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The Genetic Influences on Opiate Addiction
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Underlying Pathophysiology
Opioid work by binding to opioid receptors throughout the nervous and immune systems. Four major types of opioid receptors have been identified and include μ (mu), κ (kappa), δ (delta), and Η (nu) receptors. These receptors are the binding sites for endogenous peptides, specifically enkephalins, dynorphins and endorphins. These regulate many of the important functions of the body including pain, stress, temperature, respiratory drive, the endocannabinoid system, gastrointestinal motility, mood, and memory. The most common opiates that are abused are mostly μ-opioid receptor agonists. Thus, high-dose opioids are known to produce feelings of euphoria, and a decrease in anxiety (Dixon et al., 2017).

The μ-opioid receptor is bound by multiple opiate agonists such as morphine, heroin, and codeine. Opioid addiction is defined as a chronic, recurrent, severe primary disease characterized by a compulsion to seek addictive drugs in order to experience or avoid withdrawal symptoms (NCHS, 2014). When these genetic markers are added to the high-risk factors of developing addictions and previous studies, it provides the provider in the recognition of the problem and the development of a treatment plan.

Signs and Symptoms
- loss of ability to control or stop use
- blurred speech
- continuous, delayed responses
- itching or flushed skin
- physical pain
- continual use despite negative psychological effects
- impulsive and novelty seeking behavior
- decreased activity
- loss of friends
- decreased school or job performance
- increased economic and work problems
- decreased concentration
- development of tolerance
- withdrawal symptoms with anxiety and depression
- legal/financial/marital problems

Nursing Implications
The treatment of opioid addiction is a life-long battle with frequent relapses and high mortality and morbidity rates. Due to these poor demographics, the efforts of containing the current opioid crisis are focused on preventing further addiction. Medical providers must be educated on the risks and benefits of prescribing opioids. It is essential for prescribers to be up to date on the current recommendations and guidelines regarding opioid use and to only prescribe opioids to those that meet the most guidelines. Being aware of the genetic predispositions of various ethnic backgrounds and recognizing the signs and symptoms of behaviors highly associated with various genetic alterations and addiction can add to the provider in decision making. A thorough physical and psychiatric history and family history should be obtained on every patient prior to prescribing opioids to adequately assess the patient (Kolody et al., 2015).

Education is also key as it has been noted that more than 75% of those who abuse prescription pain medications originally obtained the medication from a friend or family member (Center for Disease Control & Prevention, 2015). Proper education regarding the risks associated with giving these medicines, especially to adolescents, is critical at preventing an addiction problem. Those who use prescription pain medications were not prescribed to them are four to nine times more likely to abuse heroin (Martin et al., 2016).

Conclusion
It is thought that genetic influences account for 40-60% of one’s vulnerability to addiction. These, combined with environmental influences including social, familial, work, and financial factors, help to determine the likelihood of addiction (National Institute on Drug Abuse, 2014). Having a strong knowledge of the genetic factors associated with an addiction can be of great value to a healthcare provider in decision making regarding treatment options. By identifying the genetic alterations and the effects they have on an individual, providers have the opportunity to provide individualized care targeted at those most susceptible to addiction (Levran, Yousef, & Krek, 2012).

Significance of Pathophysiology
References
Image retrieved from https://bluewatercenter.com/exploring-the-genetics-of-addiction-to-your-kids/
Image retrieved from https://emedicine.medscape.com/article/287790-overview
Image retrieved from https://dx.doi.org/10.1007/s00439-011-1172-4