

# Viagra and other drugs discovered by accident

By Emma Jay  
Horizon: Pill Poppers

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How viagra works

**Over the course of your lifetime you are likely to take more than 14,000 tablets - and that is just the prescription medicines.**

The average person will have taken one course of antibiotics every two years, and 28,000 painkillers. By the time you are 70 you will probably be taking at least five tablets a day.

Although we cannot seem to live without them, how much do we really know about the pills we take?

We like to think drugs are designed for exact purposes, but they are often not as targeted as we may hope.

The surprising truth is drug design owes more to serendipity than careful design, and their potential may only be discovered when we take them.

It turns out that Ventolin inhalers, a treatment for asthma, can also prevent premature labour; and arsenic, a notorious poison, is making a come back as a treatment for leukaemia.

## Viagra's discovery

Even the fastest selling drug of all time, Viagra, is not used for what it was originally intended.

It started life as plain old UK92480, a new treatment for angina, a heart condition that constricts the vessels that supply the heart with blood.

The drug company Pfizer was looking for something that would relax these blood vessels, however its trials in people were disappointing.

Pfizer were about to abandon further trials when the trial volunteers started coming back and reporting an unusual side effect - lots of erections.

Pfizer senior scientist Chris Wayman was charged with investigating what was happening. He created a model 'man' in the lab.

He took a set of test-tubes filled with an inert solution, and in each one placed a piece of penile tissue, taken from an impotent man.

Each piece of tissue was then connected up to a box that, at the flick of a switch, would send a pulse of electricity through the tissue.

Applying this current of electricity mimics what happens when a man is aroused.

The first time he did this nothing happened to the vessels. However, when he added Viagra to the tissue bath the penile blood vessels suddenly relaxed - as they would for a man to give him an erection.

He said: "What was amazing about this study was that we saw a restoration of the erectile response. Now we were on to something which could only be described as special".

“ In many ways you learn as much about your medicine after it's launched as you knew before ”

Patrick Vallance, Head of Drug Discovery, GSK



Viagra was used to treat nearly 30m men in its first ten years

Before the launch of Viagra in 1998 there was no oral treatment for erectile dysfunction, the only options were an injection or a fairly gruesome prosthetic implant.

Now, thanks to a failed Angina treatment, men had another option. Viagra is now one of the most prescribed drugs in the world.

### **Drugs trials**

Drugs go through careful and rigorous trials before they are released to the market but in many senses the real trial only begins when large populations of people start taking them.

Patrick Vallance, Head of Drug Discovery, GSK says "In many ways you learn as much about your medicine after it's launched as you knew before".

A clinical trial of Ritalin is testing its effect as a cognitive enhancer

This is no truer than in the case of Methylphenidate, most commonly known by one of its brand names - Ritalin - a drug used to treat Attention Deficit Hyperactivity Disorder, ADHD. It was only discovered by accident, it was originally designed 50 years ago to treat adults with depression.

Even now new uses are being found for the drug. Scientists have now found that Ritalin can also work as a cognitive enhancer, if a person without ADHD takes it, it can make them cleverer.

Prof Barbara Sahakian of Cambridge University has been researching its effects. Her team gave healthy volunteers a dose of the drug and then asked them to perform intelligence tests.

"Not only were we able to show an improvement in their ability to do a task like spatial working memory, but the volunteers also showed an improvement with increased efficacy of the neural networks in the brain".

Taking the Ritalin had boosted their concentration and cognition.

Not all side effects are beneficial. In the last five years in the UK alone eight drugs have been withdrawn from the market by the regulators.

The potentially damaging effects of all drugs is something we should acknowledge more readily says Dr Vallance.

"There's no such thing as a totally safe medicine, there's no such thing as a medicine that we know absolutely everything about and therefore there is some uncertainty and that persists.

"When you make a medicine you're trying to disrupt a fundamental biological process. That's a pretty profound change, you can't do that without producing some unwanted effects - so then the question is, what risks are you prepared to take for what benefit?"

**Horizon:** *Pill Poppers can be seen on BBC Two on Wednesday 20 January at 9pm or afterwards via [BBC iPlayer](#)*

<http://news.bbc.co.uk/2/hi/health/8466118.stm>