

The placebo effect: All this hype about nothing?

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Ben Colagiuri was one of the 2014 recipients of the APS Early Career Research Award which recognises excellence in scientific achievement in psychology among psychologists who are in the early stages of their research careers in Australia.

Medical treatment involves much more than the direct action of the substance or procedure being delivered. Treatments come as pills, capsules, injections, surgeries, and therapies. These treatments occur in different contexts ranging from the patient's home to a clinician's office to the hospital itself. And, the treatment is always accompanied by some form of information, whether it be the packaging, the information the health professional communicates to the patient, or what the patient hears from family, friends, and the media. All of these factors create an intricate treatment context that affects what a patient expects to experience from his or her treatment. For example, most people would expect an injection delivered in hospital to be a more powerful pain killer than a pill taken at home.

The placebo effect is the fascinating phenomenon whereby these expectancies trigger improvement even in the absence of any genuine treatment. In one of the most famous examples, after running out of morphine, a World War II physician named Henry Beecher decided to administer saline – salt water – to the wounded soldiers while telling them it was morphine. Incredibly, the saline injection relieved many of the soldiers' pain. That is, the simple belief that they had been given morphine triggered pain relief. Some even more remarkable placebo effects have been observed since then. For example, placebo surgery has proven just as effective as real surgery for osteoarthritis of the knee (Moseley et al., 2002) and sham deep brain stimulation has been found to reduce symptoms of Parkinson's disease as much as real stimulation does (Pollo et al., 2002).

My research aims to understand how exactly the treatment context generates the expectancies that drive the placebo effect. Using experimental models involving pain, nausea, and sleep, my research highlights the central role that learning plays in producing the placebo effect. Patients integrate their prior experience with any information that they are provided with to determine what to expect from a treatment. Much like other learning phenomena, these expectancies activate responses in the central nervous system that produce the placebo effect. For example, placebo treatment for pain triggers the release of endogenous opioids – the body's natural painkiller – which results in pain relief.

Placebo effects are not always positive, however. Just as the treatment context can trigger expectancies for improvement, it can also generate expectancies for adverse outcomes. This has particularly interesting implications for side effects. In two recent studies, my students and I found that warning participants about potential side effects increased their occurrence even though all participants only ever received placebos (Colagiuri, McGuinness, Boakes, & Butow, 2012; Neukirch & Colagiuri, 2015). These placebo-induced side effects present a big challenge to informed consent. There is a clear ethical obligation to inform patients about potential side effects of treatment, but this information can

actually lead to patients experiencing more side effects.

While much less studied, the placebo effect also has important implications for psychological treatments. Given the complex nature of psychological treatments, it is much harder to isolate the 'active ingredient' of these interventions. This makes comparing psychological treatments with appropriate placebos very difficult. Nonetheless, results from the placebo groups in pharmacological trials suggest that the placebo effect can induce substantial improvement in some psychological disorders. In fact, recent research suggests that at least 50% of the response to antidepressant medications can be explained by the placebo effect (Kirsch & Sapirstein, 1998) – even for patients presenting with severe depressive symptoms (Kirsch et al., 2008).

Given the evidence for placebo effects across a large range of conditions, a crucial question is whether we can harness the placebo effect to improve patient outcomes. Traditionally, any such attempt was considered unethical because it was assumed that inducing placebo effects requires deceiving patients (as Beecher deceived his soldiers). However, there are a number of ways that the placebo effect could be used to enhance patient outcomes without deception. For example, the treatment regimen can influence the placebo effect, with four placebo pills per day leading to faster recovery time from stomach ulcers than two placebo pills per day (de Craen et al., 1999). By extension, simply supplying an active treatment in two pills containing half the standard dose rather than a single standard dose pill may lead to greater improvement via the placebo effect. Similarly, adjusting the framing of side effect warnings may minimise placebo-induced side effects whilst maintaining informed consent and patient autonomy. These types of interventions may allow health professionals to use the placebo effect to maximise positive treatment outcomes and minimise negative outcomes at quite a low cost – a desirable outcome for patients and health professionals alike. ■

Ben's tips for members in the early stages of their research careers

- Never be afraid to ask for advice, whether it's a small technical question, a big conceptual one, or general career advice.
- The best way to keep learning and stimulating your own ideas is to talk with other researchers from all types areas, whether it's about your research, their research, or general developments in science.

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The list of references can be accessed from the online version of the article (www.psychology.org.au/inpsych/2015/october/colagiuri).