDIA-side-effects-18745.html	Un-Moderated Forum/Blog	This discussion is located on the drug.com site but does not contain information reviewed by the site.
18	http://www.drkoop.com/druglibrary/93/AVANDIA-side-effects-drug-interactions.html	Impartial News/Database	DrKoop.com is part of The Health Central Network, a group of Web sites which provide health related information.
19	http://AVANDIA.legalview.com/	Class Action/Litigation	“LegalView.com is a group advertising project sponsored by several law firms.”
20	http://diabetes.emedtv.com/AVANDIA/AVANDIA-side-effects.html	Impartial News/Database	The eMedTV Web site was developed and is owned by Clinaero, Inc. Clinaero is a privately held software and services company focused in two areas – clinical trials and health information. Clinaero provides all funding for eMedTV.
21	http://www.diabetesdaily.com/content/2006/01/08/fda-warns-of-AVANDIA-avandament-side-effects.php	Un-Moderated Forum/Blog	Diabetes Daily is a forum for the diabetes community.
22	http://www.nowpublic.com/health/AVANDIA-side-effects-cause-two-healthcare-providers-drop-drug	Class Action/Litigation	Article posted to a social news site by Steigerwalt & Associates. Article is designed to solicit clients.
23	http://www.healthcentral.com/druglibrary/408/AVANDIA-side-effects-drug-interactions.html	Impartial News/Database	Health Central is part of The Health Central Network, a group of Web sites which provide health related information.
24	http://www.phillipslaw.com/html/AVANDIA.html	Class Action/Litigation	Page on site by Phillips & Associates designed to solicit clients.
25	http://www.revolutionhealth.com/drugs-treatments/AVANDIA-	Impartial News/Database	RevolutionHealth page on AVANDIA. Site is an online medical information source. Also features un-moderated discussion.

	side-effects	Un-Moderated Forum/Blog	
26	http://injury-law.freeadvice.com/dруг-toxic_chemicals/AVANDIA-side-effects.htm	Class Action/Litigation	Site run by FreeAdvice.com, a unit of Advice Company, a publishing company.
27	http://www.rxcarecanada.com/HTML/AVANDIA163.htm	N/A	Canadian online pharmacy.
28	http://www.rxlist.com/script/main/rxbrand.asp	Impartial News/Database	Site is part of the WebMD network.
29	http://www.youhavealawyer.com/blog/2007/12/03/AVANDIA-side-effects-could-increase-risk-of-fractures/	Class Action/Litigation	Site soliciting clients for Saiontz, Kirk & Miles.
30	http://www.youhavealawyer.com/AVANDIA/AVANDIA-side-effects-heart.html	Class Action/Litigation	Site soliciting clients for Saiontz, Kirk & Miles.