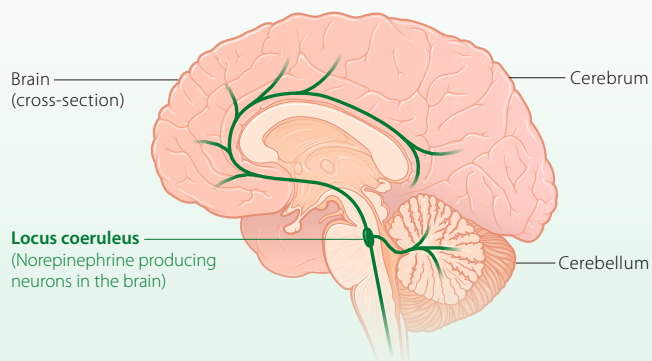


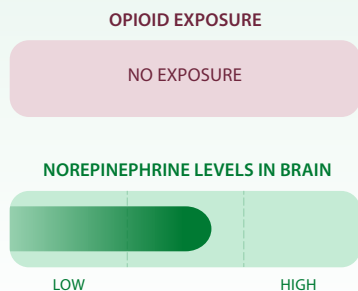
CHANGES IN BRAIN CHEMISTRY CAN TRIGGER OPIOID WITHDRAWAL SYNDROME (OWS)¹



OPIOID USE FOR AS LITTLE AS SEVERAL DAYS can create physical dependence. The brain adjusts to the presence of the opioid, and when opioid use is discontinued, a neurochemical surge occurs. This surge causes withdrawal symptoms that can last for a week or longer.

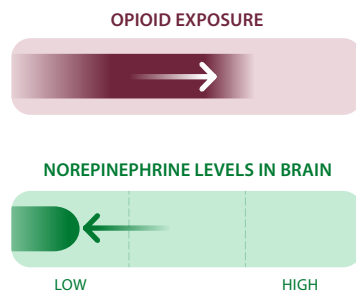
NORMAL BRAIN FUNCTION

NOREPINEPHRINE IS A NEUROCHEMICAL (brain chemical) that supports vital functions like respiration and consciousness.



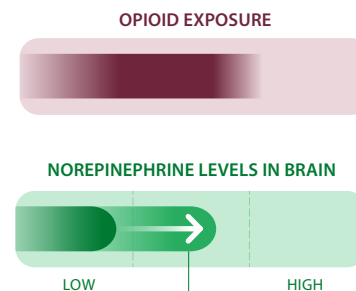
OPIOID USE RESULTS IN LOWER LEVELS OF NOREPINEPHRINE

OPIOIDS LOWER NOREPINEPHRINE LEVELS, and the brain reacts by increasing its norepinephrine production through other mechanisms.



NEW EQUILIBRIUM

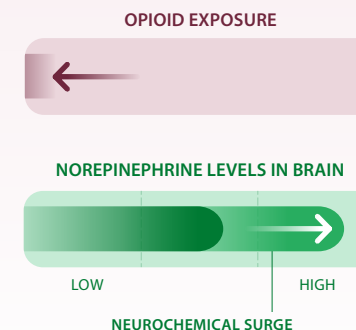
WITH CONTINUED OPIOID USE, the brain establishes new levels of norepinephrine, or a new equilibrium, to maintain normal and basic functions.



THE BRAIN MUST WORK HARDER THAN USUAL to maintain normal levels in the presence of opioids.

OPIOID WITHDRAWAL DUE TO NEUROCHEMICAL SURGE

WHEN OPIOIDS ARE REMOVED, the increased norepinephrine production is no longer offset, resulting in a neurochemical surge that produces symptoms of withdrawal.



OPIOID WITHDRAWAL is one of the most powerful factors driving opioid dependence and addictive behaviors. The management of opioid withdrawal syndrome can reduce physical and psychological barriers that prevent opioid discontinuation and can keep people engaged and retained in a full treatment experience. Appropriate management of opioid withdrawal syndrome is therefore central to successful discontinuation of opioids and moving toward recovery.

SYMPTOMS OF OWS INCLUDE:²

- Anxiety
- Yawning
- Perspiring
- Eyes tearing
- Runny nose
- Goosebumps
- Shaking
- Hot flashes
- Cold flashes
- Aching bones/muscles
- Restlessness
- Nausea
- Vomiting
- Muscle spasms
- Stomach cramps

REFERENCES: 1. Kosten TR, George TP. The Neurobiology of Opioid Dependence: Implications for Treatment. *Sci Pract Perspect.* 2002;1(1):13-20.
2. Handelsman L, Cochrane KJ, Aronson MJ, Ness R. Two new rating scales for opiate withdrawal. *Am J Drug Alcohol Abuse.* 1987;13(3):293-308.