

Dealing with Nicotine Addiction

It's the weekend and you bump into somebody you haven't seen for awhile. She was a few years ahead of you in school but you were pretty good friends because of your shared interests. Since she's been attending college several hours away, you haven't kept in touch. You realize it's strange to see her this weekend, so near the end of the college semester.

She tells you that she is back in town for a few days. Her father is in the hospital. Apparently years of smoking have caught up with him, and he is now facing some serious long-term health problems. He is going to have to carry an oxygen tank with him all the time and he will need to take lots of prescriptions to treat the hardening of his arteries and to reduce his high blood pressure.

You notice that your friend is pretty shaken up. Politely, you ask questions to see if she is worried about her father dying. You learn that in addition to her father's medical problems, your old friend is also troubled because she too has a habit she can't break — she began smoking right after starting college. Now, with all the smoking related problems her father is having, she really wants to stop smoking.

Your friend explains that college is really great. There is a lot more studying than high school but there are also lots of chances to socialize with people from all over the country. She has met a group of friends that she hangs out with a lot. They all smoke, and when she first met them she started smoking a cigarette or two at parties to fit in.

Bumming cigarettes was enough to get through the parties, but after a while your friend began smoking more and more. She has been buying about five packs of cigarettes a week for the past couple of months. The problem is that your friend KNOWS smoking is unhealthy and her father's health issues make it pretty clear. But that's just the problem.

Your friend explains that she has been trying to quit smoking. She tells you that she can go for about a day without a smoke. But after a while the urge to have a cigarette is just too strong. Before she knows it, she finds herself lighting up again. People have suggested that the only reason she continues to smoke is that she is not taking enough control of her life: if she wants to quit she just has to decide to do it. But even with the added incentive of her father's illness, she can't find the willpower to quit.

There are other times where she doesn't feel a craving for a smoke and then she's surprised to find a cigarette in her hand. This usually happens at parties — the same sorts of places where she first started smoking. It seems that lighting a cigarette isn't even a conscious decision. Instead it just seems to be an automatic behavior.

So here's your old friend: she's really worried that her father is sick and it's because of smoking. But she has discovered that it's much harder to quit smoking than it was to get started. You really feel like you should say something. And then you remember what you've learned in science...

Your assignment is to prepare a response to your friend. Imagine that shortly after this meeting you decided to write her to let her know what you think is going on with her smoking habit and how you think she can use this knowledge to kick the habit. Answer the following questions as a way to organize your response.

1. Describe the Rat Race activity that you did on the computer. Explain how the behavior of the rats differed because of the type of reward they were receiving. Describe how the information from the Rat Race activity could be helpful in explaining your friend's addiction to smoking.
2. Compare the idea of "willpower" to the idea that there is a chemical basis to addiction. Explain how your understandings about the causes of addiction have changed. Describe the similarities between how your ideas change and how scientific ideas change.
3. Give a general explanation about how signals move along nerves. Explain how dopamine is normally involved in sending signals in the reward system. Then give an example of how addictive substances interact with dopamine to hijack the reward system.
4. Outline the debate about the role of dopamine in addiction by comparing the *reward hypothesis* and the *association hypothesis*. Give examples of both behavioral and molecular experiments that support each of the two hypotheses. Explain why the uncertainty about the exact role of dopamine is an example of how scientific knowledge can be strengthened through debate.
5. Describe how the *reward hypothesis* may explain your friend's smoking habit. Then describe how the *association hypothesis* may explain the habit, too.
6. Suggest to your friend what she might try to do to stop smoking. Offer some suggestions based on what you know about the reward hypothesis and the association hypothesis. Conclude by indicating why the smartest strategy would be to act as if both hypotheses are accurate.