



Online Ethics Center  
FOR ENGINEERING AND SCIENCE

# Case: Memory Suppressor as Cognitive Enhancement

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## Year

2016

## Description

A member of a lab studying the beta-blocker, Propranolol, to treat soldiers with Post Traumatic Stress Disorder (PTSD) is violently physically assaulted. The PI suggests the Propranolol treatment could be helpful and lab members reflect on the possible outcomes of such a choice.

## Body

Anthony is a neurobiologist who works as a researcher at a government-funded lab to develop memory-altering drugs. Recently, he has been studying the beta-blocker, Propranolol, to treat soldiers with Post Traumatic Stress Disorder (PTSD). Propranolol is a promising drug to act as a prophylactic and treatment for PTSD by reducing consolidation of emotional memory (Henry *et al.* 2007).

Here is how this pharmacologic intervention is thought to work: Shortly after experiencing or observing traumatic events, one's memory of such an event is encoded in the brain. During this process, endogenous stress hormones, such as adrenaline, are released in the body. Memories with strong emotional content can lead to too much adrenaline release, which leads to high levels of noradrenalin

(norepinephrine). That hormone helps to consolidate memories, and too much of it leads to over-consolidation and symptoms of PTSD, such as avoidance, anxiety, nightmares, irritability, and detachment. These effects can, in turn, lead to other conditions, such as depression and suicide. Propranolol can be administered before or after a traumatic event to block the effect of high levels noradrenalin, and thus block the consolidation of these traumatic memories and their emotional content (Henry *et al.* 2007).

Anthony's co-worker, Joey, has just returned to work after a week of absence, after experiencing a violent physical assault from a group of hateful, anti-gay men. Everyone was shocked to hear of his assault and they have been extremely supportive during this time. Joey has expressed how grateful he is to have such supportive co-workers and he claims that he just really wants to forget about the traumatic event by concentrating on his research.

Yet, both Anthony and his boss have noticed that Joey still seems to be suffering from memories of the event. Joey even confided to Anthony that he has difficulty sleeping and eating regularly and he feels it might be affecting his ability to focus at work. Both Anthony and his boss are concerned about Joey's well-being. They have urged Joey to take more time off work to heal, but Joey is adamant that he wants to be back in the lab.

Yesterday, Joey confided to Anthony that their boss suggested that he should attempt the Propranolol treatment to help him recover from his traumatic experience and minimize any effect on his productivity as a researcher. He tells Anthony that the suggestion caught him off guard.

Joey explained to Anthony that while he believes in the aims of their lab's research to treat PTSD, he's not sure that he wants to take any drug that will alter his memories at this moment. He told Anthony that he currently volunteers in his community as a counselor for gay youth, and he thinks that his emotional memories of the traumatic event may serve him, not only in his own personal healing process as a survivor, but also as a voice for support of the LGBTQ community. Anthony is unsure what advice to give to his friend and co-worker.

## **Discussion Questions**

1. Anthony knows that his boss means well, but he can't help feeling like Joey is being coerced towards undergoing a treatment that involves potential memory-altering effects. He wonders how this may affect soldiers, the targeted group of his lab's research, if and when his lab is able to develop even more powerful memory-erasing drugs. Will soldiers be coerced into taking such drugs, or simply ordered to take them, even prior to combat as preventative measures against the symptoms of PTSD? Given the devastating effects of PTSD on soldiers and veterans, is that a morally-acceptable trade-off?
2. Anthony is also worried about the affect such a therapy would have on Joey's status as a credible witness in court when testifying against his aggressors. If the drug is administered to victims of physical and sexual assault, will the courts consider the intervention as tampering with valuable evidence? If so, does that entail an infringement on the right of the victim to seek treatment and recovery?
3. Joey's biggest worries are about whether these drugs will affect his sense of authenticity and personal identity. He wonders, what if these drugs become widely popular and accessible to treat all sorts of bad memories? Is it always morally acceptable to erase or alter undesirable memories?

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## Notes

The author wishes to acknowledge the contributions of Karin Ellison, OEC - Life and Environmental Sciences Editor, and Joseph Herkert, OEC Engineering co-Editor. They provided valuable input in selecting topics and crafting the resources.

This material is based upon work supported by the National Science Foundation under Award No. 1355547, Karin Ellison and Joseph Herkert, Arizona State University

sub-award Co-PIs. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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