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ApoE4: Test or Not?

28 FEB 2008 • BY DEREK LOWE • 2 MIN READ • [COMMENTS](#)

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Science has [coverage](#) of a diagnostic test for the [APOE](#) gene that's coming into the market. For about \$400, you can find out what form of the protein you have. The problem is, the main thing this test is good for is telling you that you have a greater-than-average chance of developing Alzheimer's disease, which raises the question of whether it's good for anything at all.

Most of the people quoted in the article have their doubts, which I share. Since we really don't have any decent therapies for Alzheimer's, what's the good of knowing that you're at greater risk for it? The only exception I can think of is mentioned by law professor Henry Greely of Stanford: if you're homozygous for APOE4, you're about 15 times more likely to develop Alzheimer's. That gets into the range where you might want to make some long-term plans. Still, yikes – think of getting those results back.

About 2% of the population could potentially open that envelope. A further 25% are heterozygous for the gene, which corresponds to maybe 3 times the usual risk. That combination of a large number of people with a smaller level of risk seems to me to put it in the "not worth it" category. The psychological distress would seem to outweigh any benefit. Personally, as someone who makes his living with his memory and his brain, I'd be horrified, and to no good end. (And I'm a pretty even-keeled person, as my wife, who does the worrying in the family, will testify). It's to the point that there's even been a study following up the psychological reaction to the news of the test. It didn't show anything alarming, apparently, but the sample was from people with a family history of Alzheimer's.

No, I think that I'd have to be at least twenty years older to consider taking such a test at all, and even then I'd only want to know if I turned out to be homozygous, which I suppose I could be. (My kids, being Arkansas-Iranian hybrids, have a decreased chance of being homozygous for much of anything). I was going to say that I'd also like to know if I turned out to have no APOE4 allele at all, but quickly realized that those stipulations would end up telling me my status no matter what.

Anyway, here's hoping that in twenty years we have something more useful to offer to people in that position. And here's hoping that Smart Genetics, the company that has licensed the test and is bringing it to market, handles it responsibly and resists the temptation to sell fear and uncertainty for a profit. But the article's quote from the company's CEO, Julian Awad, isn't encouraging: "We saw there was a big growth" in genetic testing and believed "there was something there for adding value to what people wanted," he says. I'm still working out what that sentence might actually mean, but I'm not sure I like it. Perhaps it's just my aversion to business-speak.

ABOUT THE AUTHOR



Derek Lowe [✉](#) [🐦](#)

Derek Lowe, an Arkansan by birth, got his BA from Hendrix College and his PhD in organic chemistry from Duke before spending time in Germany on a Humboldt Fellowship on his post-doc. He's worked for several major pharmaceutical companies since 1989 on drug discovery projects against schizophrenia, Alzheimer's, diabetes, osteoporosis and other diseases.

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OR SIGN UP WITH DISQUS **Rosannadevi** • 9 years ago

This dilemma is not black or white. For an assignment i have to write a paper concerning whether to test or not to test apoe-4 in patients who are scared to get Alzheimer. I therefore read all this comments securely. Especially the testimonials of both apoe-4 positive support my opinion. Namely since several tests concluded that apoe-4 does have a correlation with alzheimer but is not 100 % predictive. Most certainly with races and gender should be looked sceptically. Moreover i read that those positive tested patients here are "obsessed by getting the "right" food in order to stop this process. However scientific evidence lack. Also, psychological impact should be considered to. So, i recommend a research that looks what costeffectiveness is off this test and which lifestyle does prevent/post-poned the disease.

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**Sylvia** • 10 years ago

Alzheimer's Disease is MERCURY , primarily from amalgams but also many other sources including vaccinations. Knowing you are an APOE4 is vital and to make your genetics work for you avoid all mercury where possible Aluminum has also been implicated and is highly synergistic with mercury for toxicity to nerves . All APOE4 's must not get silver amalgams placed by dentists - preferably all dentists should screen all patients for this exact risk. And avoid all aluminum and mercury preserved vaccines and minimise eating predatory fish unless the mercury content is assessed - fish around smelters and the river and water run off are high risks for mercury content in fish. Know your genetics , work with your enzymes (APOE4 predicts the inability to excrete mercury and thus will bioaccumulate it and from the mouth the brain is the principle recipient of dental mercury.) and above all know you can stall this horrid disease and many people have reversed severe ill health by removing amalgams .To know these genetics is vital so you CAN reduce the well known risk factors.

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**Diane** • 11 years ago

I just found out that I am an Apo E 4/4. It has scared me, too. I read Pam McDonald's book, The Apo E Gene Diet, and since my father had Alzheimer's Disease I decided to be tested. I am trying to follow the diet indicated for a 4/4 in her book, but find it very difficult to figure out. If anyone is knowledgeable about the diet for a 4/4, please write a post. I have an appointment with a woman who has a PhD in Nutrition and she is going to counsel me on supplementation. I figure I had better be taking the right supplements rather than self-prescribing. I understand how other 4/4's must feel, it's scary, but I would rather know and be able to take action.

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**Mary** • 11 years ago

My husband's father had Alz.disease but wasn't diagnosed until his mid 80s and didn't die until age 92. My husband was diagnosed with Alz last year at age 69. He is going to have Apo E4 genetic testing to see if he qualifies for a clinical trial. I think this testing is important to his younger brother and sisters for FINANCIAL reasons. My husband has long term care insurance but none of them do. If he tests positive, I am going to strongly recommend to them that they get LTC insurance, since they are also likely to be at higher risk for Alz, while they still can pass the memory test the companies require for the insurance. Without long term care insurance, given my huband's age and the good general health, this disease could be financially devastating. That alone is reason enough for me to think the genetic testing is worthwhile.

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**NotGonnaHappenToMe** • 11 years ago

My father and both his brothers had AD. I vowed 15 years ago that I would NOT die of this disease. I'd rather just 'take myself out' before I lose the mental capacity to delete myself from this world. It is all a matter of timing. The test might keep me from waiting too long. My Dad spent the last year of his life in a chair, wearing diapers, and being unresponsive. I always felt that he would have been much better off if he had a fatal (a painless) heart attack about 1-2 years before he finally died.

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**Reno Rapagnani** • 11 years ago



My father was given a clinical diagnosis of AD five years ago. My doctor suggested that I test my apoe genotype. I agreed, but when I found out that I was apoe 4/4, I freaked out.

Three years later I must conclude that I am glad I did learn this information.

I believe my health issues are best served by having the information that allows me to make informed choices as to what I eat, what vitamins and supplements I choose to take, and what kind of political action I need to embark on.

I am carefully replacing my 13 silver amalgam fillings, making sure that I take a PectaSol supplements during and after the extraction and replacement process.

I think there is conflicting literature on the proper diet, but I make sure to stay away from processed foods, trans fatty acids and MSG.

I take Krill oil two to three times a day, at least 2 mg of Vitamin D-3, B vitamins (with extra folic acid) Pycnogenol and Resveratrol. I also take SAM-e for my mood (with my B vitamins) because it still scares the hell out of me to think that I might end up like my Dad.

Finally, I am trying to convince my neuro-peptides that I need to live until I am 98 with my brains still working, because I have a lot of important contributions I need to make to society before I enter that quiet night.

P.S. I also pray and try to laugh a lot.

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Stephanie K • 11 years ago

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1851126/>

This study shows that for people with A. Disease and the e4 allele, there is a 50% reduction in the amount of insulin degrading enzyme (IDE) in the hippocampus. IDE works to degrade insulin AND to clear beta amyloid plaque from the brain, but will degrade insulin FIRST. "IDE has a preferential affinity for insulin such that the presence of insulin will inhibit IDE-mediated degradation of other substrates, including Aβ" (amyloid beta plaques). Therefore, if I had the e4 allele, I'd eliminate food from m diet that causes insulin production, so the IDE is free to clear the amyloid plaque. What causes insulin production? CARBOHYDRATES. If you have the e4 allele, in my opinion, you should be on a low/no carb diet. Just my two cents.

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james • 12 years ago

My personal belief is that it's a bad idea to be tested for APOE-e4 status in the absence of proven treatment regimen(s) (therapies/drugs/lifestyle modifications), or preventive measures (including drugs) proven to be effective that we would otherwise (without knowledge of APOE-e4 status) not adopt. At this point, we have neither of the above (effective treatments or preventative measures), and the knowledge could be debilitating for many individuals, as they (& we collectively) learn more about what being APOE-e4 positive really means going forward. (It could be much worse - and the negative brain-related changes may be much more widespread & appear at earlier ages and be less amenable to therapies - than we now believe, for example. It may be that diet, exercise, various supplements, & being mentally active may have little meaningful effect on what may be inevitable changes in the brain (although we should be doing these things regardless to lower health risks generally).

However, I firmly believe there is far too little emphasis on the rights of individuals to NOT be tested for and informed of their APOE status, and individuals' rights for others (including healthcare professionals) to not know or document APOE status, and to not have it (or other health variable(s) strongly associated with APOE status) documented in their medical records. An individual's medical records are available to all insurance companies through the MIB (Medical Information Bureau), & this information could - and will - be used against individuals (without their knowledge or consent, in most cases).

When & if we have proven, effective therapies & preventive measures, testing for APOE status will make sense. But for most people at this point, it's only appropriate for very high risk individuals, and for research (i.e., drug development) purposes.

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kirkland • 12 years ago

I was tested for the APOE4 by a doctor at a large university, without my knowledge, so when i got the results i was devastated, i spent yrs crying, my family wouldn't let me discuss it at all, my grown children didn't want to hear how i felt or about the gene. this was several yrs ago, and since then i have been able to do a lot of research on how to take better care of myself. i am adopted but have found both parents, neither of whom will take the test as I am concerned about the many siblings on both sides, this is the worst part about knowing is not one of them wants to know which parents has it so they can get tested also. it is 2010 & I am still in this alone, but now glad that doctor tested me, I am happy now, and feel I have an advantage that the rest of my family doesn't have, knowledge & making good choices each day. this gene doesn't just affect AD, but causes heart disease, obesity, and many more health problems. for those of you just getting the results and are stunned, it will get better, and you will be glad you did.

peace to all of us with the APOE4!

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Douglas Simmons • 13 years ago

Quietly, a small but growing number of physicians, researchers and health advocates have come to accept Alzheimers Disease as an environmental disease. Environmental disease, in my experience, does not affect the general population equally. That is because for a person to be stricken by an environmental disease there must be both susceptibility (individual genetic variables at work) and exposure. Let me say also that the diagnoses of Alzheimers disease by personal physicians, neurologists etc are often inaccurate. Every day elderly patients are diagnosed with Alzheimers when in fact they are suffering from vascular dementia, iatrogenic illnesses (as in geriatric use of benzodiazepines and other similar substances) or other impairments.

Alzheimers, like amalgam disease and autism can occur in individuals with genetic deficiencies in excretion of toxic metals (esp. mercury) when they are exposed to low levels mercury over the long term or higher levels over the short term.

Exposure to mercury is widespread beyond what most would imagine certainly.

Here in an excerpt from sworn testimony in front of a congressional committee...

"Alzheimer's disease is most prevalent in industrialized nations. These are countries where dentistry using mercury amalgam fillings is common practice. Alzheimer's barely exists, if at all, in third world nations. There are many sources that back this up.

In 1993, a groundbreaking study by Duke University revealed that the presence of just one APO-E4 gene significantly increases Alzheimer's risk and also lowers the age of onset.

My wife took a blood test and it confirmed as being the worst case scenario, APO- E4/4. Both her APO-E genes are fours.

According to Dr. Boyd Haley, the unprotected APO-E4 form as has four arginine amino acids located on the potential mercury binding positions as opposed to the very protective APO-E2 in which there are two cysteine amino acids present, or the semi-protective APO-E3 where there is one cysteine and one arginine.

[see more](#)

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Bill • 13 years ago

Just found out that I have the ApoE4 gene today. I had been tested to see if a phase 4 study with Bapineuzumab might be helpful to me. Do I want to know this information yes but it is not easy to deal with the information received especially as I have young children. At least now I can get serious about planning for the future of my family.

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Katrina Fullman • 13 years ago

I recently made a documentary film titled UNRAVELED about my family's legacy of Alzheimer's disease (both my mother and grandmother suffered from and were ultimately killed by it) and Apoe4 genetic testing. The film follows me as I struggle with the decision of whether to have an Apoe4 test. In the process it deals with many of the issues brought up in the posts.

For more information on the film, go to:

www.unraveledmovie.com

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Audray • 13 years ago

Really, I would stay away from alcohol if you are an apoe4/4. Resveratrol you can get in supplement form and that is the active part of wine that is good for you.

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Jhurley • 13 years ago

Recent findings indicate the moderate amount of alcohol might help people with dementia and/or Alzheimers. I stopped drinking about 5 years ago hoping to decrease my odds of getting Alzheimers (which my mother has now, and my grandmother before her). So now I'm considering drinking again, but no more than 3-5 glasses of wine/beer per week.

However, other articles suggest that people with the ApoE gene should NOT drink alcohol, even infrequently, as it may increase the risk of dementia.

So for me, testing might be a good idea. I'm 61 years old and am learning all I can about the disease and supporting my own good health.

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peacefulparadox • 13 years ago

There are definitely benefits to the test and for the person knowing the test results. If the person taking the test find out that he/she is homozygous APOE4, the person can then take preventative measures such as diet and exercise as well as supplements. And the person would be doubly motivated in the preventative programs. Furthermore, it is always easier to treat/prevent AD before it takes hold or in its earlier stages than when AD expresses obvious symptoms. Therefore the test taker will have "advance knowledge" and can therefore be prescribed more potent pharmaceuticals for the resisting AD.

Do not under-estimate people's ability to be able to handle the news. Knowledge is the key to prevention.

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audray R • 14 years ago

Being one of the rare 0.1% of the population who actually is homozygous for apoe4/4, please allow me to tell you first hand that it is ESSENTIAL to know. For years, and I mean since my early twenties, I experienced an alarming decline in my stellar memory and ability to learn. I lived very cleanly thus it was quite puzzling. As time progressed, I just stopped reading since could no longer remember what I had read two sentences ago. A brilliant doctor, 15 years later, said my symptoms rang a bell and didn't seem random. He sent me to a geno lab, and sure enough, the results were 4/4. I had very high cholesterol despite being a slim person. He immediately put me on a vigorous supplement regimine and requested that I eat an extremely low fat diet. My memory improved within a few weeks! To know or not to know, is certainly not the question.

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Sili • 14 years ago

Would this kind of test *help* bringing anti-Alzheimer drugs to market?

I mean, if it's possible to beforehand determine that your test subjects/participants have and increased 'risk' of devoloping the disease, won't that give your trial better predictive power?

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sroy • 14 years ago

The problem with such tests is quite simple - they lack true predictive power. They indicate an elevated risk as opposed to certainty. Example - If you have an infectious disease say HepB, HepC or HIV - the results (antigen based tests) are almost beyond doubt and other tests can suggest the best treatment and prognosis.

This test merely tells you that you might have an increased risk of AD. So does having a stroke/ mini-stroke, carotid artery disease, hypertension, low levels of education or being a woman.

And forget about the psychological consequences, what happens to your medical insurance? Yes, there are states that have laws against it, but then again the US has the best legislators that you can buy- so expect them to be flip over and screw people if the insurance companies lobby hard enough. Long term care is very expensive.

I think this is a bad idea, unless we all have good quality single payer universal health care.

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**TW** • 14 years ago

APOE also has some predictive value for cardiovascular risk. I have high cholesterol in my family, and checked my APOE alleles. I got some comfort from the results and consequently am not medicating my borderline high cholesterol - nor am I living in fear of early onset AD. In general, genetic testing ethical/paranoia dilemmas seem overblown to me. Even without a suitable intervention for a negative result I think the information can be helpful. Many genetic traits do not result in certainties for developing disease, but are simply additional factors to consider as you navigate your life. I may be in the minority, but I'd rather know what I can know.

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**Wavefunction** • 14 years ago

Well, I think the test could be very useful in the light of possible *preventive* measures that could be taken for AD. Even if such measures have not been completely validated yet, aren't there hints that dietary components (curcumin? flavanoids?) could have preventive effects? If such benign components are easy to add to the diet and if my test comes back positive, I might start consuming them regularly...or I might start playing chess...

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