

# Gracer Medical Group

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### How Buprenorphine Works

Buprenorphine (Subutex) is an FDA approved drug that is used to treat opiate (narcotic) dependence and prevent its relapse, to decrease the withdrawal symptoms when getting off opiates and in some specific circumstances to treat chronic pain. Suboxone contains buprenorphine and naloxone, a medication that blocks the action of narcotics, thereby decreasing the chance that an addicted individual will divert his medication or seek and use narcotics while in treatment.

### The Opiate Receptor System and Opiate Dependence

Visualize a rectangular green meadow about the size of a football field with, thick grass and soft earth. This represents the area of the brain in which the morphine (also known as opiate or narcotic) receptors are found. The meadow is mildly sloped with the left side being higher. At the left edge there is a box about the size of a hockey goal. This is the endorphin factory from which a steady stream of low weight green slippery bowling balls (the endorphins in this example) is emerging. Endorphins are natural compounds which we all produce. They act as the body's own morphine and pain killer and fill the same receptor sites that narcotic drugs stimulate. There are bowling ball sized indentations in the meadow which are the sites of the morphine receptors. We all need a significant percentage of these holes (receptor sites) to be filled to be comfortable. Since the balls are low in weight they do not cause their own new indentations and because they are slippery they do not stay in the indentations for long before they slide out of the holes and then off the right edge of the meadow.

There are sensors under the meadow, which measure the weight and number of balls on the meadow and how many of the receptor site holes are filled. When there are more balls the sensors slow down the production and release of the green endorphin balls and visa versa, thereby maintaining the number of receptor sites containing balls.

Under normal circumstances if there is pain, there is an increase in endorphin production. There is also an increase in production with exercise and pleasure or with pain. When many receptor sites are filled, one may feel a "natural high".

If the person is given or takes an opiate drug, such as heroin, morphine, methadone, oxycodone (Oxycontin), hydrocodone (Vicodin), hydromorphone (Dilaudid), or fentanyl (Duragesic) a large number of heavy black slippery bowling balls is released on the left edge of the meadow. (Visualize a dump truck which dumps its load at the left edge of the meadow.) These cover almost all of the receptor site holes. This fights the pain and can give the high associated with drug use. Because they are so heavy they stop endorphin production and the factory at the left edge of the meadow becomes dormant. In addition because they are so heavy they make new holes, which now have to be filled for the person to stay out of drug withdrawal. If the drug use persists the factory is “dismantled” and can lose its ability to produce any green balls. It may take a very long period of time for it to regenerate and in some cases it may never be able to function at its former level.

If the supply of “black balls” stops the now increased number of receptor sites rapidly become bare and the person starts to feel the symptoms of opiate withdrawal. (Remember that not only does there have to be enough balls on the meadow, but there also must be a significant percentage of the holes filled as well to be comfortable.) These include muscle and joint aches, tremors, nausea, diarrhea, sweating, severe anxiety, and insomnia. This sensation is very painful and most people will do almost anything to stop it. This is why drug addicts will steal, prostitute themselves, or even kill to get their “fix”.

Eventually, since there are no longer heavy black balls on the meadow’s surface the grass can regrow and the top soil can reaccumulate. The new holes will shrink and the number of holes that need to be filled for comfort will decrease. The endorphin factory will start producing green balls again and the system will get back into balance. This process usually takes a few days to at least start to normalize, but it may take weeks to fully stabilize. Sometimes, however, this may take quite a bit longer and as stated above, for some individuals it may never be normal again.

It may be possible to gradually reduce the opiate dose and allow a slow return to normalcy, but for many, this is very uncomfortable or even unbearable. There are also those who either will never be able to produce the amount of endorphins they need to be comfortable or in whom the number of receptors is chronically increased. Many of these persons will become drug seekers or will go back to using opiates with any stress, either physical or emotional. Stress or pain potentiates the opiate receptors, causing them to require increased stimulation for the person to be comfortable.

### **Buprenorphine**

Buprenorphine is termed a partial agonist (stimulator) for the opiate receptor. The opiates themselves are full agonists. This means that they stimulate the receptor

and fully occupy the receptor area. The more that one takes, the more the receptor is stimulated, the stronger the drug effect and the more “holes” are created. A partial agonist occupies the receptor site, but only partially stimulates it. After a certain amount of buprenorphine is present adding more makes no difference and therefore taking more has no additional effect. This is called a “ceiling effect”. Buprenorphine eliminates the withdrawal sensations and treats pain, but only to a certain extent.

Picture light weight sticky blue bowling balls that fill the holes and eliminate the withdrawal symptoms. Since they are sticky they stay in the receptor holes and therefore the effect is long lasting. Once a blue ball occupies the hole a dose of an opiate (black balls) is blocked from getting into the receptor, thereby blocking the action of any opiate that the person might take while on buprenorphine. Since the blue balls are lightweight they do not create more holes themselves.

If there are heavy black balls in the receptor holes, the blue sticky buprenorphine balls can displace them and since the blue balls are only partial agonists, they can induce drug withdrawal. This is why it is so important that starting buprenorphine be timed correctly. This is why the first dose is almost always taken in the physician office so that any side effects can be handled correctly and safely. The first dose should be taken just as withdrawal starts; too early and acute withdrawal can be induced, too late causes needless suffering.

Since the blue balls are lighter in weight than the black balls, the meadow can slowly regenerate, although this is still a slow process. Since the blue balls stick in the receptors and “cover” the receptor holes drug craving is either markedly reduced or in most cases eliminated.

The buprenorphine dose can be slowly reduced, but as I noted earlier, there are many individuals who will never completely regenerate their ability to make endorphins and in whom the meadow is perpetually scarred (the holes do not disappear). For them it may be necessary to continue treatment indefinitely.

### **Suboxone**

Buprenorphine is used to treat opiate addicted persons who have the potential to relapse into drug abuse and addictive behavior. Many of these patients have been long time drug abusers. A common method of “getting high” is to crush, dissolve and then inject an oral medication. Suboxone contains buprenorphine and naloxone, a very strong opiate antagonist. An antagonist is a medication which fits into a receptor but which does not stimulate the receptor action. It blocks the ability of the agonist to enter and then stimulate the receptor. This blockades the usual action of the drug. In this case it prevents an opiate from stimulating the opiate receptor. If a person is currently taking opiates the antagonist can displace the narcotic and by blocking its action it can precipitate withdrawal. Naloxone is not absorbed orally and therefore does not interfere with

the buprenorphine action when taken through the usual sublingual route. If it is injected, however, it blocks any opiate or buprenorphine effect. This dramatically decreases the risk of abuse.

### **Getting Started on Buprenorphine**

For the reasons listed above, buprenorphine must be started carefully and under direct medical supervision. The patient must have the narcotic that they have been taking out of their system, but not have severe withdrawal symptoms. The first dose is taken in the physician office. There are possible side effects and on rare occasions withdrawal symptoms can occur. The exact dose and schedule varies depending on the specifics of each situation. Please also see the Q and A sheet for more specific information on this medication and its use.